

An examination of the
Factors Influencing Nutrition and Food Choice of the population
in the United Kingdom (with particular reference
to the period since 1951¹ and to the influence
of nutritional knowledge upon choice).

being

a series of published papers

submitted for the degree of

Master

~~Doctor~~ of Philosophy

by

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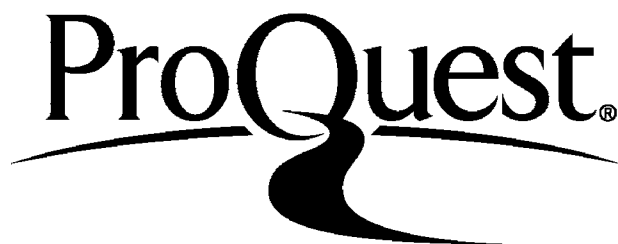
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SUMMARY

With the return of a free economy in the 1950's it became increasingly clear to nutritionists and health educators that freedom of choice to the consumer did not necessarily mean sound nutritional intake. The purpose of the research has been to explore the factors influencing choice during the period since 1953; to examine how past experience might be used to influence food choice and nutritional status in the future; and to establish the level of nutritional knowledge amongst the population and assess the impact of this knowledge on behaviour. It is hoped in this way to produce more effective guidelines by which food choice in the future may be influenced in the interests of health.

The methods used have involved historical reviews; the appraisal of data collected in the commercial world; nationally quantified surveys using structured questionnaires; studies in depth of various sub-groups; and the application of modern techniques and knowledge from a broad spectrum of the social sciences to the food and nutrition scene.

The research indicates:-

- the type of data to be collected before attempts at change are made;
- the sort of problems likely to emerge and provides suggestions of the ways change may be achieved;
- the level of nutritional knowledge during the period and a review of the extent to which it has influenced choice;
- the factors influencing food habits of minority groups and the research suggests they are unlikely to be helpful in changing habits of the country overall;

- new techniques for the study of historical and contemporary data in relationship to food consumption;
- the level of influence of price upon food choice.

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CHAPTER 1

INTRODUCTION

"The problem of what determines food habits and how they can be changed is of concern to the health of all mankind". - John Yudkin (1).

Nutrition is a relatively young science. But even younger is the recognition that the isolation of basic nutritional precepts and their communication to the community does not for many reasons necessarily lead to the modification of behaviour in the interests of better health.

This issue was of course to some extent recognised by implication in certain of the nutrition "classics" completed before the Second World War. Thus Boyd-Orr demonstrated very dramatically the influence of income upon diet and health in his survey of the British population in the mid-1930's (2). Again Drummond in his pioneering historical study referred generally to a number of the criteria that influence choice and which, by implication at least, might deter changes in behaviour in the interests of nutrition (3).

The problem was explored more specifically in a limited number of inter-disciplinary studies of food habits undertaken in the United States during the Second World War (4).

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1. John Yudkin, The Need for Change - Chapter in Changing Food Habits, edited by Yudkin and McKenzie, (1964).
 2. John Boyd-Orr, Food Health and Income, (1936).
 3. J.C. Drummond and A. Wilbraham, The Englishman's Food, (1939).
 4. National Research Council Bulletin 108, The Problem of Changing Food Habits, (1943).

But although many in their practical attempts to improve nutritional status in the decade immediately following the Second World War also identified the same phenomenon, research was not continued in any systematic way in the early post-war years. It was generally felt that increasing prosperity would bring improved nutritional status.

In consequence, the basic problem was not as such specifically isolated and stated in any sort of comprehensive form until the International Conference held in Cuernavaca, Mexico in 1960. This Conference was sponsored by the Josiah Macey Junior Foundation and supported by the Food and Agricultural Organisation, The World Health Organisation, The Pan American Health Organisation and the United Nations Childrens Fund (5).

Equally the necessity to fully understand the factors influencing individual food choice, and how they might be influenced was an area identified and explored by Professor John Yudkin in his inaugural lecture following his appointment to the Chair of Nutrition at the University of London in 1956 (6).

It was in such a context that I was appointed as Research Sociologist within the Nutrition Department at Queen Elizabeth College, University of London with the brief to lecture and develop research on the social and economic aspects of nutrition.

I took as my base point for the development of research some of the key findings identified by the distinguished gathering of delegates at the Cuernavaca Confernece. Their view was that any real success in increasing the nutritional

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5. A. Burgess and R.F.A. Dean, Malnutrition and Food Habits, (1962).
 6. John Yudkin, Man's Choice of Food, in the Lancet (1956).

value of the diet could only be achieved by "a knowledge of the cultural, social and economic factors underlining the existing food habits". They believed that this provided an "almost infinite scope for research"; that "techniques for the observation of social and nutritional change must be perfected"; and that "more knowledge of every detail of social organisation and the significance of food habits is an essential pre-requisite for the guided change".

Above all they argued that the "study of the social psychology of food habits or nutrition is much needed, but at present does not exist as a separate discipline. Anthropologists, Sociologists and Psychologists have collected many relevant data, but the collection has not been systematic".

All of this led me to develop a research philosophy which attempted to integrate my own social science background with the science of nutrition and to try to relate historical, sociological, economic and psychological aspects into one discipline for the development of work in this field.

It also led me to determine to pursue research in a limited number of key related areas. These were:-

- An examination of what we can learn from historical analysis of the factors that influence people's food habits and how they may change;
- An examination of the levels of nutritional knowledge and related food imagery of the U.K. population; the extent to which this influences food choice; and how knowledge may be increased and influence improved;
- The study of minority groups to determine what has led to their different food patterns from the community at large, and what we may

learn from this about them as individuals and about the food habits of the community as a whole;

- The significance of price as a weapon in influencing consumer food patterns.

Thus the overall objective of this research was to explain the factors influencing food habits of the U.K. population since the end of rationing in 1953 and to isolate the ways in which these habits might be changed in the interests of improved nutritional status. This has continuously remained my primary research interest and has always involved an inter-disciplinary approach.

It is in this context that the current set of 34 papers now presented together with their related commentary should be read. The papers divide consistently within the emphases identified above and as such Chapter 2 comprises four separate sections dealing with Historical Factors; Nutritional Knowledge; Minority Groups; Price.

Each section is preceded by a summary which indicates:-

- The purpose of the research;
- The methodology embraced;
- The papers included, the source of the publication and the extent to which each is based upon original research or critical review;
- Specific conclusions that may be derived from this section of the work.

In Chapter 3 an attempt is made to identify the main overall conclusions emerging from the research papers as a whole, in part by reference to further published papers (3 in number) and in part by a brief overall evaluation of the

work. A justification of why it is felt that the papers satisfy the Ph.D. requirements of the University of London is also given.

The papers are not presented chronologically in terms of publication, but rather in the order that best demonstrates the overall coherence and developing programme of research and evaluation undertaken by the Candidate. However because the study represents a series of related, but separate, published papers, it is recognised there are inevitable elements of overlap between them as the context for each paper is set and the conclusions and interpretations of one are passed into the development and evaluation of the next.

Where co-joint publications are included the work has been undertaken equally between the individuals specified.

The work reflects the long period of my association with Queen Elizabeth College, starting with my appointment as Research Sociologist in the Nutrition Department and culminating in 1977 with the conferrment of the title of Visiting Professor in Social and Economic Aspects of Food Habits and Nutrition on me by the College.

CHAPTER 2

RESEARCH RESULTS

Section A - Historical Research

1. Purpose of the Research

There were two main objectives for these studies. Firstly it provided an opportunity to examine the extent to which historical analysis may isolate the various factors that appear to influence consumer choice. Secondly it allowed for the analysis of moments of change - situations where change is forced upon the consumer and the repercussions this has in terms of food consumption behaviour.

In this way it was hoped to provide knowledge that would aid attempts to influence choice in the future, although recognised from the outset that such an approach might only have a limited influence when placed in some future context.

2. Methodology

Standard historical research techniques were involved - the isolation and analysis of contemporary data and the review of both published contemporary and current commentary. Each paper indicates the procedures adopted for original research within that specific piece of work.

3. Papers Included

Paper 1: The composition and nutritional value of diets in Manchester and Dukinfield in 1841 (in Transactions of the Lancashire and Cheshire Antiquarian Society, Volume 72, 1965).

- Paper 2: Diets in Manchester and Dukinfield in 1841 (in Proceedings of the Nutrition Society, Volume 25, 1966).
- Paper 3: Food Trends: The Dynamics of Accomplished Change (Chapter in Changing Food Habits, edited by Yudkin and McKenzie, London, 1964).
- Paper 4: Past Dietary Trends as an Aid to Prediction (Chapter in Our Changing Fare, edited by Barker, McKenzie and Yudkin, London, 1966).
- Paper 5: Introduction - Urbanization and Rising Earnings, co-jointly with T.C. Barker (Chapter in Our Changing Fare, edited by Barker, McKenzie and Yudkin, London, 1966).

Papers 1 and 2 primarily involve analysis of early 19th century documents and involve the use of new methods for the calculation of dietary analysis and the comparison of these diets with the current situation.

Paper 3 is primarily a review article involving analysis of published data from international sources over a wide time period. Some new research is reported, in particular reference to housewives' use of recipes and to levels of nutritional knowledge. A considerable proportion of previously unpublished research data is also embraced.

Paper 4 is again a review of published and unpublished data on an international basis. It also provides the first statement of the "Public Conception of Food Categories" which was to become a plank for much of the Candidate's later research.

Paper 5 is an attempt by Professor Barker and the Candidate to place the historical studies within their

appropriate context.

4. Specific Conclusions

Each paper isolates within it the key findings of the research involved. Overall the most important findings would seem to be:-

- That historical analysis provides a significant amount of relevant information concerning the factors which influence choice, the impact of sudden change and the problems that must be avoided if change is to be effectively influenced by the Nutritionist;
- An indication of the importance of the established order or "habit" on choice;
- The isolation of methodology for analysis of historical diets and for comparison with contemporary developing country situations (subsequently extended in considerable depth by others in research theses and publications); (1)
- Further affirmation that in moments of crisis, consumers do not move to the most economic or the most nutritionally effective diet;
- The establishment of a model demonstrating the overall conceptual role of food categories for aiding understanding of factors influencing consumer choice;

1. For example: University of London Ph.D. thesis by D.J. Oddy; The Dietary Surveys of Edward Smith 1862-63, Barker, Oddy and Yudkin, (1970).

- The clarification of the distinction between attitude and behaviour in terms of education, both as regards nutritional knowledge and the use of recipes;

- The establishment of certain criteria likely to determine acceptance of new food products.

THE COMPOSITION AND NUTRITIONAL VALUE OF DIETS IN MANCHESTER AND DUKINFIELD 1841

By J. C. McKENZIE, B.Sc.(Econ.)

1. INTRODUCTION

ONE OF THE major controversies of English economic history has centred upon the reasons for population growth in the eighteenth and nineteenth centuries. Perhaps the most important recent contributions to the discussion have been those of Professor Thomas McKeown and his colleagues, themselves teachers of social medicine, who have argued that medical improvements played an insignificant part in bringing about the all important fall in death rate and that improvements in environment are to be regarded as intrinsically the most acceptable explanation. Even at the very end of the nineteenth century, they believe, changes in environment and improvements in diet were more significant factors than the doctors' still fumbling, though by then better informed, attempts to save the sick from dying. In a sense, however, their conclusions are based upon the destruction of the arguments in favour of two other possible causes of a reduction in mortality, namely, specific medical therapy and changes in the balance between the virulence of the infective organism and its host, rather than on the construction of an extensive thesis in favour of environmental improvement.

One important aspect of any such thesis is that the extent and quality of the diet must have been good enough to maintain health, and indeed that it must have visibly improved in the eighteenth and early nineteenth century. Changes in diet have been touched upon by a number of those who have engaged in the discussion about standards of living during the Industrial Revolution. In particular Professor Ashton has produced indices of the changing costs of various foods in South Lancashire between 1791 and 1831². More recently in the *Economic History Review*, Dr. Hobsbawm and Dr. Hartwell have put forward very different points of view³. Hartwell states that 'the conclusion from consumption figures is unquestion-

¹ T. McKeown and R. G. Brown, 'Medical evidence related to English population changes in the eighteenth century', *Population Studies*, IX (1955).

T. McKeown and R. G. Record, 'Reasons for the decline of mortality in England and Wales during the nineteenth century', *Population Studies*, XVI (1962).

² T. S. Ashton, 'The standard of life of the workers in England 1790—1830' in F.A. Hayek (ed.), *Capitalism and the historians*, Chicago (1954).

³ E. J. Hobsbawm, 'British standard of living, 1790—1850', *Economic History Review*, X, No. 1, 1957. R. M. Hartwell, 'Rising standard of living in England, 1800—1850', *Economic History Review*, XIII, No. 3, 1961.

ably that the amount and variety of food consumed increased between 1800 and 1850'. On the other hand, Hobsbawm concludes that 'the discussion of food consumption thus throws considerable doubt on the optimistic view'. It is not therefore surprising that Dr. Eversley of Birmingham should have commented that 'there is need for closer study of contemporary evidence on changes in food and drink'⁴.

There seems particular need for detailed study of three aspects which have so far been neglected. In the first place, the result of attempts to cover a wide field of research and make sweeping generalisations regarding the whole economy has been to neglect the detailed information available from surveys of particular localities. Likewise, little attempt has been made to think in terms of nutritional value and to apply techniques now commonly used by nutritionists for analysing present day diets. As yet the only attempt to analyse past diets with such techniques has been undertaken in the revised version of *The Englishman's Food*⁵. Whilst all praise must be given to this pioneering book on food history, it must be accepted, both that the interpretation of economic history has been considerably modified since its first publication, and that the diets examined in nutritional terms are of an extremely specialised nature (e.g. the Navy Ration of 1811 and Sir James Graham's prison diet of 1843) and hence the results may be of limited value. Thirdly, there is room for comparison of food intake and nutritional status of given groups in the nineteenth century with the present position, both in developed and developing society, and with other periods of time such as the nineteen thirties. In this way, something of the nineteenth century standard of living may be envisaged, as it were, by showing how far it differs from periods with which we are more familiar.

2. WILLIAM NEILD AND HIS SURVEY

This paper attempts to discuss some of these aspects with regard to diets in Manchester and Dukinfield in 1841. The data were taken from a paper read by William Neild to the statistical section of the British Association, and later published by the Royal Statistical Society⁶.

William Neild was born on 24 January 1789 at Millington, parish of Rosthern, Cheshire. In 1816 he married Mary Royle of Manchester. At the time he was working as a fustian manufacturer,

⁴ D. E. C. Eversley, 'Population and economic growth in England before the take-off', *Communication to the first International Congress of Economic History*, Stockholm (1960).

⁵ Sir John Drummond and Anne Wilbraham, *The Englishman's food*, revised by D. F. Hollingsworth, London (1957).

⁶ W. Neild, 'Comparative statement of the income and expenditure of certain families of the working class in Manchester and Dukinfield in the years 1836 and 1841', *Journal of the Royal Statistical Society*, IV (1841-2).

but he later became a partner in his father-in-law's calico printing firm. He was a Whig, and for many years a Quaker, but he left the Society at the time of the Beacon controversy. Neild was very active in public affairs in Manchester, being an Alderman, and chairman of the Watch Committee for many years, and Mayor of Manchester in 1840-1 and 1841-2. He was also prominent in the affairs of the Police Commissioners and was chairman of the Royal Lancasterian Free School, opened in 1809. He worked increasingly for municipal reform and was one of the prime agitators for incorporation as a borough which was granted in 1838. Neild died at a New Town Hall Sub-Committee meeting on 4 April 1864⁷.

In the survey we are now considering, it seems that Neild made every effort to obtain an accurate assessment of the income and expenditure of the workers concerned.

To insure to such statements as much accuracy as possible, some precautions are necessary in collecting the information. The husband can rarely furnish any statements in detail; it is better in nearly all cases to apply to the wife. She has her character however, as an economical manager at stake, and requires cross-examining to elicit the exact expenditure. Without this she is also liable to err, not from any wish to mislead, but from mere want of caution and sufficient thought. In several cases the books of the shopkeepers were examined, and compared with the statements given by the parties themselves.⁸

Neild's concern was to analyse the whole field of income and expenditure of twelve families of Manchester and seven in Dukinfield and, in particular, to compare the position in 1836 with that in 1841. The Manchester families 'were selected because they were of sober and industrious habits. Their employment also during the general depression which has for some time existed in the trade of this district, has been almost uninterrupted and their weekly wages have remained the same'; the Dukinfield families '... as instances more nearly approaching to the general state of the cotton trade ... and (the wages) of the seven were reduced in common with those of the generality of the working class in the cotton trade. It should be remarked however that these seven cases will furnish a decidedly favourable instance of the branch of the trade as they have suffered much less from reduced hours of labour than many similarly employed'⁹. This must be noted in considering the findings of the survey. The diets are certainly those of working class, but they do not portray the position of those in the direst poverty, who had lost their employment as the result of the depression.

Neild never dealt specifically in terms of food quantities, and he analysed each family in terms of expenditure. However, in a separate table he indicated the retail price in Manchester of most

⁷ Obituary notice in *Manchester Guardian*, 5 April 1864.

⁸ W. Neild, *op. cit.*, 322.

⁹ *Ibid.*, 321.

TABLE 1
FAMILIES STUDIED BY NEILD

Occupation of Head of Family	Size of Family	Income of Family	Expenditure of Family
A. MANCHESTER			
1. Machine Printer	9	£4 7s. 0d.	£2 15s. 8d.
2. Millwright	10	£4 10s. 0d.	£2 9s. 7d.
3. Watchman	2	15s. 2d.	13s. 4d.
4. Storeman	8	£2 17s. 0d.	£2 0s. 1d.
5. Washer	2	14s. 0d.	11s. 4d.
6. Overlooker	6	£1 14s. 0d.	£1 7s. 10d.
7. Labourer	4	£1 2s. 0d.	19s. 1d.
8. Labourer	4	£1 1s. 0d.	£1 1s. 3d.
9. Dyer	10	£2 0s. 0d.	£1 19s. 0d.
10. Blue Dipper	5	£1 0s. 0d.	£1 0s. 8d.
11. Watchman	7	£1 1s. 0d.	£1 1s. 10d.
12. Dyer	9	£1 3s. 0d.	£1 10s. 0d.
B. DUKINFIELD			
13. PowerLoom Weaver	3	14s. 4d.	17s. 4½d.
14. Dresser	6	£1 4s. 0d.	£1 1s. 1½d.
15. Labourer	6	18s. 8d.	£1 4s. 3d.
16. Card Room Hand	3	8s. 8d.	11s. 4d.
17. Spinner	5	14s. 4d.	19s. 2d.
18. Warehouseman	4	10s. 8d.	14s. 6d.
19. Mechanics Asst.	7	16s. 0d.	£1 0s. 4½d.

articles listed in household expenditure¹⁰. Thus, if it is known that a machine printer with a family of eight spent 2s. on milk per week, and that milk was 1½d. per pint, it is a simple matter to redraw Neild's household accounts in terms of quantities. No price figures are given for Dukinfield and the figures for Manchester are therefore used for these families as well. It may be that the prices for Dukinfield, some seven miles from Manchester, would have been slightly lower, and therefore quantities may have been slightly underestimated for this area. Occasionally, no price figures are given for a commodity and an estimate has had to be made. The account for family 13 is not clear and this has not been used.

Neild found it impossible to obtain details of purchases for the earlier year and the method he used was to take consumption figures as constant for the two periods and merely show the impact of changing prices. Consequently, there is no value for the purposes

¹⁰ *Ibid.*, 332.

TABLE 2
PRICES OF COMMODITIES INCLUDED IN THE SURVEY

Article	Retail Prices 1841 (Neild)	Price Used in Calculation
Flour per 12 lb.	2s. 4d. to 2s. 7d.	2s. 5½d.
Meat per lb.	8d. to 8½d.	8¼d.
Bacon per lb.	7d.	7d.
Ham per lb.		7d.*
Oatmeal per 10lb.	1s. 4d.	1s. 4d.
Butter per lb.	1s. 0d. to 1s. 1d.	1s. 0½d.
Eggs per doz.		3d.*
Milk per pint	1½d.	1½d.
Potatoes per 20 lb	11d. to 1s. 0d.	11½d.
Cheese per lb.		1s. 0½d.*
Tea per lb.	5s. 0d.	5s. 0d.
Coffee per lb.	2s. 0d.	2s. 0d.
Sugar per lb.	8d. to 9½d.	8¾d.
Treacle per lb.	3½d.	3½d.
Salt per 4 lb.	1d.	1d.

* estimated cost

of this paper in comparing the two periods, and use is made only of the 1841 figures.

An analysis of the nutrient content of present day foods was made by Professor McCance and Dr. Widdowson in 1960¹¹. For the purpose of this study it is assumed that, weight for weight, nutrient content is the same for the foods mentioned in Neild's survey. In this way it is possible to analyse the significance of any food, not only in terms of cost and quantity consumed, but also in terms of the proportion of total calories, protein, iron and vitamin C it provides in the diet.

3. COMPOSITION OF DIET

It may be seen that on whatever basis you assess the importance of a food, be it expenditure, calorie or protein value, flour (mostly in the form of bread) emerges as the major staple. On average a person in this survey ate over 5 lb. per week and this accounted for one third of total food expenditure. In no household was the quantity consumed less than 4 lb. per head per week. On average flour provided over 50 per cent of the calories and 40 per cent of the protein and iron in the diet.

Aikin in 1795, after his story of attempted monopoly in the eighteenth century, commented on the extensive and growing demand for flour in Lancashire. 'Since that time the demand for corn and flour has been increasing to a vast amount, and new sources of supply have been opened from distant parts by navigations, so that monopoly or scarcity cannot be apprehended, though the price of these articles must always be high in a district which

¹¹ R. A. McCance and E. M. Widdowson, *The composition of foods*, H.M.S.O. (1960).

produces so little and consumes so much¹².

The average figure for flour consumption of 270 lb. per head per annum may be contrasted with one for wheat of 280 lb. in 1880. From then cereal consumption declined to 210 lb. per head per year in 1934-38 and 181 lb. in 1960. This was interspersed, however, by a temporary rise during the second world war to 251 lb. in 1941. In 1841 one quarter of food expenditure was on cereals whereas by 1932-35 it was only about one-eighth¹³.

TABLE 3
BREAD AND FLOUR*

	lb. per head per week	Cost per head per week (shillings and pence)	Percentage of total expenditure	Percentage of total food expenditure	Percentage of total protein	Percentage of total calories	Percentage of total iron	Percentage of total vitamin C
Average for all Families	5.4	1s. 1d.	25	33	44	53	39	0
Average for Manchester Families	5.9	1s. 2d.	26	33	43	53	39	0
Average for Dukinfield Families	4.3	10½d.	24	33	45	52	38	0
Family 1	6	1s. 2½d.	19	24	37	48	39	0
2	7	1s. 4d.	27	35	46	62	45	0
3	6	1s. 2d.	18	25	35	43	33	0
4	6	1s. 3d.	25	29	41	53	39	0
5	7	1s. 4d.	22	31	47	58	41	0
6	5	11½d.	21	29	39	51	39	0
7	6	1s. 1½d.	25	32	42	48	33	0
8	6	1s. 2¼d.	23	29	43	58	46	0
9	6	1s. 3¼d.	33	39	49	54	41	0
10	6	1s. 3d.	30	38	44	50	36	0
11	5	1s. 0¾d.	35	44	52	56	41	0
12	5	1s. 0d.	30	35	45	52	38	0
14	4	10d.	24	33	48	52	39	0
15	5	1s. 0d.	25	32	39	48	35	0
16	5	11½d.	24	33	51	58	44	0
17	4	9¼d.	20	33	46	53	41	0
18	4	10¼d.	24	33	43	50	36	0
19	4	9d.	26	35	42	50	35	0

*Variations in price for quantity are due to estimation of quantity to nearest lb. and of cost to nearest farthing.

¹² J. Aikin, *Description of the country from thirty to forty miles round Manchester* (1795).

¹³ *The Englishman's food*. Ministry of Agriculture, Fisheries and Food, *Domestic food consumption 1960*, H.M.S.O. (1962).

TABLE 4
POTATOES*

	lbs. per head per week	Cost per head per week (pence)	Percentage of total expenditure	Percentage of total food expenditure	Percentage of total protein	Percentage of total calories	Percentage of total iron	Percentage of total vitamin C
Average for all Families	5.2	3d.	6	8	11	13	17	100
Average for Manchester Families	5.9	3½d.	6	8	12	14	18	100
Average for Dukinfield Families	3.7	2½d.	5	7	10	11	15	100
Family 1	6	3½d.	4	5	11	14	17	100
2	4	2½d.	4	5	8	10	13	100
3	7	4d.	5	7	12	14	20	100
4	8	4½d.	8	9	14	17	22	100
5	5	3d.	4	6	10	11	14	100
6	6	3½d.	6	9	13	16	22	100
7	6	3½d.	6	8	12	18	16	100
8	3	1½d.	2	3	5	6	8	100
9	6	3½d.	7	9	13	14	19	100
10	9	5½d.	11	14	18	19	24	100
11	4	2½d.	6	8	11	11	14	100
12	7	4d.	10	12	15	12	22	100
14	3	2d.	5	7	10	11	15	100
15	5	3d.	6	8	11	13	17	100
16	3	2d.	4	6	10	10	14	100
17	3	2d.	4	6	9	10	13	100
18	5	2½d.	6	8	12	14	17	100
19	3	1½d.	4	6	8	9	11	100

*Variations in price for quantity are due to estimation of quantity to nearest lb. and of cost to nearest farthing.

There was an average consumption, of approximately 5 lb. of potatoes per head per week and this provided some 20 per cent of the total calorie and protein intake. The potato was virtually the only source of vitamin C in the diet. This was at the cost of only some 8 per cent of total food expenditure.

This picture must be considered in the light of many commentaries which have been made on potato consumption in the nineteenth century. Drummond stated that 'the potato meant a great

deal to the poor people of the towns at this time, which was why the devastating epidemic of potato disease in 1845-46 had such terrible consequences¹⁴. Similarly Hobsbawm argues that 'wheat production and imports did not keep pace with the growth of population so that the amount of wheat available per capita fell steadily from the late eighteenth century until the 1850's, the amount of potatoes available rising at the same time . . . somebody must . . . have shifted away from wheat; presumably to potatoes'¹⁵. When it is considered that, in terms of expenditure, calories and protein, the potato is of subsidiary importance to cereals, it seems likely that these statements overemphasised the role of the potato, at least in the diet of Lancashire workers. Certainly this is so if we disregard its function as a provider of vitamin C. Similar conclusions have recently been reached in Holland where, in the eighteenth century, increasing use of potatoes did not lead to a decrease in the consumption of cereals¹⁶.

The yearly consumption of 270 lb. may be compared with one of 296 lb. in 1880 and the present figure of 220 lb. Unlike bread consumption, which is falling, potato consumption in this country now seems to be fairly static¹⁷.

In many of the households studied in 1841 well over forty per cent of food expenditure was on bread and potatoes, but there was no increase in consumption of the two commodities with a fall in income; indeed, if anything, consumption declined. This is of some importance, since a number of historians have assumed that bread and potatoes are the supreme 'filling foods' and that in periods of hardship people will more and more buy these cheap foods in preference to more expensive items. Engels stated 'the less meat they can afford, the more bread and potatoes they eat'¹⁸. However, many cases of similar reactions to those in 1841 may be found in more recent surveys, such as Orr's survey of diet in the nineteen-thirties. Here the poorest group were also shown to be eating less of these foods than more prosperous groups¹⁹. In times of hardship people often prefer to cut down on all sorts of foods and not just the more expensive ones.

Although the quantity of meat consumed was small—an average of only 1 lb. per head per week, and one family as low as 5 oz. per head per week—meat still played an important part in the diet. The fact that 25 per cent of the protein and nearly 20 per cent of

¹⁴ *The Englishman's food*, 1939 edition.

¹⁵ Hobsbawm, *op. cit.*

¹⁶ A. M. Van der Worde, 'De consumptie van graan, vlees en boter in Holland op het einde van de achttiende eeuw', *A. A. G. Bijdragen* (1963), 9.

¹⁷ *The Englishman's food*, 1957 revision.

Domestic food consumption 1960.

¹⁸ F. Engels, *The condition of the working class in England*, translated and edited by W. O. Henderson and W. H. Chaloner, Oxford (1958).

¹⁹ J. Boyd-Orr, *Food, health and income*, London (1936).

TABLE 5
MEAT*

	lbs. per head per week	Cost per head per week (shillings and pence)	Percentage of total expenditure	Percentage of total food expenditure	Percentage of total protein	Percentage of total calories	Percentage of total iron	Percentage of total vitamin C
Average for all Families	1.0	8½d.	15	18	25	8	19	—
Average for Manchester Families	1.2	9½d.	16	19	26	9	21	—
Average for Dukinfield Families	0.7	5½d.	13	18	23	7	17	—
Family 1	2.2	1s. 5½d.	24	26	42	15	37	—
2	1.7	1s. 1½d.	23	28	35	13	29	—
3	1.4	11d.	14	16	28	9	22	—
4	2.0	1s. 4½d.	28	29	42	15	34	—
5	1.0	8d.	12	16	21	7	16	—
6	1.2	10d.	18	23	30	11	25	—
7	0.7	6d.	11	14	17	5	11	—
8	1.7	1s. 2d.	22	28	37	14	34	—
9	0.7	5½d.	12	14	17	5	12	—
10	0.7	5d.	10	12	15	5	11	—
11	0.3	2½d.	6	8	10	3	7	—
12	0.5	4d.	10	12	13	4	9	—
14	0.7	5d.	12	18	25	7	17	—
15	0.8	6½d.	13	17	19	6	15	—
16	0.8	6½d.	14	18	28	9	20	—
17	0.7	5½d.	13	18	23	7	17	—
18	0.7	5½d.	13	18	23	7	16	—
19	0.6	4½d.	12	17	20	7	14	—

*Variations in price for quantity are due to estimation of quantity to nearest one place of decimals, and of cost to nearest farthing.

the iron came from this source is evidence enough to discard the view that meat had no role to play.

However, it is equally true that meat supplies were very scarce at times. Aikin, fifty years earlier, stated 'the supply of meat and poultry is sufficiently plentiful on market days, but on other days it is scarcely possible to procure beef from the butchers; nor is poultry to be had at any price, there being no such trade as a poulterer in the whole town'²⁰.

²⁰ J. Aikin, *op. cit.*

It is noticeable that there was a fall in consumption of meat with a fall in income and the situation may have become worse for those who were unemployed. This gives weight to the view of Engels that 'the lowest paid workers have meat only two or three times a week and sometimes only on Sundays'²¹.

There was little difference in meat consumption from that of the poorest classes in the 1930's. Today, average consumption is over double that of 1841 and is much more uniform throughout all

TABLE 6
BUTTER*

	lb. per head per week	Cost per head per week (pence)	Percentage of total expenditure	Percentage of total food expenditure	Percentage of total protein	Percentage of total calories	Percentage of total iron	Percentage of total vitamin C
Average for all Families	0.4	4½d.	8	11	—	8	—	—
Average for Manchester Families	0.4	4½d.	8	11	—	8	—	—
Average for Dukinfield Families	0.3	3½d.	8	11	—	8	—	—
Family 1	0.6	8d.	11	13	—	14	—	—
2	0.3	3½d.	6	8	—	6	—	—
3	0.5	6d.	8	11	—	8	—	—
4	0.5	6d.	10	12	—	10	—	—
5	0.5	6d.	9	12	—	9	—	—
6	0.3	4d.	7	9	—	8	—	—
7	0.4	4½d.	8	11	—	7	—	—
8	0.5	6d.	9	12	—	10	—	—
9	0.4	5d.	10	18	—	9	—	—
10	0.3	3½d.	7	9	—	5	—	—
11	0.1	1½d.	5	6	—	3	—	—
12	0.2	2½d.	6	8	—	5	—	—
14	0.3	4d.	10	13	—	9	—	—
15	0.3	4d.	8	11	—	7	—	—
16	0.3	4d.	9	11	—	9	—	—
17	0.3	3½d.	8	11	—	8	—	—
18	0.2	3d.	7	9	—	6	—	—
19	0.2	2½d.	6	8	—	6	—	—

*Variations in price for quantity are due to estimation of quantity to nearest one place of decimals, and of cost to nearest farthing.

²¹ Engels, *op. cit.*

classes of the population. The figure of 18 per cent of food expenditure was below that of 27 per cent for 1932-35 and 23 per cent for 1950²².

The consumption of butter is always closely related to that of bread, but bearing in mind the quantities of cereals consumed, the figure for 1841 was not high. The figure of nearly 7 oz. per head per week for a cereal consumption of over 5 lb. must be compared

TABLE 7
SUGAR*

	lb. per head per week	Cost per head per week (pence)	Percentage of total expenditure	Percentage of total food expenditure	Percentage of total protein	Percentage of total calories	Percentage of total iron	Percentage of total vitamin C
Average for all Families	0.4	3½d.	6	8	—	5	—	—
Average for Manchester Families	0.4	3½d.	6	8	—	4	—	—
Average for Dukinfield Families	0.4	3d.	7	9	—	6	—	—
Family 1	0.7	6d.	8	10	—	7	—	—
2	0.3	2½d.	4	5	—	3	—	—
3	0.9	7½d.	9	14	—	8	—	—
4	0.4	3½d.	6	7	—	4	—	—
5	0.6	5d.	7	10	—	5	—	—
6	0.5	4d.	7	9	—	5	—	—
7	0.4	3d.	6	7	—	4	—	—
8	0.2	2d.	3	4	—	2	—	—
9	0.4	3d.	7	12	—	4	—	—
10	0.3	2½d.	5	6	—	3	—	—
11	0.3	2½d.	7	10	—	4	—	—
12	0.2	1½d.	3	4	—	2	—	—
14	0.4	3½d.	8	11	—	6	—	—
15	0.2	2d.	4	5	—	3	—	—
16	0.5	4d.	8	11	—	7	—	—
17	0.4	3½d.	7	10	—	8	—	—
18	0.4	3d.	7	9	—	5	—	—
19	0.2	2½d.	6	8	—	4	—	—

*Variations in price for quantity are due to estimation of quantity to nearest one place of decimals, and of cost to nearest farthing.

²² Boyd-Orr, *op. cit.* *Domestic food consumption 1960*, Ministry of Food, *Domestic food consumption 1950*, H.M.S.O. (1951).

with the present consumption of over 9 oz. of butter and margarine for a bread consumption of under 3 lb.²³ Hobsbawm is incorrect when he states that in Dukinfield and Manchester in 1836 outlays on it were comparable to those on meat, 'and that it was considered a greater necessity than meat'²⁴. The 1841 figure is closely similar to that given by Hartwell for Londoners of approximately the same period of time²⁵.

Of the five major foods analysed in detail, sugar was of least importance. The average figure of just under 7 oz. which provided five per cent of the calories must be compared with the present figure of 35 oz. giving twenty per cent of the calories²⁶. This indicates the widespread and growing demand for sugar over the past hundred years. Professor Yudkin in a recent thesis concerning sugar consumption states that 'the wealthier countries consume more protein and fat, and less starch, than the poorer countries. But another factor emerges when one studies these diets more closely. Increasing wealth leads to an increase in the consumption of sugar as well as of protein and fat . . . In Britain our consumption is now at the rate of something like 120 lb. per head a year, or a kilogram a week. We eat in two weeks the amount of sugar our ancestors of 200 years ago ate in a whole year'²⁷.

OTHER FOODS

Limited quantities of other foods were included in the diet. A weekly average of nearly 10 oz. of oatmeal was consumed, but in practice only some eleven households were buying this food.

There was an average consumption of 1.4 eggs per head per week but these were in fact consumed by some 6 families. There is therefore justification for Hobsbawm's comment that 'Eggs seem to have been of small importance'. He is probably equally right in indicating a decline in milk consumption²⁸. Certainly with an average consumption of only 1.6 pints per head per week, and with two families buying no milk at all, it could hardly have been increasing. This is similar to the figure of 1.7 pints per head in the poorest groups surveyed by Boyd Orr but is very different from the present average of 5 pints per head per week²⁹.

Engels implied that the poor worker substituted cheese for meat but this does not appear to be the case in the Manchester diets; of ten families purchasing cheese, consumption was higher amongst those with the higher income³⁰. The overall average of 1.3 oz. per

²³ *Domestic food consumption 1960.*

²⁴ Hobsbawm, *op. cit.*

²⁵ Hartwell, *op. cit.*

²⁶ *Domestic food consumption 1960.*

²⁷ J. Yudkin, Nutrition and palatability, *Lancet* I, 1335 (1963).

²⁸ Hobsbawm, *op. cit.*

²⁹ Boyd-Orr, *op. cit.*

³⁰ Engels, *op. cit.*

head per week was below the 1960 figure of 3 oz. but compared favourably with the poorer groups analysed by Orr³¹.

With regard to tea drinking, Drummond felt that by this time consumption was enormous and later it increased still more until by 1871 it was nearly 4 lb. per head of the population. He also quoted the *Family Oracle of Health* (1824) as saying 'We are sorry to remark also, notwithstanding all we have so often said in favour of tea, that the use of it with bread and butter, as the almost *sole* food of the working classes in manufacturing towns, is a leading cause of the extension of scrofula among the mass of their population: and it hence becomes a question whether sobriety, which the introduction of tea has promoted, compensates for the loss of vigour of constitution and power of body, which have followed its use by that class of the community'³². On reflection, however, the figures given do not suggest that tea consumption was so very high. The 1871 figure meant only 1.2 oz. per head per week, whilst today the figure is 2.8 oz.³³ The average figure for 1841 was only 0.32 oz. All families were purchasing some tea, but generally more tea was consumed as income increased.

Coffee drinking may have been of more importance, although, quantity for quantity, tea goes much further than coffee. 0.8 oz. was consumed per head per week and there was no relationship with income.

Salt purchases were high, being nearly 5 oz. per head per week. It is difficult to see what this quantity of salt was being used for, particularly since no food was being purchased for preserving. Nearly 2 oz. of treacle per head per week were also bought.

FOODS NOT MENTIONED IN THE SURVEY

A number of foods are conspicuous by their absence. Lethaby (1857) estimated that the diet of the labourer included 4 lb. of vegetables per week, whilst Hartwell estimates that the Londoner was eating 32 oz. of fruit per week³⁴. Aikin mentioned 'early cabbages and cucumbers for pickling are furnished by gardeners about Warrington, early potatoes, carrots, peas and beans from the sandy land on and about Bowdon Downs'. He placed particular stress on apples: 'Apples which form a considerable and valuable article of the diet even of the poor in Manchester used in pies and puddings, are imported from the distance of the cyder counties by means of the communicating canals and in such quantities that upwards of £3,000 in a year has been paid for their freight alone'³⁵.

³¹ Boyd-Orr, *op. cit.*

³² *The Englishman's food*, 1939 edition.

³³ *Domestic food consumption 1960*.

³⁴ Hartwell, *op. cit.*, W. Lethaby, *Lectures on the economy of food* (1857).

³⁵ Aikin, *op. cit.*

Both Aikin and Hartwell also mentioned fish. Aikin stated that 'with fish Manchester is better provided than might be expected from its inland situation'. He referred amongst others to cod, lobster, salmon, trout and brood. Particular mention was made of herrings 'The poor have a welcome addition to their usual fare in the herrings from the Isle of Man, which in the season are brought in large quantities at a cheap rate'³⁶. Hartwell comments 'another important food where consumption was increasing at this time was fish. Before 1815, except during gluts, fish was expensive, and appeared regularly only on the tables of the well-to-do. Early in the nineteenth century consumption was small partly because of religious prejudice, partly because of a preference for meat . . . nevertheless the poor by this time were becoming large purchasers of fish, taking particular advantage of price fluctuation to increase consumption . . . by 1840 ice and fast transport were enabling trawlers to fish farther north and were opening up new markets in the inland towns'³⁷.

The study of the diets of workers in Lancashire shows either that these workers were particularly unfortunate in not obtaining these foods or that other writers have made over estimates. Perhaps Aikin and Lethaby were guilty of over-optimism, whilst Hartwell may have placed an over-emphasis on London and the Home Counties. Alternatively, and perhaps most likely, these foods may have been of seasonal importance rather than ever present constituents of the diet.

The omission of alcohol from the survey is surprising. Certainly it seems unlikely that these householders would not be consuming any beer. Crell and Wallace (1824), who estimated that beer consumption of 'ordinary people' was between one and two pints a day, may have been inaccurate but they did pinpoint what must have been an important element of the diet of the working class³⁸. Probably the purchases of this important commodity are concealed under the general heading of 'money left for instruction and purchase of manufactured articles'³⁹.

4. QUALITY OF THE DIET

Nutritionists have for some time been studying how great the daily intake of various nutrients must be in order to maintain sound health. The estimates shown in Table 8 are recommendations, for calories and protein, of the National Research Council of the United States, and for iron and vitamin C of the British Medical

³⁶ *Ibid.*

³⁷ Hartwell, *op. cit.*

³⁸ A. F. Crell and W. M. Wallace, *The Family Oracle of Health* (1824).

³⁹ Neild, *op. cit.*

Association⁴⁰. Recommendations differ according to age and sex, and therefore an estimate has been made as to the age and sex of each person in the families studied by Neild. These estimates have been made with the aid of the census for 1841, which not only indicates the number of males and females living in Manchester but the proportion of the number within a series of age groups⁴¹.

TABLE 8
NUTRIENT CONTENT: COMPARISON WITH
RECOMMENDED ALLOWANCES

	PROTEIN		CALORIES		IRON		VITAMIN C	
	1841	N.R.C. Recommended Daily Allowances	1841	N.R.C. Recommended Daily Allowances	1841	B.M.A. Daily Recommendations	1841	B.M.A. Daily Recommendations
Average for all Families	65	: 64	2300	: 2400	15	: 12	50	: 20
Average for Manchester Families	71	: 65	2600	: 2500	16	: 12	57	: 20
Average for Dukinfield Families	51	: 62	1900	: 2400	12	: 12	36	: 20
Family 1	83	: 65	2800	: 2300	16	: 12	56	: 20
2	76	: 70	2400	: 2500	16	: 12	41	: 20
3	82	: 60	2900	: 2500	18	: 12	68	: 20
4	79	: 70	2600	: 2500	17	: 12	75	: 20
5	72	: 60	2600	: 2500	17	: 12	49	: 20
6	65	: 60	2100	: 2300	13	: 12	58	: 20
7	69	: 65	2600	: 2500	18	: 12	58	: 20
8	74	: 65	2400	: 2500	14	: 12	24	: 20
9	67	: 70	2600	: 2500	16	: 12	60	: 20
10	72	: 65	2700	: 2500	18	: 12	90	: 20
11	55	: 65	2200	: 2500	14	: 12	42	: 20
12	63	: 65	2300	: 2300	15	: 12	67	: 20
14	44	: 60	1700	: 2300	11	: 12	33	: 20
15	65	: 60	2300	: 2300	15	: 12	52	: 20
16	50	: 55	1800	: 2200	11	: 12	33	: 20
17	50	: 65	1900	: 2500	12	: 12	31	: 20
18	52	: 65	1900	: 2500	13	: 12	44	: 20
19	45	: 65	1600	: 2500	11	: 12	25	: 20

⁴⁰ National Research Council, *Recommended dietary allowances*, publication number 302, Washington (1953). British Medical Association, *Report of the committee on nutrition*, London (1950).

⁴¹ *United Kingdom Census (1841)*, Abstract of Answers.

Comparison is made between the daily average nutrient intake of the Manchester and Dukinfield families in 1841 and that of two groups analysed by Lord Boyd-Orr in a national survey carried out between 1932-35. Further comparisons are made with the daily average nutrient intake per head in the United Kingdom in 1950 and 1960 and in the developing countries today⁴².

By comparison with the estimated requirements for these families it may be seen that the average picture is quite satisfactory, with protein, iron and vitamin C intake exceeding requirements and with only a small calorie deficiency. However, when a division is made between Manchester and Dukinfield families, it becomes clear that the position of the latter is not nearly so good either for protein or calories. Families 1 to 10 are reasonably satisfactory with only occasional marginal deficiencies, but family 11 and all the Dukinfield families with the exception of 15 are receiving a diet sufficiently

TABLE 8a
NUTRIENT CONTENT OF 1841 DIETS
Expressed as percentage deviation from recommended allowances.

	Protein	Calories	Iron	Vitamin C
All Families	+2	-4	+25	+150
Manchester Families	+9	+4	+33	+185
Dukinfield Families	-17	-21	0	+80
Family 1	+28	+22	+33	+180
2	+9	-4	+33	+105
3	+37	+16	+50	+240
4	+13	+4	+42	+275
5	+20	+4	+42	+145
6	+8	-9	+8	+190
7	+6	+4	+50	+190
8	+14	-4	+17	+20
9	-4	+4	+33	+200
10	+11	+8	+50	+350
11	-15	-12	+17	+110
12	-3	0	+25	+245
14	-27	-26	-8	+65
15	+8	0	+25	+160
16	-9	-18	-8	+65
17	-23	-24	0	+55
18	-20	-24	+8	+120
19	-31	-26	-8	+25

⁴² Boyd-Orr, *op. cit.* Domestic food consumption 1950. Domestic food consumption 1960, F.A.O., Six billions to feed. Rome (1962)

deficient in calories and protein to be serious. It is very likely that this diet would have some immediate effect upon health and ability to resist disease.

TABLE 9
NUTRIENT CONTENT OF DIETS

	1841		ORR 1932-35		Domestic Food Consumption Survey 1950	Domestic Food Consumption Survey 1960	F.A.O.	
		Recommended Allowances for 1841	A	B			a.	b.
Energy Value (calories)	2300	2400	2300:2800		2500	2600	2200:3100	
Protein (g)	65	64	63	76	78	75	58	90
Iron (mg)	15	12	8	10	14	14	n	n
Vitamin C (mg)	50	20	57	78	84	52	n	n

n=not available.

A income per head under 10s. 0d. per week—average food expenditure 4s. (estimated lowest 10 per cent. of population).

B income per head 10s.—15s. per week—average food expenditure 6s. (estimated next 20 per cent. of population).

a. estimated nutrient content of average diet in Far East, Near East, Africa and Latin America excluding Argentina, Uruguay, Paraguay.

b. estimated nutrient content of average diet in Europe, N. America, Oceania and Argentina, Uruguay, Paraguay.

The comparison of the nutrient content of the 1841 diets with that of the poorest groups analysed in Orr's survey shows a clear similarity. The position is, however, better than that of many of the developing countries today as indicated by FAO. The major difference from contemporary Britain lies in the larger quantity of protein now consumed⁴³.

5. CONCLUSIONS

Many of the conclusions for this study inevitably depend upon the accuracy of the survey under investigation. It can only be said that Neild's survey stands out from others of the period because of its clarity and precision. A study of Neild's life would also seem to vouch for his integrity. Certainly others have sought to make wider-

⁴³ Six billions to feed.

reaching conclusions on food consumption and the standard of living in the first half of the nineteenth century from more dubious and unrepresentative surveys.

A study of the diets makes it clear that many of the generalisations made on food consumption of the period do not appear to be true for Manchester and Dukinfield. Moreover it indicates that it is superficial to assess the significance of food in the diet merely by reference to the quantity of a food purchased. Of equal, if not greater importance, is an analysis of its contribution to the nutrient content of the diet.

Those households fortunate enough to have their situations unchanged by the depression of the time are receiving a satisfactory diet and as such would probably substantiate the arguments of Professor McKeown and his colleagues. If, however, the quantities estimated for Dukinfield are correct (that is the prices taken for these areas are true, if there is no wastage of food purchased and there is no beer drinking) then for them the position is not so good. For people unemployed for any length of time the situation might well have been serious.

Orr in his study of the diet and nutritional status various groups in the nineteen thirties summed up the position as follows:—

the fact that the average diets of the low income groups are inadequate . . . does not mean that these people are starving or even suffering from such a degree of ill health as is recognized in the term disease. These diets may be sufficient to maintain life and a certain degree of activity, and yet be inadequate for the maintenance of the fullest of health which a perfectly adequate diet would make possible . . . A review of the state of health of the people of different groups suggests that, as income increases, disease and death-rate decrease, children grow more quickly, adult stature is greater and general health and physique improve. The results of tests on children show that improvement of the diet in the lower groups is accompanied by improvement in health and increased rate of growth, which approximates to that of children in the higher income groups.⁴⁴

The similarity of the nutrient content of the diet of Orr's poorest groups with the average figure for the 1841 diets analysed means that his conclusions would equally apply to this period. The diets, even of the poorest groups, might not have led to a picture of chronic malnutrition and the appearance of deficiency diseases, but they would have lessened resistance to disease. As such it cannot be argued for the lower working class that the evidence from this survey overwhelmingly supports the McKeown and Brown thesis. What may be argued without difficulty is the need for extensive research into the history of food consumption in the nineteenth century and for a thorough search for surveys on consumption so that further use may be made of modern nutritional techniques. Only then will the matter be resolved beyond dispute.

⁴⁴ Boyd-Orr, *op. cit.*

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Diets in Manchester and Dukinfield in 1841. By J. C. MCKENZIE, *Department of Nutrition, Queen Elizabeth College, London, W 8*

As part of our research designed to indicate the various factors influencing food choice, we are examining nineteenth century diets. The present paper is based on a detailed analysis of nineteen working-class families living in Manchester and Dukinfield in 1841 (Neild, 1842).

Flour (mainly in the form of bread) was clearly the staple food; average consumption was 5 lb a week and this accounted for one-third of total food expenditure. It provided 50% of the calories and 40% of the iron and protein in the diet. The weekly consumption of potatoes was 5 lb a head providing some 20% of the calories and protein intake. Potatoes were virtually the only source of vitamin C. The average weekly consumption of meat was only 1 lb, and one family was eating as little as 5 oz a head. However on average meat still took 15% of the money spent on food and provided 25% of the protein and 20% of the iron. Only 7 oz of sugar were consumed a head as against 35 oz today.

It has usually been assumed that in times of hardship people increasingly buy cheap filling foods such as bread and potatoes in preference to more expensive items. However these figures do not substantiate such a picture. The poorer families certainly eat less meat but they still buy some. However they also eat less carbohydrate foods. It seems that in times of hardship the maintenance of the established pattern of intake albeit in smaller quantities was considered of greater significance than a feeling of satiety.

The comparison between nutrient intake and recommended allowances shows that on average the picture was similar to the poorer groups analysed by Boyd-Orr (1936) in the nineteen thirties. The position was however better than that for many of the developing countries today. The main problem concerned the poorer five or six families whose calorie and protein intake was about 20% below the recommended figure.

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CHAPTER II

FOOD TRENDS: THE DYNAMICS OF ACCOMPLISHED CHANGE

J. C. MCKENZIE

A STUDY of the past brings to light societies very different in economic, political and cultural outlook from those of the contemporary western world. An analysis of distant parts of the world today brings to light similar variations between nations. Different food habits are but one example of the ways in which time and distance have sustained major differences between communities (FAO, 1962, Table 1).

TABLE I

CONSUMPTION OF VARIOUS FOODS FOR DIFFERENT COUNTRIES
IN 1960
(kg. per head)

	CEREALS	STARCHY FOODS	SUGAR	PULSES AND NUTS	VEGETABLES	MEAT	EGGS	FISH	MILK PROTEIN	FAT
BRAZIL	106	118	31	27	21	29	3	3	2	8
CEYLON	138	22	19	29	42	3	1	7	1	4
ECUADOR	74	90	22	13	30	15	5	4	3	9
GERMANY	83	131	29	3	48	57	13	7	7	25
MAURITIUS	129	15	40	10	24	6	2	6	2	13
PHILIPPINES	125	46	10	6	30	14	3	15	0	4
SWITZERLAND	93	73	41	7	69	58	10	3	9	20
TURKEY	196	38	8	5	81	13	1	2	4	8
UNITED STATES	66	47	41	7	97	95	19	5	9	21

CONSTANTLY CHANGING FOOD HABITS

However, even within a given community food habits are by no means static. A few thousand years ago, man's emergence as a farmer revolutionized his food patterns. Today the rapid development of industrial societies brings further major changes in food consumption. Perhaps nothing gives a clearer index of the economic and social changes within a society than the study of the food habits of the community concerned. In Great Britain a hundred years ago well over half of our calories came from bread and potatoes, whereas today a measure of increasing prosperity is the fact that this figure is down to less than a quarter (McKenzie, 1963a, Ministry of Agriculture, 1962, Table 2).

TABLE 2
TRENDS IN UNITED KINGDOM FOOD CONSUMPTION
(lb. per head per year)

	1880	1909- 13	1924- 28	1934- 38	1941	1947	1950	1960
DAIRY PRODUCTS								
(a) Milk Solids	n.a.	33	35	38	41	49	54	55
(b) Liquid Milk	213	219	217	217	265	306	347	324
(c) Cheese	8	7	9	9	8	9	10	10
MEAT	91	131	129	129	99	96	112	135
POULTRY & GAME	n.a.	5	6	9	6	7	7	9
FISH	18	41	41	26	16	32	22	21
EGGS	11	16	15	28	25	25	31	33
BUTTER	12	16	16	25	10	11	17	18
MARGARINE	0	6	12	9	18	15	17	15
OTHER FATS	n.a.	4	6	19	18	14	19	21
SUGAR	64	79	87	98	67	82	83	115
POTATOES	296	208	194	182	188	286	246	220
OTHER VEGETABLES	n.a.	83	106	127	123	142	132	107
FRUITS	n.a.	69	118	104	30	89	86	149
WHEAT FLOUR	280	211	198	194	237	225	206	180
OTHER CEREALS	n.a.	26	16	16	20	17	17	

(Abstracted from Hollingsworth 1957, Ministry of Agriculture 1962.)

n.a. = not available.

Hidden behind these movements are other changes whereby differences in consumption associated with social class and family composition have been reduced.

Changes in food habits occur not only with the advent of some major upheaval such as the development of industrialization. Hardly less significant changes are taking place all the time, perhaps as the result of changing attitudes of the population or some new development in food technology or merely because of a different season of the year. Some of these factors presumably also lead to the regional variations within a community (Ministry of Agriculture, 1962, Table 3).

TABLE 3

VARIATIONS IN CONSUMPTION OF SELECTED FOODS FOR DIFFERENT REGIONS OF GREAT BRITAIN 1960

(expressed as percentage deviation from national averages)

AREA	SUET AND DRIPPING	FLOUR	POULTRY	FRESH GREEN VEGETABLES
LONDON	- 8	- 18	+ 63	+ 26
NORTH	+ 56	+ 44	- 51	- 41
SCOTLAND	+ 35	- 48	- 30	- 64
SOUTH WEST	- 10	+ 44	+ 23	+ 35
WALES	- 48	- 20	- 15	+ 6

These changes and differences in food habits have not, for the most part, come about as the result of the intervention of the nutritionist, or economist, or advertising agent. Our very concern with this subject indicates our present inability to control food choice.

Mostly the changes have emerged 'spontaneously' because of new attitudes and actions on the part of the people within a given community. It is the purpose of this symposium to try to identify and quantify these factors.

The potato was probably first introduced into Europe about

1570 by Spaniards returning from South America. Sir Walter Raleigh, Sir John Hawkins and Sir Francis Drake have all at various times been accredited with bringing it to England, but no conclusive evidence has been produced. Although the potato quickly became a staple food in Ireland, in England it was for some two hundred years regarded with suspicion, reputed to be poisonous and to have alarming aphrodisiac qualities (Salaman, 1949).

However by the eighteenth century it had become accepted as a major food throughout the country. This led Adam Smith to declare 'the very general use which is made of potatoes in these kingdoms as food for man is convincing proof that the prejudices of a nation however deeply rooted are by no means unconquerable' (Burton, 1960). It is unlikely however that potato consumption increased because it was advocated by the economist and certainly not because of influence by the nutritionist. More likely explanations can be found in (a) a growing need for staples with a high yield as the result of a rapidly growing population and at the same time a declining proportion of the population working on the land; (b) the favourable soil and climate in the areas of rapidly growing population, e.g. Lancashire; (c) a crop which was easy to store; (d) a food which could be easily prepared and provide a hot filling meal.

Thus gradual economic and social incentives within the community may have persuaded the farmer to change his crops and the consumer to change his choice of food. Gradual incentives within the community is probably the significant phrase.

Abrupt pressure from outside for change even in times of dire emergency may not have the desired effect. In 1943 there was a severe failure of the rice crop in Bengal and this, backed by failure of price control, inexperienced administrative personnel, and corruption, panic and greed, led to a severe famine. Attempts to substitute wheat for rice failed. This was partly because many people lacked the facilities to grind the wheat or cook it. But it was equally due to dislike of a new food with a different consistence (Woodhead, 1945).

Thus food habits are always changing. But these changes are the result of 'natural' movements within society rather than the intervention of the outside specialist. If we can begin to study past food

trends and analyse the factors which have facilitated change then we may have a clue as to what may aid our attempts at change in the future. At the very least by looking critically at our past efforts we may learn to avoid some of the mistakes which the specialist often seems to be making today.

However, a study of the past may be significant not only as a means of finding the causes of change. It may be useful also in predicting the patterns of change in developing countries. Rates of development vary with different countries. By 1850 Great Britain had moved far towards industrialization. Today it is the turn of Ghana. Tomorrow it may be Thailand. Yet whatever the time or speed of development there tend to be predictable patterns of growth. Rostow (1960) talks of the age of 'take off', of the 'drive to maturity', and of the age of 'high mass consumption'. Within industrial growth may also be found predictable food trends characterized by such events as the introduction of the Coca-Cola sign, the decline of breast feeding, the rapid increase in sugar consumption. If we analyse these trends and the resulting nutritional problems as they occur today, we shall at least be better equipped to provide the antidote to similar developments in other parts of the world tomorrow, even if we cannot prevent their occurrence. Table 4 shows the association between sugar consumption and size of income in various countries (Viton and Pignalosa, 1961). It would seem reasonable to suppose that as in the future the incomes of the poorer countries increase, so will their consumption of sugar.

TABLE 4

THE RELATION OF SUGAR CONSUMPTION TO INCOME, 1956

ANNUAL INCOME PER HEAD IN TERMS OF SUGAR (METRIC TONS)	NUMBER OF COUNTRIES IN EACH GROUP	ANNUAL SUGAR CONSUMPTION PER HEAD (kg.)
0.10 - 0.50	11	9.7
0.51 - 1.00	12	18.9
1.01 - 2.00	9	30.3
2.01 - 3.00	12	34.3
3.01 and over	13	45.9

The fund of information available on present and past food trends may be used to assess the significance of some factors often considered to influence food choice.

ADVERTISING

One factor often mentioned as being a powerful influence on behaviour patterns is advertising. It is said that advertising directs choice. Clearly such a broad statement cannot be held to be true. The failure of General Mills to captivate the British housewife with their Betty Crocker cake-mix even after spending some £500,000 on advertising must stand as a monument to the fact that advertising does not always achieve the ends it desires.

Associated in many people's minds with a faith in advertising is the assumption that if the sales of a product are increasing then the advertising agent and his copy are good, if sales are declining they are bad and must be replaced. Yet on this basis probably any advertising agent who held an account for frozen foods over the past few years would be excellent and anyone holding a bread account would be very bad.

There is obviously more to the selling of a product than the size of the advertising account. Underwood Thompson (1962) lists 3 basic reasons why people do not buy a product. These are because:

- (1) They do not like it (this does not necessarily imply so much an absolute dislike as a relative dislike, in that it falls lower on a given list of preferences than do other products);
- (2) It is difficult to obtain (that is distribution is bad or the retailer has not been induced to carry it in sufficient quantities);
- (3) They do not know it exists.

Clearly advertising may be useful in dealing with the third point but one could well be left with a situation in which, however good the distribution and however extensive the advertising, one cannot sell a product because the public does not want to buy it. The real question therefore is to what extent advertising can influence consumer attitudes and persuade them to re-rank their order of preferences.

As yet there is no way of measuring this. Who can really tell what would have happened if there had been no advertising for bread or frozen peas, or how far the advertiser has been able to

hold back the falling sales of bread and push on the sales of frozen peas by the modification of the housewives' attitudes to these foods?

It seems likely however that the strength of advertising as a means of influencing choice grows in direct proportion to the growth in similarity of the products in competition. Advertising may well influence brand choice but leave overall product choice undisturbed. The good advertising campaign may pull drinkers of Nescafé into the Maxwell House camp. This is probably why in 1962 Nestlé and Maxwell House between them spent £1,750,000 on advertising in this country. It is even more difficult to assess how much these powerful pressures have helped along the upward trend in coffee consumption and the swing to instant coffees. But even in brand advertising other intangibles have a role. The adherence to Heinz Tomato Soup is probably attributable to more than a good advertising agent.

However, because advertising has not as yet become a predictable science is not to say that it will never be so. Recently advertisers have become less secretive about the techniques they have evolved and have begun to publish books outlining their theories. This must aid in the long run the emergence of a sound scientific appraisal. Equally new long-term evaluation is beginning in various fields.

A commercial research organization, in a series of studies carried out both in the United States and in Great Britain, has been able to demonstrate that there is a statistical relationship between 'competitive preference results' and sales performance in the market. The assessment of competitive preference is achieved by asking audiences to indicate which of a list of brands of a commodity they would like to receive should they be the winner of a raffle. This is repeated some time after they have seen a specific television commercial for one of these brands. The movement of choice towards the brand used in the commercial is regarded as an indication of its effectiveness. It can be demonstrated that 'inferior' commercials tend to result in lower sales and 'superior' commercials in increased sales (Schwerin, 1963).

Another example of the growing rational approach is the recent work on the significance of recipes in women's magazines as a means of persuasion. It is clear that the great majority of women

who purchase magazines read the recipes in them, but the extent to which they actually try them depends on the age and social class of the housewife and the type of dish to which the recipe refers (McKenzie, 1963b, Tables 5, 6, 7).

TABLE 5

EXTENT OF INTEREST IN RECIPES OF HOUSEWIVES PURCHASING
WOMEN'S MAGAZINES

(expressed as a percentage)

	HENDON	SHEPHERD'S BUSH
READING THE RECIPES	91	85
EVER TRYING THE RECIPES	76	58
SAVING ANY OF THE RECIPES	76	52
TRYING A NEW RECIPE IN THE LAST FORTNIGHT	9	3

(For this experiment Hendon was chosen to represent a middle-class group and Shepherd's Bush a working-class group.)

TABLE 6

AGE OF HOUSEWIVES WHO READ COOKERY ARTICLES AND TRY RECIPES

AGE OF HOUSEWIFE	% who had tried recipe in last seven days	% who had tried recipe in last four weeks	% who had tried recipe in last two months
16-24	3	5	8
25-34	5	11	5
35-44	6	12	5
45-64	4	10	4
65 +	2	3	1

TABLE 7

TYPE OF DISH FOR WHICH RECIPE IS CONSULTED
(expressed as a percentage of all housewives consulting recipes)

	HENDON	SHEPHERD'S BUSH
MAIN DISH	6	10
SWEETS	9	5
CAKES	41	85
SWEETS AND CAKES	21	—
ALL DISHES	23	—

The next step will be to see how far such recipes influence the housewife's choice of products even if she does not try the dish specified.

EDUCATION

It seems to be generally believed, especially by those in the academic world, that education is the panacea for all ills. People eat too little food or too much or the wrong combination of foods, so they must be educated. Once they have been made aware of the relative value of different foods, all will be well. This is, of course, an oversimplification of the truth, and may be put in perspective by reference to recent attempts to stop people smoking. The report of the Royal College of Physicians (1962) recommended that government action should be taken to curtail cigarette smoking and that this action should include:

1. Education on the dangers of smoking, the indication of tar content on cigarette packets, and the setting up of anti-smoking clinics,
2. More positive restriction on the sale of cigarettes to children,
3. The restriction of advertising on cigarettes,
4. Increased tax on tobacco.

But in the face of growing pressures people are still smoking about as much as before and will probably continue to do so in spite of all these new recommendations. The real dilemma is that the two suggested lines of attack are by education and taxation.

It has been assumed that because smoking has not declined people are not aware of the risks. But probably most people now know that there is a correlation between smoking and lung cancer. But because one accepts a scientific piece of evidence it does not necessarily follow that one will modify one's actions. Equally tax disincentives may have to be extremely harsh to have any considerable effect on consumption.

The same problem exists in nutrition. People are aware that there are health problems associated with overweight, and they have ideas about what are 'good' and 'bad' foods. But all this does not necessarily mean that they modify their eating habits in order to lose weight, or choose the best food. 'Most housewives believe that canned foods are inferior to fresh, that brown bread is better than white and that sweets are bad for the teeth. Yet most housewives buy white bread rather than brown, the sale of canned foods is high and rapidly increasing and we eat more sweets in this country than in any other' (Brown, McKenzie and Yudkin, 1963).

Rosenstock (1960) indicated why education may not have always succeeded when he suggested three basic criteria for the successful modification of behaviour:

- (1) The individual must be aware that there is a problem,
- (2) He must feel that it would have serious consequences for him,
- (3) He must feel that there is some possible solution to the problem.

This would perhaps explain the white/brown bread question. The housewife, whilst feeling that brown bread is better than white bread, sees no serious health reason for her to change her choice. Equally, although she accepts that eating sweets may cause tooth decay, she may feel that it will not happen to her or even that false teeth are not so bad anyhow! She may even be prepared to accept information which in reality she knows cannot be true simply because she is not prepared to countenance ideas which are discordant with her present attitudes and preferences.

Glucose may come to be regarded as less fattening than sugar and filter-tip cigarettes as less dangerous than normal cigarettes. In both cases the consumer has at least on the surface convinced himself that this information is true even although he has reason to doubt its validity.

All this is not to say that education will not modify attitudes and

behaviour, but merely to indicate that considerable research is required to see under what circumstances it becomes successful and which teaching techniques are the most influential. A good example of such research already begun is that instigated into milk drinking in schools (National Dairy Council, 1962). This work has indicated some interesting relationships. There was a clear correlation between the size of the school, the time, place and degree of supervision of the drinking and the numbers accepting milk (Tables 8, 9).

TABLE 8

VARIATIONS IN SCHOOL MILK CONSUMPTION WITH SIZE OF SCHOOL AND DEGREE OF SUPERVISION

NUMBER ON SCHOOL ROLL	PERCENTAGE DRINKING MILK
100-199	88
200-299	71
300-399	72
400-499	63
500-599	62
600-699	50
700-799	47
800-899	45
METHOD OF ISSUE IN SCHOOL	PERCENTAGE DRINKING MILK
By Teachers	77
By Monitors	61
Collection by Children	57

The report also indicated useful areas for further research as to why boys drink more milk than girls, and why mixed schools have the worst uptake, and why some children find milk objectionable (Tables 10, 11).

Such research is most valuable and must replace the often facile acceptance of assertions that we as nutritionists or educationists would like to think true. Is it anything more than wishful thinking when we say of the school meals service that, 'We hope children

CHANGING FOOD HABITS

TABLE 9

VARIATIONS IN SCHOOL MILK CONSUMPTION WITH TIME AND PLACE OF SERVING

PLACE OF ISSUE IN SCHOOL	PERCENTAGE DRINKING MILK
Classroom	71
Assembly Hall	48
Playground	43
Cloakroom	36
TIME OF SERVING	PERCENTAGE DRINKING MILK
Immediately before break	74
At dinner time	74
After morning assembly	71
During break	54

TABLE 10

VARIATION IN MILK CONSUMPTION WITH TYPE OF SCHOOL

TYPE OF SCHOOL	PERCENTAGE DRINKING MILK
Boys' School	71
Girls' School	59
Mixed School	54

TABLE 11

PRINCIPAL REASONS SUGGESTED FOR CHILDREN REFUSING MILK
(expressed as percentage of total answers)

REASON	PERCENTAGE
Dislike taste; do not like it	31
Makes some feel sick, ill	16
It is fattening	9
Tastes sour in summer	8

will be given the opportunity to learn to know and like a wide variety of foods and thus establish sensible food habits. Originally the purpose of the service was to feed the child. Far-reaching progress is more difficult to define, but such social implications as good table manners or consideration for others are being encouraged thus resulting in the meal becoming an integral part of school life' (Langley, 1961).

Domestic science lessons are presumably expected to widen the child's knowledge of food and nutrition and educate her to provide sound meals in the future. Yet how far is the school teacher a greater influence in these matters than the mother? For that matter, how much nutrition will the domestic science teacher really know and how far will tomorrow's housewife be concerned with providing a sound nutritious meal rather than with providing something her husband really likes? Can she be made to see that the two are not incompatible? Is the good done by the nutrition lessons and school meals service counteracted by the easy accessibility of the school tuck shop?

These questions indicate some of the difficulties nutrition education has to face. It is only if we are aware of the difficulties that we can hope to overcome them. Nutrition education may become an important tool in modifying food choice in the future but only if we try to answer questions such as those just posed and accept the limitations which confine it at the moment. Only by research can we turn what is a hit-and-miss affair into a predictable, efficient, scientific machine.

PRICE

Price is clearly a significant factor influencing food choice but it probably becomes of decreasing importance as a community becomes more prosperous. Price changes which occurred in this country in the last quarter of the nineteenth century as a result of the growing efficiency of steamships and the development of refrigeration had a considerable impact on food choice (Williams, 1960, Table 12).

Similar price reductions today would be unlikely to have so profound an effect. Housewives at least state that cost is not the most important factor in food choice (Bird, 1961, Table 13).

CHANGING FOOD HABITS

TABLE 12

PRICES OF FARM PRODUCE IN 1873 & 1896

COMMODITY	1873	1896
	s. d.	s. d.
Wheat per qtr.	58 8	26 2
Barley per qtr.	40 5	22 11
Oats per qtr.	25 5	14 9
Beef per 8 lb. stone	6 4	4 5
Mutton per 8 lb. stone	6 11	5 5
Pork per 8 lb. stone	5 0	3 4
GENERAL PRICE INDEX		
(1867 = 100)	111	61

TABLE 13

FACTORS INFLUENCING HOUSEWIVES' CHOICE OF GROCER'S SHOP
(ranked in declining order of importance)

RANKING	HOUSEWIVES WITH REGULAR GROCER	HOUSEWIVES WITH NO REGULAR GROCER
1	Clean shops	Clean shops
2	Fresh stock	Economical
3	Friendly service	Fresh stock
4	Economical	Friendly service
5	Stocks best range	Stocks best range

No one would expect a mother openly to admit that price considerations are of greater weight than those of health. However, with rising incomes and the declining significance of food in the total budget it is likely that price has no great influence on choice. Price will place limits on purchases, but not determine commodity

choice to any great extent within those limits. Increasing income only opens the gate to wider choice. As society gets prosperous, people buy more expensive foods. This is not just because they are expensive, but because they are more palatable, and the more palatable foods happen to be more expensive.

The economics of the food industry may also influence consumer choice in a very different way. In theory at least choice may become limited with the development of integrated retailing organizations. Over the past few years these organizations have concentrated the executive decisions as to what goes into many of our shops, in the hands of a few buyers. The turnover of all grocers in 1961 was £2,227 million and the estimated number of buyers for all shops was 80,000. But 1,620 buyers controlled the buying for shops doing 76 per cent of the business. These key men bought for the multiples, co-operatives, voluntary groups, voluntary chains and retailer co-operatives (Pritchard 1962).

In this way they determined the extent of choice we were given. It may be argued that, rather like the theatre ticket agencies and a new show, they could virtually make or break a new product before it reached the level of consumer choice. However, there is no reason to believe that these buyers act in unison. The very strength of competition within the grocery business would seem to work against unified action to prejudice sales of any one product. Nevertheless it serves to show how the development of a food economy controlled by a few powerful concerns could influence very extensively possible consumer choice.

SOCIAL FACTORS

I have so far concentrated on three factors regarded as being of significance in influencing food choice. It seems to me that in each case their significance has been overemphasized, particularly in Western society. One is drawn back therefore to a general statement of other social factors determining choice. A number can be listed fairly easily. They include religious injunction, taboo, prestige, habit. But having said this, one comes virtually to the horizon of knowledge on their influence and it seems that it is here that an analysis of the past might begin. Have taboos developed against fish and milk in some countries because they have produced

illness in the past or is this too simple an answer? What has caused the British addiction to tea? Why throughout history has white bread been regarded as the prestige food?

One can put this another way. Golby (1963) has stated that 'there is ample evidence to show that persuasive communication is more likely to be effective the more it is both internally and externally consistent with beliefs, attitude and "cognitions" of the audience. This is shown by recent developments in psychology (e.g. dissonance theory) where it is demonstrated that the drive for consistency is deeply rooted in the individual. There is evidence to show that an important aspect of successful persuasion is that it works by conditioning the agreement of the audience and elicits at both conscious and semi-conscious levels "assenting" reactions.' It is not difficult to carry this theory to past events. What was it in history that made food changes internally and externally consistent with the beliefs of the people and what conditioning brought about their agreement to change? A study of contemporary and past society should provide at least some of the answers to these sorts of questions. Many of the facts required to set the foundation for such research are readily available.

PRODUCT RESEARCH

I have shown that such information may be used to assess the effects of general factors such as education and choice. Equally it may be used to analyse specific foods. Bread may serve as a useful example.

Bread has been a staple food for many thousands of years. Even within the early Mediterranean civilizations there developed sophisticated baking industries (McCance & Widdowson, 1956). By Anglo-Saxon times in this country the baker had become important enough for attempts to be made to pass an 'Assize of Bread'. By this he received a salary or public allowance and was therefore removed from a position where he could begin profiteering at the expense of the community.

Since that time bread has always been a major food in the diet. Even in the nineteenth century, when potatoes were said to have become an increasingly important item of food, bread remained supreme. In 1841 for example bread supplied half of the total

calories and protein in the diet of Manchester workers whereas potatoes only provided one-tenth (McKenzie, 1963a). Even today cereals supply one-fifth of the calories and protein, and potatoes only one-twentieth (Ministry of Agriculture, 1962).

Whilst bread has maintained an important role within our diet, the twentieth century has nevertheless seen a significant decline in the consumption of cereals in this country (Hollingsworth, 1957, Ministry of Agriculture, 1957, 1962, Table 14).

TABLE 14
CEREALS MOVING INTO CONSUMPTION IN THE UNITED KINGDOM
1909-1960
(lb. per head per year)

YEAR	1909 to 1913	1924 to 1928	1934 to 1938	1941	1944	1947	1950	1953	1957	1960
QUANTITY	237	214	210	257	253	242	223	208	187	181

(Note that some goods were rationed from 1940 to 1954)

This is clearly associated with a higher standard of living. Increasing prosperity has widened choice and people have moved towards foods with greater palatability. This has also led to an increase in the number of cooked meals. Afternoon tea, as a meal providing little more than bread and butter and cakes, has to a large extent declined in importance, whilst the packed lunch has given way to the meal in the industrial and commercial canteen. Bread has also come to be regarded as a food to avoid if you want to slim (McKenzie, 1963c, Table 15).

A less obvious reason for the decline in flour sales is that bread now keeps longer and hence less is wasted.

Bread consumption does not vary much from season to season and amounts to approximately 45 oz. per head per week at a cost of 1s. 10d. Differences exist between social classes not only with the quantity but also the type of bread consumed, but there are only small variations with different sized families (Ministry of Agriculture, 1962, Table 16).

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TABLE 15

FOODS HOUSEWIVES SUGGEST SHOULD BE AVOIDED WHEN SLIMMING
(expressed as the percentage of housewives naming each food)

FOOD	PERCENTAGE
POTATOES	62
BREAD	55
SUGAR	31
CAKES	25
STARCHES	22
SWEETS	16
FAT	10
CARBOHYDRATE	7
BISCUITS	5
BUTTER	4
PASTRY	3
FRIED FOOD	2
MILK	2
RICE	2
PEAS	1

TABLE 16

VARIATION IN BREAD CONSUMPTION WITH SOCIAL CLASS
(oz. per head per week)

	A1	A2	B	C	D
BROWN BREAD	3.4	3.1	2.1	2.2	2.5
WHITE BREAD	20.2	28.1	36.5	39.8	42.7
WHOLEWHEAT WHOLEMEAL BREAD } OTHER BREAD	1.7	1.1	0.8	0.8	1.0
	7.8	5.9	5.0	5.7	5.1
TOTAL	33.1	38.2	44.4	48.5	51.3

A1 = gross weekly income of head of household of at least £34

A2 = gross weekly income of head of household between £20 and £34

B = gross weekly income of head of household between £12 and £20

C = gross weekly income of head of household between £8 and £12

D = gross weekly income of head of household under £8

It has been shown that more people eat bread for breakfast and dinner than for any other meal (Flour Advisory Bureau, 1963, Table 17.)

TABLE 17

FAMILIES SERVING BREAD AT VARIOUS MEALS 1960
(expressed as percentage of total families)

	EARLY MORNING TEA	BREAKFAST	'ELEVENSES'	MIDDAY MEAL	AFTERNOON TEA	DINNER HIGH TEA	LATE SUPPER
TAKING MEAL	51	97	45	86	49	81	68
TAKING BREAD	7	89	7	33	24	65	31

It may be seen therefore that one has a firm structure upon which to build up research. It should now be possible to begin to get answers to these sorts of questions:

On what grounds have people come to regard brown bread as more nutritious than white?

Why in spite of all this do they still choose white bread?

On what basis have they decided that bread is more fattening than most other foods?

Are some breads regarded as more fattening than others, and how has such an opinion been determined?

Why is it that bread seems to be held in less emotional esteem than other staple foods such as the potato?

Why does the type of bread chosen vary from class to class?

CONCLUSION

We have within the economically developed sections of the world a large body of information on present and past trends in food consumption. We can now begin to assimilate similar information for the less developed sections of the world. By analysis of such material we can begin to assess the influence of various factors on past food choice. If such a study is complemented by experiments

aimed at increasing the effectiveness of methods such as nutrition education, then we may hope to become much more efficient in the future in influencing food choice. Such influence will be in the interest of the health and welfare of both the developed and developing sections of the world.

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CHAPTER IX

PAST DIETARY TRENDS AS AN AID TO PREDICTION

J. C. MCKENZIE

NEARLY everyone is interested in food and perhaps never more so than when it comes to a look at future consumption. Many paint a picture rather fancifully and fearfully of a time when they will be living on three pills and a glass of water each day. However to the specialist the discussion is more than a flight of the imagination. To the food manufacturer, it is a question of what to make and how to sell it; to the nutritionist, it is a question of the possible effects on the nutritional status of the public.

NEGLECTED STATISTICS

There is no doubt that there is a real concern about future food trends, and a recognition of their significance for the future success of individual companies. But it is also true that, although the food industry spends a good deal of money on trying to predict future food consumption, its investment is rarely productive. In a way this is surprising for there is a fair quantity of statistical information available on past food trends and it is generally recognized that prediction studies are intrinsically based on historical analysis. 'Reputable methods of forecasting consist of deductions from the facts of the past.'¹

One of the probable reasons why we have not so far made greater use of these statistics is the intervention of the Second World War. During the war and for a time after it the government introduced through rationing new food habits based more upon nutritional necessity and economic expediency than popular choice. Thus, established trends in the consumption of bread, potatoes, fruit and meat were totally reversed² (Table I). However

TABLE I
Trends in United Kingdom Food Supplies from 1880 to 1962.
(lbs per head per year.)

	1880	1909-13	1924-28	1934-38	1941	1944	1947	1950	1953	1956	1959	1962
Dairy products:												
Total as milk solids	n.a.	33	35	38	41	49	49	54	53	54	54	56
Liquid milk	213	219	217	217	265	308	303	345	330	323	319	325
Cheese	8	7	9	9	8	10	9	10	9	9	9	10
Meat (carcase wt, incl. bacon and ham)												
Poultry and game	n.a.	5	6	9	6	4	7	7	7	8	12	15
Fish	18	41	41	26	16	20	32	22	20	22	22	21
Eggs	11	16	15	28	25	27	25	31	28	29	33	34
Butter	12	16	16	25	10	8	11	17	13	16	19	20
Margarine	0	6	12	9	18	18	15	17	18	17	14	11
Other fats	n.a.	4	6	19	19	19	14	19	20	21	22	24
Sugar	64	79	87	96	67	71	82	84	98	109	111	111
Potatoes	296	243	230	190	188	275	286	242	245	225	211	214
Other vegetables (incl. pulses) and												
tomatoes	n.a.	78	105	127	123	140	142	122	133	127	130	127
Fruits (incl. nuts)	n.a.	68	97	104	30	52	89	84	92	95	110	108
Wheat flour	280	211	198	195	237	234	225	206	193	179	168	161
Other cereals	n.a.	26	16	16	20	19	17	17	16	14	15	16

n.a. figures not available.

TABLE II
Trends in Food Consumption in Various European Countries since 1948.
(kg per head per year.)

	Period	Cereals	Starchy Roots	Sugar	Vegetables	Meat	Fats
AUSTRIA	1948-51	130	108	23	61	30	15
	1954-57	118	96	31	63	47	18
	1957-60	114	92	34	65	52	18
	1962-63	102	80	38	55	62	18
BELGIUM LUXEMBOURG	1948-51	106	148	28	60	47	21
	1954-57	100	150	28	65	53	22
	1957-60	92	144	32	69	58	21
	1962-63	81	123	28	76	64	30
GERMANY	1948-51	114	210	24	51	29	16
	1954-57	96	157	28	45	48	25
	1957-60	88	143	28	46	54	25
	1962-63	78	128	30	47	61	26
GREECE	1948-51	154	34	9	66	11	15
	1954-57	158	39	10	99	17	17
	1957-60	168	44	12	118	22	18
	1962-63	155	41	14	118	27	19
ITALY	1948-51	150	38	12	81	15	10
	1954-57	145	48	16	96	20	14
	1957-60	138	49	19	128	25	15
	1962-63	134	52	24	140	31	17

TABLE II (Contd.)
Trends in Food Consumption in Various European Countries since 1948.
 (kg per head per year.)

	Period	Cereals	Starchy Roots	Sugar	Vegetables	Meat	Fats
NETHERLANDS	1948-51	98	159	36	68	28	23
	1954-57	90	96	39	66	43	24
	1957-60	85	91	40	66	44	25
	1962-63	83	96	42	69	50	28
NORWAY	1948-51	116	128	24	28	33	23
	1954-57	95	105	39	34	37	26
	1957-60	84	104	38	36	38	25
	1962-63	77	95	39	33	39	25
SWEDEN	1948-51	88	120	44	25	49	20
	1954-57	76	102	42	25	50	21
	1957-60	74	92	41	25	50	21
	1962-63	72	84	41	31	52	23
SWITZERLAND	1948-51	117	89	38	73	44	15
	1954-57	101	74	40	75	51	17
	1957-60	97	73	39	76	55	19
	1962-63	101	66	41	76	63	21
UNITED KINGDOM	1948-51	106	115	39	61	50	21
	1954-57	88	98	47	58	68	22
	1957-60	84	95	49	60	71	22
	1962-63	81	94	47	56	77	23

the re-emergence of a free-running economy over the last fifteen years has allowed plenty of time for old trends to re-establish themselves and for new ones to emerge. The war can therefore no longer be regarded as a stumbling block in the analysis of trends.

Perhaps another reason for neglect of historical statistics is that some of them are almost too obvious. In Table II, I have examined the figures for six product groups from ten European countries for 1948-51, 1954-57, 1957-60 and 1962-63.³ Such a broad breakdown may seem naïve in the extreme but at this level the trends are beyond dispute. Moreover, if one had attempted to make a forecast in terms of a decrease or increase in consumption for each group for 1962-63 on the basis of the earlier figures it would in most cases have been correct. By my calculations there would be a correct prediction in thirty-six instances out of the sixty. In another twelve instances the picture would have been sufficiently cloudy as to deter a prediction altogether. In only twelve instances, that is one in five, would an incorrect prediction have been made.

It may be argued that while such an analysis is a reasonable one as long as the trend continues in an established direction, if it is suddenly halted or reversed a prediction could be disastrously off course. I do not believe that such a turn of events is all that much to be feared. It is true that on occasion consumption of a product that has been rising may suddenly become steady or even begin to fall; the converse may also occur. But this rarely happens very quickly and danger signals are usually apparent. This is borne out in Table III where I give details of consumption figures for leafy green and yellow vegetables in the U.S. since 1909.⁴ Here it may be seen that consumption moves up to a peak in the thirties and early forties and then falls away again. But the changing trend is clearly apparent from the yearly figures.

Occasionally one gets a freak figure and it is important to differentiate between this and the start of a new trend. However such a freak figure is usually apparent if only in the sense that the picture has become obscure, and there is usually some fairly obvious explanation such as a bad harvest. In every case of doubt the answer must be to await further statistics.

I have so far been assessing the value of information of past trends by looking at generalized product groupings and major staples. This has been done only for simplicity and demonstration

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TABLE III

*Consumption of leafy green and yellow vegetables
in the United States since 1909.
(lbs per head per year.)*

<i>Year</i>	<i>lbs</i>	<i>Year</i>	<i>lbs</i>
1909	65	1937	100
1911	63	1939	102
1913	65	1941	101
1915	70	1943	106
1917	75	1945	115
1919	76	1947	101
1921	84	1949	94
1923	89	1951	90
1925	96	1953	87
1927	98	1955	84
1929	101	1957	84
1931	100	1959	82
1933	94	1961	83
1935	100		

TABLE IV

*Consumption of Butter in the United Kingdom.
(lbs per head per year.)*

<i>Year</i>	<i>lbs</i>	<i>Year</i>	<i>lbs</i>
1955	14.6	1959	18.5
1956	15.6	1960	18.3
1957	17.5	1961	19.7
1958	20.0	1962	20.3

purposes. It is equally possible to examine trends in individual foods, or trends regarding various methods of producing or presenting a food. Thus a similar trend analysis could be made on the basis of consumption of butter in the U.K.⁵ (Table IV) or of the consumption of frozen peas⁶ (Table V).

TABLE V

Consumption of Frozen Peas in the United Kingdom.
(lbs per head per year.)

Year	lbs	Year	lbs
1956	0.9	1960	1.9
1957	1.1	1961	2.0
1958	1.2	1962	2.6
1959	1.5	1963	3.1

However, an examination of trends in consumption of individual foods, or of individual foods prepared by a particular process, may not be enough. An overall increase in the consumption of a food may mask trends that are occurring within a particular section of the population. It would be possible for the consumption of olives to be increasing overall but falling within one group. If this group is in any way regarded as the trend setter then it is vital that this discordant development should be kept under constant review. Even if the group does not particularly lead trends but is large enough to influence total consumption in the long run the trend is still of significance. This is in fact not so theoretical as one might imagine. There has been an overall increase in the consumption of meat in this country and of fruit in the United States in the past few years. But Professor Yudkin and I have shown that consumption of these foods is actually falling amongst the richest groups.⁷ (Tables VI and VII.)

TABLE VI

Weekly U.K. meat consumption for 1936 and 1960 related to income, and percentage of population in each income class.
(oz per head.)

Income class	Consumption			Population	
	1936	1960	Change (%)	1936	1960
Lower	32	35	+ 10	50	52
Middle	43	36	- 16	40	38
Upper	49	38	- 22	10	10

TABLE VII

Weekly U.S. fruit consumption for 1942 and 1956 related to income, and percentage of population in each income class. (lbs per head.)

Income class	Consumption			Population	
	1942	1956	Change (%)	1942	1956
Lowest	2.5	3.0	+ 20	30	30
Highest	5.6	4.7	- 16	19	20

NEW PRODUCTS

History therefore may be most useful in indicating those product areas that are likely to expand in the coming years. It can also tell us something of the specific type of product most likely to succeed. Perhaps in our search for new products we try too hard to develop a completely new food. It is true that the most spectacular developments have been in totally new products such as margarine, cornflakes or Coca-Cola.

Coca-Cola for example was first created in 1886 by a pharmacist called Pemberton in America. In his first year in business he managed to sell twenty-five gallons of the syrup. Today it is sold in 115 countries and served by over 1,800 bottling factories. It is estimated that the contents of 60,000,000 bottles are consumed each day and 500,000,000 new bottles are made each year.⁸ Cornflakes were conceived by Dr John Harvey Kellogg who ran a vegetarian sanatorium at the end of the nineteenth century and who invented some eighty new grain and nut food products to enliven his patients' spartan diet. Today cornflakes are consumed all over America, Australasia and Europe and have revolutionized our breakfast habits.⁹

However, such examples represent only a very small minority of new developments in the food industry. The great majority of successful innovations have been of a less spectacular nature. Almost every type of food we eat today was present in some form or another two hundred years ago. All that has changed is the efficiency of production, the method of preservation, and the form of presenta-

tion. In the same way the leaders of the food industry in ten or twenty years are more likely to have achieved this position by these sorts of developments than by presenting some totally new product.

Past lessons can also indicate a few criteria which these new developments in products will have to satisfy. (1) They will have to fit into the current movements in food patterns – although it may be possible to obtain an expanding proportion of a declining market, for example, crisp-bread in the bread field. (2) They must be presented in a form which is regarded as more convenient than the existing form. (3) They must at the same time be acceptable to contemporary cultural pressures for example as to what may legitimately be taken out of the hands of the housewife. (4) They must not be much above the price level associated with the product in its existing form.

Only if a new product can satisfactorily pass such criteria should a company begin to consider marketing it.

GENERAL BEHAVIOUR PATTERNS

Western society has witnessed over the past hundred or so years a rapid growth in the income of the working class both in money and in real terms. Consequently it may be useful for both the developed and the developing economy to review the influence of income on food choice over this period.

It is possible to see several behaviour patterns emerging in relation to food. Whilst income is low and the major part is expended on food, changes in income or in food prices are reflected in a corresponding rise or decline in the consumption of all foods. This may be demonstrated by reference to surveys undertaken in the 1840s and 1860s.

I have calculated diets described by William Neild in Manchester and Dukinfield in 1841.¹⁰ In many households, well over 40 per cent of food expenditure was on bread and potatoes. As one examines the richer families one observes a tendency to increase rather than reduce the consumption of these commodities. I have demonstrated this in Table VIII which indicates consumption of bread, potatoes and meat per head in each family. Families are listed in decreasing order of income per head.

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TABLE VIII

Purchase of Bread, Potatoes and Meat per head in Manchester and Dukinfield 1841.
(lbs per head per week.)

	<i>Bread</i>	<i>Potatoes</i>	<i>Meat</i>
Average for all families	5·4	5·2	1·0
Average for Manchester families	5·9	5·9	1·2
Average for Dukinfield families	4·3	3·7	0·7
<i>Family</i>			
1	6	6	2·2
2	7	4	1·7
3	6	7	1·4
4	6	8	2·0
5	7	5	1·0
6	5	6	1·2
7	6	6	0·7
8	6	3	1·7
9	6	6	0·7
10	6	9	0·7
11	4	3	0·7
12	5	3	0·8
13	5	4	0·3
14	5	3	0·8
15	4	3	0·7
16	4	5	0·7
17	4	3	0·6
18	5	7	0·5

Families are listed in decreasing order of income per head.

This picture of overall decrease or increase in food consumption according to income is perhaps portrayed best of all by diets described by Edward Smith during the cotton famine of the early 1860s.¹¹ In some fourteen cases he was able to record an accurate description of diet before as well as during the famine when incomes had fallen sharply. In Table IX, I have indicated the percentage reduction in five major foods resulting from the decline in income. In a few cases these reductions are to some extent compensated by buying oatmeal in place of bread, and treacle in place of butter.

These findings are somewhat surprising since it has been mostly

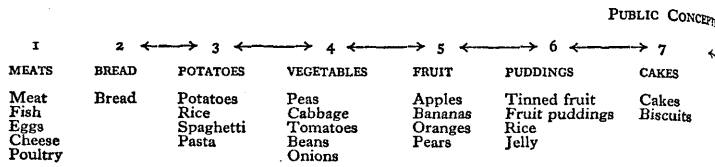
assumed that in periods of hardship people turn to the cheaper 'filling' foods such as bread and potatoes, and reduce the consumption of more expensive items such as meat and fruit. Thus as long ago as 1844 Engels stated 'the less meat they can afford the more bread and potatoes they eat'.¹² In economics the term 'Giffen good' was coined after Sir Robert Giffen who is said to have claimed during the nineteenth century that a rise in the price of bread often caused such a severe fall in the real incomes of the poorer labouring classes that they were forced to curtail their consumption of meat and other more expensive foods. Bread still being the cheapest food they consumed more and not less, now that its price was higher.¹³

TABLE IX

Percentage Decline in Purchase of Foods as Result of Lower Incomes During Cotton Famine in 1860s.

<i>Family</i>	<i>Bread</i>	<i>Butter</i>	<i>Potatoes</i>	<i>Meat</i>	<i>Tea</i>
1	-50	- 16	0	- 66	0
2	0	- 50	0	- 33	- 25
3	-20	-100	-100	-100	- 33
4	-40	0	- 80	- 81	-100
5	-36	- 50	-100	- 58	- 20
6	-33	- 50	-100	-100	- 50
7	-33	- 67	-100	-100	- 50
8	-28	-100	-100	- 86	0
9	-35	0	- 72	-100	- 25
10	-14	- 50	- 75	- 58	- 33
11	-40	- 67	- 82	- 80	+ 50
12	-56	- 85	-100	-100	- 50
13	-12	- 50	0	- 50	- 50
14	- 5	- 40	- 62	- 57	- 25
Average	-29	- 52	- 69	- 69	- 36

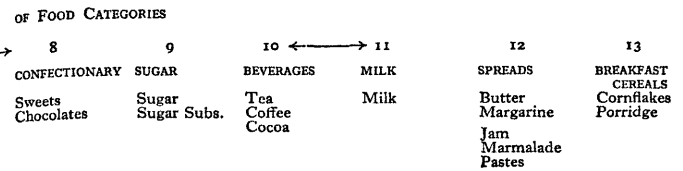
Nutritionally too such a thesis would seem to have had some significance. Man would be expected to select his food primarily so as to obtain sufficient calories or at least a feeling of satiety. But in practice it appears he was concerned to buy some palatable foods even if they were more expensive and could only be obtained at



the expense of a greater caloric intake. In times of hardship such a pattern must have meant that the maintenance of the established pattern of intake albeit in smaller quantities was considered of greater significance than a feeling of satiety.

However, prosperity has brought a new pattern of behaviour to western society. Consumption of food for most of us has now reached a high plateau: a plateau above which it is physiologically almost impossible to go.¹⁴ Therefore, as we get richer, we do not increase consumption of all foods but begin to change the ratio between the quantities of the various foods we eat. Thus the richer groups of the population consume more of some foods such as meat and fruit but less of others such as bread and potatoes. The essence of this statement lies more in the general hypothesis that increased consumption of one food is now compensated by the decline in others, than in the particular foods mentioned, for as already indicated in Tables VI and VII the trend to eating more meat and fruit may not be permanent.

Because of this new behaviour trend, all foods may now become competitors with each other. Increased consumption of one can only be at the expense of one or more other foods. Thus, if we are to understand the dynamics of both present and future trends in consumption, it is necessary to understand the basis of the interrelationship between various foods. The first step in such a study is to build up a model of the various food categories and their interrelationship. We must think of food categories not so much in terms of what might be a technically appropriate breakdown in the eyes of the food manufacturer or nutritionist but more on the public's conception of them. By this I mean that once the housewife has decided on the structure of a meal in terms for example of 'meat' and 'vegetables' one needs to know what she regards as possible alternative foods within these categories.



In the Figure I have attempted a breakdown of foods into these various categories.

The figure represents the present position but with the exception of the introduction of occasional new foods and changes in the relative consumption of the different foods within a category there is little to suggest that there has been much change within the categories over the years.

The list for each category is not meant to be comprehensive but merely to indicate some of the major alternatives within each group. Some categories are clearly interrelated. Thus bread and potatoes might be regarded by some as in the same category, or the division between some fruits and vegetables held to be marginal. In such cases I have placed arrows on the diagram indicating a possible overlap.

Such a figure may be helpful at several levels when studying trends. In the first place it will indicate the intra group relationship of the various foods. For example it might show the extent to which demand for 'spreads' had not changed, but that the consumption of butter has risen directly at the expense of margarine. Secondly it may help to establish the intergroup relationship of foods both on a complementary and inverse basis. At a complementary level a decrease in the consumption of stewed fruit may directly lead to a decline in the consumption of custard. At an inverse level there may be a relationship between the increase in the consumption of meat and the decline in the consumption of bread.

I believe that we shall come to view current trends in food consumption much more realistically if we study the whole picture in this way. We are more likely to be able to assess whether the real competitors to apples are pears or chocolates. Similarly it may spotlight the futility of using advertising techniques to revitalize

demand for a product that has collapsed not due to a fault of its own, but because it is complementary to another basic category for which demand is declining. For example given that bread consumption is falling it goes almost without saying that jam consumption will decline. In this instance the only hope for the product is for a campaign aimed at presenting it in a different light totally divorced from the other category.

CONCLUSION

I hope in this paper I have been able to show that there is very real room for the historical approach when working in the area of food prediction. This is not only in the analysis of broad product categories and the significance of their interrelationship in the explanation of consumption patterns. Of equal importance is the contribution history can make to an explanation of the factors behind changes in consumption of individual foods at various periods of time.

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¹⁴ J. Yudkin, Patterns and trends in Food Consumption. *Progress* (1964), Vol. 50, p. 63.

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CHAPTER I

INTRODUCTION URBANIZATION AND RISING EARNINGS

T. C. BARKER AND J. C. MCKENZIE

Food provides an everyday topic of conversation and is a subject that interests many people besides vegetarians on the one hand and gourmets on the other. We hope, therefore, that this historical approach to the subject will appeal to the public at large and not merely to specialists. Most of these chapters, however, have been written by economic historians and, while they have been careful to avoid technical jargon, they do assume some knowledge of the more recent past. The aim of this introduction is to provide such an outline, in a very few paragraphs, for those whose historical background may be shaky or non-existent.

The period covered in this volume, roughly the last two centuries, was marked by rapid urbanization. When the first census of population was taken in 1801, London, with a population of just over 1,000,000, was the only place which would rank as a big city by present-day standards. No other town in Britain was even a tenth of its size. Manchester and Salford, for instance, numbered about 90,000 and the other large provincial centres – Glasgow, Edinburgh, Liverpool and Birmingham – were all of approximately the same order of magnitude. However, within the space of fifty years, while the population of London doubled, most of these other centres (and smaller places as well) grew fourfold. In 1801 Britain had been a predominantly rural society: by 1851 just over half the population lived in towns.

This unprecedented urban expansion was not just the result of a redistribution of a fairly static population. It was the outstanding feature of rapid and sustained population growth, the beginnings of which date from the middle of the eighteenth century. With no census until 1801 nor any civil registration of births, marriages and deaths until 1837, figures for the eighteenth century can be no

more than approximate estimates. But there can be little doubt that the population of Great Britain increased about threefold in a hundred years: from some 6,750,000 in the mid-eighteenth century to about 10,500,000 in 1801 and 20,817,000 in 1851.

The reasons for this growth remain a puzzle and a challenge to economic historians and demographers alike; and, as more scholars enter the field, the picture seems, if anything to become more complicated and perplexing.* It is clear, however, that of great importance was the ending of the periodic famines which had previously checked any prolonged population growth. Improved methods of agriculture, a greater area under cultivation and better transport now ensured food supplies season after season, however unkind the weather might be. In former ages if there were a series of bad harvests, people – and particularly the very young – starved and became a prey to disease; now they just went hungry but more often survived. 'Such a run of wet seasons as we have had in the last ten or twelve years' remarked Gilbert White in 1773 'would have produced a famine a century or more ago.'

That population growth could continue uninterruptedly was itself a notable achievement, possible only because of more rapid industrialization from about the 1780s onwards. The contrast with underdeveloped Ireland, where the potato famine of the mid-1840s put an end to comparable population growth, underlines the degree of achievement. Industrialization and urbanization were, however, gained at the cost of considerable human hardship. Some historians believe that population growth outstripped output and that purchasing power per head fell between the 1780s and the later 1840s. On the other hand, telling arguments have been advanced in support of the more optimistic view that many of the working classes enjoyed improving conditions, at least from the 1820s. But whether the gainers exceeded the losers still remains an open question.

Whatever may be our verdict on living standards up to the later 1840s, there is general agreement that conditions did improve from then onwards, apparently quite slowly until the mid-1870s and then

* The most notable articles on the subject have been recently reprinted, together with new material, in D. V. Glass and D. E. C. Eversley (eds.), *Population in History*, (1965).

Urbanization and Rising Earnings

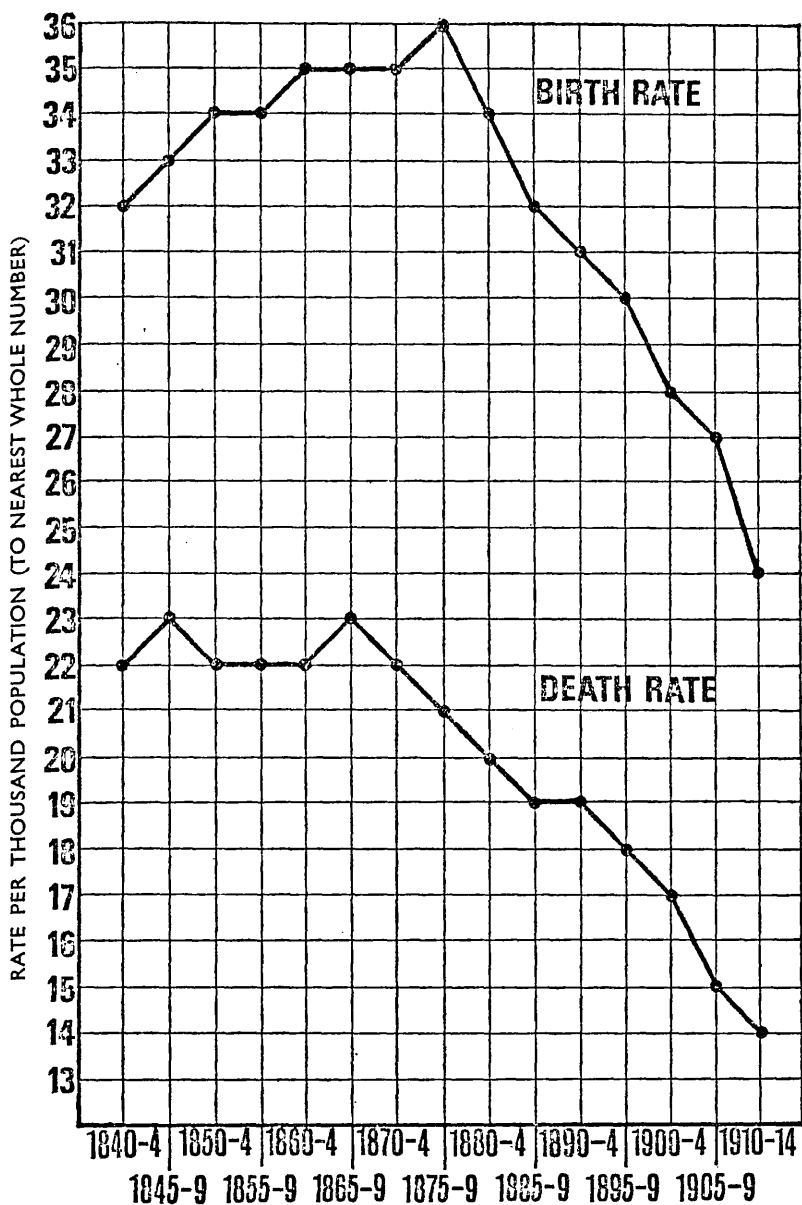


Fig. 1. Birth and Death Rates in England and Wales

more rapidly. From the mid-seventies to the mid-nineties greater competition – new manufacturing and distributing techniques competing with old, industrial and agricultural production abroad competing with that at home – brought down the prices of many commodities. Earnings fell much less and purchasing power therefore rose sharply. From the mid-nineties to 1910, however, demand caught up with supply: prices started to move upwards again and earnings lagged behind, only to regain their late nineteenth century levels in terms of purchasing power by about 1914. The Edwardian period should, perhaps, be looked upon as a period of consolidation after twenty years of great progress between 1875 and 1895.

As may be seen from the accompanying graph, the years 1875–1900 were also noticeable for the beginnings of further demographic change. The mid-nineteenth century enthusiasm for paving and draining had not succeeded in bringing down death-rates below the levels at which they had stood in the early 1840s; but after the mid-seventies death-rate did, at last, begin to fall again. And, at the same time, birth-rate began to fall, too, and at a more rapid pace than death-rate, due partly to the changing age structure of the female population, partly to later marriage and partly to the spread of birth control. There was in consequence a slowing up in the rate of population growth: fewer mouths to feed, fewer backs to clothe and less overcrowding than would otherwise have been the case had mid-nineteenth century trends persisted. But, despite this decreasing rate of increase, towns continued to absorb a growing proportion of the total population.

These broad demographic changes were also modifying the traditional picture of the family. Women, freed from the ever-continuous burden of child-bearing, were beginning to lead fuller lives. At the same time, increased mobility was beginning to break up families and to scatter their members much more widely.

All these economic and social changes which, as we have noticed, seem to have owed their earlier origins to some extent to improved food supplies, in their turn led inevitably to different criteria of food selection. Attitudes to cost and convenience altered. Greater income meant wider choice of food. Refrigeration, canning and transport developments put an ever-increasing range of food at people's disposal. Cooking facilities were improved. All of which

argues for the study of factors influencing the choice of various foods, particularly from the 1870s onwards, for, despite the First World War and the hard core of unemployment in the inter-war period (which can be traced back ultimately to the dislocating effects of that war), the basic course set in the twenty years between 1875 and 1895 continued right down to 1939. This may explain, perhaps, why so many of the contributors to this volume have focussed much of their attention on the trend-setting events of later Victorian times. In dealing with changing consumptions of, and attitudes towards, different kinds of food, they are all taking a preliminary look at aspects of a subject that deserves to be more widely recognized as one of the central themes of recent social history.

Section B - Research on Nutrition Education, Nutritional Knowledge and Food Imagery

1. Purpose of the Research

The objective of this research was firstly to isolate the levels of nutritional knowledge and food imagery of the public and of specific sub-groups of the public in the U.K. at different periods of time and to indicate how levels of knowledge changed. Secondly the aim was to establish the extent to which such knowledge/attitude influenced choice and to attempt to identify the reasons for the level of behaviour change actually derived as a result of this knowledge.

2. Methodology

The work used a range of sociological and psychological techniques and involved depth interviews, group discussions and semi-structured and structured questionnaires administered to both small and large universes. Further studies involved the critical examination and interpretation of established social and psychological parameters in a food choice and nutritional knowledge context. Details of the procedures adopted for specific pieces of research are identified within each paper.

3. Papers Included

Paper 1: Knowledge of Nutrition Amongst Housewives in a London Suburb - Co-jointly with Ann Brown and John Yudkin (in Nutrition, Volume 27, 1963).

Paper 2: An Evaluation of Popular Nutritional Knowledge (in Chemistry and Industry, 1965).

- Paper 3: Recent Developments in Social Science Related to Nutrition and Dietetics (in Proceedings of the 9th International Congress of Dietetics, Stockholm, 1965).
- Paper 4: Profile on Slimmers (in Journal of the Market Research Society, Volume 9, 1967).
- Paper 5: Housewives' Belief Concerning Past and Future Trends - Co-jointly with C.W. Golby (in Proceedings of the Nutrition Society, Volume 25, 1966).
- Paper 6: The Consumers' View of Problems and Priorities in Nutrition (in Proceedings of the Nutrition Society - in the press).
- Paper 7: Milk in Schools: An experiment in nutrition education - Co-jointly with Juliet Mattinson and John Yudkin (in British Journal of Nutrition, Volume 21, 1967).
- Paper 8: The Evaluation of Nutrition Education Programmes: A review of the present situation - Co-jointly with Pamela Mumford (in World Review of Nutrition and Dietetics, Volume 5, 1966).
- Paper 9: Food is not just for Eating (Chapter in People and Food Tomorrow, edited by Hollingsworth and Morse, London, 1976).
- Paper 10: Sociology as an Aid to Nutritional Change (in Proceedings of the VIIth International Congress of Nutrition, Hamburg, 1966).
- Paper 11: The Dissemination of Misinformation: a growing problem (in Proceedings of the Nutrition Society, Volume 27, 1968).

Paper 1 is the first report of an original research exercise embracing standard interviewing techniques.

Paper 2 is a review and evaluation of published and unpublished data and includes further original survey work undertaken by the Candidate.

Paper 3 is again a review article, but includes first publication of new research data from the work of the Candidate both in the fields of consumer knowledge and West Indian diets. It also marks the beginning of an attempt to indicate why nutritional knowledge does not influence behaviour as directly or significantly as had been previously accepted.

Paper 4 is an original research exercise involving a qualitative and national quantified survey designed, directed, analysed and interpreted by the Candidate.

Paper 5 is an original research exercise involving a qualitative and national quantified survey designed, directed, analysed and interpreted by the Candidate co-jointly with another.

Paper 6 is a report of a national survey involving qualitative and quantified research designed, directed, analysed and interpreted by the Candidate.

Paper 7 is an original research exercised designed, directed, analysed and interpreted co-jointly by the Candidate and two other persons.

Paper 8 is a review article identifying the weaknesses of earlier research studies on nutrition education programmes; indicating the limitation of their evaluation procedures; and suggesting how such procedures might be improved.

Paper 9 is primarily a review article but which, on the basis of original research, puts forward hypotheses regarding likely criteria that will influence consumers' imagery of food in future years.

Paper 10 includes a commentary upon previously unpublished work concerning food choice and nutrition in a number of developing countries.

Paper 11 is a critical comment upon the problems of presenting "misinformation" to the public.

4. Direct Conclusions from the Studies

The key findings of each paper are isolated within that paper. However it is suggested that overall significant findings are:-

- The demonstration that nutritional knowledge albeit still limited is growing and becoming more accurate over time;
- Powerful food imagery based upon long-term cultural influences remain alongside this growing knowledge and often conflicts with it;
- The indication that often nutritional knowledge does not appear to influence consumers to any degree in their choice of food;
- The interpretation of why attitude and behaviour are often so far apart in this field and an indication of the ways in which nutrition information may become a more cogent influence upon choice;
- A critique of the way in which the evaluation of nutrition education programmes have been undertaken in the past and attempts made with commentary and controlled experiment to demonstrate

the ways in which evaluation may be more effectively implemented in the future.

Knowledge of Nutrition amongst Housewives in a London Suburb

BY ANN M. BROWN, B.Sc., M.N.S., J. C. MCKENZIE, B.Sc. (Econ.) and
JOHN YUDKIN, M.A., M.D., Ph.D., M.R.C.P., F.R.I.C.
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THERE IS INCREASING recognition that the problem of adequate nutrition is not necessarily solved by simply making foods available, even though they may contain all the necessary nutrients. There exists a gap between food availability and good nutrition which can only be bridged by the appropriate choice of food. The existence of this gap is most clearly recognised in the developing countries (Burgess and Dean, 1962) but there is also reason for doubt whether, in the developed countries, our choice of food is always nutritionally desirable (Yudkin, 1962). We know very little of the reasons which determine food choice, either in the developing countries or in the more affluent countries. There is thus a need to identify these factors, in the hope of using one or more of them to guide people to correct nutrition.

One of the factors which may be concerned is knowledge of nutritional

values. It is indeed often suggested that this is a considerable factor, and that in the developing countries we can induce desirable change in food choice if only we can inculcate knowledge of nutritional values. A recent FAO pamphlet (FAO 1962) makes the point in this way:

"... People tend to eat what they like... People also eat what they believe to be good for them... Middle class families of Western Europe and America have been brought up to respect science and value its results. Once the facts have been presented to them, these families tend to accept a new food or a new concept about food and its relationship to health. Thus... education, and particularly science education, will aid the application of new scientific knowledge to the improvement of diet."

We have recently begun a programme

TABLE 1

"Can you suggest two foods containing a lot of the following nutrients?"

No. of correct answers	Number of persons giving 2, 1 or 0 correct answers:				
	Protein	Iron	Carbohydrate	Calcium	Vitamin C
2	44	19	34	14	40
1	11	37	10	37	19
0	26	25	37	30	22

of research designed to discover the factors which determine food habits. One of the questions which we hope to answer is the extent to which food choice is affected by knowledge of nutritional values. Before we can answer this, however, we need to know the extent and accuracy of this knowledge. This paper describes briefly an attempt to assess nutritional knowledge in a group of housewives, whose attitudes to food presumably affect to a considerable degree what foods they buy. The assessment took the form of a prototype survey by questionnaire, mainly in order to discover whether this method was feasible. The results, tentative though they are, may themselves be of interest.

Method

One hundred housewives were selected at random from the electoral roll in Bromley, Kent, during September, 1962. If contact could not be made with a person selected, a new name was taken from a supplementary random list. People who refused to co-operate were not replaced. Of the hundred people seen, 19 refused to take part, giving us a working sample of 81.

Results

Knowledge of various nutrients. Housewives were given a list of nutrients and asked to suggest two foods containing a good deal of each nutrient. The nutrients were protein, iron, carbohydrate, calcium and vitamin C. The average number of correct answers out of 10 was 5, with 4 people getting all right or all wrong.

There was a relatively wide knowledge of foods containing protein and vitamin C, but the number able to identify two foods containing a good deal of calcium or iron was smaller (Table 1). Thirty-seven housewives were unable to suggest any food that was a good source of carbohydrate and it was realised that this word was not in common use.

Meat, cheese, eggs and fish were the foods most often mentioned as containing protein, and oranges, blackcurrants and fruit generally were most commonly mentioned for vitamin C (Table 2). As one might imagine, bread and potatoes

TABLE 2

Foods mentioned as containing nutrients:

PROTEIN					Times mentioned
Food	..	..	..	..
Meat	..	..	..	..	31
Cheese	..	..	..	..	21
Eggs	..	..	..	..	20
Fish	..	..	..	..	17
Milk	..	..	..	..	8
Vegetables	..	..	..	..	6
Butter	..	..	..	..	5
Fruit	..	..	..	..	3
Others (mentioned once)	..	..	..	..	2

VITAMIN C					Times mentioned
Food	..	..	..	..
Orange	..	..	..	..	37
Blackcurrants	..	..	..	..	20
Fruit	..	..	..	..	12
Rose hip syrup	..	..	..	..	4
Milk	..	..	..	..	4
Citrus fruit	..	..	..	..	4
Fresh fruit	..	..	..	..	4
Lemons	..	..	..	..	4
Greens	..	..	..	..	3
Vegetables	..	..	..	..	3
Fish, tomatoes	..	..	..	..	2
Others (mentioned once)	..	..	..	..	10

were most often singled out for carbohydrate (Table 3). Milk, cheese and eggs were mentioned as containing calcium. Greens, spinach, and liver were almost the only foods generally suggested as rich in iron (Table 4). It was interesting to see that five people thought that butter was rich in protein.

Attitudes to sayings. We devised a set of 11 "sayings" and asked the housewives to state whether they were true or false. Some of the sayings are in fact quite true, others quite false; we also included sayings which represent common beliefs, but which can hardly be said to fall into the categories of true or false.

The questions concerning an apple a day, and a little of what you fancy, were answered somewhat light-heartedly, but people seemed to believe — and to do so very happily — that the foods they liked were those which were good for them (Table 5).

Most housewives knew that fish does not make you brainy, nor toast make your hair curl. However, a large number, though still a minority, believed that lemon juice is good for slimming. It would be interesting to know to what extent this wrong belief is fostered by current advertising.

The great majority of people believed that canned foods are less nutritious

TABLE 3
Foods mentioned as containing nutrients:

CARBOHYDRATES				<i>Times mentioned</i>
<i>Food</i>				
Bread	..	..	..	28
Potatoes	..	..	..	20
Cakes	..	..	..	11
Sugar	..	..	..	4
Flour	..	..	..	3
Biscuits	..	..	..	3
Rice	..	..	..	2
Others (mentioned once)	..	..	..	10

CALCIUM				<i>Times mentioned</i>
<i>Food</i>				
Milk	..	..	..	34
Cheese	..	..	..	21
Eggs	..	..	..	9
Fish	..	..	..	5
Bread	..	..	..	4
Fresh fruit, Meat, Butter, Greens	..	..	..	2
Others (mentioned once)	..	..	..	9

TABLE 4
Foods mentioned as containing nutrients:

IRON				<i>Times mentioned</i>
<i>Food</i>				
Greens	..	..	..	21
Spinach	..	..	..	20
Liver	..	..	..	19
Meat	..	..	..	5
Watercress	..	..	..	5
Cabbage	..	..	..	3
Fish	..	..	..	3
Eggs, Apple, Raisins, Tomatoes, Grapefruit, Vegetables, Carrots	..	..	..	2
Others (mentioned once)	..	..	..	17

TABLE 5

"There are a great many sayings which are often repeated about food. Would you tell me which of the following you think might be true?"

	<i>Number of persons giving answer indicated</i>		
	<i>False</i>	<i>True</i>	<i>Don't know</i>
a. Canned foods are less nutritious than fresh foods	17	59	5
b. An apple a day keeps the doctor away	31	42	8
c. Brown bread is better for you than white bread	15	60	0
d. Protein is good for body building	0	77	4
e. Calcium is good for the bones	1	79	1
f. Fish makes you brainy	60	16	5
g. Toast makes your hair curl	78	3	0
h. A little of what you fancy does you good	11	70	0
i. Lemon juice is good for slimming	40	31	10
j. Iron is necessary to prevent anaemia	1	76	4
k. Eating sweets helps to cause tooth decay	3	77	1

than fresh, and that brown bread is better than white. Yet this belief that "natural foods" lose some of their goodness by processing clearly does not deter them from buying large quantities of canned foods. Still less does it deter them from buying very much more white bread than brown; brown bread accounts for only 8 per cent. of the total bread consumed in Britain.

The answers regarding protein, calcium, iron and sweets imply a satisfactory knowledge in this area by a very high proportion of housewives. However, the implementation of this knowledge in regard to calcium and iron would require knowledge also of foods which contain these nutrients, and as we have seen many housewives do not have this knowledge. As regards eating sweets, we have here another hint that nutritional belief is not a very considerable determinant in food choice.

Fluorine. We also asked the question: "Why has it been suggested that fluorine be added to certain water supplies?" Forty-seven housewives realised that there was some association between this and the prevention of tooth decay. This figure may have been influenced by the current television advertising of a fluorine-containing toothpaste. Table 6 summarises the answers of the housewives, including the somewhat surprising ones such as that fluorine is used to make water soft, or stop cancer, or stop pipes corroding.

Energy. Most answers to the question: "What foods give you energy?" favoured foods rich in carbohydrate and especially sugar (Table 7).

Slimming. The housewives were asked what foods they would recommend to be cut out of the diet by a person who wanted to slim (Table 8). It is interesting to see the high importance attached to foods containing carbohydrate, especially potatoes, and the relatively low importance to foods rich in fat.

World Food Problems. We might have expected that many people would know something about world food problems,

TABLE 6

"Why has it been suggested that fluorine be added to certain water supplies?"

Answer	Number of people
Prevents tooth decay	47
Don't know	14
Makes water soft	5
Purifies the water	4
Kills germs	4
Clears the water, stops disease, stops cancer, gives iron, acts as a disinfectant, stops pipes corroding, kills the lime	1 each

TABLE 7

"What foods give you energy?"

Food	Times mentioned
Sugar.. ..	34
Meat	13
Bread	9
Fruit	9
Milk	8
Glucose	7
Vegetables	6
Eggs	6
Cheese	6
"Carbohydrate"	6
"Starches"	3
Vitamin C	3
Cereals	3

TABLE 8

"If a friend wanted to slim what foods would you suggest they cut out of their diet?"

Food	Times mentioned
Potatoes	45
Bread	41
Starches	20
Sugar.. ..	18
Carbohydrate	15
Cakes	13
Sweets	13
Fat	8
Biscuits	7
Pastry	5
Flour	4
Puddings	4
Cream	3
Butter	3
Milk	2
Rice	2
Cheese, "Liquids"	1

especially since the Freedom from Hunger Campaign began its work in Britain in April, 1961. In fact, little was known of these problems. It was particularly surprising to find that only one person mentioned the Campaign (Table 9).

Of the 81 housewives, 52 could not correctly name any organisation concerned with world food problems.

In view of this, it was not surprising that only 30 people were prepared directly to answer the question "What proportion of the world's people suffer from malnutrition?" (Table 10). Others resorted to mentioning various areas.

Conclusions

We do not claim that this paper represents anything more than a tentative beginning to solving the problem of discovering the factors which make people eat the foods they do. We do not even pretend that it answers the question of the extent of nutritional knowledge among British housewives.

Nevertheless, if our more extensive studies confirm these results, it would mean that we could draw three general conclusions from this. The first is that the nutritional knowledge of London housewives is not very extensive, and some of it is quite wrong. The second is that this knowledge, right or wrong, frequently does not determine the actual choice of foods bought and consumed. Most housewives believe that canned foods are inferior to fresh, that brown bread is better than white and that sweets are bad for the teeth. Yet most housewives buy white bread rather than brown, the sale of canned foods is high and rapidly increasing and we eat more sweets in this country than in any

TABLE 9

"Do you know the name of any organisation concerned with world food problems?"

Organisation	Times mentioned
Oxfam	10
W H O	9
U N E S C O	4
U N I C E F	3
F A O	3
United Nations	2
Freedom from Hunger	1
Save the Children Fund	1
Don't know, or wrong answer	52

TABLE 10

"What proportion of the world's people suffers from malnutrition?"

Proportion:	$\frac{1}{3}$	$\frac{1}{5}$	$\frac{1}{9}$	$\frac{3}{5}$	$\frac{2}{7}$	$\frac{3}{4}$	$\frac{5}{6}$
Times mentioned:	3	5	9	1	7	4	1

Countries	Times mentioned
China	14
India	12
Africa	8
Asia	2
Japan	2
Greece	2
"Arabs", Russia, Far East, Congo,	
Hungary, Italy	1 each
Don't know	27

other. If this is so, it suggests that we may be over-simplifying the problem of directing food choice into more satisfactory channels if we believe we can do this only, or chiefly, by nutritional education. The third conclusion is that nutrition education cannot be effective if it only emphasises the function of nutrients without stressing the foods which contain them. It is of no use to know that iron is good for preventing anaemia if one has little idea of which foods one should choose to obtain it. Clearly, we need far more work in order adequately to identify the factors which determine food choice.

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An Evaluation of Popular Nutritional Knowledge

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(Paper presented to the Nutrition Panel of the Food Group of the Society of Chemical Industry in London on February 5, 1964)

UP to a few years ago nutritionists saw the problem of malnutrition as simply a question of the availability of food. People were undernourished because they could not obtain enough to eat or enough foods containing certain nutrients. It was believed that, as people became more prosperous and food was increasingly made available to them, malnutrition would disappear. However, increasing evidence is now being brought forward to show that for anthropological, sociological and psychological reasons people may not make use of specific foods even if they are available, and that increasing prosperity does not completely eradicate malnutrition, but merely presents it in a different form.^{1,2}

It is therefore important for us to know a good deal more about the factors which have determined past food choice and the variables which may be most active in influencing choice of the future. One of the first aspects of such research must be to assess the present extent and sources of the public's knowledge of nutrition. The present paper summarises work, as yet unpublished, which has recently been undertaken by several commercial organisations,* and indicates recent projects developed at Queen Elizabeth College.

Awareness of Nutritional Terms

In a survey undertaken in 1958, 300 London housewives, selected by a quota sample based on age and social class, were questioned as to their knowledge of nutritional terms. Vitamins and protein were by far the best known nutrients. There was surprisingly little knowledge of calories and carbohydrate; it would be interesting to see how this has changed in 1964 with the growing amount of informative nutritional information on slimming. A considerable number of housewives, especially in the lower social classes and older age groups, were unable to suggest the name of a single nutrient.

Function of Nutrients

In another survey in 1961 of 550 housewives in the North, Midlands and London, selected by quota sample based on age and socio-economic class, an attempt was made to assess what were considered to be the specific functions of a number of nutrients. Of the 60% of housewives able to suggest a function of

*I am indebted to Quaker Oats Ltd., Bureau of Commercial Research Ltd., and one other company which wishes to remain unnamed, for permission to publish results from surveys undertaken by them over the past few years.

protein, half used in some way the phrase "body-building" while others suggested it provided the "nourishment" or the "energy" in food. Among unusual suggestions for protein was one that it provided "for the natural juices of the body," and another that it was "good for the brain." Over 60% could not suggest any answer or gave one judged to be incorrect. A higher response came from the younger housewives and those of the higher socio-economic classes; London housewives also did better than those in the Midlands and the North.

Similar studies were made of the functions of calcium, iron and the various vitamins. Vitamin C was the only vitamin in which any sort of pattern began to emerge and even here nearly 50% of housewives could offer no suggestion as to its function, 95% could

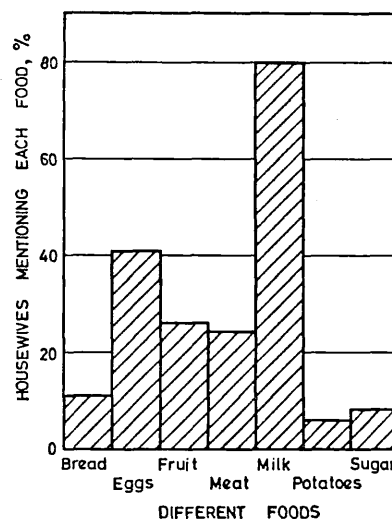


FIG. 1.—Suitable foods for giving good teeth and bones to growing children.

not suggest any function at all for vitamin E. In every case knowledge was greater among the younger housewives, those of higher socio-economic class and those coming from the South.

Knowledge of Foods containing Specific Nutrients

In a survey in Bromley, Kent in 1962 we attempted to test the ability of housewives to indicate foods containing substantial quantities of given nutrients.³ Housewives were shown a list of nutrients and asked to suggest two foods containing a good deal of each nutrient. The average number of correct answers

out of 10 was five. There was a relatively wider knowledge of foods containing iron or calcium. Thus it may be argued that the chances are that if an individual knows why he needs a specific nutrient then he will not know which foods to select in order to obtain it; if he knows a food containing a specific nutrient then the individual will not know why he needs this nutrient.

The range of foods associated with any nutrient was usually small; in each case only two or three foods were widely known. Thus meat, cheese, and eggs were the most frequently mentioned as sources of protein, as were oranges and blackcurrants for vitamin C. Greens, spinach and liver topped the list for iron, as did bread and potatoes for carbohydrate, and milk and cheese for calcium.

Generalised Food Concepts

The limited knowledge of what may be called formal nutrition is backed by a much greater fund of general information, or often more correctly misinformation,

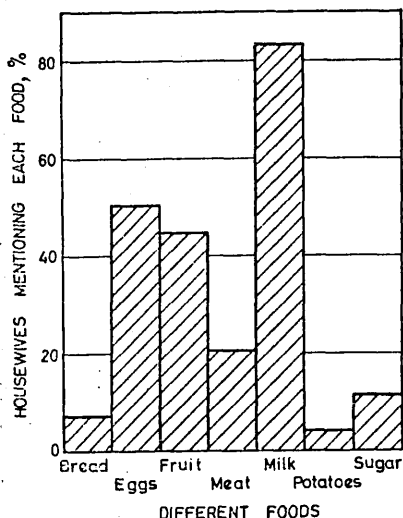


FIG. 2.—Food especially good for nursing and expectant mothers.

about food and nutrition which may be classified under a general heading of "food concepts." In many ways such information may be of much greater value since people tend to talk of food as being "nourishing" or "full of energy" rather than as containing 3g. of protein.

An attempt was made in 1960 to assess how a number of foods were rated over a wide field of concepts. A sample of 2000 housewives selected on a nationally representative basis was given a list of seven foods: bread, eggs, fruit, meat, milk, potatoes and sugar. They were asked to assess these foods for a number of qualities. Their answers are summarised in Figs. 1-7.

Many people also have ideas about slimming. In a number of surveys, undertaken in Great Britain over the past few years, foods high in carbohydrate have always topped the list of foods to avoid if you wish to slim. This may be shown by reference to the survey carried out in Bromley and also by the rating of foods (Table I).

In our studies over the past few years I believe several other generalised food concepts, widely held

by the public, have become apparent. A large proportion of the public believes that food deteriorates in taste and nutritional value with processing and preservation, and that it may even become positively dangerous if additives are included. In Bromley 80% of housewives interviewed believed that "canned foods are less nutritious than fresh foods" and nearly as many that "brown bread is better than white."

Table I

Foods making people put on weight/lose weight. (expressed as the percentage of housewives mentioning each food)

Put on weight	%	Lose weight	%
Potatoes	77	Fruit	69
Bread	67	Eggs	17
Sugar	40	Meat	15
Milk	10	Milk	7
Meat	4	Bread	2
Eggs	1	Sugar	1
Fruit	1	Potatoes	1

Perhaps this is not surprising when libraries are full of books which tell of the advantages of making yourself "almost independent of all foods which have come through a factory—keep tinned, bottled, packed food for emergency use only." This is because "there is some quality in fresh food which cannot yet be measured. No one knows what it is, but it seems likely that it is connected with the very life force itself which conveys some vital essence to man."^{4,5}

Many people also believe that relative food value is indicated by the attractiveness of the taste of a product. Nearly 90% of Bromley housewives believed that "a little of what you fancy does you good." There might at least have been some justification for such a belief in past years. Many people believe that "palatability" is the essence in food which makes it sought after by an animal and hence helps it to select an adequate diet. Similarly it has been argued that in past years at least the foods nutritionally desirable for man were those he found most palatable. That is the foods of animal origin, fruits and vegetables. However, whatever accuracy may have rested in this belief in the past certainly no longer holds true for today. The food manufacturer, by isolating the factor of palatability especially with regard to sweetness, can now present a range of extremely palatable foods which have little or no nutritional value.⁶

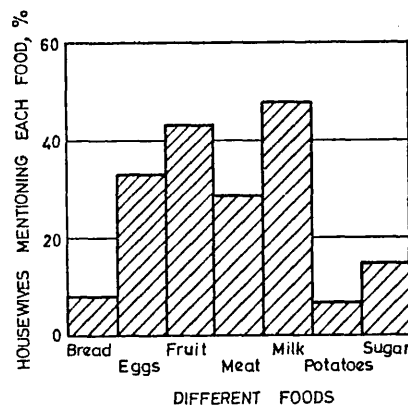


FIG. 3.—Foods giving better resistance to disease.

I also believe it is possible to detect in most people's minds a difference between foods which they themselves regard as essentially "nourishing" and enjoyable, and those which are felt by the public in general to be "clinical." Too many people see the nutritionist as the person who takes away all the pleasantest foods in life. It is perhaps not for nothing that the man who is 10 stone overweight is seen as someone who is jolly and contented rather than as someone who is likely to have a shorter life span.

Perhaps the product most severely hit by this sort of attitude is milk which is felt to have many sound nutritional qualities. But it is these qualities, plus the rather unpleasant association milk conjures up of past school days, which present the biggest obstacle ever to milk drinking. It is much more fun in life to be sinful and daring and take that extra sugary confection than to be pure and innocent and drink a glass of milk.

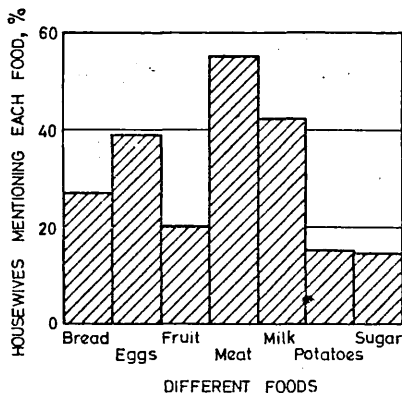


FIG. 4.—Foods good for adding flesh and muscle to growing children.

Sources and Reliability of Information

We have as yet little information about where the public obtains its ideas on food and nutrition. The following suggestions are therefore mainly based on my own beliefs and cannot be regarded in any way as conclusive.

Naturally enough the public looks to the medical profession for a great deal of sound nutritional advice. However, medical schools place little emphasis upon nutrition in their syllabuses and many practising doctors have little idea of general nutritional concepts or what is a sound approach to slimming.

Equally the public looks to the pharmacist for advice on the best products to use and expects all his articles to be of a reputable quality. Because of this they do not view with the same suspicion the claims made about the products he sells as they would a new washing powder at the grocers. However, the pharmacist often makes no attempt to assess the validity of the claims put forward about the products on display. He may well, for example, include amongst his range of genuine slimming products one or two that can only be defined as quack articles.

Schools are another likely source of information. Most girls have several years domestic science during their school career. The extent to which nutrition figures in this course varies very considerably, but it is never of major significance. In any case the standard

of nutritional knowledge of domestic science teachers is usually very limited and often inaccurate. At training college greater emphasis is generally placed upon dexterity with manual skills than on the scientific study of nutrition.⁷

Boys usually receive no nutrition education at all with the possible exception of a passing reference in a biology class.

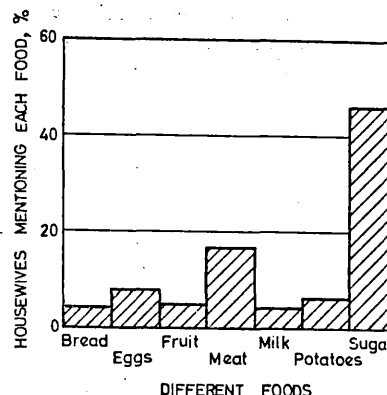


FIG. 5.—Foods causing overheating of the blood.

Perhaps one of the best sources of information comes from the increasing number of pamphlets on nutrition which are being circulated by commercial organisations. These are aimed not only at schools but the public at large. In most cases they begin by giving a basic outline of nutrition principles and requirements with special emphasis on vulnerable groups such as pregnant and nursing mothers. This is usually followed by a section showing how the specific product in question can help to satisfy these requirements.

A growing number of these firms are also setting up their own information centres to advise the public about food generally and nutrition in particular. They provide a service for all those who ask; from the specialist home economist working in industry to the

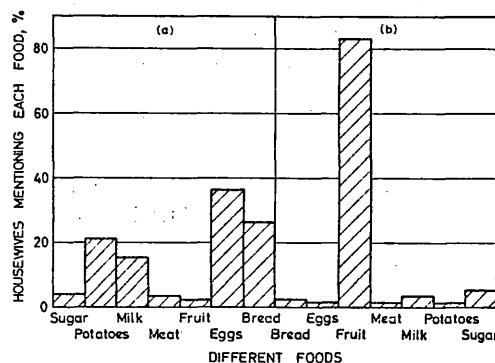


FIG. 6.—(a) Foods resulting in constipation; (b) foods relieving constipation.

average housewife in a provincial town. Normally little emphasis is placed upon their own products.

Women's magazines also provide a fair quantity of advice both good and bad. They are particularly concerned to advise their readers on ways to slim and on good foods for the younger members of the family. With one or two notable exceptions the articles are

very poor, rarely written by the specialist, and are full of eye-catching gimmicks.

Books are seldom of any real value either. Few nutritionists are prepared to make the effort required to produce a popular yet informative book for the general public. Instead the field is left wide open for the food crank. It is perhaps unfortunate that as a community we spend our time chasing publishers who seek to sell us a copy of "Fanny Hill" while we ignore completely the vast quantity of nutritional misinformation which is published.

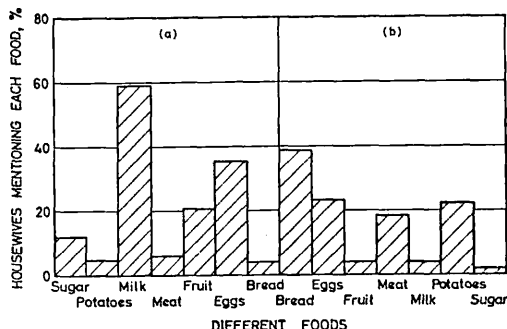


FIG. 7.—(a) Foods easily digestible; (b) foods liable to cause indigestion.

Advertisements also provide us with a quantity of "information" on nutrition. However, at the moment the nutrition angle is seldom singled out for special attention. Even if the information is accurate it rarely catches the public's imagination. Glucose for energy is one of the few that has fallen on really fertile ground.⁸

In the face of such unreliable sources of information it is surprising that the public's knowledge is as good as it is. This is particularly true when it is considered that any information is "watered down" as it passes from housewife to housewife.

Application of Information

There is a fair amount of evidence to suggest that most people do not to any great extent modify their behaviour in the light of any information they possess about nutrition. In 1958 the 300 London housewives questioned on nutrition seemed very unconcerned

Table II
Concern with nutritional factors in food
(expressed as a percentage of total answers)

Response	%
No, don't bother	56
Yes, do bother	26
Mothers with children do	6
The younger generation do	2
Some do/some don't	1
Don't know	9

with nutrition as a factor in determining food choice (Table II). The figures remain virtually constant for age and class. Indeed taking into account the fact that the question made the answer "yes" an easy one, it is quite remarkable that only one quarter answered in the affirmative.

At first thought such answers may seem to be surprising but people are clearly much more concerned

with the taste and uses of cheese, for example, than with its nutritional value (Table III). Equally, observation can easily show us that the belief that

Table III
Reasons why housewives buy cheese⁹
(expressed as the percentage of housewives mentioning each reason)

Reason	%
I like it/Family like it	66
Nutritional value	32
For cooking	12
For sandwiches	11
Has many uses	7
Makes a filling meal	3
For savouries	3
As a standby	3

brown bread is nutritionally more desirable than white, and canned foods are less nutritious than fresh, is not backed up by the extensive purchase of brown bread and abstinence from canned foods.³ In another field of health education, smoking provides the classic example of increased knowledge not acting as a deterrent.

However, I do not believe that on the basis of such findings either the academic nutritionist or the food manufacturer should decide against extending their efforts to inform the public about nutrition.

For the manufacturer, stress upon various nutrients may be highly significant in emphasising the special value of his brand. Lack of success so far may well be because of an unwillingness to stress sufficiently a nutritional theme. For example, there seems little point in placing at the bottom of a bread advertisement in very small letters "all flour contains—per 100 grams of flour, vitamin B₁ not less than 0.24 mg.; Niacin not less than 1.6 mg.; iron not less than 1.65 mg.; calcium not less than 94 mg."

Equally little research has been undertaken on the public's attitude towards various nutrients, the best media in which to create a new "image," or the extent to which the association of a particular image with a product may raise unfavourable reactions with a section of the community. For example, while the stress on the slimming qualities of a product may be favourably received by teenage girls, it may react unfavourably on mothers with young children who are looking for products full of energy with which to feed their offspring.

Similarly it may be argued that as yet nutrition education has had little chance to be effective. So far evaluation and rationalisation of teaching techniques in nutrition have been virtually non-existent.¹⁰ Moreover the subject can hardly be adequately put across in schools until those required to teach it have a sound grasp of the basic principles of nutrition themselves.

The value of nutrition education is at present open to question. It is vital for the health of the population that the issue is resolved beyond dispute as quickly as possible. If it is successful we must rapidly extend its use as a method for modifying food habits. If nutrition education is unsuccessful we must not hang on to it affectionately but intensify our quest for other more effective methods of persuasion. Only then will

developments in nutritional knowledge be complemented by the modification of food habits.

Those wishing to receive detailed tables from the surveys are invited to write to the author.

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Recent Developments in Social Science
related to Nutrition and Dietetics

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The need for social science

Dietetics is one of the most applied of sciences. Almost every description of the functions of dietitians given at the last International Congress concentrated on the application of the principles of nutrition and dietetics to the feeding of people. This of course may place hospital dietitians in an enviable position. Few of us are privileged enough to be in a position to see the direct impact of our work upon individuals within society. But this very privilege brings its difficulties. If for any reason an individual refuses to eat their scientific preparations then almost all of the contribution that dietitians can make to society disappears.

This problem would not be so severe if people automatically ate what was good for them. But I am sure that all of you on the basis of your own experience can categorically state that this is not the case. Everybody has their whims and fancies. Each patient has a different set of food preferences and habits; each on occasions may refuse to eat any or all of a meal that has been specifically prepared for his or her special requirements. This may be because they dislike cabbage, because in hospital they are forced to eat in bed, because they have been given too much, because their mind is full of other anxieties, or for countless other reasons. It may be argued that some or all of these factors are not the responsibility of the dietitians. But because their science is an applied one, because dietitians are privileged to see the direct impact of their work upon

individuals, they must accept the responsibility for both success and failure.

It is therefore essential that all dietitians be social scientists. They must try to set up on top of their scientific discipline another as yet less accurate set of principles which will help to persuade those they cater for to eat the food provided. However, to say this is not to be profound or revolutionary. It is not to ask dietitians to go back to university and read for a degree in sociology or psychology. Nearly every dietitian becomes something of a social scientist by the very nature of her experience and her closeness to the people she serves. Dietitians can well echo the motto of a well-known English Sunday Newspaper 'All human life is here'; their experience will often guide them to an understanding of the basic principles of applied social science.

It would not therefore be appropriate for me today to argue in detail that there is a need for nutritionists and dietitians to embrace social science in their discipline. To anyone with any perception who has worked with people and tried to influence their food choice such a hypothesis is self evident. Indeed over the last few years a number of conferences and reports have dealt extensively with this thesis (Burgess & Dean, 1962, Yudkin & McKenzie, 1964). What it may be useful for me to do is to draw your attention to recent basic research on behaviour change undertaken by social scientists which may have some relevant application to the problem of influencing food habits, and to more specific research aimed directly at influencing food habits.

Basic factors influencing behaviour

A useful beginning may be made by trying to explain why it is that people often take little notice of the advice we give. That is, for example, why people do not give up smoking even though they are aware of the correlation with lung cancer, or why the overweight housewife may continue to eat foods that she knows are mainly responsible for her excess weight.

In the first instance we must realise that man is influenced by a large number of psychological desires, or needs, the satisfaction of which gives pleasure to his mind and body. (Elsewhere it has been suggested that 'wants' is a more appropriate word [Yudkin & McKenzie, 1964], but for the purposes of this paper I will use the accepted psychological terminology, 'need').

It is essential that we come to understand the needs of the people whose behaviour we are trying to influence. This is because action on their part will depend on the fulfilment of needs. A response to a communication will not be made unless the individual feels that at best it will lead to the satisfaction of a need, or at worst that it will not interfere with other needs. It does not matter how often a rat has associated the response of running through a maze with food at the end of it, the rat will in most cases not go through the maze if it is not hungry. A man is not going to eat the foods we recommend or provide unless he believes that it satisfies a need.

Since on occasions man's various needs may come into conflict with one another they are rated according to their degree of importance to the individual. This hierarchy of needs is not static. Man is constantly re-assessing them according to some scale of values which is to a large extent determined by the society in which he lives (Table 1).

Similarly man for his part influences and modifies the structure of the society.

When it comes to a question of behaviour change we must not underestimate the influence of these pressures upon

Table 1. Hypothetical set of needs (rank ordered)

1. Wealth
2. Acceptance by friends
3. Love
4. Health
5. Leisure
6. Religion
7. Security

man's decision whether or not to accept the food patterns that we as nutritionists and dietitians seek to lay down. Even if a good diet fulfils a need, it fulfils only one. Good health as a basic need is in constant competition with all other forces of greater or less importance. We can be too quick to imagine that the logic of man will place good health high on his scale of values. Even if a patient accepts that in order to be restored to health he must eat meat, another need—this time perhaps a religious one strongly projected by his cultural background and higher on his scale of values—may forbid him to eat it.

It may be for reasons such as this that the individual continues to avoid or eat certain foods in spite of the information that has been presented to him, which he has accepted and which one would think would lead him to modify his behaviour.

Nutritional knowledge and attitudes

What does all this mean particularly in relation to our attempts at behaviour change? It means first of all that if we are to have any chance of success our first step must be to try to make our communications and suggested behaviour changes as consistent as possible with the existing beliefs and attitudes of the individual and society concerned. Anything which is not adapted in this way will tend to be ineffective since the individual will actively try to avoid situations and information which are inconsistent with his existing attitudes and beliefs. Now we may not be able to assess the whole cultural background of a society and here we must rely on the expert. But what we can do is study the population's concepts about nutrition and try not to offend

existing attitudes in this field, or if this is impossible, to make any change as gentle as possible.

With this in mind, we have recently in the United Kingdom been trying to assemble as much information as possible on people's attitude to various foods and their knowledge of nutrition (Brown, McKenzie & Yudkin, 1963, McKenzie, 1965 a.,b.). In one study housewives were invited to rate a set of seven foods for different qualities (Tables 2 to 5). Such a study helps to indicate the public's belief as to the relative values of different foods.

Table 2. Foods especially good for expectant and nursing mothers. (Expressed as the percentage of housewives mentioning each food).

Milk	83
Eggs	51
Fruit	45
Meat	21
Sugar	11
Bread	7
Potatoes	4

Table 3. Foods resulting in constipation/relieving constipation. (Expressed as the percentage of housewives mentioning each food)

Results in constipation		Relieves constipation	
Eggs	36	Fruit	83
Bread	26	Sugar	5
Potatoes	21	Milk	3
Milk	15	Bread	2
Sugar	4	Meat	1
Meat	3	Eggs	1
Fruit	2	Potatoes	1

Table 4. Foods giving better resistance to disease. (Expressed as the percentage of housewives mentioning each food)

	%
Milk	48
Fruit	43
Eggs	33
Meat	29
Sugar	15
Bread	8
Potatoes	7

Table 5. Foods likely to cause indigestion/easy to digest. (Expressed as the percentage of housewives mentioning each food)

Likely to cause indigestion		Easy to digest	
Bread	39	Milk	58
Eggs	22	Eggs	36
Potatoes	21	Fruit	21
Meat	18	Sugar	16
Fruit	5	Meat	6
Milk	5	Potatoes	5
Sugar	2	Bread	4

In other experiments we asked them more specifically to suggest foods that were 'Good for energy' and foods 'to avoid when slimming' (tables 6 and 7). Such an experiment can take us some way towards an assessment of the roles of various foods, but as a base it requires that we know the various roles that the public have conceived for foods in general so as to present them to the respondents.

A new technique is now being used to get the respondents to isolate for themselves the images of various foods. (Golby & McKenzie, to be published.) The person being interviewed is given a list of foods and the items are presented in groups of three; say butter, mushrooms and cabbage. The respondent is then required to say which is the odd one out, give the reason why (which must not be factual), and then divide the twenty-four foods into two

Table 6. What foods give you energy? (expressed as the percentage of housewives naming each food)

Food	% Mentioning
Sugar	42
Meat	16
Bread	11
Fruit	11
Milk	10
Glucose	9
Vegetables	7
Eggs	7
Cheese	7
Carbohydrate	7
Starches	4
Vitamin C	4
Cereals	4

Table 7. Foods housewives suggest should be avoided when slimming (expressed as the percentage of housewives naming each food)

Food	% Mentioning
Potatoes	62
Bread	55
Sugar	31
Cakes	25
Starches	22
Sweets	16
Fat	10
Carbohydrate	7
Biscuits	5
Butter	4
Pastry	3
Fried food	2
Milk	2
Rice	2
Peas	1

groups of twelve on the basis of the reason given. In this way, by a proper randomization and presentation of the triads and an analysis of the explanations given one is not only able to begin to provide an exhaustive list of concepts about food, but also some indications of the interrelationship of concepts e.g. "strong flavoured foods" may be "unpleasant foods" and "natural foods", "plain foods".

I have also begun to assess people's knowledge of the various nutrients. For example, it is possible to show what people regard as the major functions of protein and the foods associated with this particular nutrient (Tables 8 and 9).

By obtaining information in this way it is possible to increase one's background knowledge of the foods likely to be acceptable to the patient in hospital, and the way in which people may be guided in keeping the correct diet in everyday life. The advantage of such research lies in the ease of its undertaking. Any dietitian, if she felt it necessary, could undertake such a survey.

Table 8. Suggested Functions of Protein (expressed as the percentage of housewives mentioning each function)

Function	% Mentioning
Good for bodybuilding	32
Good for general health and fitness	9
Good for nourishment	4
Good for energy	3
Good for bones and teeth	3
Miscellaneous	8
Don't know	41

Table 9. Foods mentioned as containing Protein (expressed as the percentage of housewives naming each food)

Food	% Mentioning
Meat	38
Cheese	26
Eggs	25
Fish	21
Milk	10
Vegetables	7
Butter	6
Fruit	4
Others (mentioned once)	2

Such studies of the roles of various foods are, of course, of importance not only to Western society. They are of equal, if not greater, importance for work associated with food habits of people from the developing countries. Here, however, it is difficult as yet to make use of questionnaire techniques and we are heavily reliant on the descriptive studies of the anthropologist.

In every case the collection of such information will enable us to build up a more appropriate series of communications directed towards behaviour change. But the theoretical concepts outlined earlier are also of great relevance when it comes to the actual attempt at change.

Methods of facilitating change

It has been shown that if our recommendations are to be successful they must not make for inconsistency. At its simplest this means we should concentrate on telling people the foods we should like to see them eating, rather than on those foods we want them to stop eating. This point may be illustrated from the work of nutritionists in Puerto Rico who began by telling people that they must give up their rice and beans in favour of milk and tomatoes. They were much more successful when they switched to suggesting suitable additions to rice and beans which might make the diet nutritionally adequate (Burgess & Dean, 1962).

Similarly, it would seem likely that in the developing countries the emphasis should always be on encouraging the use of new foods or food supplements rather than on the consumption of an available food which is at present refused. If people do not eat fish which is abundantly available in the area it is because they do not regard it as a suitable food, or because they have some religious objection or taboo towards it. To break down such an existing cultural blockage takes much time and a great deal of patience, and even then may not be possible.

The difficulty in Western society is that the problem is often to reduce consumption of food in general or of one food in particular rather than to increase it. Calcium can easily be added to bread to satisfy a deficiency, but how does one reduce sugar consumption without being negative? Partly, of course, this may be done by stressing other foods to eat rather than the ones to avoid on the principle that you cannot eat everything. But this is not always successful. In many cases the main difficulty is to find an appropriate substitute. In health education there is a vast difference between asking people to modify a specific action slightly and telling them to stop a particular behaviour line altogether. An example of the difference would be between asking young people to wear crash helmets when riding

a motorcycle and telling them not to ride a motor-cycle at all. Unfortunately, in the case of smoking and dieting it is a major behaviour change we are recommending for often there is no generally recognised substitute to fulfil the function.

Yet in some cases a reasonable substitute may exist and the problem is to get it recognised as such. For example, we already have a number of possible substitutes for sugar. A recent experiment conducted at Queen Elizabeth College involved a period of one month in which subjects had a high sugar intake and another month during which they were required to eat no sugar or sugarcontaining foods, but were allowed to eat sugar substitutes. I talked to all of these people before the experiment began, and in every case they did not like the idea of using a sugar substitute and believed that it would taste in some way peculiar and would not fulfil their requirements. Yet at the end of the month nearly all of them agreed that they had been unable to detect any difference in taste, and that any inconvenience had been temporary and not serious. This may well have influenced their attitude as to the relative difficulty of different parts of the experiment. At the beginning of the experiment the subjects almost all believed that the period without sugar would be the more difficult to keep to. In practice they found it was the high sugar diet that presented the difficulties.

But where do we stand if it is apparently impossible to make a recommended line of action consistent with existing behaviour? In such cases it may be possible to make a statement *appear* consistent by conditioning agreement over a series of steps. This is achieved by including at the beginning of the communication or discussion statements already believed by the patient. The truth of these statements which he readily acknowledges encourages him to go on to believe the remainder of the message. Thus Golby (Yudkin & McKenzie, 1964) gave a hypothetical model of a milk campaign illustrating this principle:

<i>Statement</i>	<i>Response</i>	
1. Mothers who love their children see they get enough sleep	True	1. personal contacts are more difficult to avoid
2. A good way to help children to sleep is to give them a hot drink at night	I agree	2. they allow for the contacts to be varied to suit the relationship
3. Hot milk helps children to sleep	Yes, it does	3. people are more likely to put their trust in someone they have met and know
4. Therefore mothers who love their children give them milk before they go to bed	I see	

The success of the attempt at behaviour change may also depend on what we may call the credibility of the communicator (Hovland & Weiss, 1951). Basically this means that the educator must believe in what he is doing and actually practise what he preaches. It is hardly any good if the man who comes to school to talk on the dangers of drink is seen that same night leaving a public house in an inebriated state.

Nothing of course is better evidence of the credibility of your argument than its success. In the developing countries it is sometimes possible to achieve 'instant cures' which may have a profound effect. Unfortunately, this is often not the case even when early diagnosis can provide a quick cure because the invalid is not brought to the hospital until all possible alternatives have been tried and failed. By this time he is often in such a bad state that cure is impossible.

In Western society there are not many illnesses for which the dietitian can provide an instant cure for the patient. Usually considerable patience and perseverance is required on everybody's part. But credibility is still important. I am sure you could all find case histories in which interest, enthusiasm and sincerity on the part of the expert have worked wonders for the patient and have been of greater value than pure medicinal aid.

Katz and Lazasfeld (Brown, 1963) have clearly demonstrated the importance of these face to face relationships. They suggest that personal communications are more successful than mass media communications because:

It is also necessary for us to examine the way in which we present our material to the public. To be successful people must not only be able to understand what we say but also they must be interested in it and easily able to see what action is required of them. All this may seem obvious enough but it is surprising how often it is overlooked. Sometime ago I had to spend a few days in hospital and had in the bed next to mine a man recovering from coronary thrombosis. He was just about to leave. On entering the hospital he had been grossly overweight and ever since had been on a strict diet; a diet which the doctors wished him to keep to when he left the hospital. A dietitian came and explained the diet to him in some detail and left several leaflets giving examples of what he could and could not eat. All seemed well, but sometime later the patient came across to me in great distress. It appeared that he had a great liking for fillet steak and ate an immense amount of it, yet this was not mentioned at all on his diet sheet. The problem here was that the examples of meals given had been taken literally and he had not understood at all that for lamb chop he could read pork chop, or for boiled ham fillet steak.

In this way a communication which looks completely specific to us may have real weaknesses for the person to whom it is addressed. In this context we need to be careful in the use of technical terms. On occasions phrases like 'energy foods' or 'body building foods' may be useful descriptive substitutes. However, often people like to twist their tongue round technical words, and such words hold their attention if not used to frequently. More trouble comes over the use of a word which they are not familiar with in a particular con-

text. For example, imagine how someone might interpret the phrase 'this *field* of study' if they had only used the word *field* in an agricultural context.

There is perhaps one other point I should mention in relation to attempts at behaviour change. Most people seem to imagine that the best way to stop people acting in a certain way is to instil in them a fear of the consequences. In many cases this kind of approach is useless. Psychologists have long been aware that, by reason of what is known as the law of reversed effort, the more frightened people become of the consequences of an action, the more they may be impelled to continue or even increase committing it (Brown, 1963).

Work by Janis *et al.* (1953, 1954) has shown that in situations where persuasive communications raise high degrees of emotional tension there are three types of defensive reaction:

1. inattentiveness to the communications
2. aggression towards the communicator
3. defensive avoidance—they found, for example, with regard to prevention of disease that when a communication was threatening, the subjects remembered the consequence of getting the disease; when it was not threatening, they remembered the cause of the disease and the preventive action that should be taken.

Evaluating Results

It is very desirable that every so often we should stand back and unemotionally evaluate the effect of our efforts. This is valuable not only because it draws attention to both the strength and the weaknesses of our work, but also because taking together a number of studies over a long period of time it may help us to deduce conclusions relevant to the whole field of behaviour studies.

It is a great pity that so far evaluation studies have been the poor relation of nutrition education. In a recent review, we found that few people attempted to assess the value of the work they had un-

dertaken, and that when they did they often overlooked the vital importance of control groups, samples, time and correct framing of questions, as factors influencing their results (McKenzie & Mumford, 1965). In particular, in the context of what has been said earlier, it is important to be sure one is measuring behaviour change rather than the absorption of knowledge.

It is perhaps here that the dietitian will need to seek the aid of the specialist social scientist. Whilst one is merely operating in the context of one's own work and using a questionnaire that has been designed and tested by social scientists elsewhere, all may be well. Once one moves over to new, untried ground and needs extensively to modify a questionnaire to suit particular circumstances, then it is advisable to seek out specialised advice on both the questionnaire and the interviewing technique. The specialist will usually be only too happy to help you in every way possible.

I can perhaps illustrate the importance of such advice by reference to a survey undertaken a few years ago by a religious organisation in the United Kingdom. They wished to find out how many people went to church on a certain Sunday. They sent round their keenest members to ask the public 'Did you go to Church last Sunday?' The answer was astonishing and obviously quite false. The number who claimed that they had gone could not have got into the existing churches, let alone found a seat. It seemed that some who usually went, but had not on this particular occasion, answered yes in order not to confuse the interviewer. Others said yes simply to please the interviewer; others said yes to get rid of him. In desperation the organisation turned to the experts. The experts also sent out interviewers to ask what people had done last Sunday. They asked if they had been out for a drink, or played tennis, or watched television, but they ignored any reference to church going. All they did was to put at the bottom of the questionnaire a small insert which said 'Other activities under-

taken last Sunday'. In this way they got an adequate assessment of church going that week end.

Social nutrition research

Perhaps I may end by telling you something of the other basic studies that we are developing at Queen Elizabeth College. We are trying to isolate the factors influencing food choice by two general methods. The first is by a study of the determinants of past and present changes in food consumption. The work we have begun with West Indians coming to the United Kingdom may serve as an example of this method (McKenzie & Mumford, 1964). Here we have been examining by dietary survey and questionnaire the rate at which these immigrants have absorbed English food habits. Most of the immigrants were quick to adopt some English foods, but these were mostly snacks and subsidiary meals such as breakfast. The adherence to West Indian foods at main meals was very strong even amongst those who had lived in Britain for more than five years (Tables 10, 11 & 12). We are now examining the impact of class, age, money, children at school, the factory canteen etc. on the speed of change.

Table 10. West Indian Dishes (expressed as the percentage of housewives regularly using each food)

	%
<i>Salt fish</i>	61
Fish and chips	53
Fresh apple	100
<i>Salted pig's tail</i>	34
Frozen peas	32
<i>Stewed beef flank</i>	92
Stewed fruit & custard	34
<i>Yam</i>	79
<i>Green bananas</i>	84
Egg and bacon	95
<i>Rice and peas</i>	97
Sausages	68
av. per cent eating West Indian foods regularly	75
av. per cent eating other foods regularly	68

(West Indian foods underscored)

Table 11. West Indian Purchases (expressed as the percentage of housewives often buying each food)

	%
Tinned meat	42
Butter	100
Lard	47
<i>Red peas</i>	76
<i>Heavy W. Indian bread</i>	53
<i>Gungo peas</i>	82
White flour	97
<i>Cooking oil</i>	87
Fresh milk	100
Eggs	100
<i>Creamed coconut</i>	37
Margarine	87
Corn meal	92
<i>Hot pepper pickles</i>	71
<i>Sweetened condensed milk</i>	71
Cheese	95
av. per cent purchasing West Indian foods	71
av. per cent purchasing other foods	84

(West Indian foods underscored)

Table 12. Length of Stay related to Selection from lists

	Up to 5 years in UK %	More than 5 years in UK %
List 1		
av. per cent W. Indian foods chosen	75	67
av. per cent other foods chosen	57	72
List 2		
av. per cent W. Indian foods chosen	76	62
av. per cent other foods chosen	90	80

The second method by which we are trying to assess the determinants of food choice is by attempting to produce changes within controlled experiments. I have already mentioned the sugar experiment. In another area we are now attempting to increase milk consumption in a group of forty schools. We hope to make an as-

assessment of the relative influence of different media such as posters, pamphlets and films on consumption.

Conclusion

It is increasingly being accepted that one of the most vital issues facing nutritionists and dietitians today is how to make people modify their food choice in the light of improved knowledge. I hope I have been able to suggest a few of the ways which may help you to deal with the problem as it faces you in your everyday work. Equally, I hope that the absence of categorical statements has enabled me to show that we have by no means yet found a complete answer to these problems, and that this will encourage you to consider positively what may be an appropriate solution to the problem in the context of your own particular circumstances.

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PROFILE ON SLIMMERS

J. C. McKenzie

Some time ago I reported on studies which had examined the public's knowledge of nutrition and suggested that frequently this knowledge, good or bad, seemed to have little influence on choice of food. Perhaps the major exception to this rule occurs when we consider the whole question of slimming—an issue which has been seen as a growing influence on choice. The extent of this influence can to some degree be quantified by reference to the rapidly growing market for slimming foods which is conservatively estimated at present to be worth £20m. per annum.

However, although a number of major studies may have been undertaken for particular manufacturers, the amount of published information indicating in any detail the number of people who try to reduce weight, the ways in which they set about it, and the success which they achieve, is very sparse. The purpose of this paper is to try and fill one or two of these gaps and it is based on the results of a questionnaire administered to a national quota sample of 2,000 respondents by Mass Observation Ltd. in February of this year.*

Efforts to reduce weight are made by a sizeable proportion of the population. Thus over one adult in ten is currently (February 1967) trying to slim, whilst one in four admits to having made an attempt within the last year. The figure for women is 35% and for men 15% (Table 1).

Attempts at weight reduction increase with age. The reason for this is probably very simple; as we grow older we are more likely to become overweight. With age, activity tends to be reduced; we engage in less sport, use cars and lifts more frequently, seldom if ever run for a bus; the housewife is also coming to the end of the hectic period of her life when she is fully occupied bringing up young children. The consequent reduction in physical activity however, is often not matched by a reduction in food consumption and weight tends to rise. The result is ever increasing attempts to deal with an expanding girth.

* I acknowledge with thanks permission from Mass Observation Ltd. to publish information from a study carried out on their behalf.

TABLE I
Percentage of Population Trying to Reduce Weight

				<i>In Last Year Currently</i>	
				2008	2008
Base in numbers				%	%
TOTAL trying to slim	...			25	13
MALE	...	...	...	15	9
FEMALE	...	...	...	35	19
16-24	...	...	...	22	10
25-34	...	...	...	22	10
35-44	...	...	...	24	13
45-64	...	...	...	28	18
AB	...	...	...	34	22
C1	...	...	...	28	15
C2	...	...	...	23	13
DE	...	...	...	21	11
Married	...	...	...	26	14
Unmarried	...	...	...	22	12

In terms of food such a development is intriguing. Most of us if asked to isolate those sections of the community likely to be flexible in their food habits would point to the young. With age it is frequently imagined that people become more restricted and conservative and less willing to change. It seems that pressures such as the desire to bring down your weight may overcome such resistance; this is an area which might profitably warrant investigation. Attempts to reduce weight also vary with class. Are the AB group that much more flexible or just that much more overweight?

Attempts to slim may involve many activities (Table 2). Significantly more women than men were prepared to change their food habits. But this position was reversed when people turned to greater exercise as a means of losing weight. As one might expect the younger age groups were more willing to undertake greater amounts of exercise than the older. A surprising number took pills or medicine directly to inhibit appetite.

Previously I have demonstrated that people are aware of foods, high in carbohydrate, which they think should be avoided if you are trying to lose weight. This view is also reflected in the current study; four out of every five who tried to slim by changing their food habits, reduced their intake of starchy food. One in five cut down or cut out sugar and 15% simply reduced the quantity they ate or used special food products for weight control. Small

TABLE 2
METHODS USED TO REDUCE WEIGHT
 (Expressed as a percentage of the total sample of slimmers)

	Total	Men	Women	16-24	25-34	35-44	45-64	AB	CI	C2	DE	Married	Unmarried
BASE=	500	147	353	90	87	102	221	86	106	192	116	389	111
Changed foods eaten	78	67	82	73	80	80	77	77	83	80	70	79	71
Took more exercise	17	30	11	31	18	15	11	19	16	17	16	15	23
Took pills or medicine on doctor's or chemist's prescription	16	5	20	16	18	12	17	10	13	20	16	15	18
Took special food product for weight control	11	9	12	8	14	9	12	9	8	12	13	12	9
Bought special slimming garment	2	1	2	2	1	2	2	1	2	1	3	2	1
Went into hospital	2	3	2	—	2	—	4	2	4	1	3	2	3
Went to slimming clinic	—	—	1	—	—	1	—	1	—	1	—	—	1

minorities cut down on their fluid intake or specifically concentrated on eating specific food such as fruit (Table 3).

One of the great dilemmas about weight reduction is that for the sufferer it is almost ever-present. Mostly it is tackled in two ways; some people try to starve themselves every so often for a week or two, hope to lose a stone and then they have a satisfactory gorge for another three months; others prefer a less extreme but continuous dieting activity.

Presumably the method you employ depends upon your personality and whether, so to speak, you like your punishment short and sharp, or soft and persistent! In the same way both the method and the individual will have a considerable influence upon the success of dieting. It has always been assumed that many of the attempts to slim are failures. This might be a big problem for the manufacturer of slimming products. No one product is likely to reduce an individual's weight if he does not support it in the rest of his behaviour. The man who switches to starch reduced bread and artificial sweetening agents but at the same time substantially increases his consumption of potatoes and alcohol is unlikely to get any slimmer. The significance to the manufacturer is that the individual in these circumstances might well blame the slimming products in question rather than see the error lies with his own total behavioural response.

This study has confirmed that nearly half the people who try to slim are unsuccessful in their efforts. What is surprising is that they do not to any great degree blame the method of slimming they adopted for their failure; only one in twenty complained in this way (Table 4).

TABLE 4

(a) FAILURE TO LOSE WEIGHT
(Expressed as a Percentage of all Slimmers)

	<i>Total</i>	<i>Men</i>	<i>Women</i>
<i>Bases</i>	500	147	353
	%	%	%
Proportion failing	44	43	45

(b) REASONS FOR FAILURE TO LOSE WEIGHT
(Expressed as a Percentage of all Failures)

	<i>Total</i>	<i>Men</i>	<i>Women</i>
<i>Bases</i>	222	63	159
	%	%	%
Gave up too soon	27	21	30
No willpower	26	35	22
Did not follow method exactly	23	19	24
Method did not work	6	5	7
Still dieting	3	3	3
All other	16	17	16

TABLE 3

TYPE OF CHANGES MADE IN FOOD HABITS

(Expressed as a percentage of those changing their food habits)

	Total	Men	Women	16-24	25-34	35-44	45-64	AB	CI	C2	DE	Married	Unmarried
BASE=	390	99	291	67	70	83	170	66	88	154	82	310	80
Cut down on starchy foods	83	80	85	87	81	83	83	83	85	85	78	84	83
Eat Less/No Sugar	20	20	20	4	20	28	23	21	19	21	20	23	11
Eat Less	15	17	14	19	14	10	16	18	15	12	20	14	21
Eat special Slimming Food Products	14	13	14	14	17	18	16	12	10	15	18	15	13
More fruit etc.	11	9	12	16	10	14	8	12	13	13	5	9	18
Cut down on fluids	6	10	5	7	9	4	6	6	2	7	10	6	6
Cut down on Meals	2	1	3	3	3	5	1	2	2	3	2	2	3

TABLE 5
SOURCES OF INFORMATION ON SLIMMING
 (Expressed as a Percentage of the Total Sample of Slimmers)

	Total	Men	Women	16-24	25-34	35-44	45-64	AB	C1	C2	DE	Married	Unmarried
Advice from the doctor	35	25	39	22	28	31	45	29	33	36	41	38	27
Advice from friends or relations	19	24	18	23	21	21	17	19	17	23	16	19	22
Article in paper or magazine	17	11	20	23	18	20	13	17	19	16	16	18	14
Advertisement in paper or magazine	6	7	6	10	5	7	5	6	6	8	4	7	5
Book	3	5	3	3	5	2	3	7	5	3	—	3	4
Programme on the television or radio	2	1	2	—	3	1	2	—	1	2	3	2	1
None of these	22	31	19	20	28	24	21	26	26	19	22	21	29

The great majority indicated that the failure was due to their not following the method exactly or to their giving up too soon, or to sheer lack of willpower. It seems that the public is more reasonable in their view than might be imagined. Nevertheless it does not discount the implications for the manufacturer of weight reduction being a passing, albeit recurrent fancy. If your last attempt was not very successful you may well decide to try a different method next time; one which perhaps appears to require less willpower!

It has been indicated that those who try to slim have fairly good knowledge, particularly as concerns food consumption, of what they should do. The sources from which this information is obtained are of obvious interest. The present study confirms that there is a wide spread of sources of information which include advertisements, articles, advice from the doctor, and advice from friends and relatives (Table 5). The suggestion that a substantial quantity of advice comes directly from the doctor must however be viewed with some suspicion, and perhaps regarded as something of a prestige answer. The indication that weight reduction is widely discussed between friends and relations, and that the papers are carefully scrutinised for information on this subject, confirms all our suspicions.

Weight reduction is already a major if not altogether pleasant pastime of the community. There is every likelihood that as an activity it will continue to grow. This raises intriguing questions regarding overall food habits, for every food is involved if only because it is regarded as a good or bad aid to slimming. If the public increasingly does modify its behaviour to take note of these views, it could lead to the most substantial modification of food habits since the War. For the researcher this topic is also likely to create personal involvement. The odds are pretty much on most of us having to participate in a living experiment in this subject in the next few years, even if we have not done so already. This raises infinite scope for research albeit somewhat subjective about the sort of products we would like to see developed—my vote goes on calorie-free whisky and potatoes! It will also make us face squarely up to the crucial question—how far are we really making the maximum effort to reduce our weight and how far are we really making a token gesture to salve our consciences?

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Housewives' beliefs concerning past and future food trends. By C. W. GOLBY and J. C. MCKENZIE, *Department of Nutrition, Queen Elizabeth College, London, W 8*

As a continuation of our previous studies we have investigated the attitude of British housewives towards some aspects of food and nutrition. One thousand and fifty-four housewives were interviewed. Quota controls were set for age, social class and area.

First we asked in what way they thought they had changed their food habits over the past 10 years and in what ways they expected further changes in the future. Chicken, butter, eggs and coffee were most frequently mentioned as the foods they were increasingly consuming; the first three together with meat were also thought to be the foods they would consume more of in the future. Foods that were said to have decreased were bread, potatoes, jam and cake and these were expected to decrease still further. When compared with the trends shown by the Domestic Food Consumption Tables, the results indicate that housewives have a fairly accurate idea of the ways in which food habits are changing.

Housewives were then asked which foods they would increasingly consume if more money were available. More than half mentioned meat and this was followed by chicken, apples and oranges. Conversely these foods, after chocolate and cakes, were seen as the foods they would cut down on when money was short.

When asked which foods they thought would it be difficult to do without for a month or two butter, milk, tea, meat, eggs and sugar were most frequently indicated. On the other hand over half felt they should eat less potatoes for health reasons, and many others mentioned cakes and bread, chocolates and sugar.

Eighteen % of housewives had a member of their family on a diet at the present time. Nearly half of these were to do with slimming and a quarter with ulcers. Most of the people slimming were women and most of the people with ulcers were men.

We acknowledge with thanks the support of the Westminster Research Bureau Limited who undertook the field work for us at a nominal cost.

THE CONSUMERS' VIEW OF PROBLEMS AND PRIORITIES IN NUTRITION

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1. Introduction

In 1963 Brown, McKenzie and Yudkin examined the nutritional knowledge of housewives in a London suburb. Subsequently the findings of national studies on the subject were reported (McKenzie 1965). Further major studies have been conducted on a fairly regular basis since that date (Margarine and Shortening Manufacturers Association 1969, British Nutrition Foundation 1973).

However, the prime concern of these studies has been to look at the level of nutritional knowledge which housewives/consumers possess (in particular the extent to which they can relate nutrients to foods); their views on the role which various nutrients perform in the diet; and their attitude to foods generally. The studies have not directly concerned themselves with the identification of the consumers' view of the problems and priorities in nutrition. Indeed, were consumers to be questioned in this way, it would be probable that they would not be able to very readily identify problems in the nutrition field or to set priorities for their solution.

As such in order to adequately respond to today's topic I have felt it necessary both to re-define the problem and to conduct new research to isolate the response.

I believe that the problem may be re-defined in the following way :

- what concerns do people have in terms of food/nutrition
- what diseases do men and women in Britain worry about ?
- how far is food seen as a protection from/cause of these diseases ?

The study to deal with this problem has involved a series of group discussions in which the consumers were probed in depth regarding their concerns in health terms and the role that food/nutrients played in the development of disease.

Subsequently the findings were quantified by means of a nationally representative quota sample of 505 adults over the age of 16 years.

2. Research Study

The analysis of the qualitative research exercise identified that consumers are primarily concerned with four issues as far as food and health are concerned.

Firstly, there is a strong concern with the whole issue of naturalness in food. 'Natural food' or 'the natural diet' is definitely regarded as the best! It is, if you like, as defined by the British Nutrition Foundation survey of 1973 the "back to nature feeling". It involves in attitude terms at least the requirement to go for basic foods; to avoid additives wherever possible; and to attempt to get back to the 'natural order of things' ! After all, why should God ordained foods not result in a satisfactory diet and good health ? Thus, natural food is the best prescription for good health. Equally associated with this is almost an obsession with the purity of food and a suspicion about additives of all sorts.

Secondly, and directly related is the belief that the 'balanced diet' or a 'varied diet' is the best diet to pursue. It is the excesses of too much or too little in total terms or in terms of specific foods which is likely to cause a problem.

Thirdly, it is apparent that there is some association of individual foods with disease or the capacity to resist disease. The prime examples given always relate to dairy foods (or more widely 'fatty foods') and heart disease (sometimes with reference to cholesterol); the carbohydrate/sugar issue and overweight; the fibre story; vitamin C (and hence fruit and vegetables) and resistance to colds. For smallish minorities there is also reference to sugar and diabetes, salt and high blood

pressure, diet and arthritis, and so on.

Fourthly, they possess in broad terms a belief in the concept of 'an ideal diet for optimum health'. Consumers seem quite easily to distinguish between an acceptable diet with which you survive (often quite comfortably) and the diet which provides the best protection from and resistance to disease. The diet is seldom viewed in terms of specific nutrients but more in terms of 'proper eating helps to protect you against a cold', influenza, infections generally, and so on.

In many ways of course these fundamental principles conflict. Dairy products, and especially milk are on the one hand powerful parts of the natural diet, whilst at the same time being associated with specific diseases. Sugar is bad for you but essential for children to obtain 'energy'.

This should not in itself be seen as surprising. In some senses it reflects attitudes built up over many generations and which are not readily rejected at an emotional level, whatever science/education now tells us. Equally, as has been identified for many years, attitudes and behaviour often differ. People can quite happily disclaim on the merits of a natural diet whilst eating a convenience meal, heavily processed and containing many additives. Moreover they may give positive lip-service to one view without seeing either the need to actively pursue it or believing that the alternative is positively harmful.

There is one further reason for consumers taking and accepting these apparently contradictory views. Indeed it is a reason which they readily understand even refer to themselves. Time and time again in the qualitative research exercise it was claimed that the nutritionists 'do not know what they are talking about' because 'they are always changing their minds'. The problem seems to emerge at two levels. On the one hand, particularly in the media, scientific principles (say for a low carbohydrate or a low fat diet) are applied and distorted in such a variety of ways and with such an emphasis on gimmicks as to hide from the consumer the basic underlying principles.

On the other hand the fact that nutritionists as a group are unwilling to give pronouncements at the current stage of the debate on many issues means that the consumer is left to his own devices and to be influenced by the prognostications of the outrageous.

When questioned concerning the key diseases which concern the population at the end of the nineteen-seventies, these emerged predictably to be cancer, 'heart trouble', arthritis, blood pressure, 'strokes', pneumonia and bronchitis and so on.

As indicated earlier, some relationship has already been identified by the consumer between some of these diseases and diet. But others are seen to have only small or no relationship.

More generally a good diet is seen as protective. This may mean that it helps you better to resist 'getting' disease; better to 'throw off' an illness once contracted; and better to convalesce.

Thus the qualitative research exercise provided some understanding of the parameters within which the consumer operates. It was then necessary to undertake a quantified study to isolate the relative weight given to some of these matters. This involved a nationally representative quota sample of 505 adults over 16 years of age, with sub-quotas set for male and female, social class and different age groups in line with the I.P.A. regulations.

Firstly respondents were shown a list of ten 'health problems' and asked to indicate which was the most important. The results indicate that nearly half of the sample (46%) believe cancer is the most important, followed by 'heart trouble' (22%). An indication of the most significant diseases from the consumers' viewpoint can best be achieved by collating the total answers given by each consumer when probed regarding the most important, second most and next most important health problem (Table I). These indicate the significance attributed by the consumer to cancer, 'heart trouble', overweight, arthritis and drug addiction. It is evident that there is a good deal of variation between

sex, age, social class, and to some extent region. Thus, in the south, heart trouble is seen as much a problem as is cancer, and arthritis is given greater weight in the north.

Subsequently respondents were then asked to identify which of these health problems were to any extent influenced by food consumption (Table 2). Not surprisingly overweight comes top of the list, but there are significant levels indicated for heart trouble (47%), and high blood pressure (28%). Diabetes is also seen at a significant level (19%). The 26-44 year age group shows a particular concern with the issue of 'heart trouble' and younger people generally refer more to overweight, 'heart trouble' and high blood pressure. These issues are also stressed more by high social classes than others.

Conclusions

It emerges that consumers do have a view both as to the key health problems that exist within the UK and the contributory role, if any, which diet makes. Indeed, in terms of Miller's paper earlier today, it can be argued their views are reasonably accurate - especially if the question of dental caries is excluded as not being a 'killer'.

However, it was very evident from the qualitative research that this does not mean that consumers are able or willing to identify priorities for research. Their views are not only too much coloured by their personal experiences at a given moment in time, but also and perhaps more importantly they find it difficult to understand that there is a limited national budget that makes it inevitable that one activity can only be pursued at the expense of another. However, in spite of this there is of course implicit strong support for any political decision to re-direct funds towards the health area and to the role which nutrition is seen to play within it.

I believe the study also identifies an additional research priority for us. Such knowledge as the consumer does possess in the nutrition field might be argued to be almost without

regard to the expert, whom I have pointed out rarely wishes to pronounce in this area. But the consumer requires reassurance that the views they hold are correct. They also wish to feel that any proposed modification of behaviour as a result of their increased knowledge will not damage their life style.

Increasingly they also recognise the problems of achieving a desired change within the family. In this sense they need 'help to help themselves' to follow a diet which will be in the best interests of nutrition and health and to make it as palatable as possible. This enters an area of activity which at present we are ill equipped to handle.

ASSESSMENT OF IMPORTANT HEALTH PROBLEMS

(expressed as a percentage of the population mentioning each disease)

	Total	Sex		Social Class		Region	
		Men	Women	ABC ₁	C ₂ DE	North	South
CANCER	78	82	77	77	91	80	76
HEART TROUBLE	71	82	67	79	66	66	76
OVERWEIGHT	33	38	31	38	27	32	34
ARTHRITIS	33	29	35	35	27	29	36
DRUG ADDICTION	24	15	31	20	26	22	25
HIGH BLOOD PRESSURE	24	27	23	24	25	24	25
ALCOHOLISM	19	24	15	19	19	20	15
TUBERCULOSIS	3	2	3	2	4	2	4
DIABETES	10	1	7	7	10	10	9
ASTHMA	7	5	9	4	7	7	8
Base	505	244	251	202	303	250	255

HEALTH PROBLEMS TO WHICH FOODS CONTRIBUTE

(expressed as a percentage of the
population mentioning each disease)

	<u>Total</u>	<u>Men</u>	<u>Women</u>	<u>Social Class</u>		<u>A g e</u>		
				<u>ABC₁</u>	<u>C₂DE</u>	<u>16-25</u>	<u>26-44</u>	<u>45+</u>
OVERWEIGHT	54	32	64	59	51	59	67	44
HEART TROUBLE	47	56	43	55	42	43	59	40
HIGH BLOOD PRESSURE	28	21	30	31	26	33	34	21
DIABETES	19	15	21	22	20	22	25	13
CANCER	12	15	11	12	12	10	16	10
ARTHRITIS	5	3	8	5	8	2	8	7
ALCOHOLISM	5	3	5	6	4	7	7	3
ASTHMA	3	3	2	4	3	1	6	2
TUBERCULOSIS	2	3	2	2	2	2	2	2
DRUG ADDICTION	2	3	1	2	1	1	2	2
Base	505	244	251	202	303	86	177	242

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and Attitudes

Milk in schools: an experiment in nutrition education

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1. An experiment was conducted with 4600 children in nine schools, in which an attempt was made to persuade a greater number of children to take school milk. The proportion taking the milk before the experiment ranged from about 25 to 65 %.
2. Four methods of nutrition education were used: posters, lectures and films each in two schools, and pamphlets in one school. The remaining two schools acted as controls.
3. The material was used for one term in all seven 'experimental' schools, and again for the following term in one of the schools receiving each of the different forms of education.
4. Although it appears that there was a small increase in the number of children that said they would take milk, there was no significant increase in the number that did in fact do so, in either the first or the second term.
5. The analysis of the possible causes for this failure to increase milk consumption suggests that nutrition education does not affect dietary behaviour if the factors that limit consumption are sufficiently strong.

Nutrition education aimed at members of the public has as its objective not merely an increase of their nutritional knowledge but an increase of the nutritional value of their diet. Although a great deal has been said and written on the subject of nutrition education, very little has been published that has attempted to assess its efficacy in terms of improved nutritional behaviour (McKenzie & Mumford, 1965). Much of that which has been published has consisted of experiments that have been poorly designed and poorly evaluated; what remains certainly does not confirm that nutrition education is very successful in improving the diet that people eat.

The chief criticisms by McKenzie & Mumford of work previously done in this field were threefold: most of the experiments in nutrition education did not attempt any evaluation of their effectiveness; when evaluation was attempted, it often measured improvement in nutritional knowledge or in nutritional attitudes, and not in nutritional behaviour; when evaluation was attempted in terms of nutritional behaviour, it was often carried out within a very short time after the end of the period of education, so that one does not know how permanent were the effects.

In this paper we describe an experiment devised both to assess the efficacy of nutrition education in behavioural terms, and to compare the relative efficacy of four different types of propaganda.

EXPERIMENTAL

Methods of education

For our experiment, we chose to assess the effects of nutrition education through four different media upon the consumption of milk in schools during autumn 1965 and spring 1966—the first two terms of the 1965–6 school session. We used posters,

films, lectures and pamphlets, all the well-known methods of nutrition education except perhaps group discussion.

Posters. Two posters were put into each classroom and others were displayed prominently in public corridors. The posters remained in both schools for the whole of one term, and were then taken down in one school; in the other school they were replaced by different posters for the second term. Two of the posters contained material referring to the nutritional quality of milk; the others were those used for the usual advertizing of the National Dairy Council and included 'Good sports need lots of milk', 'In case of thirst, remove top and quench', 'Fight colds and 'flu with milk'.

Pamphlets. In the first term each pupil received a pamphlet entitled 'Good Looks Ahead', which was specifically written for teenage girls, and examined many aspects of health and hygiene of interest to them. It gave simple information about diet and made specific reference to milk. In the second term the girls were given another pamphlet entitled 'Health and Wellbeing—the nutritional value of milk'. This described the various nutrient requirements and the way milk could satisfy them.

Lectures. These were given to groups of about fifty children by one of the Dairy Produce Advisors employed by the Milk Marketing Board. The talks lasted about 20 min and were followed by 15–20 min of questions and answers. The lectures particularly described the ways in which milk might be used and how it helped to maintain health.

Films. In the first term two films each lasting about 20 min were shown. These were entitled 'Consider your Verdict' and 'Milk and Nutrition'. 'Consider your Verdict' was a humorous film based on a court case against somebody who was wasting milk. The story developed with the prosecution trying to show the value of milk and the defence counsel bringing up many of the arguments suggested as to why people do not drink much milk. 'Milk and Nutrition' dealt with the more technical aspects and described the various nutrients, why they are required and how milk supplied them. In the second term a film called 'Milk for the Nation' was shown in one school. This was of an historical nature and examined the way in which milk consumption had changed over the years. It also discussed pasteurization, sterilization, and milk hygiene generally.

Procedure

The experiment was planned to consist of several stages in order to assess first the comparative effects of the different methods of nutrition education, secondly the duration of these effects, and thirdly the usefulness of a further, reinforcement, course given 3 months after the initial one. The stages were:

Stage 1, basic information: measurement of milk consumption before institution of educational courses.

Stage 2, programme: institution of courses in five pairs of schools; four pairs received one of the four types of educational material, and the fifth pair acted as controls.

Stage 3, short-term effect: measurement of milk consumption for 5 weeks after the course of education began.

Stage 4, medium-term effect: continuation of measurement during the following school term, that is from about 3 months after the course began.

Stage 5, reinforcement: re-introduction of the same type of educational material into one of each pair of schools, in order to compare the subsequent milk consumption both with consumption before the second course of education, and with consumption in the school not undergoing the second period of instruction.

In the event, it proved that none of the types of education had resulted in significant change in milk consumption, so that we did not pursue our original intention of continuing assessment over a longer period.

With the help of the National Dairy Council, and the Reading and Berkshire Education Authorities, we found ten schools that volunteered to participate by allowing us access to all their pupils, whose ages ranged from 11 to 19 years. Before we began, however, one school restricted us to pupils in the 1st and 2nd years. After we had begun, we found the degree of co-operation in another school so slight that we have not included our findings there in our assessment of the results of the experiment.

Our study was thus carried out in nine schools with a total of 4637 pupils; six of the schools were co-educational and three were for girls only.

We began by measuring the consumption of milk in each of the schools for 2 weeks. We then introduced the four different types of educational material into four pairs of schools, keeping the fifth pair of schools as controls. The material was that routinely used by the National Milk Publicity Council throughout Britain. It was one of the schools receiving the pamphlets—school 8—that we have excluded because of lack of co-operation.

In order to assess the amount of milk consumed, the schools had to modify their usual method of measuring supplies and consumption.

Usually, the children are asked by the teachers at the beginning of each term whether they wish to take milk. The teachers then inform the school secretary, who places orders with the milkman for the required number of crates, each containing thirty bottles of $\frac{1}{3}$ pint (about 90 ml). Theoretically a new order is placed each week, but in practice no change is made unless the secretary feels that the amount ordered is excessive or, less commonly, inadequate.

For our experiment, the children were asked by the teachers each week whether they wanted milk. One teacher at each school passed this information on to us as well as to the secretary. The amount consumed was constantly checked and the order changed if necessary each week so that there was a surplus of about one crate of milk each day. This procedure was introduced into the schools during the summer term of 1965 in order to give time for the new method to become established. The amount consumed was obtained from the monthly returns made by each school to the local education authority of the amount taken into the school from the dairymen. The experiment itself was carried out during the autumn term in 1965. It was repeated in the following term in one school of each pair (and in the one school receiving pamphlets) in order to assess the effect of reinforcement.

The change in the system of ordering milk proved to have been necessary, because there was initially a very high demand for milk by the children, which was, however, not reflected in the amount consumed.

The figures for demand express only the pupils' intentions, and not whether they did in fact drink the milk. On the other hand, the figures for consumption reflect reasonably well the total milk consumed, since the amounts ordered were changed if there was obvious excess or obvious shortage. They do not, however, give an accurate number of consumers since there are always some children who take two bottles, although this is against the rules. Nevertheless, we are satisfied that significant change in the number of children taking milk would be reflected in significant change in the number of bottles ordered.

It proved to be impossible to obtain all the information desired from all the schools. One of them, school 4, had information of consumption only for the whole school, although our experiment had to be confined to the 292 girls in the 1st and 2nd years; we can thus give only the figures for milk ordered. On the other hand, during the first term we were not able to obtain satisfactory demand figures from control school 9, or for the last 2 weeks from school 6. During the second term, we continued to receive no figures for demand from either of these schools and they were joined in this by school 2, and, for 1 week, by school 4.

The reasons for the incompleteness of our results no doubt lies in the fact that our experiment was conducted in a climate of revolt by the teachers against extra-curricular duties, which included and were often symbolized by the distribution of milk. Before our experiment was concluded, one national conference of teachers had voted for the abolition of free school milk. Nevertheless, we believe that the results of our experiment, though based on less complete information than we should have liked, are not thereby invalidated.

RESULTS

In order best to be able to compare the consumption of milk in different schools, and the effect of different forms of educational propaganda, we have expressed the results as percentages of the total number of pupils in each school, or in the appropriate classes in school 4. The dates upon which the four types of propaganda were begun in the schools differed somewhat, so that the figures for demand and consumption are given for the weeks numbered before or after the introduction of the educational courses.

Comparison of the figures for the milk ordered during the week before the beginning of the course with those for the first week or two after it ended indicates its effect on attitude. In the first term, the only effect was a very small increase in ordering by the pupils of the two schools where films were shown, but this did not last for more than 1 or 2 weeks. One of the same schools (school 4) showed a repetition of this small increase when the films were shown again in the following term; in this instance the increase became somewhat greater towards the end of the 5 weeks of observation after the end of the course. There was also an apparent increase in milk ordered in school 5 although the unusually low figure of 49% for only 1 of the 2 weeks before the beginning of the course suggests that it was unrepresentative of true demand. All these differences are so small that it is most likely that they do not represent a real change in attitude.

For our purpose, the more relevant figures are those for milk consumed before and

after the course of instruction, that is, the change in percentage of children in the school or group who are presumed to have taken milk. The only possible instance of increase was in school 2 during the first term, when it seemed that consumption increased by 5% during the 4th and 5th weeks after the posters were shown.

Table 1. *Effect of nutrition education on milk consumption in schools in the autumn term, 1965*

(Number of bottles of milk expressed as a percentage of the number of pupils)

Type of propaganda	School	No. of pupils	Assessment	Weeks before course began		Weeks after course ended				
				2	1	1	2	3	4	5
Posters	1	563 (mixed)	Ordered	47	47	46	44	44	46	47
			Consumed	46	46	46	44	44	44	44
	2	567 (girls)	Ordered	67	66	65	66	65	64	65
			Consumed	48	48	48	48	48	53	53
Films	3	448 (mixed)	Ordered	53	52	58	55	53	50	48
			Consumed	51	45	45	45	45	45	45
	4	292 (girls)	Ordered	—	58	62	62	59	57	56
			Consumed	Not available						
Lectures	5	371 (mixed)	Ordered	70	72	68	67	68	63	66
			Consumed	66	66	66	66	66	66	66
	6	684 (mixed)	Ordered	26	27	28	29	29	—	—
			Consumed	18	22	22	22	22	22	22
Pamphlets	7	608 (girls)	Ordered	60	55	54	57	57	54	56
			Consumed	41	44	44	44	44	44	44
None (controls)	9	536 (mixed)	Ordered	Not available						
			Consumed	67	67	67	67	67	67	61
	10	568 (mixed)	Ordered	48	48	53	47	44	43	41
			Consumed	60*	49	49	49	49	49	44

* School 10 always indents for large quantities of milk at the beginning of term, and later adjusts to consumption.

DISCUSSION

We must conclude from these results that neither posters, nor lectures, nor films, nor pamphlets were more than marginally effective in increasing the consumption of school milk by children, in the circumstances of our study. The simplest and most obvious explanation is that nutrition education was ineffective. This, however, is an excessively superficial assessment, and we need to examine the possibilities more closely.

One possibility was that the children did in fact take more milk at home, though not in the schools. This would have been very difficult to assess, and was not within the facilities that we commanded. Whilst it cannot be ruled out, it seems to us unlikely that the effect of our courses of nutrition education would have carried over into the home whilst showing no effect in the schools.

If we assume that there was no change in milk consumption in the home, our courses of nutrition education might have failed for one of several reasons. The first is that they were inadequate and that a different programme might have been effective.

A second possible reason is that nutrition education in whatever form would have been ineffective, and that there are factors that result in a static consumption that have nothing to do with a lack of appreciation of the desirable nutritional qualities of milk; it may be that all children are already adequately aware that milk is 'good for you'. One factor preventing increased consumption might then be that all the children who could be persuaded to take milk were already doing so, and that nothing could persuade the remaining children. But the fact that there is such a wide variation in

Table 2. *Effect of nutrition education on milk consumption in schools in the spring term, 1966*

(Number of bottles of milk expressed as a percentage of the number of children)

Type of propaganda	School	Assessment	Weeks before course began		Weeks after course ended				
			2	1	1	2	3	4	5
Posters	1	Ordered	51	48	45	46	47	46	48
		Consumed	42	42	42	42	42	42	42
	2	Ordered	Not available						
		Consumed	51	51	51	51	51	51	51
Films	3	Ordered	42	37	37	42	41	41	39
		Consumed	22	22	22	22	22	22	22
	4	Ordered	46	41	—	50	55	51	57
		Consumed	Not available						
Lectures	5	Ordered	—	49	55	53	57	53	52
		Consumed	52	52	52	52	52	52	52
	6	Ordered	Not available						
		Consumed	23	23	23	23	23	23	23
Pamphlets	7	Ordered	55	59	56	56	55	56	56
		Consumed	44	44	44	44	44	42	42
None (controls)	9	Ordered	Not available						
		Consumed	60	60	60	60	60	60	60
	10	Ordered	36	35	36	33	37	34	34
		Consumed	35	35	35	35	35	35	35

consumption in the different schools makes this unlikely. What we may call 'saturation' in persuasion could perhaps have existed in schools where 65% or 70% of the children took milk, but is unlikely in schools where only 25% or less took it. We must then look for a different factor that sometimes limits the number to such a low proportion.

We chose to study school milk because we were assured of a fairly stable population, and because we were able to assess consumption by objective and reasonably simple methods. But the controlled situation that makes the schools an appropriate place for seeking reliable statistical information in such a study may also impose restraints on the distribution of milk that hinder or prevent change. It has long been known that such physical factors as the time of distribution, the distance from the classroom, and the place where the milk is to be taken have a considerable influence on the number of children that take milk (National Dairy Council, 1962). One can also think of other factors such as the amount of time available and the existence and nature of competing

interests or activities during the same period. These factors are likely to have accounted in large part for the considerable differences in the number of children taking milk in the different schools visited in our studies; consumption in school 7 was twice as high, and in school 5 three times as high, as in school 6.

If these suggestions are correct, our conclusion is not simply that nutrition education is ineffective in changing eating behaviour. It is rather that nutrition education may not change eating behaviour if there co-exist strong factors that militate against the change. Theoretically a course of nutrition education would overcome these other, inhibitory, factors either if it could be adequately strengthened, or if the inhibitory factors could be adequately weakened. With our present poor knowledge of how to induce change in eating behaviour, we cannot suggest ways that will achieve these objectives with certainty. We can only stress how great is the need for further attempts to assess the effectiveness of different methods of persuasion, and if possible, to measure the relative values of factors that make change easier or more difficult.

One practical consequence emerges. There is in Britain a considerable and continuing effort being made to increase the consumption of milk in schools. Our experiment suggests that the expense and effort that goes into a programme of nutrition education may be largely or entirely wasted if there are overriding factors that will prevent change. It is then worth considering whether some of the expense and effort would be better devoted to a more fundamental study of the problem of persuasion in relation to patterns of food consumption.

We are glad to have this opportunity of thanking the National Dairy Council and the administrative and teaching staff of the Berkshire and Reading Education Authority for the considerable help they gave us and without whose support this experiment could not have been undertaken.

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The Evaluation of Nutrition Education Programmes: A Review of the Present Situation

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I. Introduction

It is generally accepted that in the developing countries maximum use should be made of the food at present available, as well as of foods newly introduced. There is evidence that people in the developed countries also do not necessarily eat for maximum nutritional benefit (YUDKIN, 1963). In a recent pamphlet, F.A.O. suggests that nutrition education may be of prime importance in re-directing the food habits of an individual or of a nation — "Middle class families of Western Europe and America have been brought up to respect science and value its results. Once the facts have been presented to them these families tend to accept a new food or a new concept about food and its relationship to health. Thus... education, and particularly science education, will aid the application of new scientific knowledge to the improvement of diet." (F.A.O. 1962.) Similar claims may be found elsewhere (RITCHIE, 1950).

Yet clearly there are many circumstances in which education in nutrition has failed to be successful. The report of the conference at Cuernavaca (BURGESS and DEAN, 1962) has indicated the significance of sociological, psychological and economic factors in determining food choice, and the difficulties involved in inducing change. Recently social scientists and health educators have become increasingly aware that the attainment of knowledge does not necessarily result in the modification of behaviour. There is evidence, for example, that the nutritional beliefs of housewives do not necessarily influence their food purchases (BROWN *et al.*, 1963). Equally, we do not know how to persuade people to stop smoking, although they are aware of the correlation between cigarette smoking and lung cancer (CARTWRIGHT *et al.*, 1960). Many similar examples can be quoted.

ROSENSTOCK (1960) has put forward three general criteria for the successful modification of behaviour in the interests of health:

- a) the individual must be aware that there is a problem for him;
- b) he must feel that it would have serious consequences for him;
- c) he must feel that there is some possible solution to the problem.

There is need however to take this general statement a good deal further and to analyse the circumstances in which nutrition education successfully leads to the modification of behaviour. The first step in this direction would seem to be to assess the extent to which the effect of programmes of nutrition education have been evaluated. A review of this sort would, it is hoped, indicate possible shortcomings in the programmes and perhaps help both to devise better programmes and to develop better methods of evaluation.

In assessing whether or not to include a particular report in this review, we have been guided by the following criteria. No paper has been included unless:

1. It is specifically concerned with nutrition education. On this basis we have excluded behaviour studies in the general field of psychology unless they are specifically related to nutrition. We have also excluded work which has aimed at improving nutritional status merely by the addition of supplements to the diet.
2. It attempts to evaluate the success of a specific education campaign which has been conducted over a period of time.
3. It relates to a field situation and goes beyond a theoretical discussion on the principles and value of evaluation, or a study of a small experimental situation.

Given these criteria we are only able to find some forty papers from the relatively extensive literature on nutrition education which deal with evaluation. Since the value of any nutrition education programme lies in the extent to which it produces the desired changes, it is unfortunate that so little work has been done to test whether a programme has achieved this objective.

II. Reasons for Limited Extent of Evaluation

The reasons for this are by no means clear. One factor is presumably that there is an assumption that the effectiveness of nutrition education has already been established. In many people's minds there is an overriding impression that nutrition education does improve food habits and that the matter has been conclusively settled once and for all. If such an interpretation is held to be true then of course there is no value in repeating work in this field.

Perhaps equally important is the fact that evaluation comes at the end of a programme and unfortunately many programmes never succeed in reaching completion. Another likely factor is that the problem is a difficult one. The technique required for evaluating the success of a given programme is very different from that required for the development of a nutrition education campaign itself. Different personnel may be required, considerable time is needed, and—most important—there is no accepted welltried methodology upon which to base the work.

III. Studies Reporting Positive Results

We divide these studies into those in which success has been assessed subjectively as a result of the workers' impressions of the situation and those in which success has been measured objectively by some specific criterion.

A. Subjective Assessments

It may have been the lack of a well-tested methodology which has led to occasional subjective judgements. PHILLIPS (1955), after describing a 6-week rat feeding experiment carried out by a class of student nurses, concludes that "the instructors... felt that learning had taken place. The students had observed the effects of nutrition on the ani-

mals' health and therefore had become more critical of their own eating habits". NOTT (1957), after similar experiments conducted by school children, says that "it is hoped that after this experiment a change in attitude will be seen in the students". NOBLE (1952), however, reported that teachers felt little change had occurred as a result of rat feeding experiments. Yet OTHERMER (1956), commenting on the work of dietitians, states that "it is possible for us through education of one individual to bring good nutrition and eating habits to the participant's entire family".

Justified as these opinions may have been, we cannot use them as evidence for the effectiveness of nutrition education.

B. Objective Assessments

Some studies of a more objective nature have been reported which indicate change in food habits induced by education.

BOVEE and DOWNES (1941) undertook a study of 135 families. Forty-five were given home education by a nutritionist, 45 education by a health nurse and 45 were used as controls. The results were assessed immediately after the nine-month teaching period by asking the mothers about their children's food habits. Using a rating scale for grading food habits, the investigators reported that there was a significant improvement.

LEWIN (1943), in what has come to be regarded as the classic example of an experiment at attempted food change, compared the lecture and group decision method for changing attitudes to the consumption of kidney, brain and heart. The experiment was carried out with 120 women from varying economic levels in the State of Iowa. Thirty-two per cent of women who attended a group discussion began to serve one of the meats for the first time, compared with only three per cent of woman who attended a lecture. Similar percentage increases were found amongst women who had hardly ever served these meats before. It is not stated how soon after the lecture and discussion evaluation took place.

DOWNES (1943) studied the dietary records of 166 Negro families before and immediately after at least six months' teaching. The pattern revealed was compared to the N.R.C. recommended allowances for calories and nutrients. The proportion of families failing to achieve the N.R.C. standard was reduced from 71% to 51% after the teaching programme.

A similar experiment in Negro families by DOWNES and BARANOVSKY (1945) recorded an improvement in food habits after two three-monthly periods of teaching, each followed by three months' rest period before assessment.

GRANT (1950) studied 50 children of age 10-11 and kept a photographic record of meals chosen in a school canteen. After nine weeks' education, the record taken five weeks after the end of the programme showed an increased movement on the part of the children towards foods favoured in the education programme.

TISDALL *et al.* (1951) carried out five food surveys at six-monthly intervals, the first three months before a school lunch room was opened, the remainder during the course of the school meals programme. The buying habits of the families of children taking school lunches were reported to have improved over a period of two years.

WHITEHEAD (1952) reported on a nutrition education programme in five schools which was developed and supervised by a nutritionist in the years 1944-48, and evaluated in 1950-51 after a further three years of continuing nutrition education by the school staffs. It was concluded that the children's food habits had significantly improved.

KONHEIM and NAIMAN (1954) distributed free health literature to 136 mothers of students taking a course in hygiene. Over a period of three months the literature was discussed by students both in class and at home. As a result of this 42% of mothers said they had changed their food habits, whilst 26% said they had changed their habits with regard to visiting the doctor.

ARCHIBALD *et al.* (1956) in a five year nutrition programme in Nova Scotia found by the means of a dietary score card, and by teachers' observations of school lunches, that the use of soft drinks and sweet foods decreased, while the use of milk, vegetables, fruit and protein-rich sandwiches increased. It is impossible, however, to assess the precise effect of education as this was only one aspect of a programme which included economic subsidy and nutritional supplements.

O'KEEFE (1956) evolved a comprehensive education campaign involving the co-operation of parents and school authorities. This was reported by WHITEHEAD (1960), who indicated that 12 and 13 year old children taking part in the two-year nutrition programme more nearly approached daily recommended allowances than did those of the control classes, and that this improvement continued after one year at high school with no continuing programme of education.

SUTTON (1956) based his assessment on an inventory of points of

view related to health and on a health practice inventory. Students were pretested and tested immediately after two semesters of health instruction. Improved scores were attained.

KUNKE and HALL (1958) studied nutritional knowledge before and immediately after a one-semester food course at a high school, and a three-day dietary record at the end of the course showed improved knowledge.

ECOMA (1962), reporting on food demonstrations carried out at an urban Mother and Child Health Centre in Eastern Nigeria, found that after three years of food demonstrations 47% of families in the area were giving the demonstrated foods regularly to their children. The programme is a continuing one.

PINDER (1962) indicated by the replies to a questionnaire the number and percentage of 803 women reporting change in practice approximately two weeks following the Ghana National Health Week. The percentage reporting change was 67% of those who saw only an exhibition, 78% of those who saw a demonstration, and 92% of those seeing both.

SWOPE (1962) described a series of studies undertaken by students on evaluation. SOSTMAN in a study of children in the last three years of a six-year nutrition education programme in a New York public school reported gains in the quality of food habits. MANUEL studied the food habits of 6, 10 and 13 year old children before and after a nutrition education campaign and found that after the campaign (interval not stated) the number of children eating good or fair meals increased, whilst the number eating poor meals decreased. IYER reported an improvement in breakfast habits and in the consumption of foods rich in vitamin A and C after a seven-week nutrition education campaign; here too there is no indication of the interval between the campaign and the assessment.

IV. Studies Reporting Negative Results

Many education programmes fail as the result of ineffective methods. CLEMENTS (1956) gives the example of pamphlets which were distributed in the Philippines and which were ineffective because the language used was too complicated, to say nothing of being in English rather than the local language. WHITEHEAD (1957), BURGESS (1961)

and SWOPE (1962), in reviews of education, give other examples and indicate how pitfalls may be avoided. Such mistakes, however, cannot be regarded as evidence that nutrition education does not modify choice, but they do indicate the failure of research workers effectively to use the tools at their disposal.

Nevertheless, there are several publications which seem to indicate failure, that is the absence of response on the part of the population.

As long ago as 1934, BORRO studied the effects of home economics teaching in seven schools on the food habits of 17-18 year old girls, and found no significant improvement. However, the period of instruction was not stated, nor the time elapsing before evaluation of change.

SHAVER *et al.* (1948) reported on the Hartman Jones Memorial School Study which involved a clinical and dietary study of 650 children of low income families. Nutrition education was aimed both at children and their parents. Whilst the use of vitamin D preparations was raised, assessment at the end of eight months of intensive educational work showed that efforts to increase milk intake and to reduce sweet and cake consumption were unsuccessful. However, clinical re-examination showed improved nutritional status in 13% of the children.

GREENBERG *et al.* (1953) planned an evaluation programme to run concurrently with the issue of a health education pamphlet on the feeding and other habits of the baby. The pamphlet was sent to a sample of parents having their first child during a stated twelve-month period. A follow-up questionnaire-interview when the child was 14-15 months old indicated that the pamphlet had not achieved the results aimed at.

ORNEE (1957) gave instruction in correct diet to the parents of one group of children in a dietary and clinical survey. After twelve months, during which time four diet surveys were made, each lasting about two months, no demonstrable effect on the quality of the diet was observed.

SWOPE (1962) reports on a thesis by ANDERSON which indicated that students who had homemaking courses at secondary school level did not practice better dietary habits than the students without such training, and that there was no consistently significant relationship between the number of years of homemaking and the quality of dietary practice.

V. Discussion

We have been able to find only twenty-six studies in which evaluation of nutrition education programmes has been made. Of these twenty-six, a total of twenty have reported change in dietary habit after nutrition education. Out of this number of twenty, three had been assessed subjectively, and seventeen had been assessed objectively. Thus, we should compare this number, seventeen, with the number, six, five of which have included objective assessments and reported no change in dietary habit.

It is necessary, however, to remember that the successful "objective assessments" may themselves have been influenced by the techniques used. In the first place, the objectivity of the tests refers to those conducting them; they may well be influenced by subjective factors in the persons being studied. Incorrect answers may be given for a number of reasons:

- a) having been subjected to the campaign, and having accepted its validity by a modification of their attitudes, but not having changed their behaviour pattern, the subjects may feel guilty, especially if they are in some way responsible to the family as a whole;
- b) they feel sorry for the interviewer and wish to help him;
- c) they want to please people in authority;
- d) it is the quickest way of getting the interview over;
- e) the question is so loaded that it is difficult to give any other answer, e.g. "Have you changed your food habits?"
- f) they may change their habits because they are being observed, only to slip back to their old ways once they feel they are no longer under supervision.

It may be argued that these criticisms could equally be applied to the studies indicating failure, but we believe that this is less likely to be the case. These sources of error are usually the result of overeagerness to produce a desired result, and it seems to us unlikely that many people have set out to prove that education does not work.

A second criticism of the results reported as successful is that many of the assessments were made after a very short time. Of the seventeen objectively assessed campaigns which were reported to be successful, eight were tested immediately after the completion of the education programme, and two more within the following five weeks, leaving seven campaigns in which assessment was made after a reasonable

interval. WHITEHEAD (1960) pointed out that the influence of a programme falls off very rapidly after it has been completed.

A third criticism is the frequent lack of adequate control groups, making it difficult to separate the influence of education from that of economic and other environmental factors.

VI. Conclusion

It would be wrong to regard nutrition education as always being an effective tool for modifying food habits. However, it would be equally wrong to regard it as always being ineffective. The work done so far seems to suggest that the success or failure of an educational programme depends on the methods used, the personalities involved and the circumstances prevailing in the area at that time. However, we are not, as yet, in a position to isolate these factors more clearly. This is partly because so few evaluation studies have been made of nutrition education programmes and partly because the purely technical devices for use in evaluation have not been fully developed. There is a particular need for social scientists to work in close co-operation with nutritionists in order to establish a satisfactory and simple methodology, and to encourage the use of evaluation as an integral part of any programme they design.

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CHAPTER 3

Food is not just for eating.

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'Every man, woman and child has the inalienable right to be free from hunger and malnutrition in order to develop fully and maintain their physical and mental faculties. Society today already possesses sufficient resources, organisational ability, and technology and hence the competence to achieve this objective. Accordingly the eradication of hunger is a common objective of all the countries of the international community, especially of the developed countries and others in a position to help. It is a fundamental responsibility of governments to work together for higher food production and a more equitable and efficient distribution of food between countries and within countries' (FAO, 1975).

These words were part of the 'Universal Declaration on the Eradication of Hunger and Malnutrition' issued by the World Food Conference in November 1974. They reflected both an earnest desire and increasing concern about the world food problems of the future. But they omitted one fundamental aspect of the fight to eradicate hunger and malnutrition—the fact that each individual by his own freedom of action to a large extent determines his nutritional status.

In their attempts to formalise the distinction between man and all other animals, philosophers spend much time emphasising issues such as 'freedom of will', 'freedom of choice', and 'creator and controller of one's destiny'. In reality such fine distinctions do not only have a basis in man's spirit and soul but in his physiological condition as well. Nowhere is this more apparent than in the study of nutrition. Thus whilst in some physical aspects of life the individual has no direct control over the functions of his body (e.g. the beating of his heart) in other respects he has some partial control (e.g. breathing). But in the field of food consumption the individual has absolute control at least within the constraints of economic viability—his alone is the decision to eat or not to eat; to eat this food or that; to eat a little or a lot.

This is not of course to suggest that food consumption is totally unrelated to physiological needs. Undoubtedly in part the act of eating is a response, however hidden, to physiological requirements, inherent needs and taste appeal. Thus the individual sitting at his dinner table is in part performing

an automatic ritual that resembles in some way the action of, say, breathing.

However, perhaps as a result of some hidden recognition of the crucial nature of the consumption function man, in part at least, also elects to build round food and eating a whole series of issues in no way related to health and nutritional status.

SOCIAL AND ECONOMIC CRITERIA INFLUENCING FOOD CHOICE

Thus food is used as a sociopsychological tool (McKenzie, 1974). It acts as:

- an aid to security;
- a substitute for maternal creativity;
- a means of demonstrating group acceptance, conformity or rebellion, and prestige;
- a means of demonstrating mood and personality;
- a compensation for denial or an aid to the alleviation of a crisis.

Yet the issues do not even stop here.

The selection of food also reflects economic matters. It requires the planning and successful deployment of the family budget so that individual purchases fit into the overall scheme as far as the money available is concerned, not only in terms of food and drink but in terms of the total pattern of expenditure (McKenzie, 1975).

The culmination of these sociological, psychological or economic issues is an individual decision to single out specific items of food for consumption—very much bringing into play the whole issue of freedom of will, and individuality. But perhaps regrettably with no detailed attention to nutritional needs.

This is not, of course, to suggest that every individual in every purchase considers any or all of these criteria and makes a specific decision. Often another criterion: habit, works in a very different way. The very fact that last year or last week the budget was divided in this way; that the main meal of the week normally comprises these items; that breakfast always includes cereal and the main meal of the day potato, is mostly strong enough to ensure that a similar demand is made the coming week.

In such a context it is perhaps not surprising to find that as a result of all these pressures and, indeed, of the fact that the consumer does not readily acknowledge the need to eat to survive but rather emphasises the pleasure to be gained from food, that individuals seldom achieve maximum efficiency in food choice:

in economic terms we do not seek to satisfy our nutrient requirements as economically as possible (20p a day could provide the food to satisfy nutrient intake if this was the only issue);
in nutrition terms the foods we actually choose may not provide the optimum balance or even the minimum requirements.

It has, of course, long been acknowledged that these issues present fundamental problems in a developing society where the balance between selecting the right foods and surviving and selecting the wrong foods and dying, has always been a narrow one. But in Western society the development of 'the land of plenty' has resulted mostly in the achievement and maintenance of satisfactory nutritional status whatever the individual has chosen to consume. Only three problem groups emerge:

those suffering from overconsumption generally or possibly from the ramifications of too heavy a consumption of particular foods;
those minority groups still vulnerable because of age and poverty;
those with psychosomatic health problems.

Hence one of the fundamental questions for this conference to consider is whether the haphazard nature of our food choice as far as nutrition and economy are concerned is likely to present problems in the future not only in developing countries but also in Western society. Such problems as might emerge in the West could include:

at one extreme the risk of an increasing scarcity of food and therefore the need for us to avoid the waste of scarce resources and to optimise the efficiency of our intake;
at the other extreme the problem of overnutrition related to an ever-increasing abundance of choice and total availability;
in the middle somewhere also the problem of optimum nutrition. Are we moving towards the day when every individual should have a carefully individually prepared diet to which he should adhere strictly so as to correct and compensate for existing deficiencies and to exploit his talents for the maximum maintenance of health and resistance to disease?

My task in this conference is not in a sense to answer these questions but to ensure that we recognise that if these issues reflect possible problems for nutrition for the future then their solution in terms of changing food habits may not be an easy one. Indeed that if change has to be enforced it may not only have manifestations on the individual's physical health but also on his feelings of security and wellbeing and on his personal relationships within society.

Moreover, it means that to ensure that essential change is actually achieved it will be necessary to pursue all possible professional persuasion

methods with great determination—and even then they may be an inadequate tool to overcome the enormous pressures involved.

RECENT CHANGES DUE TO ECONOMIC PRESSURES

This is not of course to suggest that change seldom occurs. The consumer may resist the change he does not desire but equally he is always adapting his food habits to match new desires or economic considerations. Nowhere has this latter aspect been more clear than in the last two years.

The increase in price of all foods during 1974 was approximately 17% and during 1975 was a further 24% (Table 1). Not surprisingly these price increases had a colossal impact on food choice. Moreover impact was

TABLE 1
CHANGES IN GROCERS INDEX OF FOOD PRICES 1974–1976 (1 JANUARY, 1968 = 100)

	January 1974	January 1975	December 1975	January 1976	% change Jan 1975/76
<i>All foods</i>	168.04	195.85	237.78	243.05	+24.1
<i>Processed foods</i>	155.20	202.15	228.45	231.46	+14.5
<i>Fresh foods</i>	184.02	187.88	249.32	257.39	+37.0
<i>Beverages</i>	122.32	137.83	147.05	155.75	+13.0
Tea	109.66	114.06	117.60	117.60	+3.1
Coffee	141.14	162.24	180.40	207.34	+27.8
<i>Cereals</i>	167.72	215.94	245.03	246.17	+14.0
Bread	174.42	201.72	238.64	238.64	+18.3
Biscuits	150.57	220.17	235.36	235.36	+6.9
Cakes	152.52	215.32	251.72	254.72	+18.3
Flour	186.76	224.28	218.58	226.52	+1.0
Breakfast cereals	141.73	194.92	218.16	222.01	+13.9
Other	208.11	284.70	306.91	306.91	+7.8
<i>Dairy products</i>	167.15	216.27	244.29	251.52	+16.3
Cheese	175.07	229.05	243.56	255.16	+11.4
Milk, canned and powdered	166.20	208.37	262.96	262.96	+26.2
Cream, canned	131.68	171.42	213.93	213.93	+24.8
<i>Fats</i>	151.21	200.80	211.86	214.26	+6.7
Butter	137.67	161.90	182.77	186.67	+15.3
Margarine	173.52	271.21	273.65	273.65	+0.9
Cooking fats	172.67	255.21	242.96	242.96	-4.8

TABLE 1 (continued)

	January 1974	January 1975	December 1975	January 1976	% change Jan 1975/76
<i>Fish</i>	166.74	181.91	210.00	211.74	+16.4
Canned	142.44	147.00	155.53	155.53	+5.8
Frozen	197.49	225.73	278.25	282.16	+25.0
<i>Fruit</i>	127.91	193.66	199.08	199.08	+2.8
Dried	136.07	155.39	155.86	155.86	+0.3
Canned	123.44	214.41	222.56	222.56	+3.8
<i>Meat</i>	175.92	194.04	232.86	236.73	+22.0
Frozen	159.48	184.20	211.08	211.65	+14.9
Canned	154.52	169.51	198.87	199.68	+17.8
Bacon and ham	186.78	205.72	251.42	259.82	+26.3
Sausages, etc.	144.79	191.09	226.82	226.82	+18.7
<i>Sugar and preserves</i>	133.92	311.02	272.45	272.45	-12.4
Sugar	127.21	346.40	283.01	283.01	-18.3
Jam, honey and spreads	147.07	220.05	239.63	239.63	+8.9
Marmalade	157.61	236.82	262.87	262.87	+11.0
<i>Vegetables</i>	134.03	187.36	263.73	240.76	+28.5
Frozen	134.43	150.40	197.62	198.68	+32.1
Canned	149.52	239.47	284.44	284.97	+19.0
Dried and other	115.00	147.28	203.50	213.71	+45.1
<i>Fresh foods</i>					
Meat	210.24	214.01	253.67	257.45	+20.3
Vegetables	163.43	174.90	304.07	372.88	+113.2
Fish	346.59	363.59	423.61	446.85	+22.9
Eggs	170.19	102.57	163.64	128.11	+24.9
Fruit	161.47	231.02	248.43	233.33	+1.0
Milk	124.45	113.14	192.34	192.34	+70.0

greater than might have been expected because of the overall impact of price increases in other fields during the same period. In the short run at least it seems consumers have to cut back on food expenditure before they reduce their expenditure on other items. It is likely that this is because so many of the other items in their budget are fixed, at least in the short run—like HP payments on the car, rent and mortgages—so that the cuts have to come out of the housekeeping. Equally because the severity of the economic situation has hit home so hard, the housewife seems psychologically compelled to take a very critical view of expenditure in the main area for which she is responsible and impose change accordingly.

Thus after a year of this so-called depression (say January 1975), it was possible to identify a number of specific trends in the consumer's behaviour (McKenzie, 1975). First the housewives' attitudes towards shopping seem to have changed. More and more at this time she seemed to be taking time to check out comparative prices in various shops and spread her purchasing activity around to make use of the various bargains available. Equally there was a significant growth in the sales of own label brands from companies such as Tesco, Fine Fare, Sainsburys, Marks & Spencers at the expense of the major manufacturing brand leaders.

Secondly the housewife began to view very much more critically her purchases of convenience products or products that appealed to only certain members of the family. Thus for example there was a big decline in the sale of products such as instant potato (except briefly during the potato shortage), 'complete meals', cakes and expensive personal items such as commercial slimming aids. In Table 2 I identify some of the changes which occurred to other items. It was possible to see a reversal of earlier trends away from 'cheap foods' such as tea and bread, flour, porridge oats, sausages, apples and a particular reduction in 'expensive

TABLE 2

GROWTH TRENDS IN CHEAP AND EXPENSIVE FOODS 1968-1975

(in terms of the percentage change in quantity of specified foods consumed per head per week between the years mentioned)

	1968/73 (%)	1973/74 (%)	1st half 1974/75 (%)
<i>Cheap foods</i>			
Tea	-3	4	0
Bread (white)	-3	.3	-5
Flour	0	9	1
Porridge oats	-4	15	-6
Sausages	-1	2	-11
Apples	1	6	-7
<i>Expensive foods</i>			
Frozen vegetables	14	-4	20
Citrus fruit	1	-13	11
Bananas	-2	-3	7
Breakfast cereals	4	-2	5
Buns, scones, tea cakes	-4	-13	20
Slimming, malt and other breads	1	-15	1
Brown bread	-3	-6	33
Baked beans	2	-5	0

foods' such as citrus fruit, buns and tea cakes, slimming, malt and other breads (Mintel, 1975).

Again there was a tendency to reject the purchase of ready prepared items for consumption outside the main meal occasions. Snacks were not seen as important and if somebody had to eat between meals they were much more likely to be asked to make do with the odd left-overs!

All of this led to her increasing return to using basic ingredients to cook the products herself.

But it is interesting to see that some of these trends at least have not continued as the recession period has gone on. Over time it seems that the housewife has been more able to re-adjust the pattern of her expenditure so as to give greater priority to the foods which she really likes. Equally perhaps her psychological guilt at using convenience and expensive items has been reduced. Thus as we moved through 1975 (Table 2) the earlier trends in consumption have re-emerged with the movement away from 'cheap foods' and a movement towards more expensive ones (Mintel Report, 1975). Thus frozen vegetables, buns, scones, tea cakes, brown bread, have shown a further significant jump forward whilst consumption in products such as sausages, white bread and porridge oats has again come to show a decline. This led Mintel to conclude that whilst the future was not clear 'it seems reasonable to suggest that food consumption patterns now look more secure than consumer durables and may be permanently past the worst. The shock of the miners' strike, short time working, etc., was probably more emotionally extreme than that likely from unemployment and the real decline in living standards likely in the future—food is past the worst, leaving durables to bear the continued effect of recession'.

Yet another intriguing situation has been the slowing down on the growth in own-label sales (Mintel, 1976). This in fact reflects two things. First there is a limit to the number of product categories which can justifiably merit an own label product. Thus on the basis of Fine Fare's experience growth rate in terms of the introduction of new products was slowing down very much even by the early 1970s. Secondly, there have been increases in prices, so although the own label product has continued to be say 1p or 2p cheaper with inflation, its significance as a percentage difference between the main brand and own label has declined. Thus in 1975 the percentage difference in price between brand leader and own label products was probably only half what it was in 1973.

THEMES FOR THE FUTURE

So where does all this take us in the next 10 years? Undoubtedly it would be a brave man who would put forward very strong views on this issue

now. Indeed the whole issue of a rise or decline in the standard of living in this country as well as the development of technology and the position of world food supplies will have a very significant impact on food trends and nutritional viability. In this sense the questions asked earlier about the absolute nature of where we are going are of relevance. Nevertheless I do believe that it is possible to identify a few trends which are likely to emerge in the 1980s regardless of our standard of living position. I have attempted to identify some of these in the following paragraphs in terms of specific 'themes'. I have also attempted to present each of these in some sort of schematic form (Figs. 1, 2 and 3).

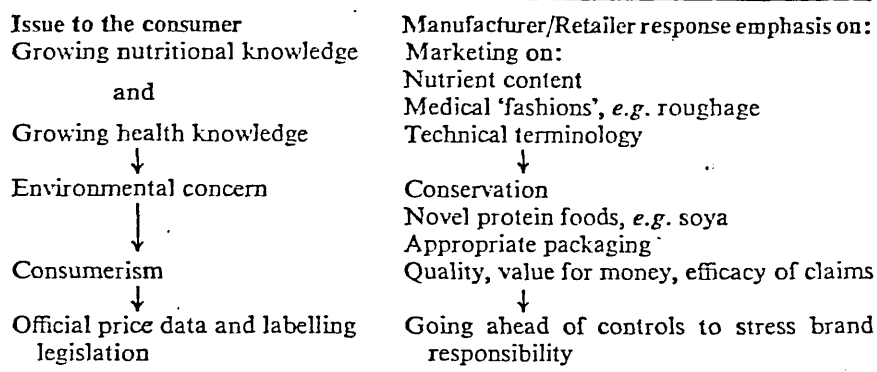


Fig. 1. Influence of information and knowledge.

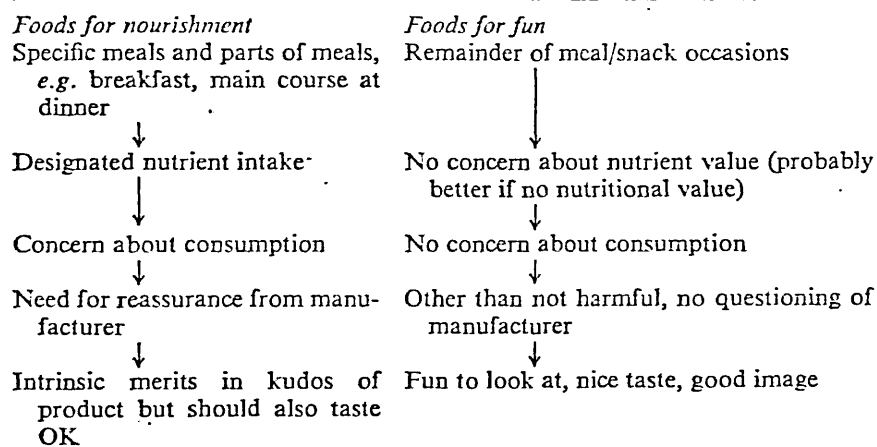


Fig. 2. Distinction between foods for nourishment and foods for fun.

The first theme is undoubtedly 'information and knowledge'. Over the past 10 years or so it has been possible to see a profound growth in the consumer's knowledge of nutrition. This knowledge has probably come primarily from the housewife's concern with slimming. Whether or not one regards this as a desirable motivation it undoubtedly has reinforced her understanding and perception of concepts such as protein, vitamins, carbohydrates, calories and led her to more readily identify the foods that are associated with these properties.

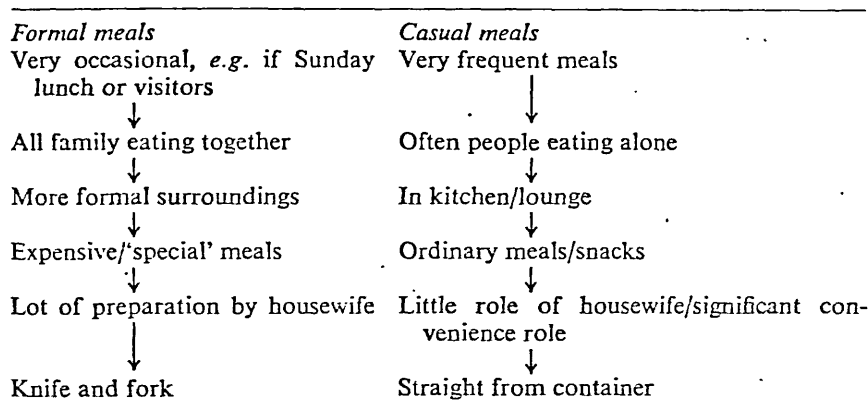


Fig. 3. Distinction between formal and casual meals.

At the same time there has been increasing awareness of health problems in middle and old age that may have a nutritional element such as coronary heart disease.

Again fashionable trends now rapidly move into the consumers vision—thus the roughage story is almost as well known to the housewife as it is to the clinician. By the same token knowledge of world food problems and environmental problems are increasingly understood by the housewife. Hence her recognition of the role of soya and other novel protein products may play in the future.

At a different level consumerism has been growing rapidly with various organisations both on television, wireless and in the press identifying 'best buys', 'buy of the week' and things of this nature. Recently in Chester for the cost of a phone call shoppers could be told the lowest prices at a number of city centre supermarkets and smaller shops with a range of 20 foodstuffs including items such as eggs, meat, bread, fruit and vegetables. At a wider level the government 'Price Check' policy could have considerable impact on consumers' choice of food items.

None of this necessarily means the consumer will, in practice, put

optimum nutrition or value for money top of her list of factors influencing food choice. But it does mean she will be mindful of these issues and at least pay lip service to them. I also believe these issues will be reinforced by manufacturers and retailers who will 'jump onto the bandwagon'. I predict they will go far beyond legislative requirements regarding price, nutrient content and the provision of information on their products in an effort to court consumer loyalty.

I would also expect nutrition/health trends to be exploited by the manufacturer in new products. An example of how such themes can be developed may be found in the contemporary situation. Over the last few years it has become apparent that the consumer wants nutritional reassurance and naturalness in a palatable form. At the same time she wants probably more basic foodstuffs which meet the mood of the times.

How has the manufacturer responded? Let us look at the yogurt situation. Basically what existed for many, many years was a product which had many favourable health connotations and which was seen as highly desirable. But it was too expensive and it did not taste right to most people. Then the major manufacturer was able to come onto the scene and build up a product which had elements of the existing product about it but none of its current deficiencies. It was made to taste good, it was made to include fruit and its price was reduced. Moreover it was presented in a marketable form with a reasonable shelf-life in the supermarket. Many of the original devotees of yogurt would argue that the product had now lost everything of essence which it had originally contained in taste terms. But it introduced the product to the public which they found very, very acceptable (Fig. 1).

The second theme which I believe will emerge may be summarised as 'Distinction between foods for nourishment and foods for fun'. In a way this concept stems from the previous one. As consumers become more and more knowledgeable about food, so I think they will clearly distinguish between items of their diet which are of recognisable nutritional significance and which should be 'packed full' of protein, vitamins, etc., and items which are there just as a 'frivolous' addition to the meal and whose whole criteria should be that they taste and look good. Indeed, it may even be desirable that these latter items are 'full of nothingness' with no calories or other nutrients in them so as not to upset any nutritional calculations.

This is not to say that the 'nourishment foods' should be in any sense clinical or savour in any way of medicine. They would be basic 'good' foods. And to a large degree the trend would simply accentuate existing trends. Thus for example breakfast and the main course at dinner time would have the nourishment theme strongly attached to them whilst snacks, desserts, etc., would be there just for fun. Again the manufacturer will probably reinforce such a positioning by implicitly or explicitly categorising his foods in this way (Fig. 2).

The third theme is in a different dimension and, I believe, will be a further manifestation of 'formal meals versus casual meals'. As time passes more and more meals are no longer consumed at a table in the dining room. Indeed in a separate piece of research I have recently undertaken there is a great deal of evidence to show that the sideboard is becoming redundant! Thus many meals are taken either in the kitchen or on the consumer's knee. In the same way items within the meal are taken straight from a package, for example many of the chilled desserts. I suspect that this and the enormous cost of traditional English dishes, such as roast beef and Yorkshire pudding will polarise the situation still further over the next few years. We will be left with a small number of 'formal meals' per week served on traditional occasions, such as Sunday lunch or when visitors come and when expensive, long-established basic foods will be used. It is also likely that they will involve the housewife in using, as best she can, her technical cookery skills. And the end result will certainly be served in a formal setting possibly the separate dining room if such a room still exists. However, most other 'casual meals' will not be served in such a way; they will major on convenience so that the cooking role performed by the housewife as against the manufacturer will be much more limited; they will be confined to simply the family (either as a group or as individuals eating at separate times); often they will be eaten straight out of the container provided by the manufacturer; and very frequently they will be eaten in an armchair (Fig. 3).

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SOCIOLOGY AS AN AID TO NUTRITIONAL CHANGE

It is increasingly becoming accepted that some of the biggest problems facing nutritionists today are not scientific issues involving the need to discover new formulae or understand physiological phenomena but are of a human nature. Too often new scientific discoveries which urgently recommend change are not implemented for economic and political and social reasons. Man is so often his own worst enemy. My task today is not to argue such is the case. To anyone with any perception who has worked in nutrition these human stumbling blocks are self evident. Indeed over the past few years several books and countless articles have dealt extensively with this whole area (Burgess and Dean; Yudkin and McKenzie). The purpose of this paper is to indicate how sociology as a discipline may aid in the achievement of improved nutritional practices.

Definition and Function of Sociology

Perhaps I should begin with some explanation of what is meant by "sociology". For too long social scientists have sought to differentiate between sociology, social psychology and social anthropology. Fortunately of recent years there has been a tendency to realise that such a division is artificial and can only reduce the individual worth of particular studies. Consequently there has been a movement back towards a more integrated approach. This is in line with the definition of sociology in the Encyclopedia of Social Science. "Sociology is the most ambitious of all the social sciences because in a sense it is the most comprehensive. As its very name signifies it is an endeavour to lay bare the foundations of all living together, to elucidate the laws which lie at the basis of social intercourse Sociology is the social science par excellence". It is in this very wide sense that I propose to consider sociology today.

I believe that as a discipline sociology can have two major roles to play in fostering nutritional change. It can provide an understanding of the mechanism motivating community and individual behaviour and in the light of this it can indicate both the areas most likely to be responsive to attempts at change and the techniques most likely to be successful in encouraging such change.

The key lies therefore in an understanding of the community and of the individual. Let us look first at the community. "Wherever human beings are thrown together, separated in whole or part from the world outside so that they must live their lives in one another's company we can observe the effects of social impulses which bring men all over the earth into communities" (MacIver and Page). Out of such situations develops community involvement.

This involvement is fostered in three distinct ways. Within the community each person comes to feel he has a role to play and that this is of importance to the community. He also feels dependent upon the community for the satisfactory development of his own good life and uses it as a refuge from solitude and fears that would accompany individual isolation. Lastly and perhaps most important man develops some sense of communion with the community itself; of what may be called collective participation in an individual unity.

It is not therefore really surprising that the individual is likely to react with great hostility to any encroachment or criticism of the community from the outside and that he will resist as strongly as possible any change which appears to have been instigated by an outsider. In practical terms what does this mean for the scientist attempting to improve upon nutritional standards? It begins not so much with nutrition but with the personal behaviour of the nutritionist himself.

Attitude to Moral Code

The first issue is that the nutritionist must not criticise the moral code of the community in which he or she is working. For example the nutritionist, as an ardent feminist, may enter a culture in which women are the second sex. The men may be lazy and selfish and the women completely down trodden. In such circumstances it would be easy, but inexcusable, to rally to the cause and make deprecatory comments about the way in which the women are treated. Such action would be seen as an attack upon the very nature of the community and thus lead to a general unwillingness to listen to the nutritionist's pronouncements. By all means the nutritionist must observe the whole concept of the culture - indeed this will be a key aspect in attempts to change nutritional practices. But equally he must not attack what he finds however strongly he disagrees with its basic philosophy.

Patronage

In the same way the nutritionist must realise that he has patronage to confer. His interest in certain individuals and his visits to a household may increase the prestige of a particular group. It is important to make sure that this patronage is not exploited by the wealthier members of the community nor used as a political lever. Similarly one must be careful not to associate with one group of the community more than another or this may lead to rejection.

Realistic Advice

It is also important to assess how sensible your recommendations are likely to be in particular areas, however valid they are generally held to be. Thus Freedman (1951) and Kelly (1959) have reported that cookery classes or demonstrations often provided a setting, and used utensils, that had little resemblance to those found in the poorer homes and led to the women discounting the advice given. In a different context Foster (1952) and Burgess (1955) have reported instances where mothers who cannot tell the time by the clock have been instructed to feed the baby "regularly every four hours".

This point was particularly well driven home in a report on Home Economics made to the Government of the Federation of Malaya (Burgess 1960). I will quote in detail. "The Malay woman is usually a good cook. She handles food well, preparing it carefully for cooking with a minimum waste and spending considerable time in blending a variety of seasonings for the curry. Most of the women report using wood as the cooking fuel and boiling and frying as the methods of cooking. In view of the limitations imposed by cooking over an open wood fire, it is understandable that these women are not interested in preparing food in a variety of ways. Food is always cooked in the morning and well in advance of the time of the meal. By mid-day the fire has burnt down, and the house is more comfortable and the food is cool enough to be eaten with the fingers. For many reasons she does not readily accept the suggestion that vegetables should be prepared immediately before they are to be eaten in order to preserve their nutritive value. The Westerner cannot understand why meat and fish are cooked rather hard until he tries to take his food in Malay fashion. The typical Malay dishes prepared and served in a home where forks and spoons are used have a texture more nearly resembling that of Western food. But foods that are mushy are disliked by the Kampong women because they are difficult to eat with the fingers. This fact may help to explain their reluctance to prepare purees for weaning infants."

The Understanding and Use of Folklore

Change may also be considerably influenced by the attitude of the nutritionist to the community folklore on disease. The nutritionist should try to learn what are regarded as the basic causes of the various diseases within the community. Then he will be able to discuss the illness in what the patient regards as a realistic manner and have a much better chance of being able to convince him of the wisdom of his recommendations. Ridicule of the community's ideas on illness on the other hand will only irrevocably offend the patient.

Adams (1951) gives a number of good examples of this in his study of the medical beliefs and practices in Magdalena, a Guatemalan Indian town. He points out that the inhabitants believe many illnesses are the result of stretching of the veins, molera and spells cast by spirits or evil humans. Unfortunately the doctor usually ignores these factors in his prognosis. "The Magdaleno knows for example that the patent medicine majoran may be good for a headache; but the headache is probably a symptom of any one of a number of things of which amongst the commonest is cataro; cataro in turn comes from getting cooled. Consequently for majoran to be effective it must be taken with hot water, for this will serve to get at the fundamental trouble of the coolness."

"Since the doctor so frequently fails to prescribe something to get to the causes of the illnesses it must be concluded that he is really ignorant of them. If a baby is sick the doctor may prescribe some series of remedies but will usually fail to warn the mother concerning her carelessness in permitting the baby to be hit by the air; further he will fail to tell the mother of the necessity of remaining constantly with her child in order that the child will be protected against further harm."

Adams concluded that "The doctor must make a real attempt to understand the systems of rationalisation which underlies the beliefs concerning the causes of ailments. You must attempt to talk with every patient to find out what things they have done in the recent past which might be interpreted in these terms and might be at the back of the patient's mind as the real causes of illness. You must then strike a mean somewhere between the patient's explanation of the illness and his own diagnosis and explain the effectiveness of the remedy in terms which will make sense to the patient. If there is too great a discrepancy between his scientific explanation and the patient's conditional explanation you must at least for the present let the scientific interpretation go and interpret the cause and the cure in terms which the patient can understand."

Study of Food Habits

But a study of the community must not only be to establish the ways in which we should generally behave to make our programme successful. The implementation of the programme itself will be concerned to change food habits or agricultural techniques. Yet these habits and techniques will be part of the general culture of the community and attempts at change therefore likely to be seen as a direct attack upon the heart of the community itself.

However, fortunately for us people do not have uniformly strong feelings or attitudes towards all practices. Some habits are seen as integral to the community; others are regarded as transient passing fashions. It becomes essential therefore to have a detailed understanding of the whole community's feelings towards food and agriculture and to see those areas that are likely to allow change and those which will be highly resistant to change.

Let me give an example. Jelliffe and Bennet (1961) give an excellent description of the food classification of the food used by the Buganda, a tribe in Uganda. Briefly the classification is as follows :

- a) Clan foods. Each of the clans of which the Buganda people are composed has a totem which may not be eaten by a clan member. These restrictions include grasshoppers, lung fish and one variety of bean.
- b) Foods prohibited to women. As in several parts of East Africa, eggs and chicken are proscribed as are mutton and several special types of fish.
- c) Foods in childhood. Two fruits are thought to be especially children's food - paw-paw and passion fruit. On the other hand certain protein foods are thought to be undesirable for children. Thus it is believed that the eating of eggs will lead to stupidity, the eating of fish will produce a rash, and the eating of meat make the child greedy.
- d) Significance of matoke. Matoke (steamed plantain) is seen as a very important food for children and consequently may often constitute a very large proportion of their diet.

We can see therefore that the only likely result of sudden attempts to make women in East Africa eat eggs and chicken will be open hostility and little success. A much more reasonable solution would seem to be to encourage the consumption of some other foods which contain high quantities of protein and which are not specifically prohibited in the food classification of the Buganda. Alternatively it may be possible to recommend the use of a protein supplement. In either case the suggestion will not generate the same emotional heat and automatic rejection as will the attempt to make women eat eggs and chicken.

These types of study may also show what are likely to be the most profitable ways of encouraging particular changes. Thus MacArthur (1958) gave a clear description of why rice so often provides almost the only constituent of a toddler's diet in Malaya. Side dishes are not given because :

- a) it is believed it is the rice that gives the body strength and that the side dishes are only used to aid the consumption of the necessary quantity of rice. Moreover fish and meat dishes, which are the preferable accompaniment, are often felt to be harmful to children;
- b) in poor households people can only afford a very little fish or meat, and therefore most of it is reserved for the husband;
- c) the women, who are mostly rubber tappers, and during the season also work in the rice fields in the afternoon, tend to cook side dishes only for the evening meal. Often the children will want to be fed earlier than this but because she is tired the woman is unwilling to cook side dishes twice. Therefore the child is given only rice with some sugar or ketchup.

Such a study indicates that if one wishes to encourage the consumption of protein food in toddlers in Malaya it would be most sensible to encourage the use of a protein supplement with rice. This will have the advantage of not being too expensive, or of taking too much time to prepare. The study also leads one to believe that it may be important to publicise the protein supplement as being something which is particularly suitable for children, and which complements rather than is competitive with the consumption of rice.

The Individual and his Psychological Needs

It would be nice to feel we could stop at this point and say that, given a thorough understanding of the cultural background of the community involved and competent methods of handling the situation, the problem of change would not be difficult. Unfortunately this is often not the case. Even when all such considerations are born in mind the best education in the world may not produce a desired change in behaviour. The other major task of sociology therefore is to explain why the individual may act in what appears to be an irrational way.

The answer lies in the study of the individual. Man is influenced by a large number of psychological desires or needs, the satisfaction of which gives pleasure to his mind and body. Thus he will feel the need for security, for acceptance amongst the group of people he admires and for many other things. However, he cannot satisfy all his needs at the same time. Acceptance by a particular group may imply an adventurous spirit which is hardly compatible with a high level of security. Consequently a conflict emerges and man is forced to rate these needs according to their relative importance to him. In the accompanying table I have tried to demonstrate hypothetically an individual's sets of needs.

Table I Hypothetical set of needs (rank ordered)

1. Group Acceptance
2. Love
3. Wealth
4. Security
5. Health
6. Leisure

This may perhaps help to indicate why a rational explanation of the reasons people should change their pattern of behaviour for health reasons does not always have the impact we desire. It is because health may be lower on the list than group acceptance and because something in our recommendation for change for health reasons explicitly conflicts with group feeling.

Cigarette smoking in Western societies provides a classic example of such a situation. People are generally aware of the association between smoking and lung cancer yet they continue to smoke. Clearly other considerations such as "it soothes the nerves" or "all my friends do it" or "I enjoy it" indicate the needs felt to be more significant than health considerations.

All this leads to several recommendations. Initially it will be important to assess the psychological needs of the individual in the same way as we have already indicated it will be necessary to understand the cultural background of the community. If all the possible projected changes are likely to clash with other issues having a higher rating than health in the individual's hierarchy of needs then it may mean that the initial aspect of any propaganda or education campaign must be directed to persuading the individual to give health a higher rating rather than towards encouraging any particular behaviour change.

However, if this is found to be too difficult a task it may be possible to make some apparently conflicting line of behaviour appear consistent with man's needs by conditioning agreement over a series of steps. This is achieved by including at the beginning of the communication or discussions statements already believed by the recipient. The truth of these statements, which he readily acknowledges, encourages him to go on to believe the remainder of the image. Let me give an example. It might be considered important that boys should drink milk at school but they object because milk drinking is associated with childhood rather than maturity. A communication might condition agreement in the following way :

Girls like boys
 Girls like strong boys better
 Drinking milk makes you strong
 Girls like boys who drink milk best.

Problems Facing Sociology

I believe that it is possible to demonstrate that sociology has a very real role to play in attempts to improve conditions in the developing countries. However, we should not underestimate the obstacles. It is important to realise that sociology by its very nature can never be as definitive as many scientific subjects. Sociology deals with human beings who are always subject to a degree of unpredictability.

Thus economic laws are based on economic rationality but individuals may decide on the spur of the moment to purchase a product for purely emotive reasons and totally disregard relative price. So much for rationality on such occasions! Consequently social science has its limitations. However, if we are sensible we learn to live with these limitations rather than in consequence reject the discipline out of hand.

We must also realise that sociology is as yet a young subject. As indicated by Horine (1966) although certain experiments have indicated areas which may be of considerable significance in inducing change, it is important that they be repeated in order to determine the validity of their finding in different socio-cultural settings. It is of course equally important that we spend as much time as possible undertaking more basic research aimed at refining and improving our limited, and often theoretical, knowledge. The wise man plans his route before he begins his car journey if he wishes to get to this destination in the quickest possible time. The same may be said of nutrition. It is a very human thing to wish to rush out into the developing countries and spend all our resources on immediate aid, however ineffective the final results may be. But equally our current limited knowledge in this sphere must lead me to recommend that at least part of our resources be spent on research aimed at increasing our understanding of the way in which we may most effectively influence man's behaviour rather than upon immediate aid.

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The dissemination of misinformation: a growing problem

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It is true that on occasions deliberate evasion or distortion of truth causes misunderstanding, but we should not overemphasize this source of difficulty. Government legislation, control by industrial associations and advertising authorities ensure an ever-increasing strict control.

Most misinterpretations of the facts are caused by one or more of the following:
(a) An oversimplification of scientific principles because of attempts to make them comprehensible to the layman. For example, we talk of body-building foods instead

of protein, and energy-giving foods instead of carbohydrate. Initially such a technique may provide a graphic description for the layman, but in the long run as a result of it people may imagine that high-protein foods do not contain calories, and that without sugar we would lack energy.

(b) A misinterpretation of what has been said or written. One sentence from a balanced statement taken out of context, or a misunderstanding of the overall philosophy behind a research publication, may lead to total misjudgment of the conclusion.

(c) The publication of inadequate research which is accepted for more than its worth.

(d) The time lag between the initial production of research findings and their general publication. For example, it might take 10 years or more between the unearthing of a new fact and its appearance in a text book.

(e) The role of the judgment factor in nutrition. The subject is in many ways a deductive one, involving the subjective valuation of objective criteria. As such, human fallibility may lead to the wrong conclusion.

(f) The difficulty of defining who is an expert in a field so close to human life, where everybody regards themselves and even calls themselves experts on food.

The solution lies in teaching people how to look for information, and how critically to assess its value rather than in simply giving them facts which is what so often occurs. Perhaps also organizations such as The Nutrition Society need to make authoritative statements to the press and the other media which can stand against, and even positively attack, the well-publicized views of the charlatan.

Section C - Research on Food Habits of Minority Groups

1. Purpose of the Research

The first objective of the research was to examine the extent to which food habits of minority groups in the U.K. produce particular social and economic problems. The second objective was to see whether a study of these groups could help us to understand the factors influencing food choice as a whole and the means by which food habits may be changed.

2. Methodology

The work used a range of sociological and psychological techniques, involving depth interviews, group discussions and semi-structured and structured questionnaires administered to specific universes. Attempts were made to relate the specific findings to overall established social and psychological parameters. Each paper identifies the specific methodology used for original research included therein.

3. Papers Included

Paper 1: Social and Economic Implications of Minority Food Habits (in Proceedings of the Nutrition Society, Volume 26, 1967).

Paper 2: Profile on Vegans (in Human Nutrition, Volume 2, 1971).

Paper 3: Food Habits of West Indian Immigrants - Co-jointly with Pamela Mumford (in Proceedings of the Nutrition Society, Volume 22, 1963).

Paper 4: Nutritional Knowledge and Food Preferences of Students at Teacher Training Colleges - Co-jointly with John Yudkin (in Proceedings of the Nutrition Society, Volume 22, 1963).

Paper 5: Social Implications of Alcohol Consumption (in Proceedings of the Nutrition Society, Volume 31, 1972).

Paper 1 is a review article which sets out to identify the bases and problems resulting from minority food habits. First publication is made of original research by the Candidate in relation to Vegans, Vegetarians and West Indian immigrants. An attempt is made to identify the key criteria which leads Man to respond so emotionally to his food habits and to any challenge upon them, and also to indicate the economic ramifications of special diets for minority groups.

Paper 2 is a report of an original research study designed, directed, analysed and interpreted by the Candidate into the attitudes and behaviour of Vegans in the U.K.

Paper 3 is a preliminary report of research by the Candidate and another into the food habits of West Indian immigrants. This research involved both qualitative and quantified surveys.

Paper 4 is a preliminary report of original research by the Candidate and another into food attitudes and preferences of Teacher Training College students, and is based upon a quantified survey.

Paper 5 is a report on the role of alcohol within the diet and its social and psychological ramifications. It includes a limited amount of original new research based on quantified exercises.

4. Direct Conclusions from the Studies

Each paper isolates within it the key findings of the research involved. The most significant general findings would appear to be as follows:-

- The studies re-confirm the extremely powerful role that food plays in social and psychological terms within society. It appears to have a particular significance for many minority groups;
- Minority food habits usually involve great expense to the individuals concerned, and also restrict their social intercourse with the community as a whole. However, for members of the group they cement their relationships within that group;
- Individuals' motivations for adopting unusual diets are usually exceptionally strong, and are not paralleled amongst the community as a whole. As such it is not felt that these criteria would be a powerful influence upon choice amongst the population as a whole;
- There is little evidence that students training as teachers in the field of home economics modify their food preferences in the light of their widening food experience and nutritional knowledge;
- Alcohol in moderation may provide a valued therapeutic social/psychological role, but that this does not necessarily outweigh the major problems associated with its excessive consumption.

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Social and economic implications of minority food habits

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'Minority food habits' is something of an ambiguous phrase and I propose to begin this paper by defining the field which I shall be examining. Several years ago Professor Yudkin and I (Yudkin & McKenzie, 1964) defined food choice and food habits in the following way:

Food choice—the food selected by an individual at a given time.

Food habits—the sum of the food choice of an individual constituting his total diet.

In this paper I shall take 'minority food habits' to mean those habits which either in the preparation of food or the type and pattern of consumption of food are so different from those of the community as a whole that this factor is by itself sufficiently distinctive to separate off a group of individuals from the rest of the community.

Classification of groups with minority food habits

In this country groups with food habits substantially different from the community as a whole are of two distinct types. Firstly, there are those for whom a particular type of diet or preparation of food, or both, is a key aspect of their religion or the philosophy of life to which they adhere. Secondly, there are those immigrants who bring with them the food habits which they practised in their native country.

Religious food laws

Many religious groups have precise dietary laws. Thus Muslims are forbidden to eat: (1) animals that have died of natural causes, (2) blood, (3) pig's flesh, (4) animals slaughtered as an offering by another religion.

Whilst, traditionally, other foods may be rejected only these four categories are specifically designated by the Koran (2.172-3) 'He has forbidden you only what dies of itself, and blood, and the flesh of swine, and that over which any other [name] than [that of] God has been invoked. Then whoever is driven by necessity, not desiring, nor exceeding the limit, no sin is upon him. Surely God is Forgiving, Merciful'.

Care must also be taken to differentiate designated foods from those which are merely the subject of personal dislikes. 'We have a case on record from the Prophet Muhammad who, while visiting Maymoonah [his wife] was offered the meat of a dhibb [a kind of lizard]. Instead of saying that it was unlawful he merely said, "I do not care much for it". But he did not prevent his companions from eating it if they so liked'. (Jalandhari, 1966).

The Jews provide another example of a religious group with detailed regulations about food. The restrictions are not confined to the types of food they may eat.

Meat and milk must not be cooked or eaten together. Consequently, Jewish housewives are told to arrange their kitchens with separate working surfaces for meat and milk foods and keep separate utensils specifically for each of the foods. Animals and poultry must be examined before slaughter to see if they have any imperfections and if any are found they must be rejected. Slaughter itself must be by traditional method which is designed to allow the maximum drainage of blood. Butchers are licensed by a recognized communal authority such as the Board for Shechita and purchase should only be made from shops displaying such a licence. Meat and poultry must also be kashered either by the butcher or housewife (Jewish Marriage Education Council, 1966). 'For kashering the following procedure must be adopted: (1) Into your enamel or plastic bucket you should put sufficient fresh cold water to completely cover the meat and/or poultry, meat bones, etc. Leave it soaking for half an hour. (2) At the end of the thirty minutes, remove the meat or poultry,

etc., and place it on a wooden, plastic, or wire grid which allows free drainage. Leave it to drain for a few minutes, and then sprinkle it with kashering salt on every side. Meat and poultry, etc., should be left in salt for one hour. (3) When the hour has elapsed, wash all surfaces well in cold water three times and then the meat will be ready for use. After kashering, poultry should be scalded and cleaned once more.'

The vegan philosophy

Some groups do not adopt minority food habits as part of a series of religious tenets; their attitude to food may be the keystone of a particular philosophy, and indeed the only unifying factor holding the group together. Thus members of the Vegan Society may have little in common with each other except their agreement to the principle of the Charter laid down by the Society: 'Veganism is a way of living which excludes all forms of exploitation of, and cruelty to, the animal kingdom, and includes a reverence and compassion for all life. It applies to the practice of living on the products of the plant kingdom to the exclusion of flesh, fish, fowl, eggs, honey, animal milk and its derivatives, and encourages the use of alternatives for all commodities derived wholly or in part from animals. Veganism remembers man's responsibilities to the earth and its resources and seeks to bring about a healthy soil and plant kingdom and a proper use of the materials of the earth'.

As may be seen from this statement veganism embraces a good deal more than just the rejection of consumption of animal products. In a recent study of the Vegan Society, I found that the strict vegan will whenever possible buy clothes and footwear made of synthetic materials rather than animal ones. Similarly over three-quarters of the women in the Society avoid the use of cosmetics which include animals products. Considerable emphasis is also placed upon the use of 'natural' and 'whole' foods. Brown sugar is preferred to white on two counts—brown is regarded as the natural product; white is bleached using bone charcoal. Similarly brown bread is used almost to the exclusion of white because of the belief in its greater nutritional value. Vegans also smoke and drink less than the general population.

Table 1. *Types of food consumed by vegans (expressed as the percentage of the sample consuming each food)*

	Vegans	Vegetarians*
Tinned food	81	83
Frozen food	37	46
Sugar:	85	92
Brown	95	84
White	2	3
All	3	13
Bread:	93	98
Brown	71	75
White	0	4
Home-made	25	12
All	4	7

*Full members of the Vegan Society who 'although hoping eventually to give up eating all animal foods, have not yet achieved this end'.

Table 2. *Smoking and drinking amongst vegans (expressed as the percentage of each sample smoking or drinking)*

	Vegans	Vegetarians*	General population†
Smokers	7	14	57
Drinkers	40	50	78

*See footnote to Table 1.

†Based on a survey of over 4000 interviews conducted on my behalf by Westminster Research Bureau Ltd.

Immigrant food habits

Both of the groups so far mentioned differ in their motivation from immigrants who continue to eat the types of food which they were eating in their country of origin once they have settled in the United Kingdom. Here there is no major religious or philosophical reason for adhering to what are now minority food habits. The main reason for continuing to eat specific foods is because they like them and have always eaten them. This adherence to traditional food patterns may also provide psychological stability and reassurance during the period of great uncertainty which must develop as people move from one country with all its tradition and culture to a totally different sort of country.

Resistance to change

There is no doubt that people may modify their food habits over time. Thus Jews, with or without renouncing their faith, may begin to modify their food habits or at least interpret religious edicts less strictly. Similarly, the indigenous community may begin to shop at local delicatessens, dine at Chinese or Indian restaurants, even start cooking 'foreign' dishes. However, we should not overemphasize the speed at which such integration may occur. Indeed, as has been demonstrated earlier in this paper, in some instances existing food habits form such an intrinsic part of the group's existence or have become so personified with their overall philosophy that they are unlikely to be modified even in the very long run. Even immigrant food habits are not very susceptible to change. In 1963 Pamela Mumford and I (McKenzie & Mumford, 1964) demonstrated that whilst West Indian families coming to this country were quick to start eating some English foods, these were mostly for snacks or subsidiary meals such as breakfast. However, even immigrants of more than 5 years' standing still tended to eat West Indian foods and dishes for their main meals.

Further studies currently being completed by Miss C. Jones and myself (to be published) have confirmed this picture. A study of the Golborne Ward, North Kensington, London has shown that many popular West Indian foods are widely available in local shops and the trend is for international specialist stores to continue to expand the range of West Indian foods sold. We were also able to confirm that length of residence in this country did not materially affect the position. Only in the case of the least available, least convenient and most expensive West Indian food was there a noticeable reduction in purchases by West Indians of long residence.

Hostility and isolation

If minority food habits are always slow and sometimes impossible to change, we must be concerned to examine the sort of problems that will emerge from these manifestations. Later papers will examine the nutritional position in some detail. There are, however, some sociological and economic problems that need to be considered.

Perhaps most significant sociologically is the fact that these food habits set the group apart from the community as a whole. In order to understand this fully we should be aware of two sociological phenomena.

Firstly, man is a gregarious animal. Although many of us occasionally have pipe-dreams of spending our life in isolation away from all the pressure of the modern world, there are few of us who would really like to live for long in such a way. Mostly we are prepared to accept that many of our pleasures and interests are dependent upon other people being around. We are in reality intensely involved with the community about us. This involvement is fostered in three distinct ways. Within the community each person comes to feel he has a role to play and this is of importance to the community. He also feels dependent upon the community for the satisfactory development of his own good life and uses it as a refuge from solitude and fears that would accompany individual isolation. Lastly, and perhaps most important, he develops companionship with particular members of the community (McKenzie, 1967). As such it is not surprising that the individual is likely to react with great hostility to anything which he regards as an attack on the integrity of the community. At best the individual is steadfastly ignored.

Secondly, we are intensely involved emotionally with food. This is partly because it is so vital to our very existence. We are very aware that if we do not eat and drink we are not going to stay alive for very long. Food is also one of the very first means by which we demonstrate our mood and individuality; thus a baby demands food and then perhaps rejects it; it asserts its personality by asking for particular foods and rejecting others. As we grow older, simply because we eat three meals every day, we come to regard ourselves as experts on the subject. In the same way food asserts itself as an integral part of our culture and many social events in our lives take place round the meal-table. Thus we have another clear set of motivations behind the suspicion, hostility and isolation which faces the individual with noticeably different food habits.

The implications are clear. Everybody likes to be an individual and therefore minor modifications of group behaviour are acceptable; thus a person who does not like greens or will not drink coffee or eat the white of an egg is not regarded unfavourably. But people whose food habits are considerably different are frequently going to arouse major emotional responses. Such developments are evident in the case of each of the minority groups I have examined.

The immigrant at work is regarded with suspicion because of the odd, even repulsive-looking foods, in English eyes, that he brings to work for his lunch. Visits to immigrant's homes are discouraged because of the indigenous population's unwillingness to eat different types of foods. This may be one reason why so few

immigrants have many social contacts with English people (Table 3). Most immigrants also have to share houses with other tenants (Table 4). If it is a house with mixed races the different cooking smells may well cause offence. All these issues influencing the preparation and eating of foods which are unfamiliar to the indigenous population encourage hostility and may lead to the use of phrases such as 'savage' or 'witch-doctor'. It is surprising that social scientists have not been more aware of this factor in racial tension.

Table 3. *Social contact between West Indians and English (Davison, 1966)*

	Men (%)	Women (%)
West Indians having any English friends after 2 years in this country	69	53
West Indians having been in an English home after 2 years in this country	42	27

Table 4. *Percentage of households in shared dwellings (Davison, 1966)*

Head of household born in:	Borough							
	Lambeth	Stoke Newington	Hackney	Paddington	Deptford	Battersea	Camberwell	Seven boroughs
England	26	25	44	41	29	36	16	30
Jamaica	79	69	89	78	65	72	59	76
Caribbean	77	67	91	87	75	73	66	82
India	35	57	74	62	37	50	23	52
Pakistan	50	65	63	65	44	45	27	57
Poland	37	34	47	51	36	61	32	45
Ireland	41	48	68	63	36	49	24	50
Cyprus	45	51	72	59	32	45	32	51

If food is regarded as a key aspect in the practice of a religion it may be used not only to demonstrate the continual observance of the religion in everyday life but also to preserve the unity of the group and exclude the outsider. Thus the group may wish positively to isolate itself. This view is put fairly explicitly in a recent Jewish publication (Jewish Marriage Education Council, 1966) 'There is also a social value implicit in the observance of these laws. There is the common bond which links Jewish communities everywhere more closely together, and then there is the even more intimate factor of the meal-table becoming the centre of family unity, the more so as the dietary laws make it more convenient to eat at home. In this connexion the constant observance of the laws of kashrut helps the Jew, in his social, business, or professional relationships in the world around him, to retain his own distinctiveness.'

'Whenever and wherever the dietary laws cease to be observed, there is the first step towards a weakening of religious restraints, with a consequent drift away from the community. Unfettered social intercourse with non-Jews inevitably brings in its train intermarriage, and intermarriage ultimately means the end of Jewry. The one sure defence against this drift and assimilation is the Jewish home, and there is no substitute for a home in which the domestic observances of Judaism are lovingly maintained.'

Segregation may occur not only because a group objects to a particular type of food habits or because there is an unwillingness to allow people with a different view into the home. It may also occur simply because people are uncertain of the type of meal they should provide. Thus meat eaters are often reluctant to invite vegans and vegetarians home for a meal because they cannot imagine how they could feed them on what is felt to be a very limited diet. Moreover, they are not even clear about the intricacies of the diet; is normal margarine, chocolate or bread acceptable to the vegan? Often therefore the vegan is cut adrift from society because of his specific views on food. Recent studies I have undertaken also suggest that he does not respond to this isolation in the same way as other minority groups by linking himself with others of the same views. Consequently he can become a very lonely person.

It is also interesting to note that even though a key aspect of the vegan way of life centres around a specific view about food this philosophy either reflects or encourages the growth of a whole series of other attitudes that differ markedly from the community as a whole. Thus he has distinctive opinions upon issues such as vaccination, animal experiments, spiritualism and contraception.

Table 5. *Attitude of vegans to certain activities*

Activity	Vegans	Vegetarians*	General population†
	Percentage approving		
Vaccination	4	7	91
Herbal medicine	76	71	32
Animal experiments	1	3	53
Blood transfusions	38	37	97
Zoos	15	15	78
Immunization	9	7	91
Campaign for Nuclear Disarmament	50	45	17
Keeping pets	44	49	87
Euthanasia	34	27	23
Contraception	57	65	75
	Percentage believing in		
Spiritualism	38	28	12
God	72	71	89

*See footnote to Table 1.

†See footnote to Table 2.

Economic considerations

The relative cost of providing a diet different from that of the majority of the population depends on three considerations. These are:

(a) The distance of the individual's food habits from the norm. If all the foods demanded are not consumed by other members of the public the cost will be high. However, if certain items available to the public as a whole are acceptable then the minority will receive the benefits accruing from large-scale production.

(b) The size of the minority group. Speciality foods imported or manufactured for a very limited number will clearly be very expensive. Economies will develop as the size of the minority group and hence the market grows.

(c) The degree of variety which the individual wishes to have within his diet. Miller & Mumford (1966) have shown that we could all live on a diet costing 1/- a day provided we were prepared to sacrifice variety and palatability. So too it is likely that any minority group armed with an appropriate set of food tables could find acceptable and adequate food at a cheap price. However, the more they demand a wide range of foods the more likely it is that these will have to be imported or manufactured at high cost.

There is little specific information available on the average cost of diets for different minority groups. It is clear, however, that relatively long-established minorities such as the Jews have a wide variety of services for providing appropriate foods prepared in the correct manner.

Foods common to the West Indies cost a good deal more than their English counterparts. In this country the 'starchy' staple West Indian foods are not cheap by comparison with potatoes. If immigrants are not prepared to change their food habits they will therefore be confronted with two alternatives: they can either spend a greater than normal proportion of their income on food or they can choose a cheaper diet which is likely to be limited both in variety and nutritional value. I believe that most choose the latter alternative with all its implications. This view is based on the evidence that whilst, like for like, West Indian foods are more expensive than English foods in this country, the West Indian spends a smaller proportion of his income on food than English workers in the same wage category.

Table 6. *Expenditure on food related to income, country of origin and length of stay (expressed as a percentage of total expenditure) (Davison, 1966; Ministry of Labour, 1963)*

Weekly wage	West Indian		English
	1st year in UK	2nd year in UK	
£5-£9	34	34	41
£10-£14	28	34	34
£15-£19	27	21	33

Conclusion

Minority food habits may present us with many problems. If some of these are of a nutritional nature we must accept that certainly in the short run, perhaps even in the long run, their solution will not be achieved by advocating major changes in food habits. Nutritionists must look in other directions to deal with any resultant deficiency. Efforts might reasonably include attempts to persuade people to select different, more appropriate combinations of the foods they are already consuming and the addition of nutrient supplements to existing types of dishes. However, the significance of minority food habits goes far beyond nutritional considerations. Food habits are a vital yet almost totally neglected aspect of community integration. Choice of food not only influences our physical health, it also determines our social 'well-being'.

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PROFILE ON VEGANS

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Summary—117 vegans (consuming no animal food) were compared with 112 vegetarians (consuming no flesh food) for their consumption of dairy produce, brown and white bread and brown and white sugar. Their attitudes to various activities and their drinking and smoking habits were compared with those of the general public. Only about 15 per cent had visited a medically qualified doctor during the previous 12 months as compared with about 70 per cent of the general public.

However, no significant differences in disease pattern and clinical status were detected between vegans and omnivores (ELLIS and MONTYGRIFFO, 1970).

INTRODUCTION

IN SOME COUNTRIES of the world vegans and vegetarians constitute most of the population and their way of life will be the 'norm' for that society. To a large extent their attitudes and behaviour will be representative of the nation as a whole. But veganism in the United Kingdom is a vastly different matter. Those who abstain from the use of animal foods are only a minute part of the community; indeed because of their small numbers we are not very knowledgeable about them. There is no clear cut indication of the exact number of vegans there are in Britain or why they have adopted this way of life, let alone any understanding of the impact of their, by conventional standards, extreme views upon society. Are they accepted by the rest of the community or isolated from them? Do they form a compact minority group supporting each other? Do their attitudes and views to other aspects of life differ from the society as a whole?

The object of this article is to try and examine some of these issues. It is based on a postal questionnaire, sent in 1966, to all known vegans in the United Kingdom, and followed by detailed personal discussions with a number of the respondents.

Two copies of the questionnaire were sent to all members of the Vegan Society. They were asked to complete one themselves and pass on the other to any vegan whom they knew in the community and who was not a member of the Society. They were asked to send for further copies if they required them, and many did so. Excluding some ninety replies which were received from members outside the United Kingdom, two hundred and twenty nine questionnaires were completed and returned. Given that no accurate data exists as to the number of vegans within the country, it is not possible to work out a sample response rate. Nevertheless, it is clear that by far the great majority of vegans who were members of the Society or in any way associated with it completed the questionnaire.

BACKGROUND DATA

Using a series of key questions it was possible to divide the replies, regardless of whether or not individuals were members of the Vegan Society, into two groups; those who eventually hoped to give up eating virtually all food derived from animal origin but who had not yet achieved this and who were classified for the analysis as *vegetarians*, and strict

vegans who were only eating, if any, very small quantities of any animal food. The percentages given in this study are based on 117 vegans and 112 vegetarians.

Nearly all the vegans (92 per cent) had been vegetarians before becoming vegan. Indeed, most vegans one spoke to indicated that they thought it would be impossible to go immediately from an omnivore diet to a vegan one; it could only be achieved slowly. Moreover, a large number of people took up a vegetarian diet for health or ethical reasons, and only at a later stage saw that veganism was a logical extension of this philosophy. Once having become a vegan, most people stay with it for a long period. 35 per cent of those studied had been vegans for more than fifteen years.

I also made some analysis of the extent to which whole families or at least more than one member of a family was vegan or vegetarian. Surprisingly, most vegans (60 per cent) and vegetarians (70 per cent) were alone within their family in adhering to this way of life.

An attempt was made to obtain a detailed analysis of what had caused individuals to adopt the vegan way of life. At the end of their questionnaire they were asked to explain in as much detail as possible why they had decided to adopt a vegan regimen. From their answers it was possible to see two major factors, ethical and health, at work. It should be stressed that these motivations led individuals to vegetarianism. The transition to veganism was slower and usually seen as the logical culmination of a decision to practice this way of life.

By far the most important of the two motivations was ethics. This involved a number of issues. For some, being shown round a slaughter house or living in close proximity to or actually on a farm where animal husbandry took place resulted in a single or cumulative series of experiences which led them to see immense cruelty or horror in the use of animals as human food. To others, a physical or emotional repugnance to the actual eating of the flesh of animals developed. This may have occurred in childhood or early adult life. In either instance the experience usually caused an emotional crisis and a fairly immediate decision to forsake meat and fish. Lastly, for a few there was the background experience of having been brought up in a vegetarian household—as such they were emotionally unable to consider eating the flesh of animals.

The second general line of motivation leading to a vegetarian diet was associated with health matters. After a childhood, or other period of life in which an individual has been subjected to much illness, in desperation or on the recommendation of someone by whom they were impressed a vegetarian diet had been adopted. This had led to a marked improvement in health and the diet had been persisted with from that time forward.

Occasionally a third motivation was expressed. This concerned economic issues and took the line that as there was such a great scarcity of food in the world, productivity per acre could be increased by changing from an omnivore to a vegetarian diet. However, in general this was not the *initial* cause of the change to a vegan diet. More, it came as a *rational justification* to support a decision to change once it had been made.

FOOD HABITS

Which foods do vegans and vegetarians find it most difficult to give up? In studying the vegetarians who hoped to become vegans it was found that virtually all of them (97 per cent) ate no fish or meat. However, 70 per cent ate four or more eggs a week and more than a pound of cheese per week. 36 per cent had one to three pints of milk a week, and 35 per cent more than this (Table 1).

TABLE 1. QUANTITIES OF ANIMAL FOOD CONSUMED PER WEEK
(expressed as a percentage of vegans/vegetarians consuming
particular amounts of each food)

	Vegans (per cent)	Vegetarians (per cent)
Milk		
none	92	12
under 1 pint	7	11
1-3 pints	1	37
4-5 pints		23
more than 5 pints		11
don't know		6
Cheese		
none	95	24
less than 1lb	5	63
1-3lb		5
don't know		8
Meat		
none	99	97
less than 1lb	1	3
Fish		
none	100	98
less than 1lb		2
Eggs		
none	94	30
less than 4	6	50
4-10		12
more than 10		4
don't know		4

Both groups were concerned to supplement their diet with vitamin tablets. Two-thirds of the vegans and 40 per cent of vegetarians took B₁₂ tablets, and just about a third of each group also took other vitamin supplements. However, something like 20 per cent of vegans indicated products they believed to contain B₁₂ and which did not in fact do so.

It appears that both vegans and vegetarians are careful not to eat foods in any way derived from animal products. Thus often they reject foods mainly derived of vegetable origin because some small amount of animal products have been used in their preparation. On occasions the line of development is obvious. Thus, milk chocolate will be refused because of the use of milk when it is made. However, sometimes the issue is more obscure. Most of those questioned consumed sugar, but 95 per cent of vegans and 85 per cent of vegetarians used only brown sugar. Two issues were involved here. Partly brown sugar was preferred because it was regarded as the more natural product, partly white sugar was rejected because bone chareoal is used in the refining process.

A preference for so-called natural foods was also demonstrated when vegans were questioned about their consumption of tinned and frozen foods and of brown bread. The use of frozen foods may well be partly restricted, however, because they are regarded as very expensive. There are further remarkable variations in comparison with the community at large, where, for example, only 7 per cent of the bread consumed is brown bread (Table 2).

TABLE 2. TYPES OF FOOD CONSUMED BY VEGANS (expressed as the percentage of the sample consuming each food)

	Vegans	Vegetarians
Tinned food	81	83
Frozen food	37	46
Sugar	85	92
Brown	95	84
White	2	3
All	3	13
Bread	93	98
Brown	71	75
White	0	4
Home-made	25	12
All	4	7

Something like two-thirds of vegans and vegetarians occasionally visit vegan or vegetarian restaurants, but for the great majority these visits occur less than once per month. Partly this reflects a general community reluctance to eat out, but accessibility is also important. Only in the large towns will it be possible to find suitable restaurants. Many had also visited vegan or vegetarian guest houses, but by far the great majority had not done so within the last two years (Table 3).

TABLE 3.

	Vegans (per cent)	Vegetarians (per cent)
Percentage of vegans ever having visited vegetarian/vegan restaurants and the frequency of visits		
Ever having visited	68	61
Visit less than once a month	75	65
At least once a month but less than once a fortnight	3	8
At least once a fortnight but less than once a week	1	6
Once a week or more	11	9
Not stated	10	12
Percentage of vegans ever having stayed at a vegetarian/vegan guest house or hotel and occasion of last visit		
Ever having stayed	74	70
Within last 2 years	33	38
2-5 years ago	13	13
5-10 years ago	10	6
More than 1 year ago	17	12
Not stated	27	31

VEGANISM AS A WAY OF LIFE

Veganism embraces a good deal more than the specific rejection of animal foods. This is clearly shown from the principle in the Charter of the Society:

“Veganism is a way of living which excludes all forms of exploitation of, and cruelty to, the animal kingdom, and includes a reverence and compassion for all life. It applies to the practice of living on the products of the plant kingdom to the exclusion of flesh, fish, fowl,

eggs, honey, animal milk and its derivatives, and encourages the use of alternatives for all commodities derived wholly or in part from animals. Veganism remembers man's responsibilities to the earth and its resources and seeks to bring about a healthy soil and plant kingdom and a proper use of the materials of the earth."

Such an overall view means that the strict vegan will, whenever possible buy clothes and footwear made of synthetic materials rather than animal ones. Similarly, my study demonstrated that more than three-quarters of women vegans avoid the use of cosmetics which include animal products.

However the vegan way of life embraces much more than the issues involving the animal kingdom. Vegans also hold many other views not shared by the community as a whole. This was clearly demonstrated by a series of questions in the study (Table 4).

TABLE 4. ATTITUDE OF VEGANS TO CERTAIN ACTIVITIES

Activity	Vegans (per cent)	Vegetarians (per cent)	General population (per cent)
	Approving		
Vaccination	4	7	91
Herbal medicine	76	71	32
Animal experiments	1	3	53
Blood transfusions	38	37	97
Zoos	15	15	78
Immunization	9	7	91
Campaign for Nuclear Disarmament	50	45	17
Keeping pets	44	49	87
Euthanasia	34	27	23
Contraception	57	65	75
	Believing in		
Spiritualism	38	28	12
God	72	71	89

"Mercy issues" seem more favoured than amongst the population as a whole. Thus, the level of support for the Campaign for Nuclear Disarmament and Euthanasia was much greater amongst vegans. Similarly spiritualism had much greater approval. Conversely and predictably, animal experiments are disapproved of more strongly than by the population as a whole, as are zoos and the keeping of pets.

There is particular resistance amongst vegans and vegetarians to smoking, but they are nearly as willing as the public as a whole to take an occasional alcoholic drink (Table 5).

TABLE 5. SMOKING AND DRINKING AMONGST VEGANS
(expressed as the percentage of each sample smoking or drinking)

	Vegans (per cent)	Vegetarians (per cent)	General population (per cent)
Smokers	7	14	57
Drinkers	40	50	78

Many vegans and vegetarians believe in herbal medicine. Conversely, very few believe in vaccination and immunisation. This reflects a different attitude to illness and treatment

generally. Both vegans and vegetarians would tend to use naturopaths and health cures more frequently than qualified general practitioners when mildly ill. However, when confronted with serious illness the percentage prepared to visit the general practitioner increases (Table 6). This is also reflected in an analysis of their claimed past behaviour. For the public as a whole, about 70 per cent would have seen their doctor in the last year, yet only about 15 per cent of vegetarians had seen a medically qualified doctor in that period, and well over a third had not seen a doctor in five years.

TABLE 6. PERCENTAGE OF VEGANS PROPOSING TO VISIT A MEDICAL PRACTITIONER IF MILDLY OR SERIOUSLY ILL

	Mildly ill		Seriously ill	
	Vegans (per cent)	Vegetarians (per cent)	Vegans (per cent)	Vegetarians (per cent)
Medical Practitioner	19	20	23	38
Medical Practitioner and some form of health cure	3	6	11	8
Health cure	66	54	57	42
Don't know	12	20	9	12

ISOLATION

It has already been indicated that there are few families of vegans or several vegan generations within one family. Yet family life with one member a vegan and the rest of the family not even vegetarian would be difficult to imagine. In practice, many vegans live alone. However, this is not the only cause of isolation. Often they are also isolated from the community as a whole. It has been indicated elsewhere that there are two sociological phenomena which encourage integration within a community and to which vegans run contrary.

"Firstly, man is a gregarious animal. Although many of us occasionally have pipe-dreams of spending our life in isolation away from the pressure of the modern world, there are few of us who would really like to live for long in such a way. Mostly, we are prepared to accept that many of our pleasures and interests are dependent upon other people being around. We are in reality intensely involved with the community about us. This involvement is fostered in three distinct ways. Within the community each person comes to feel he has a role to play and this is of importance to the community. He also feels dependent upon the community for the satisfactory development of his own good life and uses it as a refuge from solitude and fears that would accompany individual isolation. Lastly, and perhaps most important, he develops companionship with particular members of the community. As such it is not surprising that the individual is likely to react with great hostility to anything which he regards as an attack on the integrity of the community. At best the individual is steadfastly ignored.

Secondly, we are intensely involved emotionally with food. This is partly because it is so vital to our very existence. We are very aware that if we do not eat and drink we are not going to stay alive for very long. Food is also one of the very first means by which we demonstrate our mood and individuality; thus a baby demands food and then perhaps rejects it; it asserts its personality by asking for particular foods and rejecting others. As we grow older, simply because we eat three meals every day, we come to regard ourselves as experts on the subject, In the same way food asserts itself as an integral part of our culture and many social events in our lives take place round meal-tables. Thus we have another clear

set of motivations behind the suspicion, hostility and isolation which faces the individual with noticeably different food habits.”

The implications are clear. Everybody likes to be an individual and therefore minor modifications of group behaviour are acceptable; thus a person who does not like greens or will not drink coffee or eat the white of an egg is not regarded unfavourably. But people whose food habits are considerably different are frequently going to arouse major emotional responses.

Segregation may occur not only because a group objects to a particular type of food habits or because there is an unwillingness to allow people with a different view into the home. It may also occur simply because people are uncertain of the type of meal they should provide. Thus meat eaters are often reluctant to invite vegans and vegetarians home for a meal because they cannot imagine how they could feed them on what is felt to be a very limited diet. Moreover, they are not even clear about the intricacies of the diet; is normal margarine, chocolate or bread acceptable to the vegan? Often therefore the vegan is cut adrift from society because of his specific views on food.

However, it is not only because of his attitudes to food that the vegan tends to become isolated. As we have just indicated, his attitudes to a whole series of issues totally outside the food field are different from those of the community as a whole. These reinforce his own isolation.

Normally under such circumstances minority groups tend to form an integrated group of their own members as a buffer against the community. Thus, immigrant groups or ethnic groups remain closely linked in particular areas. Surprisingly, the vegan does not seem to respond in the same way. Frequently an individual may only know two or three other vegans and will seldom meet them. Our research in several instances led to vegans living in the same area meeting for the first time. They knew of each other, perhaps even had corresponded previously, but had never made any effort to meet each other.

CONCLUSION

It has been indicated elsewhere, that a much larger population can be supported on a given area of land if vegetable products are grown rather than cattle reared. Equally, it has been shown that the nutritional health of a vegan community can be quite satisfactory providing any latent deficiency in the diet is insured against by adding small nutrient supplements. With an impending population and world food crisis it would not be unreasonable therefore to look to a time when it might be necessary to try and persuade the British community to move towards a vegetarian diet. However, from the evidence of this chapter it is clear that however acceptable this might be in economic and clinical terms, in social terms it would be unrealistic unless rigidly enforced by a crisis of the first dimension.

Vegans living in Britain are, to a large extent, separated off from the rest of society. Not only are their attitudes very different but they represent to the society at large a rather austere unappealing way of life. Moreover, the food pattern they adhere to is regarded as one which would be extremely difficult to follow and anyhow has virtually no appeal. The vegan suffers under or enjoys this way of life because of the very strong motivation which he obtains from his ethical and emotional beliefs. It would be difficult if not impossible to convince the British community as a whole of the advantages of such a regime. People enjoy food for food's sake, and the animal products provide much of the palatability and excitement of a meal. They see little which is sinful in it and long term world economic considerations have little relevance.

APPENDIX 1

Vegan A—Single man in his sixties

I began to be a vegetarian (i.e. a 'lacto-vegetarian') at about the age of 14 or 15. This was a purely spontaneous decision, made partly under the influence of a strong feeling of disgust (partly aesthetic, partly sheerly physical) aroused by the sight and smell of flesh-foods. One of my earliest recollections of childhood is of a feeling of nausea and revulsion occasioned by the smell of a dish of boiled mutton upon the family meal-table. And at the age of 14/15 also, I feel fairly sure that a strong sense of "moral" revulsion against the killing of any living thing was already present. I remember, at about this time, being sent to the local butcher's to fetch the family's meat: finding the front door of the shop closed, I went round to the back door—and there was the butcher himself in the very act of slaughter. What I saw and experienced during the few minutes that I was there completely determined my mind, once and for all, upon the subject of vegetarianism. At that time I think I knew nothing of vegetarianism as an organized "movement". It was a case of "myself against the world", and incidentally it produced years of bickering between me and my parents. I was probably too shy to attempt to explain myself fully to "conventional" parents who did not sympathize with, and indeed did not even begin to understand, my position. My only ally was Tolstoy, in whom I found a trenchant declaration of the principles that I had already vaguely discovered for myself. In later years, for instance as a student living in lodgings, I found vegetarianism very difficult to maintain with any sort of consistency; I am sure there must have been numerous occasional lapses into "semi-orthodoxy" on my part, partly through sheer cowardice in the face of a hostile world, and partly from a real wish not to make things impossibly difficult for other people who could not be expected to understand. But I never had any real doubt that I *wanted* to be a vegetarian—completely—and towards middle life circumstances made it possible for me to order my feeding-habits more or less as I wished. At about this time, too, I began to feel more and more that my vegetarianism had a religious basis (in the broadest sense of the word "religious"), and it became increasingly clear that for me at least (I have never wished to force my views upon other people) *all* exploitation of the lower animals was morally unacceptable. I am sorry that I cannot say exactly when I became completely Vegan, as I have no written record. I do not think that there was a day when I said to myself "I will now become a Vegan". Rather, what happened was, that eventually I found that I *had become* a Vegan.

APPENDIX 2

Vegan B—Single man in his thirties

I came to vegetarianism 16 years ago when I was 14 (approx). I was not one of a vegetarian family and knew no other vegetarians and, in fact, did not meet one for the next dozen years or so. I grew up always sensitive to cruelty and violence and suffering. I was horrified to see my father and elder brother slaughter chickens. When I grew old enough to realize fully what meat was and associate it with the horrors of the slaughter house I developed an aversion for flesh foods. This growing aversion was encouraged by such incidents as when I was given meat that was distinctly "high", and meat that was undercooked and red in the centre. Also soft fat was quite repulsive to me. So eventually I gave up eating meat. My father was somewhat concerned but my mother sympathetic.

I became progressively stricter in my abstention from animal foods and in a few years was not eating anything containing, or cooked in animal fat.

Six or seven years ago I gave up eating eggs. This was prompted by seeing my father draw un-laid eggs from dead chickens. Later, after seeing a chicken that had been egg-bound and had died a bloody death, I gave up cakes containing eggs.

Four years and 2 or 3 months ago I gave up cheese when I learned of rennet, and exactly 4 years 1 month ago I became a *complete* Vegan. It was a New Year Resolution (one of 2—the other being to abstain from all alcohol) which I have not broken and never shall.

APPENDIX 3

Vegan C—Single woman in her twenties

I came to veganism via vegetarianism over a period of several years. Looking back, I cannot distinctly remember what brought me to vegetarianism but I remember seeing a film in which lobsters were being cooked, and thrown into the boiling water alive. I was struck by how barbaric this was, and from there went on to realize that it was just as barbaric to kill animals and birds in order to eat their flesh. I cannot say this was the starting point, but this is the first memory I have of even thinking about vegetarianism. I did not at the time know any vegetarians, and I was not sure it was possible to live without meat—also my family were against me, and I carried on with an orthodox diet for some time, though all the time

knowing at the back of my mind that some day I would become a vegetarian. After about a year I became acquainted with several vegetarians and came to realize that a meatless diet was possible, and that many people were already living in this way. I immediately gave up eating all meat and fish, and have only twice eaten meat since, and that in the first year after my "conversion".

I had of course heard of veganism, but thought that for the moment I had gone far enough. Then I found that in discussions with non-vegetarians I was often accused of inconsistency, and asked why I wore leather shoes, ate eggs, used soap made from animal fat, etc. I realized that they were right, and began to eliminate all non-vegan items of clothing, toilet articles etc., but delayed changing to a completely vegan diet, mainly because of family opposition and the social inconvenience involved. I then got in touch with the Vegan Society and with their help I was finally able to become a vegan in every respect.

APPENDIX 4

Vegan D—Married woman in her fifties

Vegetarianism

My father had a good position on the staff of a big bacon curing firm. The slaughter-house was on the same site as the offices and one could hear the pigs screaming as one came within several hundred yards of the street where it was situated. When I had to call at the office sometimes to see my father I hated doing so on account of this, and I often asked him if the pigs were killed quickly. He assured me that they were and went to great lengths to tell me about the "humane" killer etc., but I was never quite convinced. He even offered to take me to see how instantaneously it was done—but I couldn't bring myself to face it and just wanted to run away as fast as I could and try to forget it. But I often dreamed about the place. Even when I got older, and seemed to get more conditioned to the idea, I would not go and see it. It was always something I seemed to be thrusting to the back of my mind—and it must have been in my sub-conscious for years, for I often had bad dreams about it. I hated handling raw meat when I learned to cook later on and hated going into the butchers' shops. It never occurred to me all this time that we could live without eating flesh—the word "vegetarian" only cropped up about twice in my first 20 years or so—and then only as a joke about some hermit or eccentric—what was more, in spite of all this I still liked meat, although I admit I had a preference for the more "disguised" type—bacon, ham, mince, etc.

With the coming of the war years, I realized I could do without meat and still go on living, much to my surprise. I met a vegetarian girl with whom I shared digs, but she put me off on account of getting terribly anaemic. I was afterwards to discover that it was bad balance of diet that did this, and not merely because she didn't eat meat. She was not getting enough of the foods that should replace her meat. Later, when touring as a professional singer, I met some vegetarians—and these seemed to be in radiant health and very lively and fit, and I began to wonder if it were possible after all. Just before this I had gone over to wholemeal bread, stepped up my salads and greens and fruit, and replaced meat with cheese more often than not, so I suppose I must have been a mild type of food reformer. I believed, I would have more stamina for singing.

But it wasn't until I started reading theosophical literature about the Animal Group Soul, the Law of Karma, reincarnation, evolution, and the Oneness of all life, and attending lectures about these things, that I became fully convinced, between 1954 and 1956, that we have been wrong all these thousands of years in slaying animals for food. With that realization more doubts have crept into my mind. Are the so-called "top people" in the world today really civilized after all? If they haven't got this awareness how can they be? Should we trust their judgement and abide by their decisions? If they hunt, shoot and fish as well as eat dead corpses should we indeed be governed by them? They cannot be the ultimate and therefore must be unfit to govern us. With this thought I decided from then onwards to let my conscience be my guide, and became vegetarian overnight on 1st February, 1956. I have never lapsed since. I met my husband in the meantime at the T.S. meetings, our diet and theosophy formed a bond between us, and we were married in 1957. We were both nauseated with having to live in carnivorous households and formed our own wholesome establishment.

Veganism

I had slowly been turning against eggs for some time. This was surprising, as I had come to be very fond of omelettes and scrambled egg—but I had never really fancied boiled or poached eggs. Anyhow, despite the knowledge that probably the biggest proportion of my Vitamin B₁₂ ration was contained in my eggs, I ate fewer and fewer eggs. Ruth Harrison's investigation into factory farming, however, decided me. I didn't eat another egg from that day to this. This was long before my husband left off eggs. Then I decided I could substitute vegetable margarine for butter and also started this before my husband. Cheese and milk were my big struggle. For a long time I couldn't see any harm in this. I had looked at it from the angle that the cow had to be milked—but what I didn't realize was that we were having the milk intended for the calves—and the calves therefore had to be killed. So I gave up cheese—and last of all milk. I had not really intended to give up milk just yet, as the Plantmilk had started in the London shops, and it is only a matter of time

before it reaches the provinces, but in view of the fact that we will be shortly launching the Vegan Communities Movement, which will be entirely self-supporting, I thought I may as well throw the lot over, and so my husband and I decided to dispense with every non-vegan item (except our current clothes which will eventually be replaced by vegan clothing) by 16th October, 1964—and we have been strict vegans to date.

APPENDIX 5

Vegan E—Single woman in her forties

I have always disliked killing, always rescued spiders from the bath and worms from the wet pavement, so it followed that in my early teens I started to refuse meat, but as my mother was catering for 5 of us in family meals mine was the same as theirs—minus the meat and I suffered from severe colds continually.

In my teens I started reading books on diet—Josiah Oldfield's books and Gayford Hauser etc. and tried to improve my food and resistance to colds. I could not have a proper vegetarian diet while at home in family but the war gave me the opportunity to register as a vegetarian and have cheese instead of meat.

Perhaps I was also influenced by my elocution teacher who was vegetarian, and taught me during formative years 9–18, although I never recollect her criticizing my meat diet. When I was about 17–18 I became more interested in religion and it always seemed absurd to me for any church to preach love and then proceed to kill and eat animals I read all Paul Brunton's books and many yoga books and these must have had some influence, but I feel that basically it was an aversion already within me. The thought of killing the animals stirred my conscience. I could not kill a sheep or chicken, therefore why should I expect someone else to do so on my behalf.

The veganism led naturally from vegetarianism.

APPENDIX 6

Vegan F—Single man in his seventies

I became a vegetarian in 1916, by that time I had come to realize what cruelty was involved in the rearing and slaughtering of animals for food.

About 15 years ago I decided that logically I ought to give up all animal foods since their production entailed varying degrees of cruelty with which I couldn't associate myself. I then gave up eggs, cheese, butter and cream, though of these I was never a heavy consumer. About 7 years ago I went the whole way and gave up milk. On social occasions, however this still does sometimes find a place in my diet, but as my consumption of coffee and tea is very small and the "social occasions" are very infrequent, my total consumption of milk is very small indeed.

My wearing apparel does include some leather and wool. I've not yet satisfactorily been able to solve this problem. My consolation, such as it is, is that my needs are small and my purchases of goods made wholly or in part of leather and wool are rarely necessary. The clothes I wear serve me for more years than I care to admit and by the time they are discarded have literally served their purpose I believe that my needs in this connection could easily be met from animals allowed to live a natural life.

APPENDIX 7

Vegan G—Married man in his forties

About 4 years ago I picked up a book in the library about healthy ways of living regarding diet. I cannot remember the title but the author was a lady. Anyway I decided to try the regime it advocated because it seemed very sensible. Wholemeal bread, honey, sprouted wheat, raspberry vinegar, fresh vegetables, fruit, fruit juices, yoghurt etc. As this was a vegetarian type way of eating I decided to join the Vegetarian Society and began seriously to follow the vegetarian way of eating. I used to get the magazine and I noticed the advertisement in it about Veganism, and the complete breakaway system from animal exploitation appealed very strongly, although until that time I had never heard of vegans or realized that it was possible. I joined the Vegan Society and with help from Mrs Batt and vegan literature I soon got into the swing of it and have never been better in health physically or mentally. I also was helped by the literature from "Crusade Against Cruelty to All Animals".

The disclosures revealed by this organisation were a revelation and a challenge to my Christian beliefs. I was convinced that the practice of eating flesh, the exploitation of the animal kingdom is a terrible evil in this world and just cannot be condoned by an active Christian. My religious faith was a great help, and convincing, when I contemplated and studied in this vein.

My conclusions to date are that it has all been to my benefit. My faculties are more acute, my health couldn't be better, at times I feel so healthy and well it just doesn't seem possible. All my sensations are, I regard, at an optimum level, I am more compassionate, thankful, and my religious life also has become more meaningful and alive to me. All in all I have made an advancement in my life for which I shall always be thankful.

[The Nutrition Society's Meeting for Original Communications, 22 May 1964, Abstracts of Communications, *Proceedings of The Nutrition Society*, 1964, vol. 23, no. 2, p. xlii.]

[Reprinted from *Proc. Nutr. Soc.* 1964, 23, xlii.]

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PRINTED IN GREAT BRITAIN

Food habits of West Indian immigrants. By J. C. MCKENZIE and PAMELA MUMFORD, *Department of Nutrition, Queen Elizabeth College, University of London, Campden Hill, London, W 8*

In recent years a number of studies have been made of the immigrant, though no extensive investigation appears to have been undertaken into their food habits. The present investigation is designed firstly to test the frequently expressed belief that the food habits of immigrant groups are slow to change to those of the country which they enter and secondly to try to indicate the pressures making for such changes as do occur.

This interim paper presents information gained from interviews designed to pre-test our survey techniques. The sample consisted of thirty-nine W. Indian housewives: thirteen attending a hospital prenatal clinic and twenty-five living in Notting Hill Gate.

The results in Tables 1 and 2 indicate that these families maintained a strong interest in W. Indian foods after their arrival in this country.

Table 1. *'As I read you a list of various kinds of foods, would you tell me if you have any of them regularly—say at least once a fortnight?'*

(% of housewives regularly using each food)

Salt fish	61	Stewed fruit and custard	34
Fish and chips	53	Yam	79
Fresh apple	100	Green bananas	84
Salted pigs tail	34	Eggs and bacon	95
Frozen peas	32	Rice and Peas	97
Stewed beef flank	92	Sausages	68

Average % eating W. Indian foods regularly: 75
Average % eating other foods regularly: 68
W. Indian food dishes in bold-face type.

Table 2. *'I have another list of foods here—would you tell me if you often buy any of them?'*

(% of housewives often buying each food)

Tinned meat	42	Fresh milk	100
Butter	100	Eggs	100
Lard	47	Creamed coconut	37
Red peas	76	Margarine	87
Heavy W. Indian bread	53	Corn meal	92
Gungo peas	82	Hot pepper pickles	71
White flour	97	Sweetened condensed milk	71
Cooking oil	87	Cheese	95

Average % purchasing W. Indian foods: 71
Average % purchasing other foods: 84
W. Indian dishes in bold-face type.

Most families quickly adopted some English foods, but these were mostly snacks or subsidiary meals such as breakfast. Of the main meals eaten at home on the previous day, 85% had included W. Indian foods and dishes. The adherence to W. Indian foods was true even amongst those who had lived for more than 5 years in Britain.

[The Nutrition Society's Meeting for Original Communications, 24 May 1963, Abstracts of Communications, *Proceedings of The Nutrition Society*, 1963, vol. 22, no. 2, p. xxxi.]

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PRINTED IN GREAT BRITAIN

Nutritional knowledge and food preferences of students of teacher training colleges. By J. C. MCKENZIE and JOHN YUDKIN, *Department of Nutrition, Queen Elizabeth College, University of London*

This paper gives an interim report of a study, designed to last at least 3 years, which is being conducted at two London training colleges for women, one specializing in domestic science (D) and one giving a normal teacher training course (T). Our intention is, first, to assess the ways in which food habits and preferences change with increased knowledge and experience of food and nutrition in domestic science students, and second, to compare the students who have this somewhat special interest with students who do not have it.

All students of T and the 1st-year students of D were asked to select from a list of foods those which were rich sources of protein, iron, carbohydrate, calcium or vitamin C. Over 90% in each group could correctly identify foods containing a good deal of carbohydrate or calcium, but the results for the other nutrients were less satisfactory. For example, only 48% of T students gave two correct answers for protein. In every case D students gave better answers than T students. However, when asked to assess the truth or falsehood of a set of sayings, D students, although still better than T, showed a considerable inability to apply their nutritional knowledge. Over half the students of D thought that canned foods are less nutritious than fresh foods, and that lemon juice is good for slimming. In both groups of students, nearly 40% did not know any of the organizations concerned with world food problems.

Students from the 1st, 2nd and 3rd year at both colleges were given a list of foods and asked to signify whether they liked or disliked them, were indifferent to them, or had never tried them. In D, the number of foods never tried decreased from an average of 5% in the 1st year to 2% in the 3rd year. There was no clear pattern for T students, although at every stage the percentage of foods not tried or disliked was above that for the D students. Similar food preferences were found in both colleges: chipped and roast potatoes, grilled steak, chicken, apples, peaches, grapes and strawberries were almost universally liked.

Any conclusions must at this stage be tentative but there is no indication that food preferences are favourably modified by the domestic science students in the light of widening food experience and nutritional knowledge. The dislike of foods is spread equally amongst those which may be regarded nutritionally as good foods or as bad foods. Specialist (domestic science) students have at the beginning of the course a good idea of the nutrient content of various foods but do not reliably apply this to their choice of food. Non-specialist students have only a fair knowledge of nutrition and it does not appear to change during the 3 years they are at college.

Social implications of alcohol consumption

By J. C. MCKENZIE, *Food & Drink Research Limited, Centre House,
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Introduction

To a large extent the papers at today's meeting are concerned with physical abnormalities occurring as the result of alcohol consumption. As such my paper is something of 'an odd man out' in two ways. Firstly, I am concerned to examine the social and psychological reasons behind the consumption of alcohol. And secondly, I am concerned as much, if not more, with the normal unharmed effects resulting from this consumption.

In a way much of my paper is concerned with establishing some sense of perspective about alcohol consumption for, however well known the facts are, the subject remains emotionally highly charged. Perhaps just one example will suffice—from a recent publication of the National Society for the Prevention of Cruelty to Children (Stewart, 1971).

About one person in five hundred in England and Wales is an acute alcoholic, that is to say an addict. Two or three times as many are chronic drinkers, dependent on alcohol to maintain their personal and social equilibrium. The National Council on Alcoholism has calculated that the cost to the nation, in terms of prison and social security maintenance, sickness and hospital treatment, absenteeism, etc. is upward of £40 million. Alcohol is responsible to a greater or lesser extent for the killing or maiming of thousands of people on the roads and plays some part in much of the crime committed in this country.

Yet millions of pounds every year are spent in advertising drink and about 350 000 people in this country work at its manufacture and distribution.

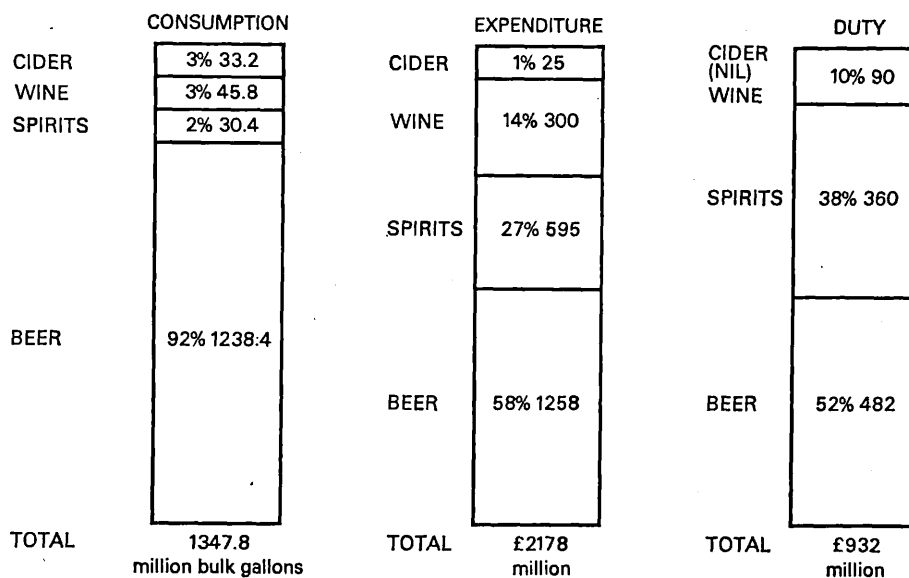
Alcohol is 'socially acceptable'.

This is by no means an accurate and complete picture of the situation as I shall attempt to show in this paper. Firstly I shall give some details about consumption of alcohol and diseases associated with it, and then go on to show the role alcohol plays in contemporary society. I shall end by examining the social causes and consequences of alcoholism.

Some facts about alcohol consumption in Great Britain

Consumer expenditure on alcoholic drink in the United Kingdom during 1970 was £2 178 000 000 of which nearly half (43%) went straight back to the Government in tax (Fig. 1). In terms more real to us the average person spent £39 per annum on alcoholic drink—this is some 7% of their total expenditure. Given that a proportion of this population is below the age likely to find drink acceptable and that a small percentage of adults are total abstainers, the figure for 'drinkers' becomes

nearly £80 per annum. There are nearly 140 000 licensed outlets for the sale of alcohol—some 105 000 being on licensed premises and 35 000 off-licences.



Sources - Customs & Excise (provisional)
Central Statistical Office
Stats (MR) estimates

Fig. 1. Consumption of various types of drink, the amount spent and the duty paid on them in 1970 (1 gallon (imperial) = 4.546 l). (Nutt, 1971: with acknowledgement to *The Grocer*.)

Perhaps most significantly, in view of what has been said earlier about diseases resulting from alcohol consumption, 92% of alcoholic drinks consumed in this country is beer—a drink with such a low content of alcohol per fluid ounce that other than causing an occasional hangover its impact on 'disease' is likely to be negligible. In terms of expenditure and customs duty the predominance, although reduced, of beer remains (Nutt, 1971).

Trends in consumption are emerging both between and within the various alcoholic drink categories. Thus consumption of wines and, to a less degree, spirits is increasing faster than that of beer (Fig. 2). Within the spirits category, consumption of brandy and whisky is increasing rapidly while that of gin is declining at some speed (Fig. 3). Consumption of draught lager and keg beer is growing fast while that of mild and brown ale is declining.

The social advantages of drinking

Since time immemorial consumption of alcohol has been an everyday occurrence. Not surprisingly therefore the World Health Organization in defining alcoholism openly recognizes that alcohol consumption forms a part of our everyday life styles. Alcoholism is 'any form of drinking which in its extent goes beyond *traditional*

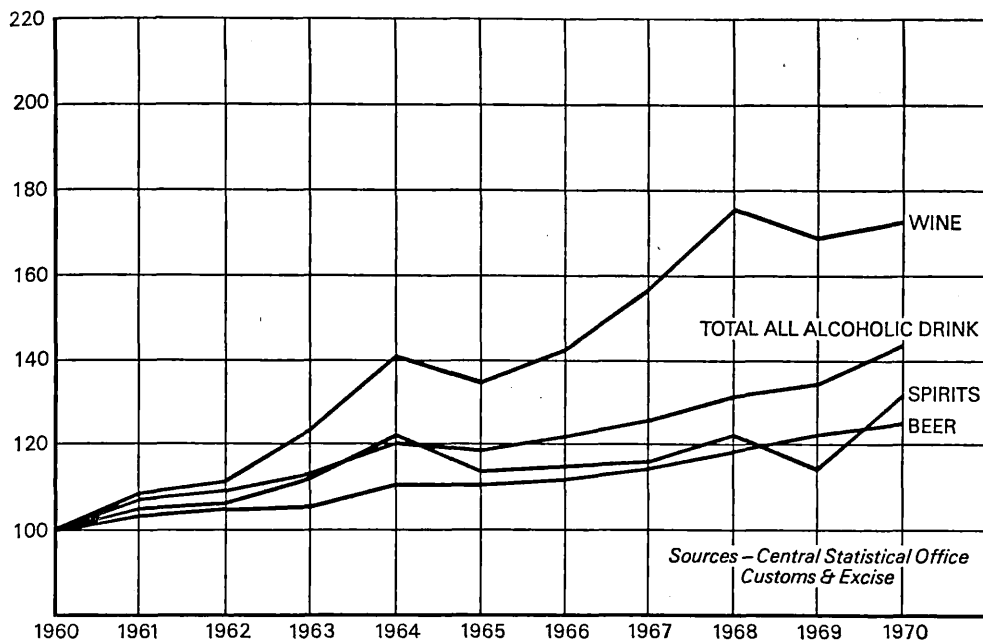


Fig. 2. Indices of consumption of various types of alcoholic drink during the period 1960-70. (Nutt, 1971: with acknowledgement to *The Grocer*.)

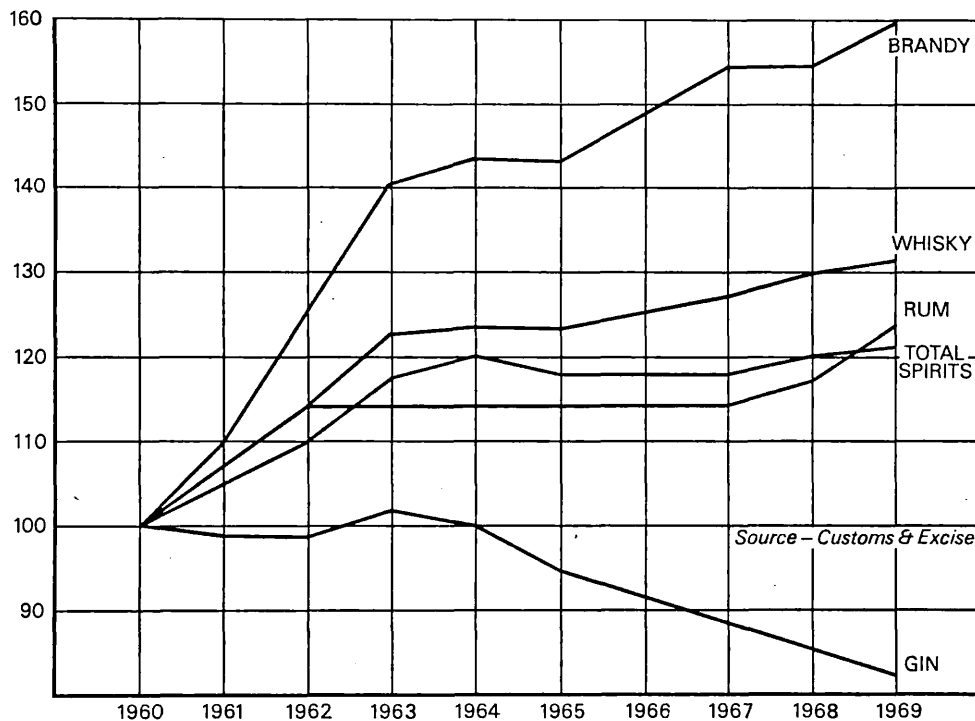


Fig. 3. Indices of the volumes of different spirits consumed (3-year moving averages). (Nutt, 1971: with acknowledgement to *The Grocer*.)

and customary dietary use, or the ordinary compliance with the social drinking customs of the whole community concerned. [Author's italics.] (World Health Organization, 1952).

In fact, alcohol contributes a great deal to our contemporary society in a number of ways. Firstly we use it as a symbol of affluence or celebration—a champagne reception, a cocktail party, a 'booze-up', a bottle party, to name but a few drinking occasions, which all convey images to every one of us and portray situations over and above the actual drinking context. Yet without the drink the situation would lose tremendously. Thus in such circumstances alcohol helps to make an occasion.

Secondly, it removes inhibitions. Mostly this is in a small way and is a highly desirable means to ease tension. You walk into a room full of strangers and a glass of sherry and a cigarette break the ice. Equally it often overcomes any pretentious outward facade or play-acting role – we become more ourselves – 'the real us'. It also encourages congeniality. Of course in more extreme situations drink can lead us to overcome desirable inhibitions (or at least those society currently deems as desirable) and can cause harm.

Thirdly, for young men, in particular, the 'pub' situation is a major aspect of their life style—the whole complex of the place, the atmosphere, the beer, the company, is wholly amenable to them and represents very much the male 'pack' situation equivalent to 'coffee parties' for women.

Lastly, drink has been traditionally used as a means to ease personal stress, to forget and to cause oblivion. This may not always be a bad thing. The funeral feast was a traditional means by which poor societies reconciled themselves to the death of a loved one. The man who takes a stiff whisky at the end of the day uses it to help him relax. A large drink to overcome a scare, a shock or a disaster is psychologically justifiable. Clearly, particularly behind the 'oblivion' category, more dangers exist—indeed as is shown later in this paper it may well be a classic sign of alcoholism. Nevertheless, in general terms drink may contribute a good deal to the smooth running of the individual's life and the corporate functioning of society.

Extent of alcoholism

Against a background of increasing consumption of alcohol we find a general picture of declining deaths from alcoholism, although the trend has been reversed in the last 10 years among men. Similarly, deaths from cirrhosis of the liver have declined (Office of Health Economics, 1970) (Figs 4 and 5).

The exact incidence of alcoholism in a given population is never easy to establish but Table 1 shows figures taken from two authoritative accounts for England and Wales of 1100 and 865 per 100 000 population. Both sources give an indication of the favourable position in this country compared to much of Europe and North America. Perhaps because of this relatively favourable position the disease is not viewed as serious by the British public. Thus, a recent survey showed alcoholism to be placed below cancer, heart disease, drug addiction and tuberculosis (Allied Breweries Ltd, personal communication) (Table 2).

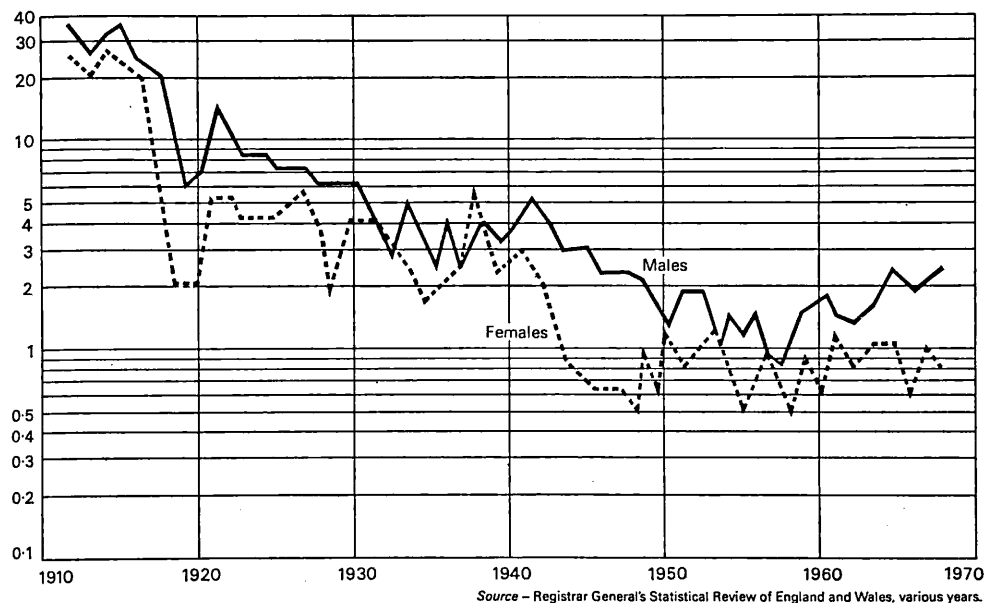


Fig. 4. Death-rates (per million living) from alcoholism for males and females in England and Wales, 1911-67. (From Office of Health Economics, 1970; with acknowledgement to that Office.)

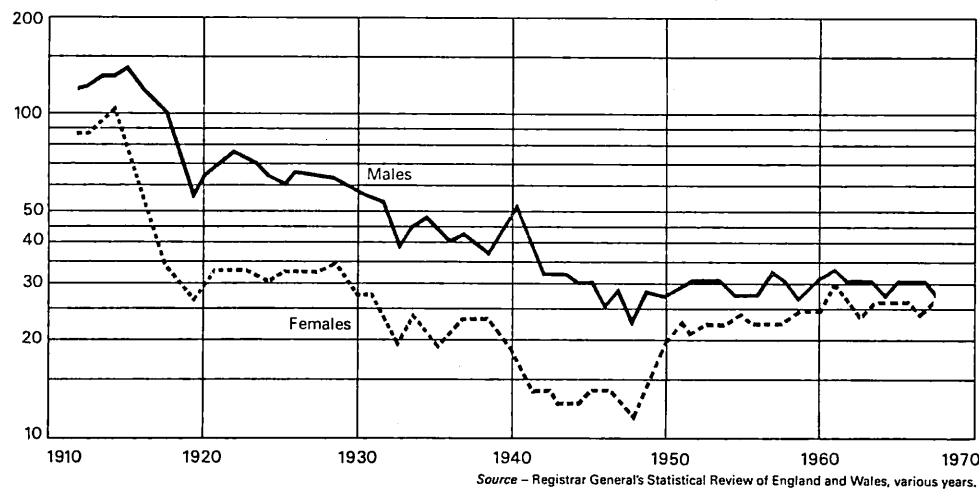


Fig. 5. Death-rates (per million living) from cirrhosis of the liver for males and females in England and Wales, 1911-67. (From Office of Health Economics, 1970; with acknowledgement to that Office.)

Table 1. *Prevalence of alcoholism (rates per 100 000 population aged 20 years or more) in selected countries (Source : Office of Health Economics, 1970)*

Place	Year	Estimate	
		Jellinek* method	Office of Health Economics†
France	1951	5200	7300
USA	1953	4390	—
Chile	1950, 1953	3610	4150
Canada (Ontario)	1961	2460	2375
Switzerland	1953, 1947	2100	2700
Denmark	1948	1950	1750
Finland	1951-7	1120	1330
England and Wales	1948, 1960-3	1100	865

*The Jellinek formula is $A = PD \div K$. A is the total number of alcoholics in a given year, D the number of cirrhosis deaths, P the proportion of these attributable to alcoholism and K the percentage of all alcoholics with complications who die of cirrhosis of the liver. These measures can be obtained from hospital records and autopsy surveys. R, the ratio of all alcoholics to those with complications, was added to the numerator later (World Health Organization, 1951).

†Based on field surveys (either interviewing reliable informants or by sampling the general population).

It is generally accepted that alcoholism affects more men than women; it has been suggested that the proportion is between four and seven times as many men as women. There is also a pronounced peak in incidence between 40 and 50 years of age (Office of Health Economics, 1970).

Table 2. *Results of a survey asking the question: 'What are the three most serious problems facing people in Britain today?' as given by different sections of the population*

Disease	Total	Social class		Region		
		ABC1*	C2DE*	North	Midlands	South
	%	%	%	%	%	%
Cancer	83	85	82	79	86	86
Heart trouble	73	82	68	72	76	72
Drug addiction	47	40	51	45	49	49
Arthritis	36	44	32	29	40	41
Alcoholism	21	18	23	27	18	18
Asthma	13	13	14	15	13	12
Tuberculosis	13	8	15	17	8	12
Diabetes	12	10	13	16	9	11
No. of people interviewed	460	165	295	165	143	152

*The social class terms ABC1 and C2DE are agreed ratings provided by the Market Research Society in the UK. ABC1 approximates to the professional and white-collar workers, and C2DE to semi-skilled and manual workers, old age pensioners and the unemployed.

The social and psychological problems of alcoholism

For the great majority of the population we have shown that alcoholic drinks are not only pleasurable in taste terms but also have a major role to play in our life styles. But for a minority they are a vehicle to personal disaster.

The development of alcoholism, perhaps more dramatically than any other illness, is reflected in changes in the individual's social behaviour regardless of his physical condition. This is described dramatically by Kessel & Walton (1967). They suggest three stages in the development of alcoholism: excessive drinking, the addictive stage and chronic alcoholism. Excessive drinkers are not alcoholics though they may become so. In the early stages, the excessive drinker drinks in the same pattern as social drinkers but drinks more, starts to spend more time drinking and begins to do so surreptitiously. He adopts strategies to obtain more drink without others knowing. Drinking affords him positive relief from specific problems and lessens tension. He begins to use it to relieve all his problems and soon develops increased tolerance, where he has to drink more to obtain the same relief; he often has increased guilt feelings.

This phase moves on to the period where alcohol is a necessity and the drinker is now dependent on alcohol. He often drinks to the point of drunkenness, he suffers loss of memory and is unable to regulate his drinking. As soon as a small amount of alcohol is consumed the demand for alcohol continues until either the alcohol runs out or the drinker is too sick or intoxicated to drink more. His interests become narrower and drink is the main concern of his life. His work-record deteriorates and he drinks heavily during the working day. Psychologically he is beset by remorse and dwells on past achievements. Debts mount up, social isolation occurs and, if married, relations deteriorate with his wife and family—he often becomes morbidly jealous. At this point he may begin to be continuously drunk throughout the weekend and may lose his job. He begins to drink in the morning, conceals supplies of liquors, neglects his food and may make suicide attempts.

Clearly our main concern must be with the factors that turn someone from a 'social drinker' to an alcoholic and I would suggest that there are strong grounds to suggest that addictive consumption of alcohol is the effect of basic psychological deficiencies in an individual. Robins, Bates & O'Neal (1962) did a 30-year follow-up study on 500 children who had been seen in a child guidance clinic and a group of matched controls. They found a higher proportion of the children from the clinic developed alcoholism than among the controls.

Some psychoanalysts favour another thesis. They suggest that alcoholism is associated with an unusual experience at the oral stage of development, the stage when the infant is completely dependent on the mother's nurture. Later experiences call for the fulfilment of conflicting needs, of independence and achievement and thus the repression of dependency wishes. Alcohol is a device for coping with these problems by, some say, symbolically re-creating a satisfying dependency.

There is also evidence to suggest that emotional stress resulting from changes in marital status may be of significance (Table 3). While in terms of divorce it is difficult to ascertain whether alcoholism is the cause or effect, this is undoubtedly not so where the spouse has died. Again, as was indicated earlier, alcoholism is particularly prevalent amongst middle-aged men—that is those suffering from the pressures of stress jobs or those who have to reconcile themselves to the fact they have not 'made it'.

Table 3. *Incidence of alcoholism in 1967 according to marital status (rates per 100 000 of population) (Source : Office of Health Economics, 1970)*

Status	UK	USA
Widowed	1360	1050
Divorced		680
Single	680	290
Married	550	250

The significance of these issues is important in determining our attitude to alcohol consumption. If alcoholism is an 'effect' rather than a cause, then in medical terms undoubtedly our attention must be directed towards dealing with the root cause of the problem rather than with the symptom. Certainly much of the evidence I have put forward would lead me to suggest this should be concerned with mental rather than physical health and well-being.

In any event considerably greater research is required to determine what makes an individual move from 'normal' drinking to addiction and how the 'risk' factor may be diminished. If this greater understanding can be achieved, then alcohol may well prove to be one of the few great companions and solaces of our time that does not bring with it to the community considerable health hazards.

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Section D - Research on Economic Influences upon
Food Choice

1. Purpose of the Research

The purpose of the research in this area was to analyse the impact of price upon choice and to assess the ramifications of changes in price or income of different consumer groups upon nutritional status and social well-being.

2. Methodology

The majority of work in this section involved analysis of published data on food expenditure in this country and Europe. It is supported by original research based upon qualitative and quantified surveys. Details of procedures adopted for specific research exercises are identified within the papers concerned.

3. Papers Included

Paper 1: The Impact of Economic and Social Status on Food Choice (in Proceedings of the Nutrition Society, Volume 33, 1974).

Paper 2: Food Prices and the Consumer (in Nutrition, Volume 29, 1975).

Paper 3: Economic Influences on Food Choice (Chapter in Lifestyles and Nutrition, edited by Turner - in the press).

Paper 4: Factors Affecting Demand for Protein Products (Chapter in The Biological Efficiency of Protein Production, edited by Jones, 1973).

Paper 5: Poverty: Food and Nutrition Indices (Chapter in The Concept of Poverty, edited by Townsend, 1969).

Paper 6: Changing Food Habits and the Caterer
(Chapter in Catering Management in the
Technological Age, edited by Fuller, 1968).

Paper 7: Food Choice and Price (Section in The
National Catering Enquiry, 1970).

The first four papers are all primarily based upon critical analysis of published data, but they also introduce a limited quantity of new research by the Candidate and include reports on previously unpublished research.

Paper 5 is an attempt to analyse in the broadest possible way the ramifications of poverty upon food choice in the U.K. This paper embraces some new research by the Candidate.

Papers 6 and 7 specifically examine the influence of price and other criteria on the choice of food in a restaurant, and indeed the choice of restaurant in which food is consumed. This involves the reporting of original research collected and analysed by the Candidate.

4. Direct Conclusions from the Studies

Each paper isolates within it the key findings of the research involved. Overall the most significant findings would appear to be:-

- The demonstration that price influences choice within broad categories. Thus it may remove certain items from potential choice, but it will not determine absolutely how the consumer spends his/her money on food;
- The isolation of the importance of short-term poverty and its ramifications upon diet;

- The demonstration of the changes in the economic climate of the late 1970's and their ramifications upon food choice and shopping behaviour;
- The identification of the influence of various levels of income upon food choice and nutritional status;
- To provide an understanding of the various criteria influencing choice of restaurant and choice of meal within a restaurant.

The impact of economic and social status on food choice

By JOHN MCKENZIE, *Food & Drink Research Limited, Mill House, 87 Shaftesbury Avenue, London W1V 7AD*

1. *Fundamental considerations*

There are a number of fundamental factors related to our primary concern, nutrition and poverty, that have been considered implicitly in our discussions but which in my view need to be stated specifically. I say this because it is around these issues that concern and indeed policy should be centred.

Specifically I list the prime fundamentals below.

(a) To the individual, poverty is much more of a relative thing than it is an absolute matter. Particularly in Western society, frustration with physical conditions and capacity to purchase particular items is primarily related to two issues: what an individual has now compared to what he used to have, and what an individual has now compared to what other people have. It is by these criteria that people decide whether or not they are poor and indeed whether they should complain. Moreover, it should be recognised that these concepts are much easier to measure than is poverty in absolute terms. And it means poverty is as much concerned with no longer being able to afford a telephone as it is with the quantity of meat consumed in any one week.

(b) In social terms poverty is seldom self-imposed but almost always real. Too often, calculations are done which suggest that if a family spent their money in a different way they could have adequate nutritional status and living conditions. But to give up food patterns they are used to (or even cigarettes or alcohol), whilst it would possibly remove physical deprivation, would not remove poverty in any social sense.

(c) Poverty is about individuals and their personal circumstances and not about averages. Too often we look at poverty in terms of the average position, but, just as technically in nutrition terms this does not remove concern about deviations from the mean, and in particular the lowest 10%, so too it ignores personal issues that are the very essence of poverty.

(d) People choose food, not nutrients, and nutrition is as much about the former as the latter. We tend to forget the adage promulgated so succinctly by John Yudkin for so many years. But nowhere is it more relevant than in the context of a poverty debate. Even if we persuade people to adopt new patterns to maintain nutritional adequacy in time of hardship, if they cannot choose the foods they want, they will still rightly consider themselves to be poor: they will have been deprived.

(e) Short-term crises may well be of greater significance both socially and nutritionally than longer-term deprivation. This is an issue I return to in some depth later in this paper.

If the above concepts are in any way acceptable, I would suggest that we may have taken far too complacent a view in our specific analysis of various at-risk groups in the papers and discussions furnished earlier. Certainly it is in the context of these concepts that I would like to undertake my review.

2. Impact of economic choice on food choice

There is an abundance of evidence in both developed and developing countries to demonstrate that food choice is related to income and that, generally speaking, richer people have a more adequate, varied and palatable diet. A few examples will suffice in the present context.

The National Food Survey Committee (1972) report for 1970 shows that there is a steady decline in the consumption of milk, meat and fruit as one goes down the social classes, with growth in consumption of bread and potatoes (Table 1).

Table 1. *Consumption of various foods by families in the UK related to weekly income 1970*

	Gross weekly income of head of household*					OAP	All
	A	B	C	D ₁	D ₂		
Liquid milk (pints)	5.28	4.70	4.39	4.10	4.49	4.87	4.63
Meat (oz)	41.90	40.24	38.73	37.65	39.20	41.07	39.53
Fruit (oz)	44.84	31.67	25.94	22.11	27.28	30.41	30.34
Bread (oz)	29.84	36.51	40.97	44.44	39.55	29.17	38.11
Potato (oz)	39.33	51.12	56.63	55.91	52.42	43.17	51.84

*A, £45 or more; B, £27-£44; C, £14-£27; D₁, under £14 (earned); D₂, under £14 (unearned).
OAP, old-age pensioners.

From The National Food Survey Committee (1972).

On a world basis, a similar picture emerges if we look at the percentage of total energy intake derived from cereals, starchy roots and sugar. Thus 80% of the energy is derived in this way in the Far East region, 72% in the Near East and 74% in Africa, compared to only 63% in Europe, 48% in Oceania and 40% in North America; the figure for Latin America is 64% (Sukhatme, 1961).

Table 2. *Amount of money spent weekly on food by families in the UK in different income groups, in absolute terms and as a percentage of total income*

Amount	Total income per week					All
	Under £10	£15-£20	£30-£35	£50-£60	£80+	
Absolute terms (£)	3.09	5.61	8.06	10.58	14.61	8.72
Percentage of total income	33	30	27	25	20	25

From the Family Expenditure Survey (1972).

Again, as is shown in Table 2, in the UK the total amount of money spent on food increases in line with the increase in the total amount of income entering the

household. However, at the same time, as is equally shown in this and Table 3, the percentage of total income being spent on food declines with a rise in income. A similar situation is true for the percentage of income going on housing, but as people get richer they spend more on clothing, transport and vehicles, and services. (Family Expenditure Survey, 1972).

Table 3. *Percentage of total expenditure on various commodities or services by families in the UK in different income groups*

Item	Total income per week					All
	Under £10	£15-£20	£30-£35	£50-£60	£80+	
Housing	22	18	15	11	10	13
Food	33	30	27	25	20	25
Clothing	5	7	8	9	10	9
Transport and vehicles	3	6	12	17	18	14
Services	8	9	8	9	15	10

From the Family Expenditure Survey (1972).

All in all, the changing diet resulting from higher income is reflected in improved nutritional status. Thus the National Food Survey Committee (1972) report again shows that nutritional intake as a percentage of recommended intake is higher for almost all nutrients amongst the better-off social classes (Table 4).

Table 4. *Nutrient intake of families in the UK, as a percentage of recommended intake, related to total income*

Nutrient	Gross weekly income of head of household*					OAP	All
	A	B	C	D ₁	D ₂		
Energy	110	110	109	106	108	122	111
Protein	132	127	124	124	125	136	128
Calcium	207	194	189	176	182	204	194
Iron	125	124	124	118	113	124	124
Thiamin	124	123	122	118	121	133	124
Vitamin C	231	192	172	158	165	154	184
Vitamin D	80	89	87	81	83	110	84

*A, £45 or more; B, £27-£44; C, £14-£27; D₁, under £14 (earned); D₂, under £14 (unearned).
OAP, old-age pensioners.

From The National Food Survey Committee (1972).

However, it would of course be wrong to argue that prosperity creates no problems in terms of diet and food choice. Problems emerge on two fronts. On the one hand it can produce the 'self-induced' diseases of affluence such as obesity, heart disease and diabetes. On the other hand some 'prestige foods' of affluence may be singularly less desirable than the alternatives consumed by the poor; here I am thinking of such products as unfortified white flour, carbonated soft drinks and even such Eastern delicacies as bird's nest soup.

3. *The impact of social status on food choice*

The role of income in choice is almost too deceptively obvious and significant, but the social and psychological roles are much more complex. Fundamentally we deal with choice at two levels. Imagine a table: on it are placed all the foods which we can afford (or alternatively which we could afford if we spent all our available money on them). This is the level of imposed economic choice. But then from this wide range of available foods (or indeed brands) we make a selection of those which we wish to eat. This is based on sociological and psychological criteria. Again, given that from the foods available on the table it would be easily possible to choose a nutritionally adequate diet, it very much becomes the sociological and psychological criteria that determine whether our diet is good or bad.

Below I list five essential criteria of a sociological-psychological nature which influence this choice.

(a) *Food as an aid to security.* A great deal of our choice of food is to provide reassurance when we feel insecure or uncertain. Frequently security means retaining past habits and not trying anything new or in any sense different. When everything else is going wrong, our ability to gain comfort from a standard diet is well recognised. Partially at least this reflects our need psychologically to demonstrate consistently that now, when we no longer directly provide for ourselves by hunting for or growing food, it is still readily available to satisfy our every requirement. But it may be more than this. Old people, for example, tend to store up food: their larders will contain many more packets of tea or tinned fruit than the average, a clear demonstration about their fears both of a practical, physical and an emotional nature for the future.

(b) *Food selection and preparation as a substitute for maternal creativity.* As women become liberated and lose many of the traditional means of demonstrating their creativity and the quality of their performance as a homemaker (in particular by not now having a continuous child-bearing and rearing role of 25 years or more), they increasingly turn to food as a new indicator of their talent. By budgeting well, shopping well, cooking well, they implicitly or explicitly seek to show their creativity and to earn praise from the family.

(c) *Food choice as a means of demonstrating group acceptance, conformity, prestige.* Because everyone is aware of food and it has such a prominent position in our life, we demonstrate by our selection our attitude to society (whether we seek acceptance by it or wish to rebel from it) and the image we want to project of ourselves. Dry versus sweet sherry, instant versus ground coffee, how we eat our peas (and whether they are fresh, frozen or tinned), whether we use a fork with our dessert, would be just a very few examples of how such criteria may work.

(d) *Food as a means of demonstrating mood and personality.* Not only do we use food to portray to the outside world a celebration (champagne and more exotic foods) or special occasion (Christmas turkey, birthday chicken, Sunday lunch beef), but also we project our personality and our reactions to certain circumstances. Thus, for example, second children often reject a basic food or drink (in particular tea or

coffee) to assert their individuality and we all, if we are excited or in a temper, may find it extremely difficult to eat at all.

(e) *Food as a compensation for denial or during times of crisis.* At both the extremes of food intake there is often a psychological condition reflecting an unhappy marriage, death, boredom, frustration, inability to cope with a particular situation or the world at large, etc. Cure the emotional situation and you can usually make people eat again or cut back on their intake.

In this way we form a set of food habits. They make for almost a unique formula for each individual, although of course they often only differ in minimal ways from our peer groups. Yet these minimal variants resulting from social and psychological implications can well affect the total food intake and the nutritional status of individuals.

4. *The problem of the short-term crisis*

The problem of the short-term crisis has been viewed in a number of different ways in this symposium. Thus Dr Land has identified a particular vulnerable group to be those on the edge of poverty, for whom marginal changes in income or mistakes in how they spend it can create a real problem situation. Dr Cohen has identified two problems amongst the elderly which require financial readjustment: when they stop work and have to live on a pension, and when the savings run out. In discussion, Dr Whitehead has identified a large proportion of Ugandans who live in what we might call a nutritional danger zone but who only 'drop over the edge' into malnutrition in bad times. A major part of my own thesis is that poverty and food choice is in itself of particular concern when it emerges in the context of a short-term crisis, usually a reduction in income due to illness, unemployment or old age.

Let me examine how people react to this situation. Basically, when faced with a smaller income in an emergency or as a result of some change in their circumstances, respondents tend to cut back on food and drink rather than on other items of expenditure. This is simply because items such as the rent or mortgage, electricity and gas, even car hire-purchase payments, are rigid items which it is difficult to modify. But it is quite possible to change the amount of money one spends on food quite rapidly whether it is as a result of one of the crises outlined above or simply because one has overspent on something else this week.

A second feature at this time is that when the individual does cut back on food he does not necessarily cut back in a way which is nutritionally most desirable. Rather he cuts back on foods which are of less emotional significance to him. This was shown in a study of the workers in Dukinfield as long ago as the 1840's. Their diet was measured during a period of prosperity in 1836 and during a period of relative hardship during 1841. In the latter period respondents cut back dramatically in their consumption of potatoes and meat (down 69%), less so in that of butter (down 52%), and much less in that of bread (down 29%) and tea (down 36%) (McKenzie, 1966).

But whatever the changes which occur in diet at these times and whether or not they have any nutritional effect, it may be argued that they do carry important

psychological significance. As I have tried to demonstrate throughout my paper, food consumption is undertaken for much more than nutritional purposes: it adds to emotional stability. If, at a time of dire crisis, families are forced to alter their food intake this adds to their instability at a most vulnerable time and should be avoided at all possible costs.

Unfortunately these short-term crises not only are much more likely to occur amongst the old and the poor, but equally these specific groups are much less likely to be able to cope with the situation. This can be explained by the following reasons:

(a) The poor tend to use money as an aid against intolerable conditions in which they live. Thus whether it is a visit to the Batley Variety Club, a pub down the road, or simply eating out with some friends, it reflects a situation in which they buy relief. Conversely they seldom socially eat or entertain in their own homes. Thus, a reduction in money removes this 'relief element' in their income.

(b) The old and the poor are less flexible in their attitude to foods and meal patterns. The lower social classes are more conservative in their attitude to life and both they and the old are less intellectually able to comprehend, absorb and find acceptable recommended changes in food patterns. In general, they are much more insecure about anything which creates a change in their life. As such, the short-term crisis hits them worse.

(c) As was shown early in this paper, the proportion of income going on fixed items such as rent and food is much greater amongst the poor. Thus they have less room to manoeuvre when their income is suddenly reduced.

(d) Commercially it has been recognised for a long while that the poorer sections of the community are less efficient shoppers. The 'Which' type of document is very much aimed at and appeals to the middle class. The old and poorer are less able shoppers because they are more influenced by advertising; they are much more likely to purchase the leading brand than the Sainsbury or Tesco variety which is 2p cheaper; they have less time and are less good at bargain hunting; they have more problems in persuading their family to adapt to some new method.

Thus my argument is that short-term crises not only obviously come more frequently in the life of the poor and the elderly and affect a much larger proportion of the population than those who live directly in absolute poverty, but also come to groups of the population who are emotionally ill-equipped to deal with the crises.

In relief terms the implications are clear: one needs to support individuals financially to the level of their previous standard of living rather than compared to some absolute basic standard. Equally, one has to be careful in the short term to ensure that the money made available actually goes on the provision of an adequate diet: this at least might be one of the few positive merits about a payment in kind procedure.

5. *Conclusions*

If it is recognised that short-term poverty is of major significance, then we really have to gear our research programme in a totally different way. By this I mean

we need to watch people over some time to measure both the nutritional and psychological effects resulting from changes in their income. And we need to measure them at the appropriate times. Thus we should not just observe old age pensioners, but people before they retire, when they have been retired for a year and later when their savings run out. Equally, we should observe people who are sometimes employed but who have a significantly greater chance of being unemployed within the next 3-year period. Again, both in nutritional and psychological terms, we need to watch individuals who represent a below-average position within the community. And we need to measure their desires and attitudes as much as their physical well-being.

The implication of all this to me is twofold. First, to return to an old hobby-horse of mine, it is abundantly clear that our research must involve both the nutritionist and clinician, and the social scientist. Many of the apparently different conclusions we come to at present reflect a total lack of understanding and collaboration between the clinical and scientific disciplines on the one hand and the social scientist on the other. We really do need to co-operate and co-ordinate our activities.

Secondly, we have to recognise that in the sort of society in which we live almost everyone is going to suffer at least some of the short-term crises resulting from illness, unemployment and old age. Whilst these conditions may have little effect on over-all health status, they are emotionally of considerable significance. As such they merit further exploration.

Our Chairman began by commenting that politicians often seem little interested in the nutritional state of the community provided an adequate level was being achieved by the majority of the electorate. But one of the key things about the sort of arguments I have been presenting is that whether or not poverty results in diets which are nutritionally unsatisfactory, certainly these diets are totally unsatisfactory in social terms to the consumer. Such social discontent is not only enormous but can have powerful political impact. Perhaps this is the way to the heart of the politician!

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Food Prices and the Consumer

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WHEN a housewife walks into a supermarket, picks up a packet of tea (most probably only briefly checking the price, brand and packaging as she makes her choice) and puts it into her trolley for purchase, the activity looks very simple, certainly individual and relatively unplanned. Yet the apparatus and decision-making processes which stand behind this apparently simple task are enormous.

On the producer's side, there has not only been the decision to go into the market at all, but also the complex activities undertaken by them or on their behalf related to the planting, growing, harvesting, possibly processing, and packaging of the product. There follows all the complex distribution issues related to getting the product to the shop.

On the consumer's side there are all the aspects of the planning and successful deployment of the family budget, the selection of specific foods which appeal to the housewife and her family, and which are believed to be relatively good for them, and above all, the need for individual purchases to fit into the overall scheme of things as far as the budget is concerned.

In particular, there is the huge negotiating machinery between the buyer and the seller to determine the quantity sold and the price charged which far exceeds in complexity anything which Dr Kissinger, the TUC and the CBI all rolled into one could ever have had to tackle.

This is, of course, not to suggest that at a given moment of time the housewife recognises any aspect of this decision-making and negotiating process— a particular purchase now probably emerges as almost some unthinking task based on total habit formed out of the cumulation of a whole series of behaviour modules developed by her and her peers over a period of time. Moreover, no one individual will have been directly involved in all elements of these procedures and of course, no one person can really affect the total chain of events.

But the price charged and the quantity of various foods purchased encapsulates in economic terms all the basic attitudes and decisions made by both producers and consumers in the course of their respective activities.

In this article I shall concern myself with the issues which lead the consumer to demand a specific amount of a commodity and hence set a price for it, and to try to indicate how they react to various price changes that may occur over time.

1. Factors determining price

Perhaps the best place to begin any examination of the relationship between price and demand is with some fairly simple theoretical economics which help to demonstrate how the price for a product is set. This is not, of course, to suggest that any consumer really recognises such procedures in everyday life, or indeed that decisions can be broken down as simply as all this. Certainly the economists' catch-phrase "All other things being held equal" seldom occurs in the real world. Nevertheless, in spite of these limitations such an analysis does, I believe, give some insight into the basis of behaviour and each aspect can be related to real-world consumer decisions about food choice.

Let us begin with the justifiable assumption that at any moment of time it is possible to isolate the amount of a particular food which the consumer is willing and able to buy at a specified price. By checking out how much she would be prepared to pay at various prices, all other things being held equal, we can produce a Demand Schedule for a product. This is shown in graphic terms in Figure A.

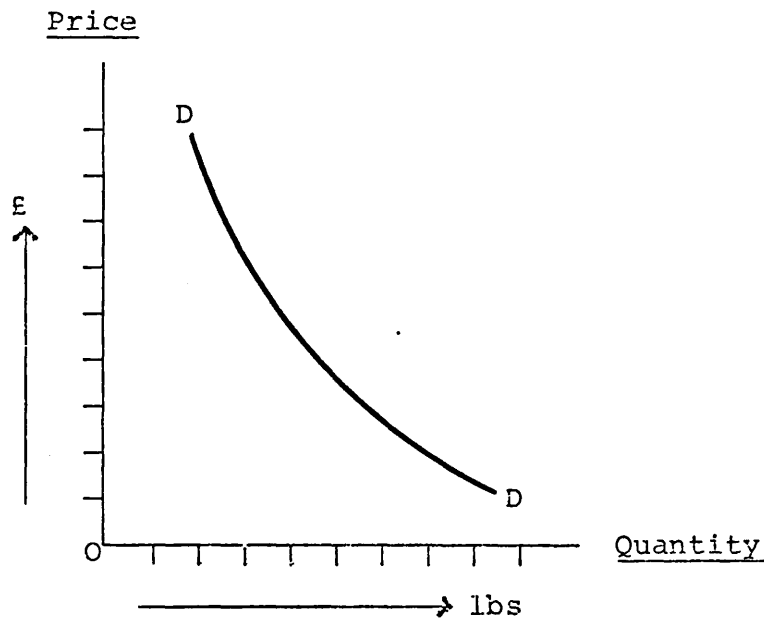


Figure A. Consumer Demand for a Specified Product

Conventionally a Demand Curve slopes downward to the right simply because for most commodities more is demanded as the price is reduced. This is because it is likely to lead to the substitution of this food for others which are now relatively more expensive. This may be true at a number of levels—not only fairly obviously in the decision to purchase one brand rather than another, but also in the choice of one food against another, both within set categories (for example beef versus lamb or even meat versus fish) and sometimes between categories (bread versus meat). This direct inter-relationship of all foods is an important aspect of our understanding of consumer behaviour. In Figure B I set down a possible set of categories which show the extent and complexity of the possible substitutions that may occur between foods.¹

Figure B. Public Conception of Various Food Categories

Meats	Bread	Potatoes	Vegetables	Fruit	Puddings	Cakes
Meat	Bread	Potatoes	Peas	Apples	Tinned	Cakes
Fish		Rice	Cabbage	Bananas	Fruit	Biscuits
Eggs		Spaghetti	Tomatoes	Oranges	Fruit	
Cheese		Pasta	Beans	Pears	Puddings	
Poultry			Onions		Rice	
					Jelly	
Confectionary	Sugar	Beverages	Milk	Spreads	Breakfast Cereal	
Sweets	Sugar	Tea	Milk	Butter	Cornflakes	
Chocolates	Sugar	Coffee		Margarine	Porridge	
	Subs.	Cocoa		Jam		
				Marmalade		
				Pastes		

But the demand for specific food items does not always move consistently with such price changes. On some occasions the same amount of a product may be bought even if the price goes up - indeed purchases may even increase. At least three reasons for this may be isolated:

- if food in general is scarce, respondents may be prepared to spend almost all of their income on satisfying this basic need;
- certain food ingredients spread themselves across a whole range of product categories and seem almost essential parts of the diet. Flour and sugar are two examples of this and we have had recent demonstrations of how, if necessary, consumers are prepared to "bid up" the price of these products since without them they seem to believe their whole dietary habits are threatened;
- some foods gain their kudos from their limited availability. For example caviar might lose its popularity if it was available in abundant quantities.

A comparable schedule can be drawn for the supply of a product—that is the quantity which the producer is prepared to sell at a given price (Figure C). In the long run such a supply move is likely to slope downwards to the left simply because a producer is likely to grow more and sell more of a commodity if the price is high than if the price is low.

The point at which cumulative demand and supply curves for a community cross equals the equilibrium price in a competitive market situation. That is the

price at which the quantity demanded and for sale is equal and it is at this point price tends to settle unless influenced by rationing, subsidy or some monopolistic situation.

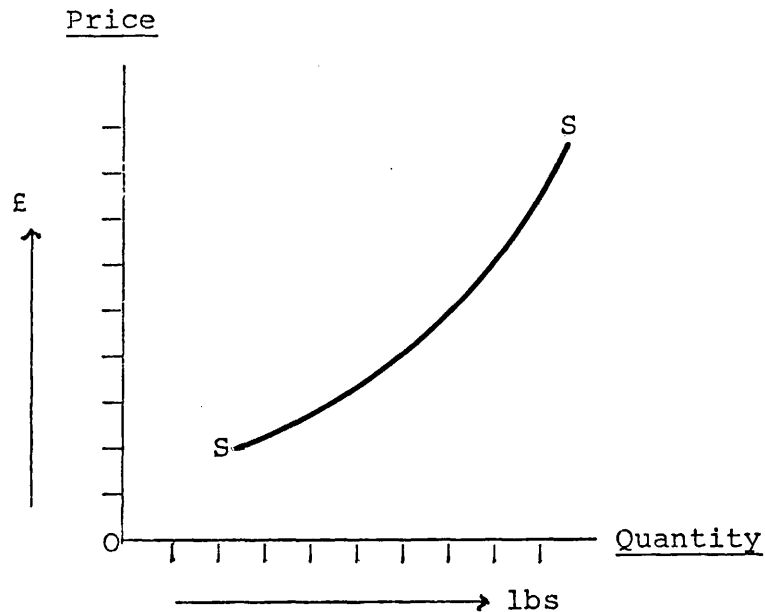


Figure C. Possible Supply of Specified Product

Undoubtedly one of the things which is evident from such an activity is that neither the supplier nor the consumer can live in isolation—one is powerless without the other.

It should also, of course, be noted that just as the demand curve for one food product will be different from another according to the interest which the consumer has in that product, so too, the supply schedule will vary from food to food according to the ease with which a product can be grown, stored, processed distributed. Hence a different supply schedule for meat against bread, as against tea.

One must also recognise that attitudes and behaviour do not remain constant. Demand and supply schedules may change bringing with them repercussions on price. Examples of this are shown in Figures D & E. Changes such as this in the demand curve may occur because the consumer has now more or less money to spend or because the price of competitive or complementary food products have changed or because their attitudes towards a product has changed. Thus, for example, in 1975 demand curves will probably have shifted because real income has gone down, because diet has been affected by the summer heat wave (for example with an increased desire for ice cream and soft drinks) and because the price of beef vis-à-vis other meat has altered.

Correspondingly shifts in supply curves may occur because the producer re-assesses the rewards he is obtaining from providing a particular commodity—

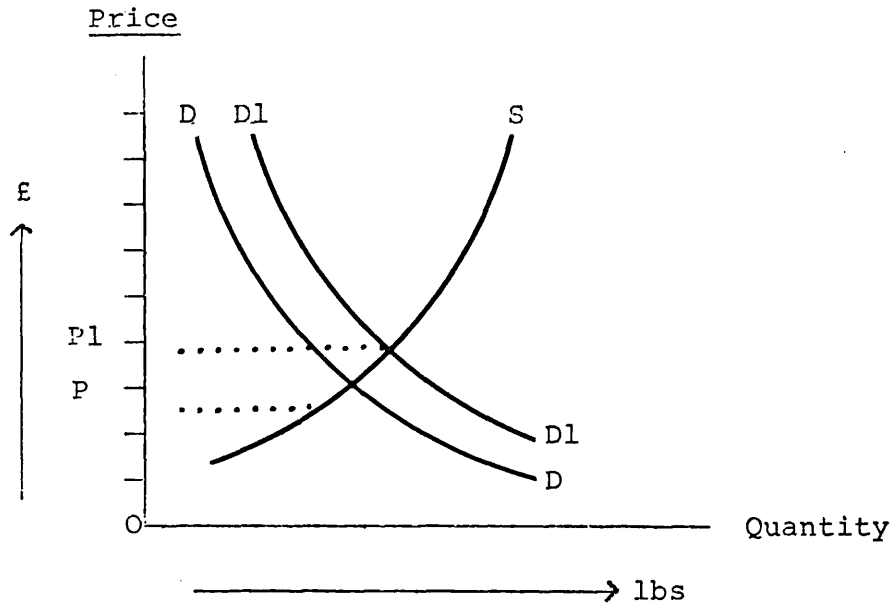


Figure D. Impact on Price of an Increase in Demand

Footnote: There is a shift in the demand curve from DD to D1D1. As a result of this increase in Demand price increases from P to P1.

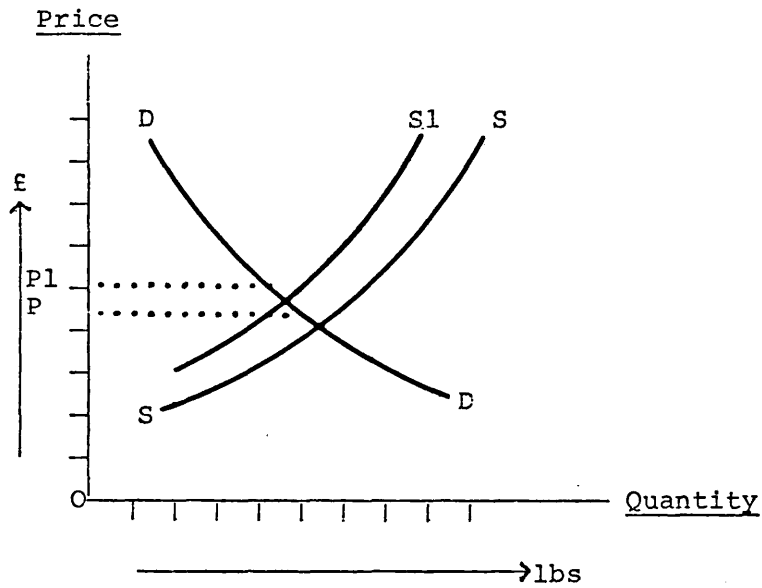


Figure E. Impact on Price of a Decrease in Supply.

Footnote: There is a shift in the supply curve from SS to S1S1. As a result of this reduction in supply, price increases from P to P1.

he may be able to sell his land off for building; alternative crops may be producing greater profits; his overall costs of production may have changed quite significantly.

One of the problems about shifts in supply is that, ignoring for the moment any stores the producer may have by him, a decision to plant more or less land with a particular crop does not lead to an immediate change in supply. Crops or cattle take time to grow! Equally, supply of agricultural products is never totally predictable. As such, adjustments may take a year or two and in the short run (say for a few months or during a particular season) supply may be totally inelastic. This explains why you may get dramatic fluctuations in price for basic agricultural commodities from one year to the next.

2. The decisions made

Perhaps the reader may be excused from wondering, as a result of the last section, how it is the consumer manages to buy anything at all, or indeed whether choice does not vacillate so dramatically from one moment to the next that no overall accurate pattern or trends in consumption emerges. In real life, however, food habits tend to remain very constant and any trends and changes in basic patterns that do occur come very slowly.

What then are the facts? The British household had at its disposal in 1974 on average a little under £50 per week. They elected to spend about 21 per cent of this on food and 5 per cent on alcoholic drink, with most of the purchases undertaken by the housewife.²

It also appears that as people get richer they tend to spend more money on food. Thus for example families with a total income of £15-£20 per week spend £5.6 on food per week as against £14.6 by families earning £80 per week or more. But equally, the actual percentage of income going on food declines with wealth. Thus for families earning under £10 per week, food accounts for one third of the total budget, whereas for families earning over £80 per week it is down to 20% of the budget³ (Table 1). This can be quite consistently explained by the fact that there

Table 1. Amount of Money Spent Weekly on Food by Families in the UK in Different Income Groups, in Absolute Terms and as a Percentage of Total Income.

Amount	Total income per week					All
	Under £10	£15-£20	£30-£35	£50-£60	£80+	
Absolute terms (£)	3.09	5.61	8.06	10.58	15.61	8.72
Percentage of total income	33	30	27	25	20	25

there is a limit to the amount of food which people want to buy. Hence as people grow richer, they spend an increasing proportion of their income on clothing, transport and vehicles and services. Equally as the Nation has prospered over the last 15 years, the proportion of income going on food has declined.

The actual amounts spent on the various foods and the quantities consumed are identified in Table 2⁴. Most money is spent on meat and meat products (74p) followed by 36p on cereals, 27p on vegetables and 15p on fruit. But these figures do not, of course, correspondingly reflect the quantities of different foods consumed per individual per week. Indeed, if we analyse the figures in

terms of cost per ounce of the various foods obtained, we get a much clearer understanding of the price rationing which occurs and of the restrictions imposed by supply on the consumers' effective demand for certain attractive foods (Table 3).

Table 2. Domestic Food Consumption and Expenditure per Member of the Family per week 1972 (expressed in ounces and pence unless specified).

	Ounces	Pence
Milk & Cream	5.05 pints	27.97
Cheese	3.53	7.16
Meat & Meat Products	37.84	73.79
Fish	5.05	10.64
Eggs	4.24 number	7.56
Fats	11.12	12.76
Sugar	17.58	6.38
Potatoes	46.70	5.79
Other vegetables	40.51	21.37
Fresh Fruit	17.54	9.46
Other fruit	6.59	5.12
Bread	34.44	14.88
Other cereals	24.26	21.19
Tea	2.24	4.81
Other beverages	1.00	4.05

Table 3. Cost per ounce of Various Foods, 1972

	Pence
Tea	2.15
Fish	2.11
Meat	1.95
Fruit	0.60
Vegetables (not potatoes)	0.53
Bread	0.43
Sugar	0.36
Potatoes	0.12

This is again reinforced if we examine how consumption and expenditure patterns change according to income. As consumers get richer there is a steady increase in consumption of milk, meat and fruit and a decline in such staples as bread and potatoes. Whilst there may be some sociological factors influencing this variation it would hardly be contentious to suggest that consumption of milk, fruit and meat are being restricted in many families by limited income (Table 4).

Table 4. Consumption of Various Foods by Families in the UK Related to Weekly Income

	Gross weekly income of head of household*						
	A	B	C	D1	D2	OAP	All
Liquid milk (pints)	5.28	4.70	4.39	4.10	4.49	4.87	4.63
Meat (oz)	41.90	40.24	38.73	37.65	39.20	41.07	39.53
Fruit (oz)	44.84	31.67	25.94	22.11	27.28	30.41	30.34
Bread (oz)	29.84	36.51	40.97	44.44	39.55	29.17	38.11
Potato (oz)	39.33	51.12	56.63	55.91	52.42	43.17	51.84

*A, £45 or more; B, £27-£44; C, £14-£27; D1, under £14 (earned); D2, under £14 (unearned); OAP, old-age pensioners.

This view was reinforced by a survey I carried out some years ago when housewives were asked to indicate the foods which they would purchase in greater quantities if more money was available (Table 5).⁵

Table 5. Foods People Would Buy More of if They Had More Money.†

Item	Total (%)	Social class *			Children		Area	
		AB (%)	C1 (%)	C2DE (%)	With children 16 and under (%)	Without children under 16 (%)	South (%)	North (%)
		Meat	46	48	53	61	42	49	54
Chicken	27	38	43	43	39	34	52	
Apples	17	26	30	34	23	28	29	
Oranges	20	24	30	34	22	27	29	
Butter	12	15	24	20	21	16	30	
Fish	19	16	20	18	20	18	21	
Milk	6	12	16	14	14	12	17	
Eggs	7	13	15	13	14	12	17	

*IPA Social Class Definitions

†Expressed as % of total sample

3. But what determines demand for an individual food?

Everything which I have dealt with so far has been concerned with explaining how consumer demand relates to price, what that demand is and what is the impact of changes in supply, or indeed demand itself. But I have not tackled the fundamental issue of what determines the consumer's demand in the first place. Why is it that the demand for frogs legs in this country is so small compared with France, whilst such a Philippines' delicacy as live mice dipped in honey seems to be seldom requested in conventional circles in London. And indeed, why is it that some people go much more for coffee, sausages or tomatoes.

I believe the basic criteria which determined the original demand schedule for a food product is dependent on four basic factors—they are:

- physiological considerations;
- socio/psychological issues;
- economic aspects;
- habit.

There are three elements that relate to the physiological aspects. Firstly, the basic taste senses have a role to play. Some flavours are rejected, whilst others are found appealing. Our taste mechanism is apparently equipped, albeit in a crude way, to screen possible foods in terms of palatability. However, here of course Yudkin has argued at some length that the food manufacturers' ability to create palatability in all food products has blurred this built-in discriminating mechanism. Also, of course, we must be careful to discriminate between basic physiological taste elements and so-called taste appeal which is influenced by all sorts of social factors.

Second comes the whole issue of the level of satisfaction and satiety achieved from the consumption of particular food items.

The third, less specific element in physiological terms might be summarised by the phrase 'innate instinct'. Much controversy exists over whether such instincts

really exist but at least some would argue that there is a built-in compulsion within us to select foods which at least give us a minimum intake of various essential nutrients and certainly, of course, we may make an allergic response to particular food items. What is clear is that there are strong fundamental requirements in most people to seek a variety of foods and in relatively abundant situations at least this will ensure a nutritionally adequate intake.

However, all of this is only the starting point for consumer choice. Since food is of such fundamental importance to us and eating is both the first act that we consciously make in life as well as the one we most frequently repeat, it is not surprising that we build up a whole series of socio/psychological manifestations around the subject. This is both in terms of images associated with the various foods themselves and with the people who consume them.

Elsewhere I have examined in some depth the various criteria at work, but the five key image attributes provided by specific foods and their preparation by the housewife may be summarised as follows⁷:

- an aid to security;
- a substitute for maternal creativity;
- a means of demonstrating group acceptance, conformity or rebellion, prestige;
- a means of demonstrating mood and personality;
- a compensation for denial, or to alleviate a crisis.

We have already talked about the amount of money available to a family for budget purposes and the way in which this money is divided between food and other activities. Having set a food budget, the housewife needs to make it work as effectively as possible. As such intuitively on the basis of the physiological and socio/psychological criteria identified, she will allocate this money between various foods. Inevitably this means some sort of rationing—hence demand, or lack of it, for a particular item. In the same way the relative cost of other competitive food items will be considered in making a final choice.

Lastly, on a day to day basis, habit becomes a fundamental issue. The very fact that last year or last week the budget was divided in such and such a way; that the main meals of the week comprised the following items; that breakfast *always* included cereals and the main meal of the day potato, are enough to ensure that similar demand is made in the coming week.

Hence on the basis of these criteria, the individual housewife determines her requirements for a given product at a particular price—and out of the cumulation of this effective demand from the six million households in the UK comes the Nation's food habits.

4. Changes in demand in the current economic climate

The current depressed economic situation accompanied by the very real pressure on income presents a fairly unique opportunity in modern times to assess how the consumer responds to a loss in purchasing power. Whilst it will be some time before the full Government statistics are available, it is already possible to glean from confidential commercial studies some of the broad trends as far as food is concerned.

Perhaps the most fundamental thing is that this decline in real income has had a very significant impact on food habits. In the short run at least it seems consumers have cut back on food expenditure before they reduce their expenditure on other

items. It is likely this is because so many other items of their budget are fixed, at least in the short run—like HP payments on the car, rent and mortgages—so that the cuts have to come out of the housekeeping. Equally, because the severity of the economic situation has hit home so hard, the housewife seems psychologically compelled to take a very critical view of expenditure in the main area for which she is responsible and impose change accordingly.

As such, it is possible to identify a number of specific trends in her behaviour. Firstly, her attitude towards shopping is changing. More and more at this time she seems to be taking time to check out comparative prices in various shops and to spread her purchasing activity around to make use of the various bargains available. Equally, there is a significant growth in sales of own-label brands from companies such as Tesco's, Fine Fare, Sainsbury's, Marks & Spencers, at the expense of the major manufacturing brand leaders.

Secondly, the housewife is viewing very much more critically her purchases of convenience products or products of appeal to only certain members of the family. Thus, there has been a big decline in the sale of products such as instant potato (except briefly during the potato shortage), complete meals, cakes, and expensive personal items such as commercial slimming aids have been very hard hit. Conversely, the housewife is spending much more time on making her own cakes and biscuits and pies. Baking is on the upswing and with it the sale of basic ingredients such as flour and suet.

Lastly, there has been a tendency to reject purchase of ready-prepared items for consumption outside of the main meal occasion. Snacks and nibbles are not seen as important and if somebody has to eat between meals now they are much more likely to be asked to make do with the odd left-overs!

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ECONOMIC INFLUENCES ON FOOD CHOICE

by John McKenzie, Ilkley College

1. Introduction

Perhaps the most significant problem facing nutrition today is not to isolate the basic relationship between nutrient intake and health but to establish means by which we can ensure that people modify their behaviour in the light of up-to-date nutritional knowledge. Certainly there is increasing evidence that to change food habits in the interest of better health is no easy task.

There are a wide range of factors which have been isolated as determinants of initial food choice and which may influence change.

In terms of basic determinants the situation was perhaps summarised best by Professor John Yudkin in his inaugural lecture to the University of London on obtaining the Chair of Nutrition in 1956. (Table I) (Yudkin, 1956)

Much more recently I have attempted to look at the situation not in terms of the factors which determine initial choice but rather in terms of the likely ways in which choice may be changed (Table 2) (McKenzie, 1977)

It will be apparent that in both instances the economic/price issue is seen to be of considerable significance. Moreover it is often suggested that this is probably the key variable of all in influencing choice. The purpose of my paper is to assess this view; to indicate the role which price plays in choice; and to suggest the limitations which occur in attempts to change food choice solely using economic variables.

2. Past Evidence of Economic Pressures on Food Choice

In 1936 Boyd Orr presented his classic study which indicated both the significance of price upon food choice for different income groups, and the ramifications of these factors upon nutritional health (Boyd Orr, 1936).

Figure I which indicates the estimated income and food expenditure by groups of the population in the 1930s demonstrates that food expenditure rose with income but of course not at a proportional rate of increase. The following figures indicate the very significant growth in consumption of products such as fruit and vegetables, meat, fish, eggs and cheese, fresh milk and butter with increase in income. The reverse position is demonstrated for products such as condensed milk, margarine. And to a large extent a static position is shown for jam, sugar, potatoes, bread, flour (figures 2-5).

If we examine the current position we find that much of the data suggested by Boyd Orr still holds true, at least in so far as price is an influence upon food choice.

Thus, in summary we can establish

- that approximately 25% of household expenditure goes on food, and that this varies between 20% and 30% according to income;
- that there is a direct relationship between food price; family income; and both total expenditure on food and the nature of consumption patterns (Table 3)
- the correlation is equally true for family size (although of course this may in part reflect the standard economic situation

(Domestic Food Consumption Survey 1978; McKenzie, 1976)

In other studies I have indicated that housewives also would buy more fruit and meat if more money were available (Table 4, McKenzie 1973).

Thus it is evident that even as we enter the 1980s, as a result of transferring a very significant proportion of income to other areas of expenditure, income still restricts our choice of more expensive foods.

3. Ramifications of recent economic pressures

Perhaps one of the most interesting findings in terms of income and price relationships to food purchase is that although food obviously represents probably the key item in self-preservation terms, there is no evidence to suggest that if households suddenly lose part of their economic wealth, they transfer a significantly greater proportion of their income towards food purchase. Indeed the opposite appears to be true; namely that in some periods of economic crisis it is the food budget that is particularly hit.

This concept may be demonstrated by examining the economic pressures of the 1970s and particularly of the mid-70s years. Here we find that the percentage increase in food prices was not comparably matched by a percentage increase in household expenditure on food.

The reason may be explained at three levels. Firstly, as costs rose on all fronts, the family was faced by fixed parts of the household budget that could not be reduced - indeed might have to be increased. One cannot readily avoid continuing to pay for the mortgage; the rates; the hire purchase on the car; and so on! And in consequence, as real income declined, the only short-term opportunities for re-budgeting lay within those fields where there is some flexibility : luxury items; entertainment and holidays; savings; and the food budget. Thus, most housewives did not obtain housekeeping budget increases during the period 1975-1977 (Table 5) (Williams, 1977)

Secondly, within any food budget there exists considerably greater room for flexibility without overt hardship. It is possible to move to cheaper brands; own label products; even close substitutes. This trend was demonstrated recently by a major market research company - Audits of Great Britain (Figure 6) (Ramsbottom, 1977)

Thirdly, there may be room to eliminate food wastage - certainly this would seem to be the most reasonable explanation for the apparent drop in household food consumption during the period (Figures 7 and 8)

4. Theoretical Price Consumption Relationships

In view of all that has been said so far, it is perhaps not that surprising to find that it is often possible to identify a direct relationship between price and purchase. The classic example is usually argued to be the cross-elasticity between butter/margarine (Figure 9). But as is demonstrated in the following figures it is possible to identify this also in terms of, for example, canned food, instant coffee, seasonable purchases. (Figures 10, 11 and 12) (Ogilvy, Benson & Mather 1978).

5. So How Important Is the Price ?

An appraisal of the points we have examined so far indicates that both price and income do have a significant influence upon food choice - and as such we can certainly isolate it both as a key factor historically in determining choice and as an influence upon future consumption patterns.

Thus, in terms of manipulation of choice, undoubtedly the use of agricultural subsidies (currently around £270 million a year and primarily aimed at milk) must have an influence, just as the decision to place a tax (for example VAT) on specific food items would have an impact.

However, an analysis of the past story also indicates that, as in so many other spheres, the price mechanism is a crude often impractical weapon which may have all sorts of unexpected repercussions. Whilst undoubtedly when directed at a brand or particular narrow product category it will have a profound influence, when used more widely it may work in a most haphazard fashion - with even the possibility of more not less of products being purchased if the price goes up! This can well be identified by reference to the percentage changes in price and consumption of a range of commodities during the 1973-1975 period. Clearly more than price was involved in an influence upon the changes, for example in flour consumption where in 1973-1974 a 48% price increase was matched by a 1% increase in consumption as against 1974-1975 where a 2.3 % price increase resulted in a decline of 2.6 % in consumption (Table 6).

Undoubtedly such issues as the 'essential' nature of the food; the nature of its substitutes and their price; what happens to other foods which compete or complement; and so on, are of considerable significance.

To summarise therefore, price/income undoubtedly has an influence - but only of a limited and crude nature. The point may perhaps be well identified by reference to a table upon which all foods have been placed. Whilst price will ensure that for certain individuals at least particular items may be removed from the table, and in consequence from choice, it is unlikely to have

overall significance on the combination of foods chosen from those that remain.

Above all it will not ensure that food is selected by the housewife operating as a gatekeeper in a way which is most beneficial to the family as individuals. Equally the decisions as to which items are selected from those remaining on the table will be primarily influenced by cultural, social and psychological pressures - issues to which other will refer in greater detail at this conference.

Factors Determining Food Choice

Physical :	Geography
	Season
	Economics
	Other
Social :	Religion and Social Custom
	Social Class
	Education in Nutrition
	Advertising
	Other
Physiological :	Heredity
	Allergy
	Therapeutic Diets
	Acceptability
	Needs

Do It Yourself Food Change Guide

1. Move with the trends
2. Identify needs and attitudes
3. Conceal changes within foods
4. Watch for effect on overall behaviour pattern
5. Import controls, price manipulation and rationing
6. Products on shelf at right price
7. Realistic commercial operation

TABLE 3

Consumption of Various Foods by Families in the U.K. related to Weekly Income 1977

	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>OAP</u>	<u>ALL</u>
Liquid Milk (pints)	4.80	4.50	4.43	4.34	4.73	4.54
Meat (ounces)	42.89	37.87	37.76	38.52	39.00	38.58
Fruit (ounces)	33.19	24.02	20.12	17.32	23.63	23.52
Bread (ounces)	25.92	31.73	34.49	37.71	35.40	32.73
Potato (ounces)	29.24	39.09	44.75	51.74	37.01	40.79

TABLE 4

Foods People Would Buy More of if They Had More Money.†

Item	Total (%)	Social class *			Children		Area	
		AB (%)	C1 (%)	C2DE (%)	With children 16 and under (%)	Without children under 16 (%)	South (%)	North (%)
Meat	51	46	48	53	61	42	49	54
Chicken	40	27	38	43	43	39	34	52
Apples	28	17	26	30	34	23	28	29
Oranges	28	20	24	30	34	22	27	29
Butter	21	12	15	24	20	21	16	30
Fish	19	19	16	20	18	20	18	21
Milk	14	6	12	16	14	14	12	17
Eggs	14	7	13	15	13	14	12	17

*IPA Social Class Definitions

†Expressed as % of total sample

TABLE 5

Husbands' contribution to housekeeping money in May 1977

	husbands with net weekly earnings			
	below £40	£40 to £80	over £80	all
average contribution to housekeeping	£25.90	£27.30	£29.80	£27.40
average increase in contribution 1976-77	12%	16%	20%	16%
percentage of husbands paying no increase (according to wives)	44%	29%	28%	31%

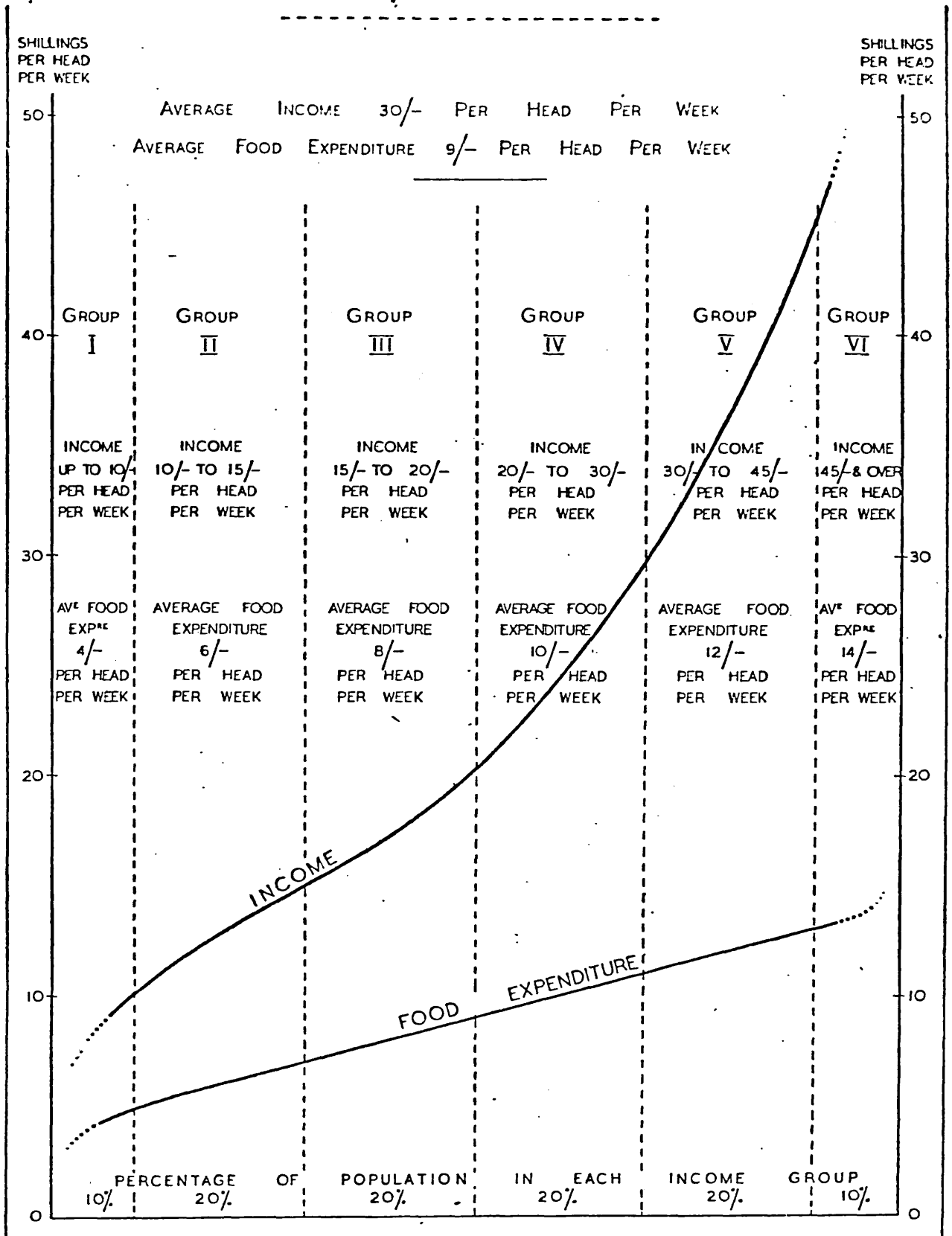
TABLE 6

SOME CHANGES IN FOOD PRICES AND CONSUMPTION

	1973-4		1974-5	
	Price Paid	Volume per capita	Price Paid	Volume per capita
Flour	+48.0%	+ 1.0%	+ 2.3%	- 2.6%
Bread	+25.3%	+ 0.2%	+14.5%	+ 5.4%
Buns, Scones	+28.2%	-12.1%	+14.4%	+19.1%
Cakes, Pastries	+24.6%	- 6.2%	+25.3%	-11.2%
Jam	+14.8%	- 3.4%	+44.8%	+ 4.3%
Margarine	+24.2%	-14.2%	+26.0%	=
Butter	+ 6.1%	+ 7.1%	+27.4%	+ 0.4%
Cooking fats	+26.3%	- 0.6%	+18.5%	+ 8.2%
Beef & veal	+ 2.2%	+17.4%	+ 8.5%	+12.3%
Mutton & lamb	+ 0.7%	- 7.4%	+ 6.0%	+ 3.4%
Pork	- 3.6%	+ 6.7%	+24.7%	-14.7%
Poultry	- 1.2%	-14.9%	+21.0%	+11.0%
Fresh Green veg.	+14.0%	+ 1.8%	+24.2%	- 8.9%
Canned Beans	+45.0%	- 5.3%	+15.6%	+ 7.0%
All Food (Index)	+18.0%		+25.6%	

FIGURE 1

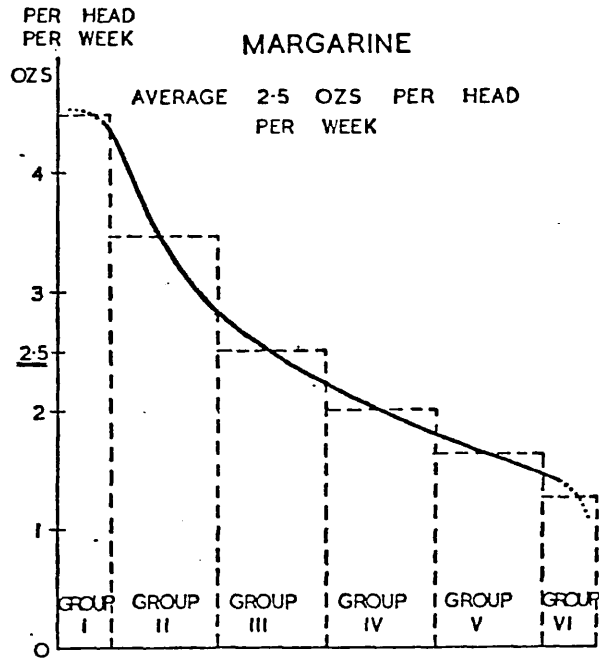
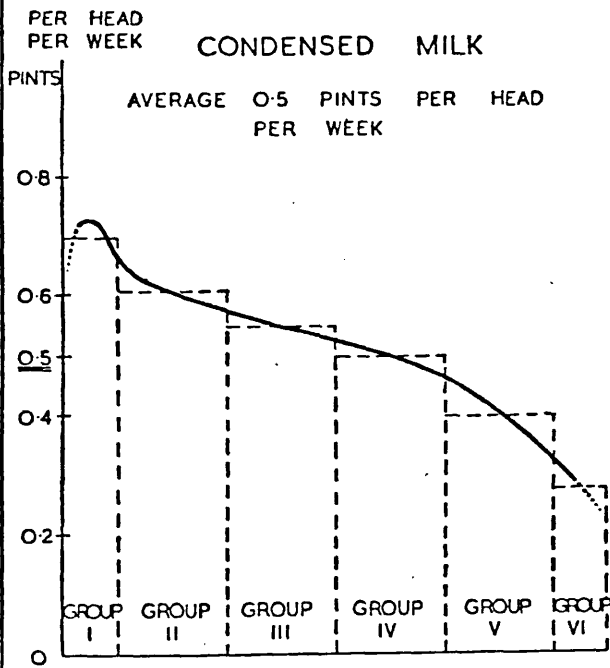
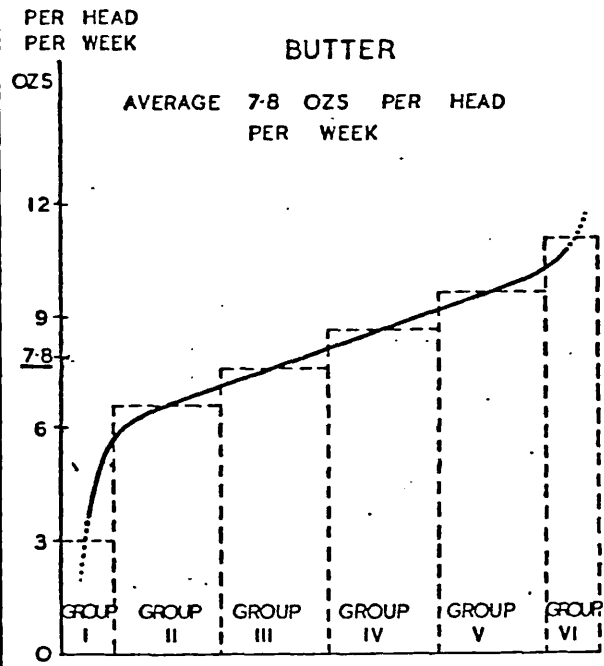
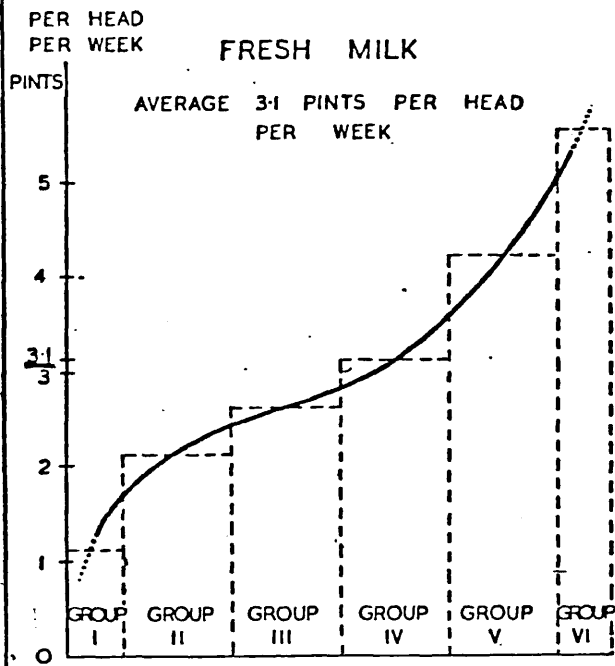
ESTIMATED INCOME & FOOD EXPENDITURE BY GROUPS OF THE POPULATION



ESTIMATED CONSUMPTION PER HEAD OF CERTAIN FOODSTUFFS BY

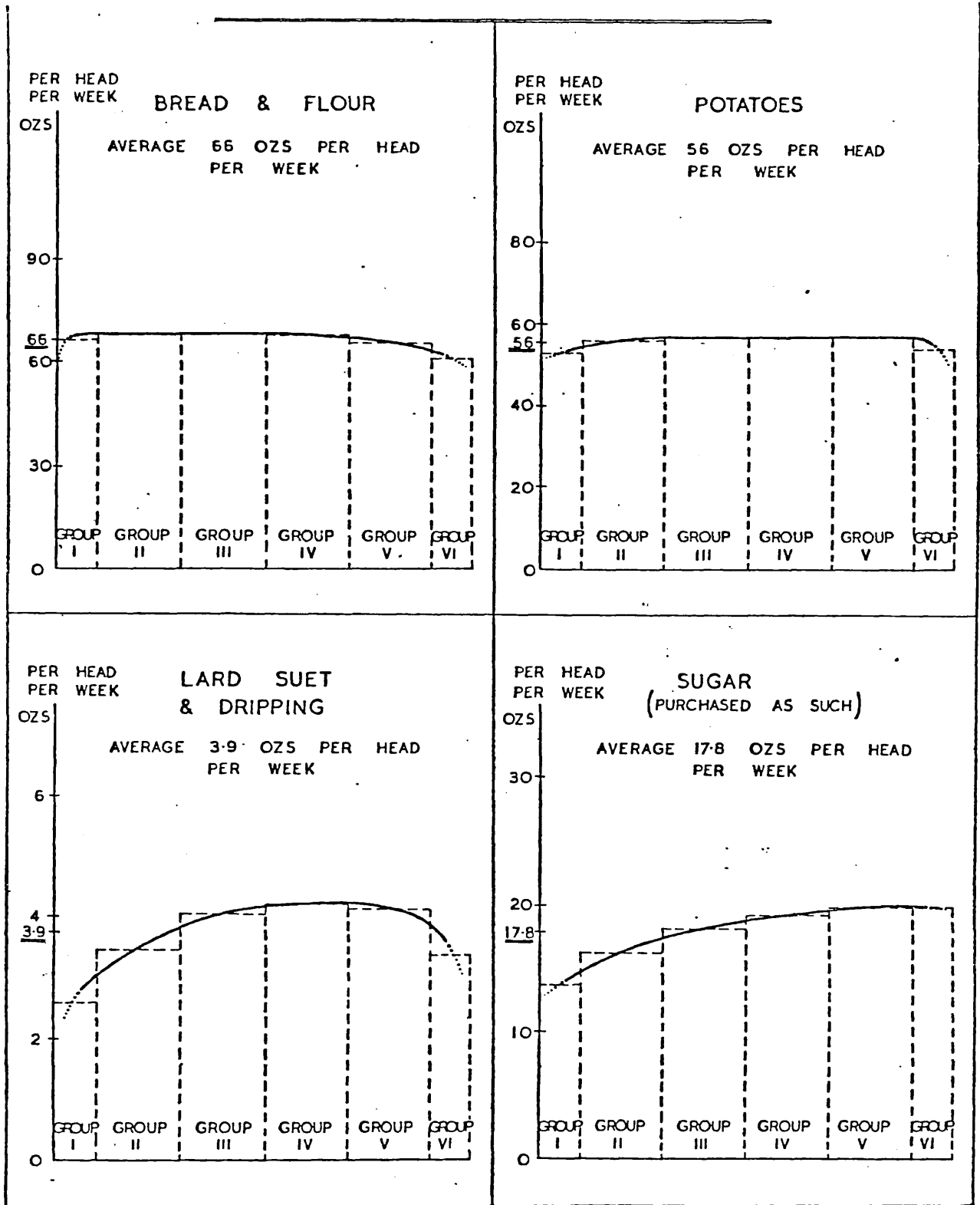
FIGURE 2

INCOME GROUPS



ESTIMATED CONSUMPTION PER HEAD OF CERTAIN FOODSTUFFS BY INCOME GROUPS

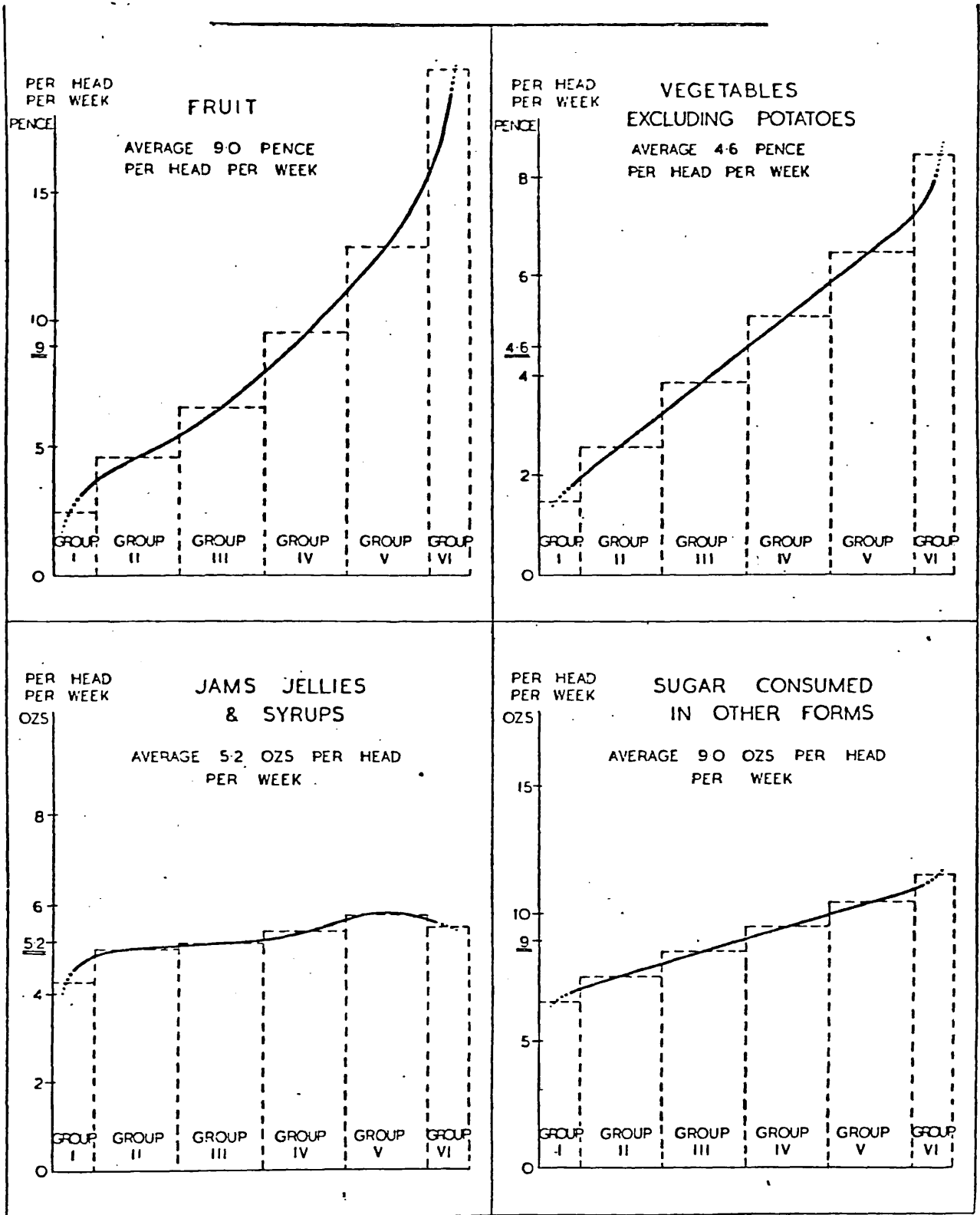
FIGURE 3



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ESTIMATED CONSUMPTION PER HEAD OF CERTAIN FOODSTUFFS BY INCOME GROUPS

FIGURE 4



ESTIMATED CONSUMPTION PER HEAD OF CERTAIN FOODSTUFFS BY
INCOME GROUPS

FIGURE 5

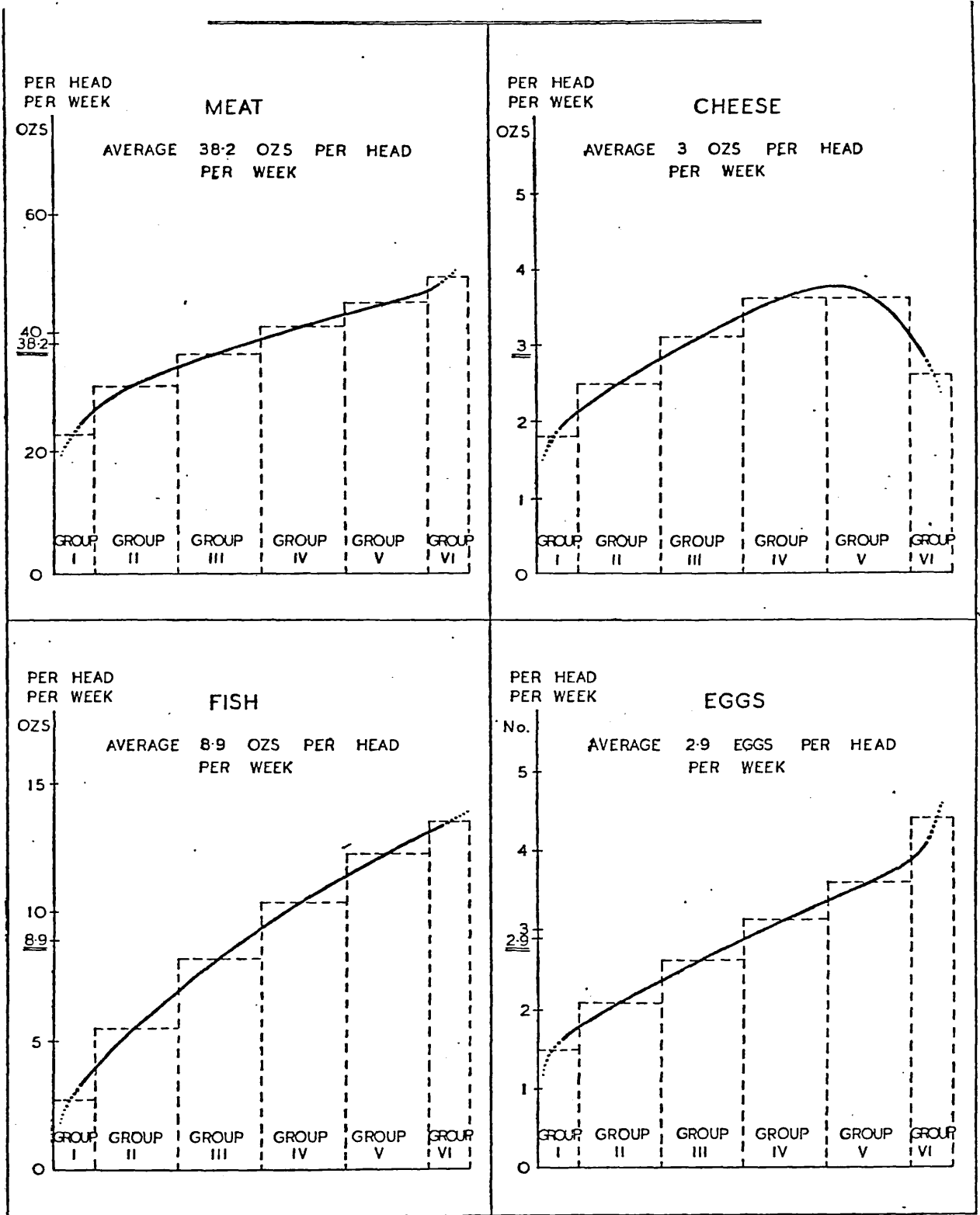
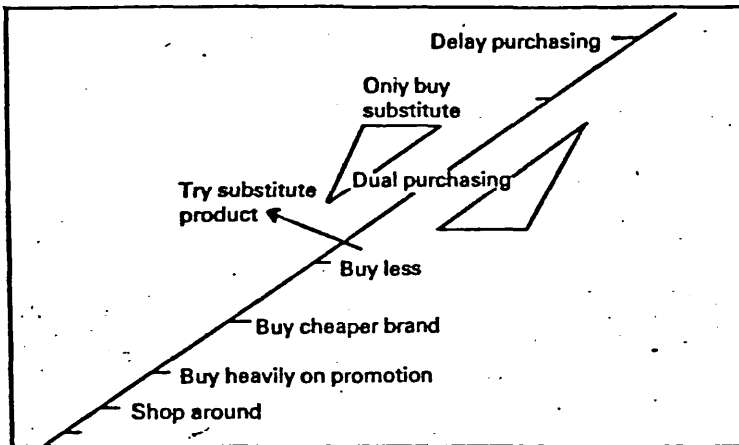


FIGURE 6



Modification of purchasing behaviour (after Ramsbottom, 1977).

FIGURE 7

DOMESTIC FOOD CONSUMPTION
Ounces Per Head Per Week

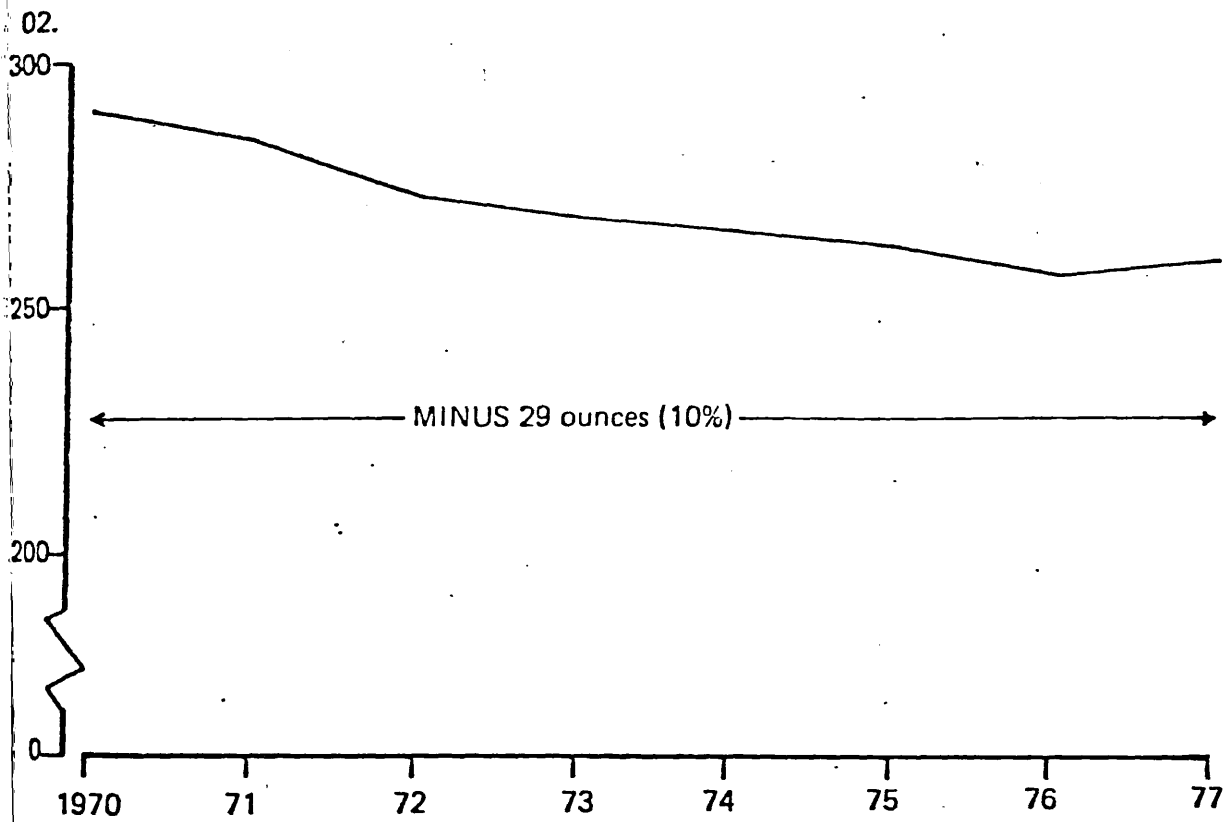


FIGURE 8

DOMESTIC FOOD CONSUMPTION
% Change — ounces per head per week
1970 — 1977

%
Change

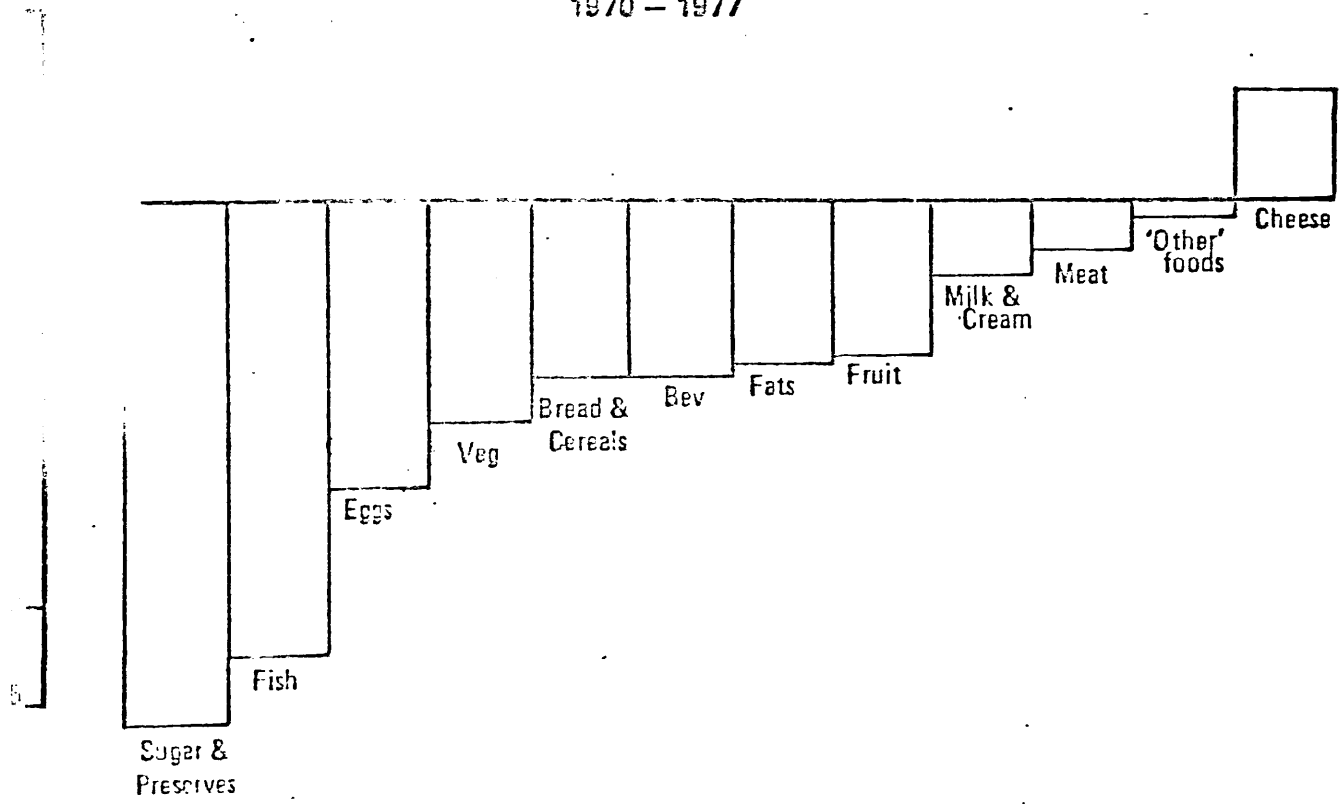
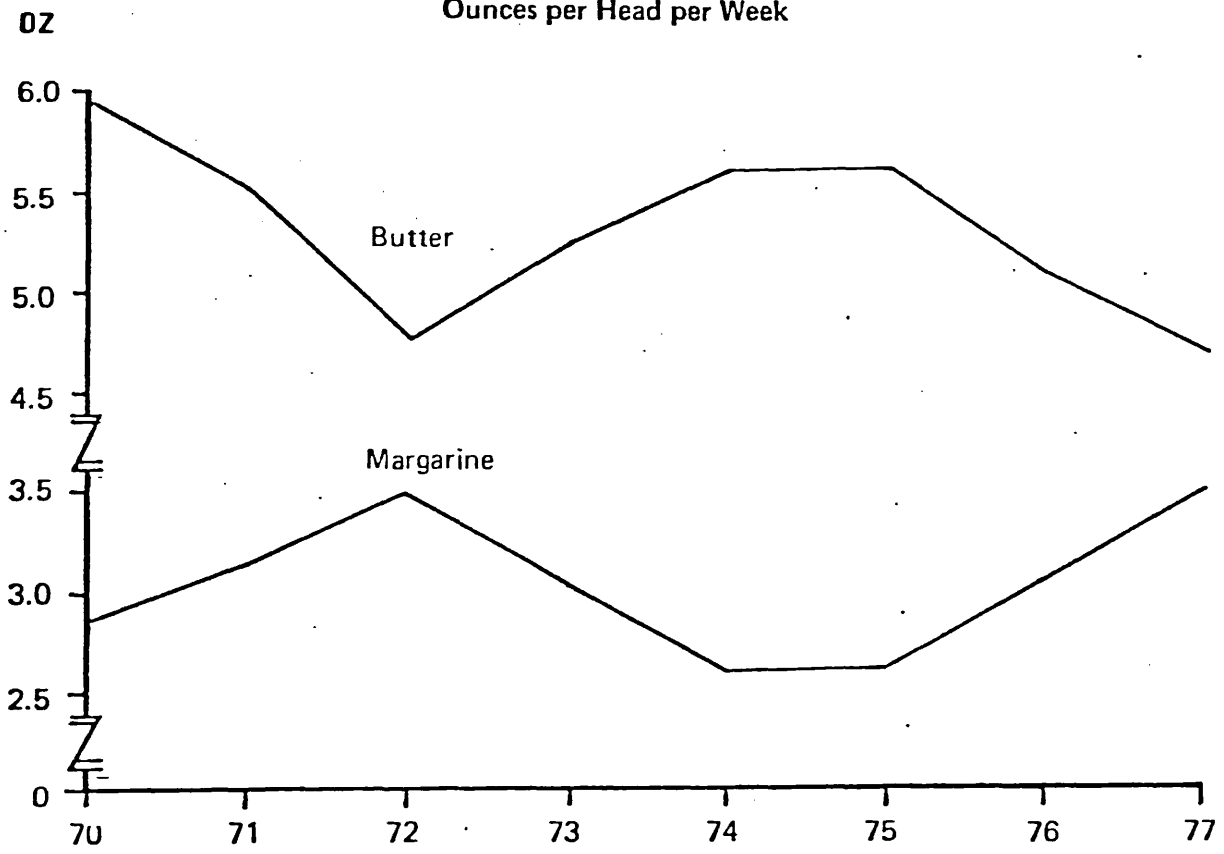


FIGURE 9

DOMESTIC FOOD CONSUMPTION – BUTTER AND MARGARINE
Ounces per Head per Week



% change
on year ago

PERCENT CHANGE IN PRICE PAID AND HOUSEHOLD PURCHASES
ALL CANNED FOOD

FIGURE 10

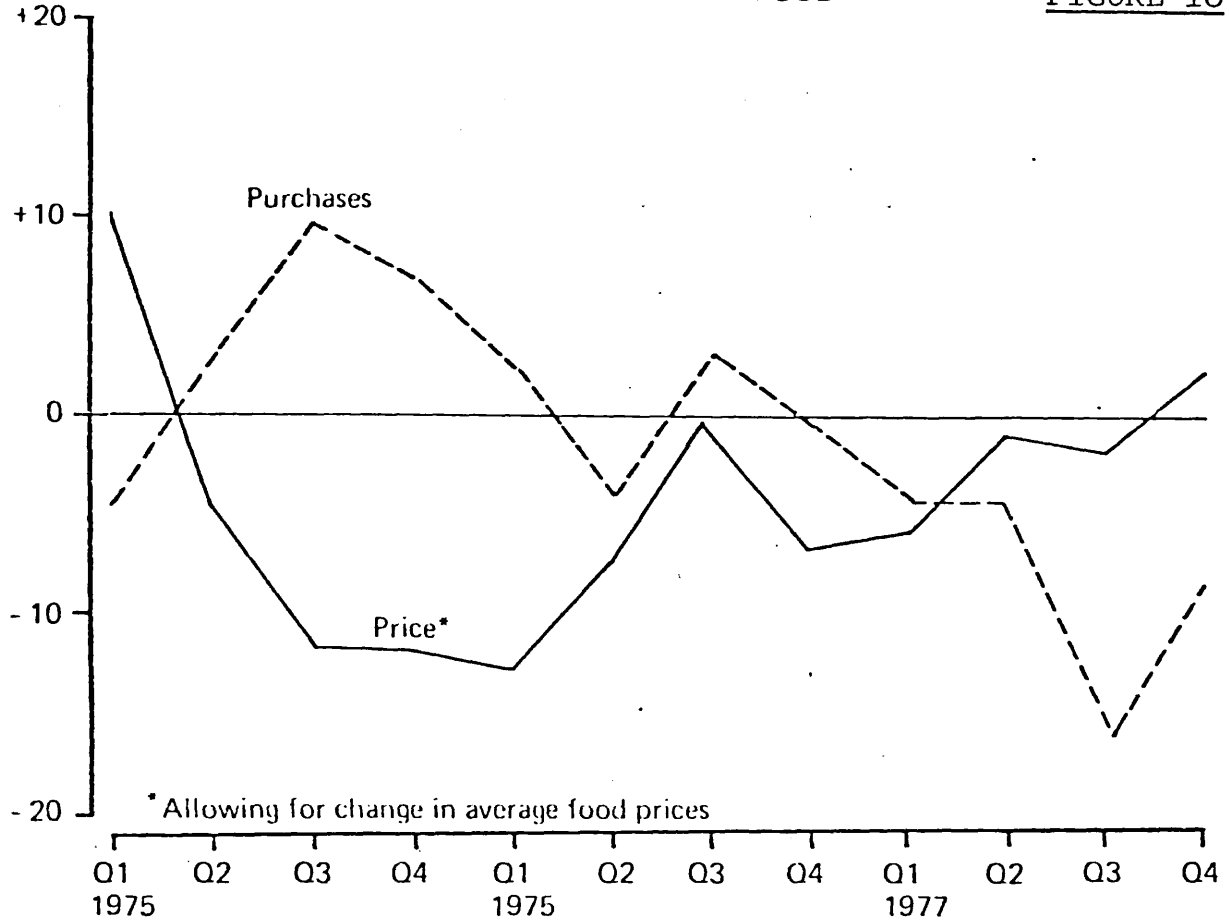


FIGURE 11

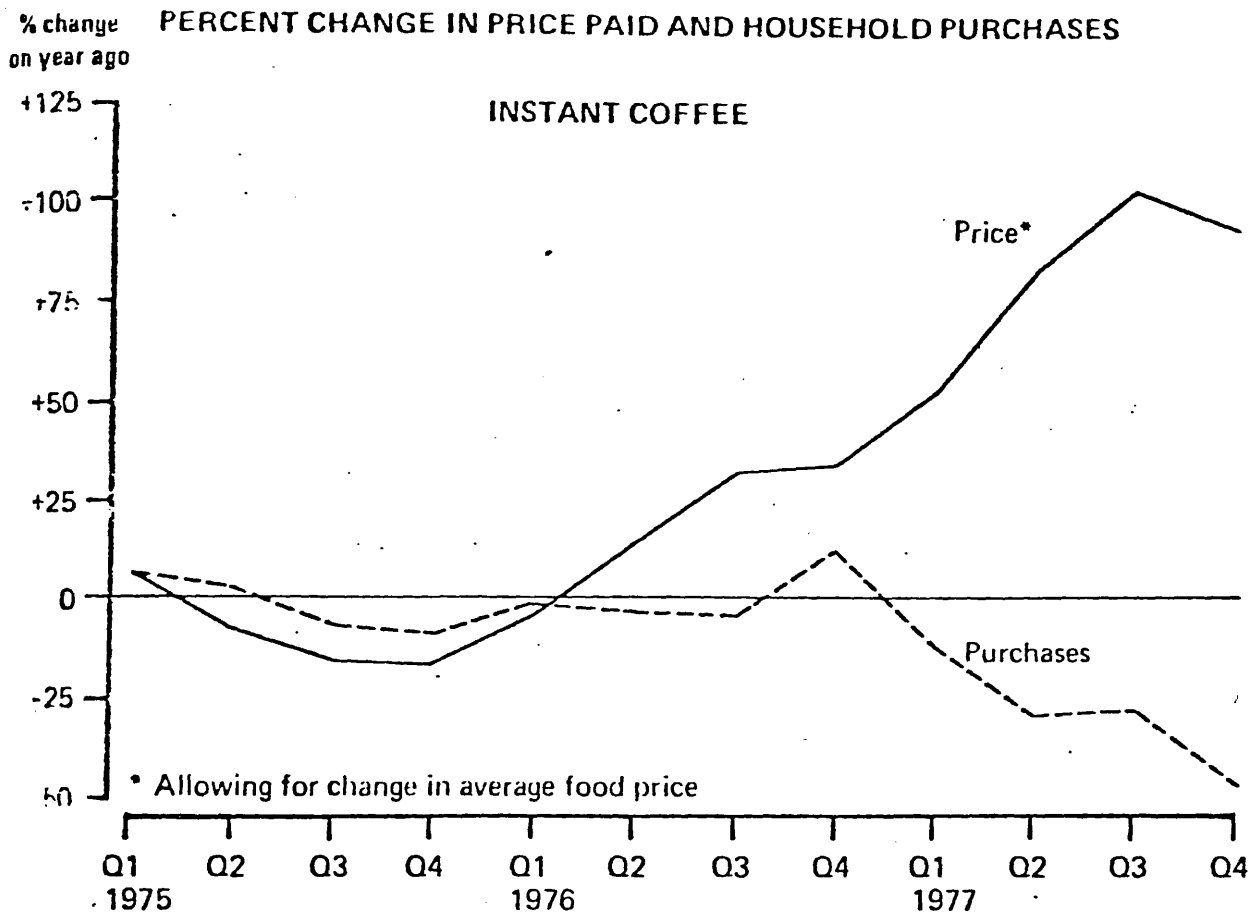
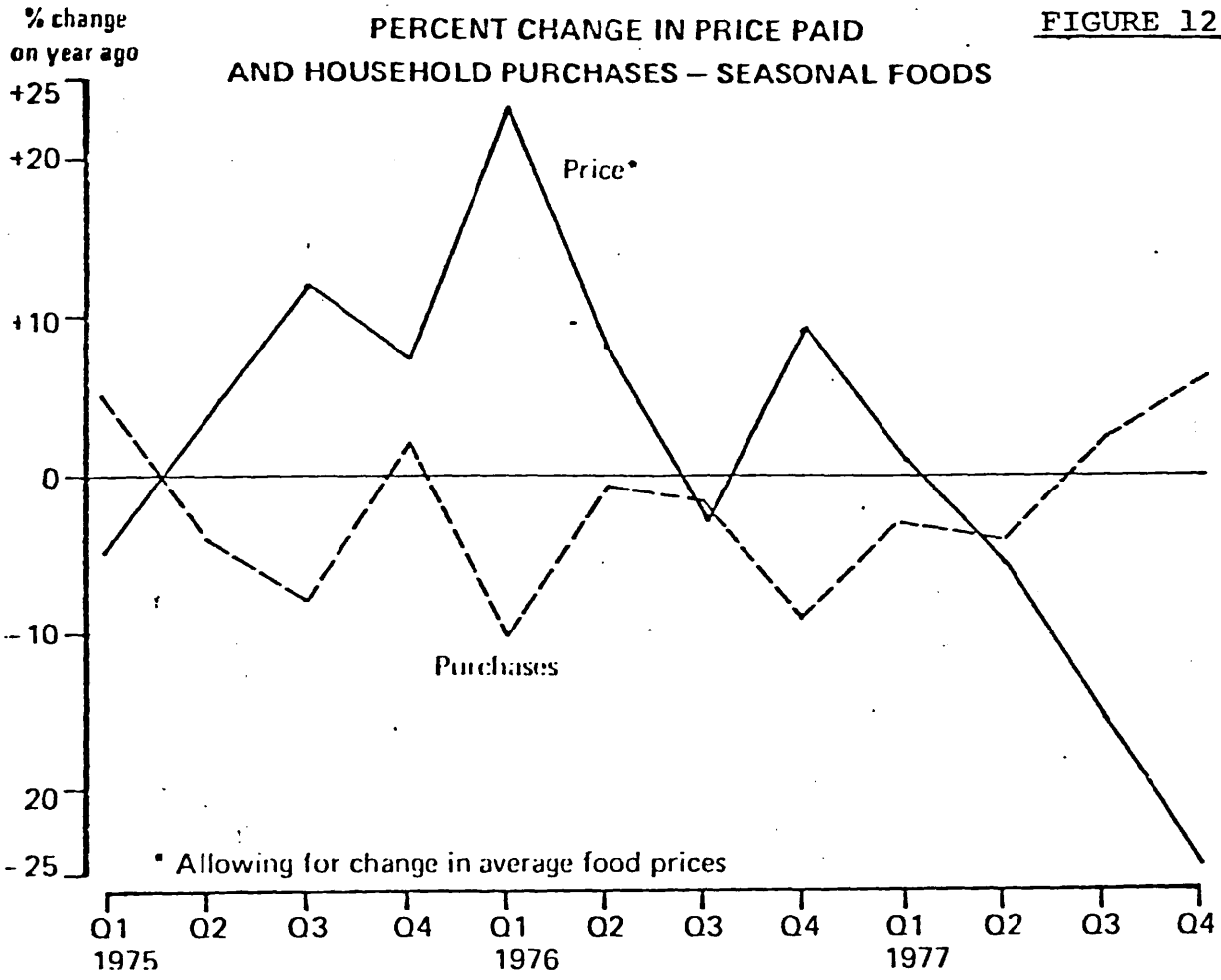


FIGURE 12

PERCENT CHANGE IN PRICE PAID
AND HOUSEHOLD PURCHASES – SEASONAL FOODS



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4

FACTORS AFFECTING DEMAND FOR
PROTEIN PRODUCTS

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'People can only consume products which are available.'

Such a statement may seem a particularly naive way in which to introduce a paper on factors affecting demand for protein products, but in essence perhaps the only clear and explicit assertions which can be made concerning demand by the consumer concern those aspects of what we tend to call availability. Availability of food means that it is physically there and we have the means to buy it. As such we can move from day-dreaming desire to *effective* demand – demand that can be activated. Whatever we may want to eat, we can only consume products which are physically available, are fresh or have been preserved in such a way that they have not completely deteriorated, and which we can afford to buy.

Unfortunately, whilst it is on such limited bases that most scientists have developed new food products and supplements, in reality to the individual consumer they only reflect the starting point from which selection of foods is made. They indicate foods that *can* be chosen, not necessarily which *will* be chosen. Thus, by analogy, availability may be portrayed as a table full of all the possible foods from which one may choose, but the mechanics by which individuals select particular items, if any, are a good deal more complex.

It is these less tangible demand criteria with which I wish to concern myself today. Others at this symposium have projected estimates concerning protein requirements in both the developed and the developing world and it is for the scientist and politician to make sure that these requirements are matched by availability.

But what are the criteria which lead us to choose particular foods and reject others? What are the ways by which we can encourage individuals to go for particular items?

Let us get one thing straight right from the start. Choice does not adequately reflect nutritional needs. Humans do not normally go for the foods that will do them good and which will satisfy their deficiencies,

either by intuition or as a result of learning. People do not usually crave for suitable foods or go for the right ones because they have been told to do so.

The basic criteria on which demand is fashioned are threefold – taste, fashion, habit. People have inherent preferences for particular tastes, others they learn to like over time, others corrupt their palate with experience. But all have some influence on food selection, if only in an arbitrary way distinguishing sweet or sour, bland or spiced.

The sociological phenomena involved with fashion are considerably more complex. In selecting a particular product, for example, one may be:

‘Keeping up with the Joneses’;

Satisfying some cultivated need or instruction put forward by advertising;

Projecting the image of oneself one would like others to see; or

Conforming to social patterns or rebelling against them.

One knows that nutritional requirements have only a very small role to play in selection of food, but one cannot help conjecturing somewhat cynically, as one explores this area, as to whether or not food has anything to do with the issue at all!

Lastly, selection is most strongly hidebound by habit. What we select today is almost totally predetermined by what we selected yesterday. If a decision-making process ever took place in our minds it has usually been forgotten long since; at 11 o'clock we now simply ask for or weakly accept a cup of coffee; we no longer contemplate why we act in this way, we just do.

The points I have made here directly relate to experience in Western Europe, but they are equally relevant for developing countries. The same sort of symbolism was very aptly demonstrated by Miss Whiteman (1966) in a table some years ago (Table 1). Thus the position is clear in terms of the problems affecting demand for protein in the coming years. We can easily make foods available, but we cannot ensure that the products are selected.

Thus to my mind a major problem in both developing and developed society is not only to make protein foods available but also to actually ensure that they are consumed, that is, that they taste right, are fashionable and become part of the food habits of the community. How can we ensure that a demand exists for these products?

First, we could best achieve the situation by the ideal of providing what people want, namely, the highly palatable animal protein foods they go for whenever possible. Some years ago I conducted a major survey amongst members of the public who were asked, amongst other things, to identify the foods they would like to have more of and the food they find it difficult

Table 1. *The comparison of social functions of food in the United States and the Trobriand Islands*

Function	American society	Trobriand society
For prestige status and political power	The giving of cocktail parties, banquets, dinner parties, etc., on a scale suited to one's social position; agricultural programmes, etc., related to national and international politics	The public display of yams grown or given away; receiving of urigubu* by chief and its redistribution by him; display of best yams in open store houses and in prominent places in the village by men of importance
Economic purposes and the use of food like a currency	The giving of Christmas presents, business dinners, etc., in order to establish favourable business relationships between people	The barter of vegetables for fish and vice versa; gifts of food in return for services, articles of value, articles requiring skill in their making or repayment for gifts received; all these act as an incentive for the economic production of food
Fulfilling social and kinship obligations; establishing friendly relations	Day to day family meals which are a social event in most households; meals eaten with friends at home or out; wedding receptions, etc.	Urigubu payments of food by brother to his sister's husband; in the case of a chief a brother's kin group help him with his urigubu payment; urigubu demonstrates the ties a married woman has with her natural group.
Recreation	Pleasure of eating with friends	Pleasure at seeing the display of food
Aesthetic and creative satisfaction	Banquets, private dinner parties, etc.; the cooking of special dishes	Sight of public display of food; satisfaction of careful cultivation of gardens which also demonstrate the skill of the gardener if they produce well; bragging about one's skill as a gardener
Religious significance and satisfaction	Jewish, Mormon, Seventh Day Adventist and Roman Catholic observances regarding food	Public displays of food at harvest time to please the visiting ancestral spirits

Table 1 (cont.)

Function	American society	Trobriand society
Symbolism, mythology and superstition	Communion bread and wine; some fattening and slimming foods, when without scientific justification; fish being a brain food; oysters causing sexual potency	Funeral rites; mythology of origin of garden magic and land-ownership
Magical significance	Throwing salt over the shoulder to ward off bad luck	Special kinds of fish required for the performance of some magical rites
Ceremonial	Christmas and Thanksgiving dinners	Funeral feasts
Legal		Urigubu initial payment sanctions marriage and is a form of endowment; the boy and girl eating together in public is an indication that they are married
Medicinal	Senna pod tea; slimming foods	For diarrhoea, bananas in their skins are washed and boiled and the cooking water drunk

* Urigubu is the name given by the Trobriand Islanders for the system of gifts of goods and services that a man gives to his sister throughout her married life. Usually about half the produce of his garden is given away ceremonially in this fashion to the husband of his sister. In return the sister and her husband produce and bring up children who are members of the brother's kin group and who will eventually inherit from their uncle.

Table 2. Foods people would buy more of if they had more money

Item	Total (%)	Social class				Children		Area	
		AB (%)	C1 (%)	C2DE (%)	With children 16 and under		South (%)	North (%)	
					With children 16 and under (%)	Without children (%)			
Meat	51	46	48	53	61	42	49	54	
Chicken	40	27	38	43	43	39	34	52	
Apples	28	17	26	30	34	23	28	29	
Oranges	28	20	24	30	34	22	27	29	
Butter	21	12	15	24	20	21	16	30	
Fish	19	19	16	20	18	20	18	21	
Milk	14	6	12	16	14	14	12	17	
Eggs	14	7	13	15	13	14	12	17	

to do without for any length of time (McKenzie, 1970). The results are shown in Tables 2 and 3. This in fact takes one step forward projections based quite simply on the poundage (or I suppose, more scientifically, in 1971 on the grams) of various food types we eat each year and on the ways in which the proportions consumed are changing.

Table 3. *Foods people hate to do without for a month or two*

Item	Total (%)	Social class			With children 16 and under (%)	Without children under 16 (%)
		AB (%)	C1 (%)	C2DE (%)		
Butter	58	64	62	56	57	59
Milk	58	59	61	56	57	58
Tea	54	45	52	55	49	57
Meat	50	58	55	47	56	44
Eggs	47	53	53	44	51	43
Sugar	29	27	25	30	33	26
Bread	28	23	28	29	29	28
Cheese	27	30	29	26	26	27
Potatoes	17	14	16	17	20	13
Apples	16	21	22	14	16	16
Fish	16	22	18	14	14	17
Coffee	15	26	19	12	18	13
Oranges	14	19	17	12	14	14

Comparable studies for the developing world might easily be made, and, indeed, in terms of volume turnover per product category have already become commonplace (McKenzie, 1966).

If we cannot give people simply what they want, the next easiest step is to provide protein or other nutrient supplements which may be added to existing foods. This has a number of advantages:

(a) It enables people to continue with their established, well tried food patterns.

(b) It enables one to overcome inherent deficiencies in the diet without forcing them to change from the foods they like – protein-supplemented Coca Cola rather than no Coca Cola!

(c) It is easier to make people wear crash helmets than it is to stop them riding motor cycles; in other words one is making positive recommendations for additions to a diet rather than negative recommendations to stop eating things. And most people react better to the first line of approach.

(d) 'What the eye does not see the heart does not grieve for' – it may be possible to add supplements 'secretly' so that nobody knows. This may

not necessarily imply deceit but simply lack of general publicity; how many people are really aware that we add supplements to flour?

Once past this stage one is really in the nitty gritty of persuading people either to eat new foods or products already around but which they have not regarded as food for human consumption. Both are considerably more difficult tasks to succeed with than were the earlier suggestions.

There are many reasons for this. The advantages of the *status quo* are usually self-evident. Moreover,

it must be recognized that if change involves anything more than a switch of two identical brands of a particular type of food, then it sets off a series of complex interrelated movements. In essence all foods are competitive with each other. At a physiological level once in terms of bulk we have enough to eat, increased consumption of one food tends to lead to the reduction in consumption of another.

Similar interrelationships exist both in economic and socio-psychological terms. Most people have a relatively fixed amount of money which they are prepared to spend on food, at least in the short run. A change in the amount spent on one set of food products automatically leads to a change in the amount of money available for other food products. Similarly, a change in one food may change the whole meal pattern because only certain foods are regarded as acceptable in combination with others.

The marketing implications of the two issues outlined are clear. To sell a product it must be shown to satisfy needs at least as effectively as foods already consumed. In addition, because one item in the diet cannot be changed without a whole series of repercussions on overall choice, some support must be provided to justify these resultant total responses. This is why commercial involvement is so important - these sorts of problems frequently face the businessman. He is always working in competitive situations. Most cigarettes marketed at a given price and using a particular type of tobacco have a similar appearance and taste. Most tins of canned fruit will have the same basic constituents as each other. Thus once price has been settled and the taste found to be acceptable, the job of selling has only just begun. Complex advertising themes will be required to encourage the consumer to believe he needs these products and that this packet of cigarettes or that tin of canned fruit is the best brand to buy. When the problem involves a totally new type of product the task becomes of even greater importance (McKenzie, 1969).

How can we successfully achieve the requisite change in these

Table 4. *Key information required before initiating sale of new product*

Area	Type of information required
1 Product usage	When is the product likely to be used, and with what foods will it be combined? Will it blend well with these foods?
2 Product competitiveness	With what other foods will the product effectively be competing? Can it successfully demonstrate some acceptable superiority? If the product is a supplement to be added to existing foods during preparation, then can methods of justifying this addition be substantiated?*
3 Impact on food habits	Does its acceptance require any major or minor modification in eating habits? If so, can these changes in consumer behaviour be successfully achieved?
4 Equipment required	Is any new equipment or cooking procedure necessary? If so, can the housewife be easily persuaded to make this change?
5 Storage	Does the product require any special type of storage arrangements? If so, will these special facilities be available and acceptable?
6 Advertising copy	How can advertising copy be designed to indicate effectively the fulfilment of a need, overcome competitive products, and justify changes in behaviour?†
7 Name	What, from the consumer's viewpoint, would be a suitable name for the product?
8 Packaging	What sort of packaging would be most acceptable to the consumer?

* The superiority or justification will not be in health or nutritional terms but in terms of appeal based on taste, better fulfilment of psychological needs, etc.

† This will imply general knowledge of the consumers' motivations.

circumstances? It will of course help a good deal once we recognise the problem and all too often people seem to have difficulty in doing this. Ever since the Cuernevaca Conference in 1960 we have had a text book identifying the problems but this has been frequently ignored (Burgess & Dean, 1962). Over and above this we must get the facts about the food habits of a particular community before we can hope to effect any change. Such essential data must cover the areas identified in Table 4. Then we shall be aware of the real problems to be dealt with and indeed whether any change of plan on our part can ease the situation.

Once the task is tackled scientifically in this way many of the apparently insoluble problems disappear, and the commercial world is being increasingly adroit in dealing with the rest; thus in an earlier paper (McKenzie, 1965) I have suggested ways in which conflicting needs may be accommodated. However, it must still be acknowledged that, on

occasions, the task is too great and then we would do better to accept defeat and try a different line of approach rather than labour on trying to persuade a community to modify its food habits in a way they find unacceptable.

One last word however; often the food industry has been conspicuously unsuccessful in selling desirable nutritional products, especially in developing countries. The reasons for this may be many. But in many instances

I believe that if we carry out a post-mortem on attempts to sell nutrient supplements or change food habits, it is evident that even the businessman has often not studied the social and psychological problems involved when planning his marketing strategy. Perhaps this has been partly due to the false assumption that these problems are less significant and these patterns are less complex in developing society. Perhaps it is that some salesmen have for the first time become really convinced that the products they are trying to sell are really good and that in these circumstances they imagine they will be successful without persuasive encouragement. Whatever the reason, it seems that in this context too often the marketing men have at worst left at home or at best skipped a couple of pages in their text book on how to sell products (McKenzie, 1969).

The implications of what I have said, if you find it acceptable, are inevitable. Hard as we labour to provide acceptable protein products and other nutrients over the coming years, the crucial decision in attempts to provide a better-nourished community will not rest with the scientist or politician but with the individual consumers. This is both refreshing and sad, refreshing in that in our increasingly mechanistic world the individual can still have a significant role to play, sad in that at least a proportion will not decide in the best interests of their health and welfare.

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3. Poverty: Food and Nutrition Indices

J. C. McKenzie

One of the most difficult problems to deal with is one which a community does not believe exists. Such a statement in many ways summarizes the major difficulties concerning any evaluation of nutritional deficiencies in the affluent society. In developing countries there is no debate as to whether or not people are mal-nourished. This can be obviously and fairly simply demonstrated just by looking at the population and the conditions in which they have to live. In consequence the debate becomes one on the extent of the problem and the best ways of dealing with it. But in the so-called affluent world many are not prepared even to consider whether or not any problem of malnutrition still exists and certainly there is no longer very obvious visual evidence of chronic deficiencies to remind them. In this area, therefore, the major issue becomes one of isolating the key nutrition indices and of indicating in real terms the nature and extent of the problem, if indeed a problem exists.¹ As such this chapter will be concerned primarily with isolating the indices, indicating limitations and pointing out the problems surrounding such measurements. They will be considered in the context of a study to assess whether or not there are any indications of malnutrition in the United Kingdom.

*The United Kingdom: A Case Study*²

The economic and social history of the twentieth century paints a picture of substantial improvement for the community as a whole. Poverty and hardship for large sections of the population in the 1920s and 1930s was replaced in the 1950s and 1960s by full employ-

1. It is possible that this problem of non-awareness is the key issue not only of malnutrition but also of poverty generally and that throughout this paragraph the word 'poverty' might appropriately be substituted for 'malnutrition' and 'nutritional deficiencies'.
2. Much of this section of the chapter is based on an Office of Health Economics booklet, *Malnutrition in the 1960s*, June, 1967.

ment and the attractions of a 'boom' economy. I shall review the extent to which the nutritional status of the United Kingdom population has shown a similar improvement over the period. Such an investigation requires the collection and assessment of several types of evidence and I will examine each in turn. Information is required on the food consumption and nutrient intake of the population. Details of clinical examinations are needed to indicate the extent to which health has been affected by differing diets. The results of biochemical tests may be used to indicate the level of nutrient reserves within the body. The study of vital statistics and anthropometric data will demonstrate the impact of dietary variations. Too often in the past attempts have been made to investigate the nutritional status of a community using only one of these methods and unjustified deductions based on these findings have been published. Only after an examination of all these areas and their inter-relationship can an adequate assessment of nutritional status be made.

Dietary Intake and Nutrient Requirements

Evidence on the dietary intake of the population of the United Kingdom has rested mainly with the National Food Survey. This is a continuous sampling enquiry into the domestic food purchases of private households in Great Britain. A sample is selected by means of a three-stage stratified random sampling scheme. In 1964 the effective response rate was only 52 per cent.³ The housewife is asked to keep a record of the description, quantity and cost of food which enters the household during one week. Items such as soft drinks, ice cream, alcohol and other items likely to be purchased by the other members of the family are not included.

The energy value and nutrient content of the recorded quantities of food are evaluated using tables of food composition which make allowance for inedible material.⁴ The calculated nutrient intake is then compared with the allowances based on British Medical Association recommendations of what is believed to be the quantity of each nutrient required to maintain health.⁵ In making this com-

3. *Domestic Food Consumption and Expenditure, 1964*, London, HMSO, 1966.

4. In addition, to allow for loss in cooking and storage, the figure for thiamine is reduced by 15 per cent and for Vitamin C by 75 per cent for green vegetables, and by 50 per cent for other vegetables.

5. It should be noted that these allowances are not minimum requirements to

parison allowances are made for the presence of visitors and for meals eaten outside the home, and in addition a general reduction of 10 per cent in the total intake figure for each nutrient is made to allow for wastage.

TABLE 1
Energy Value and Nutrient Content of Food Consumption of Certain United Kingdom Households in 1950 and 1964 Expressed as a Percentage of Recommended Allowances

Nutrient	Families with 1 child			Families with 4 or more children		
	1950	1964	Change	1950	1964	Change
Energy Value	109	114	+ 5	101	101	- 0
Total Protein	117	112	- 5	94	90	- 4
Calcium	120	118	- 2	92	87	- 5
Iron	123	126	+ 3	107*	110	+ 3
<i>Vitamins†</i>						
Vitamin A	167*	211	+44	145*	176	+31
Thiamine	140*	141	+ 1	131*	122	- 9
Riboflavin	126	130	+ 4	109	108	- 1
Nicotinic Acid	146	154	+ 8	123	128	+ 5
Vitamin C	283*	272	-11	213*	187	-26

* 1952 figures.

† No details are given for vitamin D as there are no BMA recommended allowances for this nutrient.

Source: *Domestic Food Consumption and Expenditure Survey, 1950 and 1964*, London, HMSO, 1952 and 1966.

A number of issues emerge from the figures. The first is that the recommended allowances for protein and calcium are not on average reached by certain sub-groups, *namely*, households with a man and woman and three or more children, or adolescents and children. Similarly, the standard is not reached for protein in other households with adolescents but no children or for protein and calcium

keep a particular individual alive. They are allowances 'believed to be sufficient to establish and maintain a good nutritional state in representative individuals in the groups concerned'. Adjustments are made for age, sex, and activity. British Medical Association, *Nutrition Committee Report*, 1950.

in other households with one or more children. The types of household in which the standards for protein or calcium are not on average reached constitute 48 per cent of the families with children in the sample.

The trend over time also demonstrates a slight decline in standards compared with the period of austerity in 1950. Thus today families with only one child have a lower nutrient intake of protein, calcium and Vitamin C than in 1950. For families with four or more children the intake is lower for protein, calcium and the vitamins thiamine, riboflavin and Vitamin C (Table 1). Additionally, variations between classes are also still substantial and in some nutrients growing (Table 2).

However, the situation may be more serious than these figures suggest, depending on the extent of dispersion around the average. This is particularly important if the average intake comes close to the recommended allowance (Table 3). Thus families with a dietary intake 10 per cent less than the average would be below the recommended allowance for calories, protein and calcium. This problem has long been appreciated by the Ministry of Agriculture.

TABLE 2
*Range in Nutrient Consumption for Different Social Classes in
the United Kingdom—1950 to 1964*

Nutrient	Difference in percentage points between highest (A1) and lowest (D1) social classes, when the intake of each is expressed as a percentage of the average intake				
	1950	1954	1958	1960	1962
Calories	6	-0.5*	6	5	3
Protein	8	5	12	13	9
Fat	12	9	20	20	13
Calcium	16	11	14	19	16
Iron	10	7	9	7	9
Vitamin A	30	18	32	30	18
Thiamine	4	6	12	7	9
Riboflavin	20	17	21	23	19
Nicotinic Acid	7	8	15	14	17
Vitamin C	27	50	45	36	44
Vitamin D	22	10	11	4	2

* Negative figures indicate higher consumption for social class D1

Source: Greaves, J. P., and Hollingsworth, D. F., 1966.

TABLE 3

Energy Value and Nutrient Content of Household Food Consumption of Households of Different Social Class in the United Kingdom in 1964 (expressed as a percentage of recommended allowances)

Nutrient	CLASS								
	A1	A2	A11	B	C	D		All Households	
						Excluding OAP			
						with earners	with-out earners		
Energy Value	113	110	111	108	105	107	115	114	108
Total Protein	118	107	110	104	100	103	113	115	104
Calcium	123	114	116	109	104	102	110	115	108
Iron	128	118	120	118	116	114	110	101	118
Vitamin A	223	210	213	198	168	180	170	156	193
Thiamine	144	138	139	131	126	130	141	133	131
Riboflavin	138	128	130	118	110	112	123	120	116
Nicotinic Acid	175	148	154	144	137	144	152	144	143
Vitamin C	329	278	291	239	219	204	237	207	236

Percentage of Energy Value Derived From Certain Nutrients

Protein	12.5	11.8	11.9	11.6	11.4	11.6	11.3	11.2	11.6
Fat	43.7	42.1	42.5	40.4	39.4	38.9	39.7	40.5	40.3
Carbohydrate	43.7	46.0	45.5	47.9	49.0	49.3	48.8	48.2	48.0

Percentage of Protein Derived from Animal Protein

Animal Protein	67.5	63.7	64.6	60.5	57.8	57.4	59.7	60.7	60.1
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Source: *Domestic Food Consumption and Expenditure Survey, 1964*, London, HMSO, 1966.

The reports of the National Food Survey and the Report of the Committee on Nutrition of the British Medical Association express their findings in statistical terms. They deal with average households, average families and average allowances. Those who are concerned with the standard of nutrition for the whole community will not be satisfied merely because average people are adequately fed, but will

wish to ensure that, provided a surplus does no harm, the average intake will be so much greater than the average requirements that even the individuals whose intakes are most below average still receive enough.⁶

Doubts also exist regarding the accuracy of the estimates of vitamins and other nutrients available from various foods. For example, the National Food Survey indicates that potatoes provide one-third of the Vitamin C in our diet. However, recent studies have shown that the Vitamin C content of potatoes fluctuates very substantially between samples. Storage may also reduce vitamin value considerably and cooking is always a source of great uncertainty.⁷ Thus the quantity of water used in the cooking of vegetables and the length of time they are allowed to cook will have a substantial influence. In the event a potato nine months old will only have a content of Vitamin C a quarter that of a new potato and much of the Vitamin C that remains may be lost in cooking. The National Food Survey figure for the Vitamin C content of potatoes cannot therefore hope to be very precise.

Not only the estimate of intake may be difficult to ascertain accurately. Estimates of requirements vary according to sex, age, degree of activity and other factors (Table 4). Some account can be taken of these influences in estimating average requirements for the family. However, since the recommended intake of calories, protein, niacin, thiamine and riboflavin can change by several hundred per cent according to degree of activity the question of assessing leisure activity arises. Clearly, the keen athlete's requirements will differ from the man whose most active leisure time pursuit is to change the channel of the TV set he is watching, but the problem is how to record this in a national study. Moreover, there is no way of assessing whether the food consumed and therefore the nutrients available for absorption are distributed in a correspondingly correct manner within the family.

Even given the same stature and activity, individual requirements will differ considerably. A number of studies have demonstrated that given a number of individuals the levels at which apparently adequate nutrition can be maintained varies very substantially. The FAO Committee on Protein Requirements defined average

6. *Report of the Panel on Composition and Nutritive Value of Flour*, London, HMSO, 1965.

7. *Vitamin Contents of Modern Diets: Losses due to Various Procedures*, Basle, Roche, 1967.

TABLE 4
Summary of daily allowances as recommended by the Nutrition Committee of the British Medical Association (1950)

Sex/Age	Heaviness of Work	Calories	Protein	Calcium	Iron	Vitamin A and Carotene		Thiamine	Niacin	Riboflavin	Ascorbic Acid	Iodine
						g.	i.u.					
<i>Both Sexes</i>												
0-1 year	—	1,000	37	1.0	6.5	3,000	800	0.4	4	0.6	10	—
2-6 years	—	1,500	56	1.0	7.5	3,000	400	0.6	6	0.9	15	150
7-10 years	—	2,000	74	1.0	10.5	3,000	400	0.8	8	1.2	20	150
11-14 years	—	2,750	102	1.3	13.5	3,000	400	1.1	11	1.6	30	150
<i>Males</i>												
15-19 years	—	3,500	130	1.4	15.0	5,000	400	1.4	14	2.1	30	150
20 years and over	No work, lying in bed	1,750	51	0.8	12.0	5,000	—	0.7	7	1.0	20	100
	Sedentary work	2,250	66	0.8	12.0	5,000	—	0.9	9	1.4	20	100
	Light work	2,750	80	0.8	12.0	5,000	—	1.1	11	1.6	20	100
	Medium work	3,000	87	0.8	12.0	5,000	—	1.2	12	1.8	20	100
	Heavy work	3,500	102	0.8	12.0	5,000	—	1.4	14	2.1	20	100
	Very heavy work	4,250	124	0.8	12.0	5,000	—	1.7	17	2.6	20	100
	Extremely heavy work	5,000	146	0.8	12.0	5,000	—	2.0	20	3.0	20	100
<i>Females</i>												
15-19 years	—	2,500	93	1.1	15.0	5,000	400	1.0	10	1.5	30	150
20 years and over	No work, lying in bed	1,500	44	0.8	12.0	5,000	—	0.6	6	0.9	20	100
	Sedentary work	2,000	58	0.8	12.0	5,000	—	0.8	8	1.2	20	100
	Light work	2,250	66	0.8	12.0	5,000	—	0.9	9	1.4	20	100
	Medium work	2,500	73	0.8	12.0	5,000	—	1.0	10	1.5	20	100
	Heavy work	3,000	87	0.8	12.0	5,000	—	1.2	12	1.8	20	100
	Very heavy work	3,750	109	0.8	12.0	5,000	—	1.5	15	2.2	20	100
<i>Pregnancy</i>												
First half	—	2,500	93	0.8	12.0	6,000	400	1.0	10	1.5	40	150
Second half	—	2,750	102	1.5	15.0	6,000	600	1.1	11	1.6	40	150
Lactation	—	3,000	111	2.0	15.0	8,000	800	1.4	14	2.1	50	150

minimum requirements as 'the smallest amount of protein which will maintain nitrogen balance when the diet is adequate in other respects'.⁸ However, as long ago as 1920 Sherman reviewing 109 balance experiments showed that the mean intake required was 44.4g. per 70kg. body weight, but that individual requirements varied between 21 and 65g.⁹ A study just reported by Garrow and Pike has suggested that the child whose genetic make-up is such that he would grow very rapidly if well fed, will suffer more on a restricted diet than one with more modest demands. This could explain both the fact that in a given family on a restricted diet some children suffer much less harm than others, and also the tendency of the child who has been successfully treated for malnutrition to outgrow his siblings.¹⁰

In the light of such opinions, it is not surprising that there is no consensus of opinion even at official levels as to the quantity of nutrients various individuals require. Thus the United States National Research Council (1964) recommended allowance of Vitamin C for adults is 70 milligrams per day whilst the British Medical Association (1950) recommends 20 milligrams per day.¹¹ This is by far the greatest variation between recommendations, but there are many smaller variations between other items on these two lists. There are also variations on lists produced in other countries. In each case they occur not only for the normal adult, but also for special groups at risk such as the pregnant women or lactating mothers¹² (Table 5). Clearly, there are differences in definition. Thus the US allowances are 'those which will maintain good nutrition in essentially all healthy persons under current conditions of living'. The BMA figures 'are believed to be sufficient to establish and maintain a good nutritional state in representative individuals in the groups concerned. It is recognized that in every group there must be cases where the need for one or other nutrients is greater than that of the average'. In part the variations may also reflect differences in views as to requirements.

Any assessment of the nutritional adequacy of a diet will depend

8. *Protein Requirements: Report of the F.A.O. Committee*, Food and Agriculture Organization, 1957.

9. Sherman, H. C., *Journal of Biological Chemistry*, 41, 1920, pp. 97-109.

10. Garrow, J. S., and Pike, M. C., *The Lancet*, 1, 1967, pp. 1-4.

11. National Research Council, Food and Nutrition Board, *Recommended Dietary Allowances*, National Academy of Sciences, USA, 1964.

12. Marks, J., *The Vitamins in Health and Disease*, London, Churchills, 1967.

TABLE 5
Variations in recommended daily dietary allowances for certain nutrients during pregnancy and lactation for different countries

Nutrient		USA	GB	W. Germany	USSR
Vitamin A (i.u.)	normal	5,000	5,000	5,000	4,500
	pregnancy	6,000	6,000	6,000	6,600
	lactation	8,000	8,000	8,000	6,600
Thiamine (mg.)	normal*	0.8	1.1	1.7	3.0
	pregnancy	1.0	1.1	2.1	2.5
	lactation	1.2	1.4	2.3	3.0
Riboflavin (mg.)	normal*	1.3	1.4	1.8	3.0
	pregnancy	1.6	1.6	2.0	3.0
	lactation	1.9	2.1	2.5	3.0
Vitamin C (mg.)	normal	70	20	75	100
	pregnancy	100	40	100	100
	lactation	100	50	120	120

* GB rates are those for women occupied in light work.

Source: Marks, J., *The Vitamins in Health and Disease*, London, Churchills, 1967.

upon the series of recommendations against which it is rated. Thus if Vitamin C intake in the United Kingdom is expressed as a percentage of US standards it would indicate that the average for all households was 27 per cent *below* recommended allowances instead of 136 per cent *above* when rated against the BMA figures.

All of this means that only a limited and general impression can be obtained from figures of average dietary intake. Such a view has long been held by nutritionists.¹³

If the results of a dietary survey show that the diet has a very low calorie content, the conclusion that the group in question is suffering from under-nutrition is perhaps a legitimate one. But the fact that intake of certain nutrients falls below some recommended allowance does not justify the conclusion that a proportion of any group surveyed is suffering from malnutrition. In such circumstances the possible presence of malnutrition may be inferred, but the dietary survey *per se* provides no evidence of its existence.¹⁴

13. Hollingsworth, D. F., *Federation Proceedings*, 20, 1961.

14. Norris, T., *F.A.O. Nutritional Studies No. 4*, 1949.

For this and other reasons the members of the National Food Survey Committee have also always stressed the limitations of the Survey as an assessment of nutritional status.

Since the Survey is concerned primarily with food purchases by family units it cannot at the same time provide detailed information on diet and nutrition of individuals. Moreover, with the derationing of food, emphasis has shifted from the nutritional to the economic aspects of the Survey. Thus the results are used for the analysis of demand for food and for making demand projections for administrative purposes. On the nutritional side less interest attaches to the relatively minor changes in the estimates that occur from year to year, than to the study of long term trends. The results are of importance in enabling, for example, calculations to be made of the probable consequences of a change in Government policy concerning the fortification of foods with certain nutrients. With regard to the assessment of nutritional status the Survey has always been recognized as an imprecise instrument, *but it is nevertheless of value in indicating sections of the community which might merit closer investigation by more appropriate methods* (my italics).¹⁵

Clinical and Biochemical Evidence

Each year there are references in the medical literature to cases of vitamin and other nutrient deficiencies in the United Kingdom. Such reports are usually limited to fairly clear-cut groups. These are the elderly, often incapacitated or living alone without the means or incentive to provide a diet of any real value, and the poverty-stricken large families. Both groups find it very difficult not only to make ends meet but also to make the maximum use in a nutritional sense of available income; the latter group may even fail to collect subsidized supplements. In a different way, the immigrant who is short of money but has set food habits based on his indigenous diet which is both expensive and relatively difficult to provide for in this country may also be vulnerable. Nutritional deficiencies may also emerge as a secondary response to serious illness, either physical or psychological, which diminish the individual's appetite. In such circumstances the need for certain vitamins may also be increasing.

Nevertheless, it seems that general practitioners believe that nutrient supplements are required by a much greater section of the population than those just mentioned. A study of the morbidity

15. Private communication from the Secretariat of the National Food Survey Committee.

statistics from general practice for 1955/6 indicated that just under one person per thousand was being diagnosed by doctors as suffering from avitaminosis of one type or another. The figure is highest for the young and the old, 5.7 persons per thousand were diagnosed as suffering from iron deficiency anaemia and as might be expected the figure was much greater for women than men, reaching nearly 13 per thousand for women between 15 and 45.¹⁶

Estimates of prescriptions indicate that 16½m. prescriptions were issued in the United Kingdom in 1965 for vitamins and other nutrients including iron. Over half of the 16m. is for iron preparations with another 4m. going on tonics which include nutrient supplements and another million going both to multivitamin and B Vitamin tablets. Again the pattern indicates a substantially large number of prescriptions going to women especially of child-bearing age. In both sexes a relatively high percentage goes to the over 65s.¹⁷ Some of these prescriptions may have been used as little more than placebos. But this number compares with only 3m. prescriptions for anti-obesity preparations.

As is indicated by the morbidity statistics perhaps the most widespread deficiency state in this country is iron deficiency anaemia and this may in part be due to malabsorption of nutrients rather than to inadequate intake. In this case the figures indicate very clearly the limitation of the current statistics on consumption. According to the National Food Survey every group of the population is receiving an adequate intake of iron. Yet malabsorption or excessive loss, especially in menstruation, appears to have led to many individuals having anaemia.¹⁸ Indeed, where deficiencies do occur, they may be due just as frequently to the phenomena of malabsorption as to inadequate intake. Certainly the whole issue of malabsorption places a limit on the value of relating nutrient requirements to intake and from this making some pronouncement about nutritional status.

Another problem is to assess how far clinical reports of nutritional deficiencies in the literature represent the only cases within the country. If this is so, they indicate that the problem is very small. On the other hand, many other doctors may not write up reports

16. Logan, W. P. D., and Cushion, A. A., *Morbidity Statistics from General Practice*, London, HMSO, 1958.

17. Private communication from Intercontinental Medical Statistics.

18. It is interesting that the BMA recommend the same allowance for both men and women.

of similar cases. It is possible that the published reports represent only a small minority of the cases.

Many studies are based simply upon biochemical tests. Andrews, Brook and Allen examined 136 subjects aged 59 to 98 years living either at home or in different types of residential care. They showed that there was a significant fall in the leucocyte Vitamin C content of these subjects during the winter and that the majority of the subjects were likely to be receiving less than 30m.g. a day of Vitamin C in their diets. Vitamin C status was significantly inferior in those resident in two hospitals and a large welfare home.¹⁹ In March 1966 Griffiths, Brocklehurst, MacLean and Fry reported on an investigation of ascorbic acid and thiamine blood levels in the elderly. They showed that in Farnborough in Kent 41 per cent of elderly people were deficient in ascorbic acid and 59 per cent deficient in thiamine on admission to hospital. Of people living at home and not ill, or not sufficiently ill for admission to hospital 27 per cent were deficient in ascorbic acid and 22 per cent in thiamine.²⁰ This particular study is now being extended to assess the impact upon health of improving these nutritional levels.

Studies of this sort have been used to imply directly that many individuals are suffering from malnutrition and consequently facing ill health. This may not be the case. Biochemical tests are important in that they give a clear-cut scientific measurement for use as a yardstick. But the significance of borderline deficiencies as indicated by such tests needs to be established. Thus women with evidence of marginal iron anaemia present no clinical symptoms and are not demonstrably fitter when their haemoglobin levels are improved. Similarly in the diagnosis of diabetes there are many people with a borderline elevation of blood sugar who occupy an intermediate position in terms of pathology between the normal person and the grossly diabetic.

At this stage much research is needed to assess whether or not a biochemical test indicating a low nutrient level is of itself sufficient to justify the term malnutrition; whether such non-specific symptoms as loss of appetite, general malaise, insomnia, increased irritability can be and on occasions are the result of nutritional problems; whether 'sub-optimum' nutrition leads to lowered resistance to infectious disease or to a health problem at a later period of one's

19. Logan, W. P. D., and Cushion, A. A., *op. cit.*

20. Griffiths, L. L., Brocklehurst, J. C., MacLean, R., and Fry, J., *British Medical Journal*, I, 1966, p. 739.

life. For example, it is now agreed that 'the nutritional status of a pregnant woman depends more upon her life experience of diet than upon the nature of the diet she happens to take during pregnancy'.²¹

One of the remarkable things about nutrition is that in the area between chronic deficiency and optimum health, more is known about animals than about man. Thus in animal nutrition a clear distinction is drawn between minimum requirements for health, under which no specific symptoms of deficiency occur, and 'optimum-nutrition' where maximum growth occurs. No study designed to examine whether a similar concept is valid for humans has been undertaken. Indeed it is difficult to assess whether such a study would be realistic because one of the major difficulties is to decide what we mean by 'optimum' health for humans. Does it mean maximum growth, maximum resistance to disease, long life, or what? For animals the issue is usually more clear cut—they are fed for maximum growth, maximum milk yield, or some other specific criterion.

The issue may also be sufficiently imprecise to defy quantification. 'It is relatively simple to establish minimum levels just sufficient to prevent the development of specific overt signs of deficiency, exceedingly difficult to ascertain at what point additional supplies cease to confer additional advantage.'²² Thus the recent Ministry of Health report on protein requirements commented, 'We have attempted to delineate as closely as possible a gap in our knowledge concerning protein requirements. This gap is bounded at the lower level by what can be derived (albeit with much uncertainty) from the result of balance studies and similar information, and at the upper level by information about the average dietary intake of protein in Britain. Somewhere between these limits which themselves are not precise, lie physiological requirements'.²³ In fact, it may not have been correct in accepting that the present average intake exceeds the optimum physiological level.

To some extent the problem also involves the subjective nature of clinical assessment:

The state of nutrition of the population of this country is such that it is rare to see people with classical signs and symptoms of deficiency

21. Thomson, A. M., *Proceedings of the Nutrition Society*, 16, 1957.

22. Greaves, J. P., *Nutrition Reviews*, 23, 1965.

23. *Requirements of Man for Protein*, London, HMSO, 1964.

diseases. . . . The clinical examination therefore raises not only the problems of the comparability of assessments by different observers and the consistency of assessment by the same observer, but also doubts of the ability of clinicians to detect relatively small changes in the state of nutrition which would not be reflected in specific diagnostic features, but in unspecific elusive and subtle changes.²⁴

However, there is no doubt that anthropometric evidence of optimum growth and fitness does demonstrate that health is related to social factors. Health and physique is directly related to social class.²⁵ As health and physique deteriorates, the percentage of still births and neo-natal death rate increases²⁶ (Table 6). There is also a good deal of evidence to show that in large families the height of children is less than that for the average, or for 'only children'²⁷ (Table 7).

TABLE 6

Incidence of obstetric abnormalities in Aberdeen primigravidae by maternal health and physique, as assessed at the first antenatal examination (Twin pregnancies have been excluded)

	Health and Physique			
	Very Good	Good	Fair	Poor; Very Poor
Prematurity* (%)	5.1	6.4	10.4	12.1
Caesarean section (%)	2.7	3.5	4.2	5.4
Perinatal deaths per 1,000 births	26.9	29.2	44.8	62.8

* Birth weight of baby 2,500g or less.

Source: Thomson and Billewicz (1963).

24. British Medical Association, *Nutrition Committee Report, op. cit.*

25. *Annual Report of the Ministry of Health for the year 1965*, London, HMSO, 1966.

26. Thomson, A. M., and Billewicz, W. Z., *Proceedings of the Nutrition Society*, 22, 1963.

27. Berry, W. T. C., and Hollingsworth, D. J., *Proceedings of the Nutrition Society*, 22, 1963.

TABLE 7

Mean height in inches of boys of school or pre-school age in England with no siblings or with three or more

Mean Age	Place	No Siblings	Three or more Siblings
5 years 6.1 months	Croydon	43.8	43.1
	Salford	43.9	42.1
	Exeter	43.6	42.3
	York	43.4	42.7
	Sheffield	43.8	42.1
	Southampton	43.7	42.6
	Lancashire	44.4	42.7
	Nottinghamshire	44.3	43.6
	Northumberland	43.6	43.4
	Gloucester	44.0	43.3
14 years 6.0 months	Croydon	64.9	63.5
	Salford	62.8	59.8
	Exeter	65.4	62.7
	York	64.3	62.7
	Sheffield	64.1	61.7
	Southampton	63.9	62.1
	Lancashire	65.0	63.0
	Nottinghamshire	64.1	62.9
	Northumberland	65.1	62.8
	Gloucester	64.5	63.9
Cumberland	63.6	61.2	

Source: Berry and Hollingsworth, 1963.

Lack of Data

In 1950 the British Medical Association's Report on Nutrition ended in the following way:

The final assessments of the states of nutrition of the various groups of the population came from a synthesis of the mortality and morbidity, clinical, anthropometric and biochemical data which the committee has considered. Perhaps the first feature of importance which emerges from that synthesis is the patchy nature of the data available, especially in regard to certain population groups, so that it is difficult to speak with certainty concerning them. But this is not surprising since the methods of assessing nutrition in the main are new and still relatively undeveloped; they deserve to be the subject of more investigation and research.

Such a summary would still be a fair one seventeen years later in 1967.

The evidence deduced both from a critical study of the National Food Survey and from the clinical material shows how insufficient is the evidence available on which to assess the nutritional status of the community. There is need to consider whether the National Food Survey should be developed in order to assess more realistically individual intake of nutrients. There is also need to examine the position of individuals such as students in hostels, those in prison and others who are not living in households. If this is not possible within the existing framework then further dietary studies as well as detailed morbidity surveys should be undertaken. Only then will we be able to isolate the percentage of the community suffering from symptoms of deficiency. Above all, there is a need for substantial research into the level of nutrient intake required for the maintenance of health and an assessment of how far this differs from the level required for optimum well-being. Until such work is done, uncertainty as to the precise nature of the position will remain and with it not only the inability adequately to isolate and deal with potentially vulnerable groups but also perhaps an over-readiness to discount any suggestion of malnutrition.

Freedom to Choose: The Problem and the Illusion

It has been demonstrated that even in a country such as the United Kingdom which is relatively proud of the quantity of information it collects about the population, there are visible gaps which need to be filled as well as areas in which considerably more research is needed. However, even if more information is made available and the position becomes much more clear cut, other problems of significance will confront the sociologist attempting to assess the impact of poverty on nutritional status. Even if there is evidence of malnutrition he will need to decide whether this is directly the result of poverty: is a bad diet in nutritional terms due to the individual's financial inability to obtain a better one or simply to his unwillingness to consume a different sort of diet or to give food a higher priority on his list of purchases? Certainly we know that it is possible to survive on a diet costing a shilling a day.²⁸ Nobody would ask any section of the community to subsist in this way, but whether

28. Miller, D. S., and Mumford, P., *Getting the Most out of Food*, London, 1966.

in fact the individual should be expected to adjust his food choice so as to achieve an adequate nutritional intake within the limits imposed by his financial means is a different issue and one which I would hope will be discussed at this Conference.

It has been indicated earlier that in reality man consumes food whilst his body absorbs nutrients.²⁹ Yet of course the individual is not equally concerned with both these issues. He is primarily interested in getting a diet that he likes rather than one that is necessarily good for him. The foods he wants are by no means certain to be the ones he needs. Thus it might be argued that a person is at the poverty level irrespective of his nutritional status if his income is so limited that he is unable to have a reasonable opportunity of selecting the foods which he would ideally like.

Some indication of the variety obtained by different groups and the degree to which they are able to choose their 'ideal' diet may be obtained from an examination of:

- (a) Total expenditure on food
- (b) The quantity of particular foods selected and their cost
- (c) The types of food which people want to eat

Variety of Food Choice in the United Kingdom

It is usually asserted that the proportion of expenditure going on food declines as income rises. This is to some extent supported by an analysis of data from the Family Expenditure Survey (Table 8). However, the 'drop off' is slower than might have been imagined and does not hold true for the lower income groups where the percentage of expenditure attributed to food actually rises as income rises. In money terms, however, such an analysis masks the vast variation in expenditure by different groups. Thus on average a family with an income of under £5 per week spends only £1. 16s. 0d. on food and a family with an income between £5 and £10 only £2. 16s. 0d. This compares with £7. 17s. 0d. for a family earning between £35 and £40 and £8. 16s. 0d. for families whose total income is £40 or more. Perhaps most important of all, the average household expenditure on food is £6. 12s. 0d. Therefore the lowest income group spends only just over a quarter of the average amount on food.

29. Yudkin, J., and McKenzie, J. C., *Changing Food Habits*, London, MacGibbon and Kee, 1964.

TABLE 8
Percentage of Average Weekly Expenditure Spent on Food

Household Expenditure	£5	£10	£15	£20	£25	£30	£35	£40	All Households	
	Under £5	£5 but under £10	£10 but under £15	£15 but under £20	£20 but under £25	£25 but under £30	£30 but under £35	£35 but under £40 or more		
Percentage spent on food	33	33	34	34	30	29	28	27	22	28

Source: *Report of the Family Expenditure Survey for 1964*, London, HMSO, 1965.

There are also major variations between groups regarding the type of food consumed. Comparing those families where the head of the household earns more than £24 with those where he earns between £9. 10s. 0d. and £15, consumption of milk, eggs, and in particular fruit, is greater for the higher income group. Whereas bread and potato consumption is a good deal higher amongst the lower income groups. Similar variations occur for different sized families³⁰ (Tables 9 and 10).

TABLE 9
Consumption of Various Foods Related to Income

	Income of head of household			
	More than £24	£9 10s. to £15	Under £9 10s.	OAP
Liquid milk (pints)	5.6	4.5	4.3	4.9
Meat (ozs)	40.1	36.2	38.0	36.0
Fruit (ozs)	43.6	25.1	22.3	24.3
Bread (ozs)	34.3	45.9	48.9	41.2
Potatoes (ozs)	47.1	60.3	60.6	42.0

Source: See Table 8

30. *Malnutrition in the 1960s, op. cit.*, p. 8

TABLE 10
Consumption of Various Foods Related to Size of Family

	Man and Woman with:		
	No children	2 children	4 or more children
Liquid milk (pints)	5.2	5.1	4.3
Meat (ozs)	46.6	30.3	23.5
Fruit (ozs)	36.2	30.0	17.6
Bread (ozs)	43.2	35.6	40.9
Potatoes (ozs)	50.9	51.2	55.8

Source: See Table 8

These variations do not necessarily demonstrate unreasonable restriction on selection for those who are less wealthy or with larger families since it is possible that they may select differently on the basis of choice rather than necessity. However, other studies would seem to refute any suggestion of preference for a different diet. In a recent survey I asked housewives to indicate foods they would buy more of if they had a little more money to spend on food. The results were illuminating. The foods most frequently mentioned included milk, meat, eggs and fruit; the very foods where variations exist between different groups (Table 11). A similar picture emerged when the question was reversed and housewives were asked which foods they would hate to do without for a month or so, although here the picture is complicated by the fact that nobody wants to be completely without the major staples (Table 12). Thus even a cursory glance at food choice suggests that there are severe restrictions upon those who have a small income or a number of children.

Some might argue that any major restriction in choice is 'self imposed' by a desire to give other products a higher priority within a limited budget, rather than due to 'real poverty'. When a higher percentage than average of total income is being spent on food and a substantially smaller percentage than average being spent on the so-called luxuries of life, such as alcohol, tobacco, cars, to say nothing of clothing and durable household goods, then such a thesis becomes little more than an illusion³¹ (Table 13).

31. *Report of the Family Expenditure Survey for 1964*, London, HMSO, 1965.

TABLE 11
Foods People would Buy More of if they had More Money

Item	Social Class				Children		Area	
	Total %	AB %	C ₁ %	C ₂ ,DE %	With children 15 and under %	Without children under 16 %	South %	North %
Meat	51	46	48	53	61	42	49	54
Chicken	40	27	38	43	43	39	34	52
Apples	28	17	26	30	34	23	28	29
Oranges	28	20	24	30	34	22	27	29
Butter	21	12	15	24	20	21	16	30
Fish	19	19	16	20	18	20	18	21
Milk	14	6	12	16	14	14	12	17
Eggs	14	7	13	15	13	14	12	17

Source: See Table 8

TABLE 12
Foods People Hate to do Without for a Month or Two

Item	Social Class				With children 16 and under %	Without children under 16 %
	Total %	AB %	C ₁ %	C ₂ ,DE %		
Butter	58	64	62	56	57	59
Milk	58	59	61	56	57	58
Tea	54	45	52	55	49	57
Meat	50	58	55	47	56	44
Eggs	47	53	53	44	51	43
Sugar	29	27	25	30	33	26
Bread	28	23	28	29	29	28
Cheese	27	30	29	26	26	27
Potatoes	17	14	16	17	20	13
Apples	16	21	22	14	16	16
Fish	16	22	18	14	14	17
Coffee	15	25	19	12	18	13
Oranges	14	19	17	12	14	14

Source: See Table 8

TABLE 13
*Percentage of Total Expenditure Spent on Different Items by
 Households with Different Incomes*

	Household Income		
	Under £5 %	£5 but under £10 %	All households %
Housing	19	18	11
Fuel, light and power	14	13	6
Food	33	33	28
Alcoholic drink	3	2	4
Tobacco	3	5	6
Clothing and footwear	6	6	9
Durable household goods	3	4	6
Other goods	6	7	7
Transport and vehicles	3	4	11
Services	9	8	11

Source: See Table 8

Thus poverty can be demonstrably shown to be curtailing food choice; curtailing choice in an area in which man is particularly vulnerable for we are all intensely involved emotionally with food. This is partly because it is so vital to our very existence. We are very aware that if we do not eat and drink we are not going to stay alive for very long. Food is also one of the very first means by which we demonstrate our mood and individuality; thus a baby demands food and then perhaps rejects it; it asserts its personality by demanding particular foods and rejecting others. As we grow older, simply because we eat three meals every day, we come to regard ourselves as experts on the subject. In the same way, food asserts itself as an integral part of our culture and many social events in our lives take place round the meal table.³²

It would be unfortunate if today one per cent of the population of the United Kingdom face very real poverty every time they turn to the meal table or open their larder door. Yet evidence such as that indicated above suggests that at least 10 per cent may be affected in this way.

3. McKenzie, J. C., *Proceedings of the Nutrition Society*, 26, 1967.

Conclusion

The tools required for measuring poverty specifically in terms of food consumption are clear and in the case of the United Kingdom are readily available. The assessment of malnutrition is complicated not only by lack of data but also by the limitations of current nutritional knowledge and the lack of precise methods of assessment. Further research and the collection of information is a matter of top priority.

The evidence at present available concerning the United Kingdom indicates that there is a major restriction on food choice of those with low incomes or with large families. The fact that the evidence is too imprecise to indicate whether or not malnutrition still exists should not lead us too readily to assume by inference that because of this the case for no malnutrition has been conclusively proven.

CHAPTER 2
CHANGING FOOD HABITS AND
THE CATERER

J. C. McKenzie

Those who have tried without success to tempt people away from their predilection to "Roast Beef and Yorkshire Pud", and have muttered under their breath about the conservatism of the English may find it hard to believe that food habits are changing. But in spite of what amounts on occasions to considerable resistance to change, it is nevertheless a fact that the food habits of the nation have changed substantially during the last one hundred years (Table 1).

TABLE 1
Trends in United Kingdom Food Supplies from 1880 to 1962
(lb per person per year)

	1880	1909- 13	1924- 28	1934- 38	1941	1944	1947	1950	1953	1956	1959	1962
Dairy products:												
Total as milk solids	n.a.	33	35	38	41	49	49	54	53	54	54	56
Liquid milk	213	219	217	217	265	308	303	345	330	323	319	325
Cheese	8	7	9	9	8	10	9	10	9	9	9	10
Meat (carcase wt. incl. bacon and ham)	91	131	129	129	99	110	96	112	111	134	132	142
Poultry and game	n.a.	5	6	9	6	4	7	7	7	8	12	15
Fish	18	41	41	26	16	20	32	22	20	22	22	21
Eggs	11	16	15	28	25	27	25	31	28	29	33	34
Butter	12	16	16	25	10	8	11	17	13	16	19	20
Margarine	0	6	12	9	18	18	15	17	18	17	14	11
Other fats	n.a.	4	6	19	19	19	14	19	20	31	22	24
Sugar	64	79	87	96	67	71	82	84	98	109	111	111
Potatoes	296	243	230	190	188	275	286	242	245	225	211	214
Other vegetables (incl. pulses) and tomatoes	n.a.	78	105	127	123	140	142	122	133	127	130	127
Fruits (incl. nuts)	n.a.	68	97	104	30	52	89	84	92	95	110	108
Wheat flour	280	211	198	195	237	234	225	206	193	179	168	161
Other cereals	n.a.	26	16	16	20	19	17	17	16	14	15	16

Since 1880 there has been a 50 per cent increase in the consumption of liquid milk, meat and butter; almost a 100 per cent increase in sugar consumption and a 300 per cent increase in egg consumption. These increases have been matched by a considerable fall in cereal consumption and also a fall in demand for potatoes.

Of course, it is possible to argue that these figures are to some extent arbitrary. Different results could be obtained by taking a different starting date. Similarly, any average figure masks variation with class and region (Table 2). Also even where no change exists over a period for a broad food category such as meat, the preference for different cuts may vary substantially.

TABLE 2
*Variations in Consumption of Selected Foods for Different
Regions of Great Britain 1963*

(Expressed as percentage deviation from national averages)

Area	<i>Suet and dripping</i>	<i>Flour</i>	<i>Poultry</i>	<i>Fresh green vegetables</i>
London	-10	-16	+40	+3
North	+15	+39	-15	-35
Scotland	+45	-50	-48	-60
South-west	+55	+35	+25	+29

But whatever the arguments as to their limitations, these figures, however they are presented, clearly indicate that substantial changes have occurred.

It is natural that we should all be interested in these changes, and in particular the directions which future change will take. As scientists and medical practitioners we are concerned with the impact of food choice upon nutritional status and consequently health. As food manufacturers we are concerned to provide the food which people will want to buy, and as caterers we will want to prepare food which people are willing to eat. It would be wrong for me to pretend that we at present understand the causes of all past change and can predict with a fair degree of accuracy what will happen in the next year or in five years time. Nevertheless, what I can do is to draw your attention to some factors that are claimed to influence choice and try to assess their validity.

Factors Influencing Change

The idea that food habits are not changing has been based, I believe, on the fact that in this, as in everything else, people do not necessarily do what you tell them. Not surprisingly, people tend to eat what they want; not what we think they should want.

Perhaps this needs elaboration. I believe that most of the major changes that have occurred in food habits have not come about as the result of the intervention of the nutritionist, caterer or advertising agent, but have changed almost "spontaneously" because of changes in the attitudes and actions on the part of a people within a given community.

I am sure that some of you who have read *The Hidden Persuaders* or *The Affluent Sheep* will feel that I have underestimated the power of advertising, while others will believe that education in nutrition has increasingly led people to re-orientate their food choice. Let us examine the position.

It can be categorically stated that advertising cannot persistently sell to an individual a commodity that he or she does not like or does not want to buy. If proof is needed to back up such a statement, one need surely go no farther than Betty Crocker cake mixes or Nestea, where considerable advertising pressure did not lead to big sales of the products in question. On occasions, of course, at brand level advertising may be vital and extraordinarily successful. The brand of baked beans or frozen peas that we buy may well depend on the quality of the advertising. Yet even such a statement as this may be in dispute, for certain brands may have a "quality" image that will lead to their purchase almost regardless of advertising copy.

One also cannot ignore completely the cynic who would argue that one persuasive advert cancels out the next and who asks what happens to the sales of a particular brand of cigarette if you find you do not get the oh, so alluring young lady that everyone knows will drop into your arms the moment you light up a . . .!

The real problem with advertising is that it is so difficult to evaluate its success because one cannot isolate the influence of this factor upon choice from all the rest. Who can really measure what would have happened to the sales of frozen peas or bread if there had been no advertising? At least surely nobody will argue that the rapidly increasing sales of frozen peas has been entirely dependent upon a good advertising agent and the falling sales of bread upon a bad one.

All in all, advertising as a persuasive force probably has a much more middle-of-the-road role to play than most might

imagine. If there is a product that we like, that does not cost too much and is easy to obtain, then advertising may encourage us to buy it. It may even slightly nudge us away from one product to another very similar one. But however often the "Drink a Pint of Milk a Day" slogan is pushed in front of us it will not achieve its goal unless we decide we prefer milk to Coca-Cola or Schweppes.

Perhaps therefore we can go at least some way to break the fable that we are compelled almost by reflex to buy the products whose images are sinisterly concocted by the depth psychologist in his advertising penthouse. But others would take us to a dream world of enlightenment, in which they argue that choice of food is now based upon sound principles of nutrition. If a retrograde few eat too little food or too much, or the wrong combination, then by making them aware of the relative values of foods and their significance to health all will be made well and one's problems will disappear.

Public's Knowledge of Nutrition and Science

Such a legend is based upon several misconceptions. In the first place it implies that most people have a substantial body of nutritional know-how, yet our own studies show that knowledge is in fact very limited (McKenzie, 1965).

The second misconception is based upon the belief that if you have not got a sound knowledge of nutrition, then it is easy to obtain. Nutrition, it is argued, is not only taught in schools but is well taught; the former suggestion is contentious, the latter downright explosive. Domestic-science training colleges are only just beginning to regard nutrition as an essential part of their courses, and it still usually takes second place to manipulative cooking skills. (Dare I also say the same of Catering Colleges?) Perhaps more important, the considerable scarcity of nutritionists means it is difficult to find a specialist to teach the subject adequately. If such is the position in the training college, it inevitably produces a similar position in the schools.

The general public whose schooldays are behind them look for advice to popularly written books and magazines. But more nutrition books are written by quacks than by qualified men,

and for many magazines the nutrition "expert" is also the expert in fashion cosmetics, "womens troubles", knitting and pets—need I say more!

The other, and in the long run probably the far more important, misconception is the assumption that if you have correct scientific knowledge, then you automatically act upon it. This has been the basis of the campaign against smoking. If you tell people the facts of the association between smoking and lung cancer, then they will automatically give up smoking. But this is not the case. Most people now are aware of the facts, but this has not stopped many of them smoking. Most in fact have not changed their position at all.

The same is true of nutrition. Most people in Britain believe that canned food is inferior to fresh, that brown bread is better than white and that sweets are bad for teeth. Yet most housewives buy white bread rather than brown, the sale of canned foods is high and rapidly increasing, and we eat more sweets per head in this country than in any other (Brown, McKenzie and Yudkin, 1963).

Influence of Cost

However, I must not be merely negative. Several other factors can clearly be earmarked as influencing food choice. Cost is always an important consideration. If you have a wife and four children to provide for on £10 a week it is not surprising if smoked salmon and caviar are not often included in your meals.

Perhaps cost is the most important at two levels. In the first instance it separates off foods into those which you can and cannot afford to buy. In other words, it makes a very basic preliminary choice for you. Once this has been done, other factors may hold more sway over which of the wide range of foods that remain you buy. When you reach the brand level price may again become important. The housewife may, for example, take a keen interest in whether Brand X peas are a penny more or less than Brand Y. The same will be true of eating out, if only in the sense that the customer will initially decide on a restaurant which will provide a selection of dishes in the price range he desires. He may also have a clear idea of the dish he wants when he gets inside, although here he may be

more open to influence. The type of occasion and whether he or his company are paying will also influence his choice of restaurant and of meal.

Of course, it may be argued that as we become more prosperous and the proportion of our income which we spend on food declines, so cost as a factor in choice decreases in importance. It is true that economic considerations must have a much greater priority in developing countries. But I am certain that the experience of us all would confirm that even in the western world today we have not come to disregard cost completely.

Availability

We should also note other economic influences. Broadly the food we buy is selected from food that is made available to us. Availability is inevitably influenced by the methods of preservation and production that the manufacturer has been able to develop over time. In the same way new foods and drinks, such as chocolate, cornflakes and Coca-Cola, have widened our choice.

Availability is also determined by what the retailer is prepared to stock. Particularly at a brand level, there may be some restriction, say, of baby foods which stores may choose to stock. This may be because of lack of space or of the small profit margin of a particular brand, but whatever the cause, it results in a limitation upon choice. Moreover, the development of integrated retailing organisations has led to some 1,600 men buying for three-quarters of the food shops. Imagine the influence that these buyers could bring to bear, both on the food manufacturer and consumer, if they were to act in unison.

This again will be true of restaurants. People's choice is restricted to what is made available to them. As I have hinted later on, it may in some cases be the restaurateur who inhibits change by the selection of his menu. Yet equally, of course, by making exotic foreign foods available he extends availability.

Palatability

I argued just now that price was an early influence upon choice, in that it divided foods up into those you could and could not afford. Taste acts in a similar manner, and people

are quick to divide up foods on a basis of their taste or palatability. Thus one can talk in terms of those whose taste we like a lot, a little and not at all. Equally within food products our preference for, say, different cuts of meat may well be determined by palatability. At every level this factor will influence our choice of food, and it would probably be easier to sell ice to the Eskimo's than in normal circumstances to make people eat foods whose taste they positively dislike.

In olden times this ability to find some foods palatable and others not may have been a key physiological mechanism for survival. Professor Yudkin (1964) has argued that just as animals select the foods which are nutritionally important to them, so man by selecting whenever possible those foods, usually meat and fruit, which were most palatable to him was also being guided to a sound diet. This natural selection method has now been thwarted by the ability of the food manufacturer to isolate palatability from nutritional value and usually, at a considerable reduction in cost, to provide the former without the latter.

When we refer to the major changes in food habits that have occurred in the last hundred or so years I am sure we should view them for a large part in terms of these two factors *cost*, or equally our ability to pay more, and *palatability*. But even so an enormous number of foods would qualify in terms of cost and palatability, and consequently each individual will certainly have other issues as well in mind when determining which foods to select.

Convenience Foods

For the housewife at least an issue of growing importance in food selection will be convenience. By convenience foods I mean those foods in which certain aspects of preparation which in the past have been carried out by the housewife are now undertaken by the food manufacturer. This may, on the one hand, involve the shelling of peas, the stringing of beans or the peeling of oranges, and on the other, of partially or wholly cooking the product in question. As more and more women hold down a job as well as looking after a family and as society becomes increasingly prosperous, it is not surprising or surely

retrograde that we should ease the burden of the housewife in the kitchen. Equally, it cannot be considered a surprise that she should take advantage of this new aid and select much of the food of the family on the basis of convenience.

Other factors can be classified under the general heading of class. Thus it may be accepted by a certain group that you should end your meal with coffee rather than tea, or even "real" coffee rather than the instant variety. Similar attitudes may influence the type of vegetables or fruit you should eat, to say nothing of the times at which meals should be served and how you should eat them.

Effect of Foreign Holidays

Closely allied with this may be the new food habits resulting from the growing cult of the foreign holiday. We are all aware of the developments of restaurants catering for the more exotic new tastes of the English. However, even here we can over-emphasise the significance of change. In 1963 I undertook a survey in two London suburbs, Hendon and Shepherds Bush, and I asked them to select from a menu the meal they would choose if taken out to lunch (McKenzie, 1963). The results (Table 3) indicate the different class reaction to slightly more exotic dishes, and I would imagine that the various groups would react in similar ways to continental meals. Restaurants selling good, plain English dishes such as fish and chips and roast beef are not, for example, unheard of in most popular foreign holiday resorts. I would imagine that an analysis of preference for more exotic dishes based on age might also be illuminating.

In many ways I have only just begun to touch on some of the factors influencing food choice. This is in fact unavoidable, since our understanding of the subject is as yet very limited and we are not certain of what all the factors are, let alone able to start quantifying them as to their relative importance. As was shown at the Conference on "Changing Food Habits" some time ago at Queen Elizabeth College, both academic and commercial workers are unanimous in acknowledging not only the importance of understanding the ways in which food habits change but also our lack of understanding of the problem at the moment (Yudkin and McKenzie, 1964).

TABLE 3
Choice of Dishes from Menu

	Hendon, %	Shepherds Bush, %
FIRST COURSE		
Artichokes	10	5
Tomato soup	12	42
Grapefruit	36	33
Melon	42	15
FISH COURSE		
Fish fingers	10	32
Trout	25	13
Mackerel	1	3
Caviar	4	6
Smoked salmon	60	40
MAIN COURSE		
Pigeon pie	2	0
Roast duck	48	12
Roast beef	31	51
Steak and kidney pudding	6	26
Roast pheasant	12	12
VEGETABLES		
Roast potatoes	69	53
Mashed potatoes	15	
Chips	12	14
Peas	77	65
Parsnips	2	14
Spinach	20	15
Turnips	2	5
SWEET COURSE		
Peaches	32	23
Apple pie	28	51
Prunes	4	13
Creme de Marron	6	3
Charlotte Rousse	25	6
Summer pudding	2	3

Food Habits and Choice when Eating Out

However, I would not like to close my chapter on a note of despondency. Clearly an understanding of the overall changes in food habits that occur would be useful to the hotel and catering trade. To know in advance what would be the "rate" to follow the Wimpy or Steak House would augur well for a prosperous future. To set up a new kind of speciality restaurant because you think it is a good idea may be a pretty expensive experiment. Even when something such as a steak house has

become an established success in London, it may not necessarily be the rave of Truro, Oldham or Aberdeen.

Nevertheless, I have the feeling that for many of the small problems facing the catering industry more limited answers may give you the help you need. Recently I asked a director of one of the major catering companies the question "What major developments have occurred in the catering side of hotels over the last few years?" He answered in the following way:

(a) The increasing popularity of fruit juices as a breakfast item.

(b) Increased sales of ice-cream either on its own or with a pudding or sweet.

(c) The enormous increase in the use of quick-frozen vegetables, fruit, poultry, fish and now meat. Over the past few years our purchases of canned vegetables and fruit have declined by 75 per cent.

(d) An increasing demand for expensive grilled meat, which, of course, has led to the "quick-service" type of buttery or grill bar in hotels and restaurants.

I think that bearing in mind the overall changes in food habits since the war the limited number of changes regarded as important to the catering industry is significantly small. Even some of those mentioned are more technological developments rather than changes in food habits.

Likewise it may be wrong to see a direct relationship between overall food habits and the food chosen in a restaurant. Perhaps I can best explain this by repeating some definitions which Professor Yudkin and I have given in *Changing Food Habits*. Food habits, food choice and food preferences are often regarded as synonymous terms. We, however, believe it is possible to distinguish between them in the following way:

Food Preferences. The particular foods an individual likes or dislikes.

Food Choice. The foods selected by an individual at a given time.

Food Habit. The sum of the food choice of an individual constituting his total diet.

You will see, therefore, that although I have an immense liking for strawberries, it is very unlikely that I will choose them at every meal of every day of the year. Thus my preference is not completely reflected in my food habits. However, when one comes to eat out at a restaurant, especially on some social occasion, this may well reflect very closely personal food preferences.

This is probably why so many people choose grilled steak when they eat out. Of course, such a choice may be influenced by other factors, such as less regard for cost on an evening out and perhaps, most important of all, a sense of predictability. When someone goes into a restaurant, naturally they are usually anxious to get something to eat that they like; it would be both an embarrassment and a waste of money to choose something which, when it arrives, at best they do not really enjoy and at worst they cannot eat. Many people will therefore plump for something which they can automatically predict they will enjoy. (This was to some extent shown in Table 3.) Even the worst cook in the most dubious restaurant will have a job, at least so they optimistically believe, to muck up grilled fillet steak. The one field of uncertainty that I feel might occur here is that few cooks seem to define "rare", "medium", "well done", in the same way. However, compare this with Beef Curry—you cannot even be sure whether it's beef or not, let alone tell how hot it will be.

Catering Consumer Surveys

In many ways these more specific aspects of food preferences can be studied by the caterers themselves quite readily. For example, unless you are running a speciality bar or a single fixed-dish menu you can begin to test change by including a new dish in your menu. If everyone says that Spaghetti Bolognese will be the rave of Battersea next year, then you can include it in a wide-choice menu to see how many people ask for it. If it turns out that everybody wants Spaghetti Bolognese, then economics may well drive you to the speciality spaghetti restaurant in the same way as it led to the formulation of the steak-house concept.

The problem of whether or not to introduce a new speciality

restaurant can, of course, be aided by the research worker with an on the spot survey. Almost everywhere it should be possible to undertake small random or stratified surveys in which people are asked to select from a menu. From this it should be possible to make definitive breakdowns by class, age, frequency of visits to restaurants, etc. This work should not be costly, especially if compared with the expense of opening a new type of restaurant which fails to attract the public.

Another important aspect is, of course, the factors over and above the provision of the right types of food which make people visit a particular restaurant. In December 1964 I undertook a survey in London with a random sample of 300 men and women, and they were asked to indicate from a list of items which was the most important factor influencing their choice of restaurant at lunchtime when they were out at work and during a social evening out (Table 4).

TABLE 4
Factors Influencing Choice of Restaurant
(Rated in order of priority)

<i>Lunch-time</i>	<i>Evening</i>
1. Quality of food served	1. Quality of food served
2. Cost of meal	2. Attractiveness of surroundings
3. Speed of service	3. Attractive presentation of food
4. Nearness to work	4. Cost of meal
5. Attractive presentation of food	5. Variety of dishes on menu
6. Variety of dishes on menu	6. Courtesy of waiters and waitresses
7. Attractiveness of surroundings	7. Speed of service
8. Courtesy of waiters and waitresses	

The order for each, and the comparison between the two different meal occasions, is, I believe, interesting. In every case there is virtually no variation with age, sex or class. As one might imagine, a meal out when at work is a much more down to earth, no frills affair than an evening out, and this is reflected in the relative priorities given to the various items. Certainly for most at lunchtime a combination of quality, cheapness, speed and proximity to work would seem to be a winner. The cynic might say that people do not mind a dirty table-cloth and the waiter spilling soup down them as long as it is good soup! At night-time one might search farther afield for a restaurant

providing a large number of favoured attributes. For the future I would predict that we will on all occasions come automatically to expect the items high on the list and look for the restaurant giving the others as well.

This research also serves to show the disparity which often exists between what the public actually wants and what the caterer thinks they want. Thus most caterers would imagine that service would come much higher on the public's list of requirements than is the case.

This overall disparity has been highlighted by the recent report of the National Catering Inquiry sponsored by Smet-hursts. Customers' choice of food from a menu was related to what caterers thought would be selected. There were often quite remarkable variations (Table 5).

The National Catering Inquiry goes on to provide information concerning eating out in seven towns and cities in the United Kingdom. In these areas we now have a much more accurate assessment of the number of occasions per week when people eat away from home, the price they are prepared to pay for a meal and the type of place at which they eat (Tables 6, 7, 8). Such information is valuable not only in its detail but in its broad outline, which further goes to emphasise the different reactions people have according both to the region they live in and as to whether they are eating out for pleasure or when at work.

However, I am afraid that the total amount of research to date is just a drop in the ocean when one sees the broad questions that need to be answered. Why is it, for example, that people quickly tire of institutional meals or a particular restaurant however wide the choice on the menu? How can we decide which will be the star attractions for next year, let alone scientifically plan our speciality restaurants on an economically viable basis for the next five years? It is truly remarkable that an industry providing £500 million worth of meals and refreshments each year knows so little of the basic needs of its customers and of the trends which are developing towards particular types of meals and restaurants.

However, if this chapter has done no more than to help draw your attention to these problems, then perhaps it may

TABLE 6
The Number of Meals Taken Away from Home
 (Per cent)

	<i>Nationally</i>	<i>London</i>	<i>Liverpool</i>	<i>Birmingham</i>	<i>Leeds</i>	<i>Edinburgh</i>	<i>Cardiff</i>	<i>Torquay</i>
AT WORK								
Every weekday	39	50	42	39	41	37	34	19
At least once a month	18	14	17	20	17	16	22	24
Less often	43	36	41	41	42	47	44	43
PRIVATE OCCASIONS								
More than weekly	3	1	5	4	4	2	1	1
Weekly	20	17	17	30	29	21	24	18
Monthly	24	22	34	24	23	26	22	22
Every few months	34	39	25	29	27	32	38	30

have been worthwhile. Certainly I believe that half the battle is won by being aware that a problem exists, but of course final solution can only be achieved by co-operation between the research worker and the practical caterer.

TABLE 7
The Cost of the Meal
 (Per cent)

	<i>Total</i>	<i>London</i>	<i>Liverpool</i>	<i>Birmingham</i>	<i>Leeds</i>	<i>Edinburgh</i>	<i>Cardiff</i>	<i>Torquay</i>
AT WORK								
2s. 6d.	27	26	32	29	40	28	29	16
5s.	28	34	25	29	22	25	24	28
7s. 6d.	7	7	3	5	8	8	11	8
10s.	2	2	2	4	3	1	3	3
15s. +	5	2	2	6	3	4	5	5
Average	5s.	4s. 7d.	4s. 6d.	5s.	4s. 6d.	4s. 9d.	5s. 3d.	5s. 3d.
ON PRIVATE OCCASIONS								
2s. 6d.	1	1	2	1	1	—	—	3
5s.	9	9	14	7	8	8	8	11
7s. 6d.	19	20	29	12	26	16	19	15
10s.	22	20	20	20	23	21	31	23
15s.	23	18	25	28	19	29	23	18
£1	11	13	5	12	10	19	11	8
£1 +	9	13	2	14	5	6	5	13
Average	13s. 2d.	14s. 4d.	11s. 7d.	15s.	12s.	15s. 4d.	13s. 5d.	13s. 5d.

TABLE 8
The Location of the Meal

	<i>At work</i>					<i>On private occasions</i>			
	<i>Canteen</i>	<i>Restaurant</i>	<i>Café</i>	<i>Public-house</i>	<i>Fish and chip</i>	<i>Hotel</i>	<i>Restaurant</i>	<i>Hotel</i>	<i>Café</i>
Nationally	41	29	17	6	3	4	70	20	5
London	40	31	18	18	1	1	78	12	4
Liverpool	50	25	16	—	3	4	74	11	11
Birmingham	50	22	10	6	5	5	66	22	3
Leeds	41	27	17	5	4	1	70	15	6
Edinburgh	38	32	18	2	—	10	67	29	1
Cardiff	52	23	13	3	3	4	66	23	5
Torquay	21	37	23	8	5	5	56	32	8

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FOOD CHOICE AND PRICE

*A Supplementary Report to
The British Eating Out*

Prepared by John McKenzie,
Former Research Sociologist,
Queen Elizabeth College

For the National Catering Inquiry

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FOREWORD

*By John Fuller, Professor of Hotel Management and
Director of the Scottish Hotel School,
University of Strathclyde.*

The first stage of the National Catering Inquiry which resulted in a report, *The British Eating Out*, provided useful basic information about customers' demands and caterers' attitudes. Perhaps the greater value of the initial Inquiry was the way in which it suggested continuing research. It was clear, for example, that more knowledge was needed of consumers' choice and taste in relation to their social and economic background. Choice, too, is affected by the price of menus in their entirety and the cost of individual items in particular. These aspects are further illuminated by this second study.

The study which is now the subject of this supplementary report to *The British Eating Out* thus carries a stage further our knowledge of guests' reactions of food choice and price and their general expectancy in the "eating out" situation.

Some caterers may feel that this part of the investigation merely provides further evidence of customer attitudes which they already interpreted intuitively or "by experience". But almost all caterers will welcome this appraisal of guest reaction to eating out and food choice, accompanied as it is by supporting evidence. There is today much wider acceptance in our industry of the urgent need to study our markets and potential markets more closely. There is growing awareness that intuition and "experience" alone will not suffice.

Apart from the merit of this particular study, the present report will, I am convinced, be welcomed by our industry as evidence of the continuing existence and activities of the National Catering Inquiry. It is my own personal hope that the continuance of the National Catering Inquiry will bring a sequence of studies of varying types—all designed to increase our knowledge of the way the catering industry now operates and could operate even more effectively in the future.

In introducing this supplementary report to *The British Eating Out*, I would also like to express the hope that its sponsors, Smethursts Foods Limited, heartened by the reception already accorded to the work of the National Catering Inquiry, will continue their enlightened support of research projects—and may indeed be partnered by other sponsors in some future exercise of the Inquiry.

The British Eating Out has already captured the interest of hoteliers and caterers, and consolidated a mass of moral support for continuing research. I trust this supplementary section will equally prove of interest and of value in our vocation and similarly demonstrate the worth of the continuing work of the Inquiry.

Ross Hall,
University of Strathclyde, 1967.

WHAT DOES THE CUSTOMER REALLY WANT?

Without food man could not survive for more than a few weeks and without drink he could not survive for more than a day or so. But these essential physiological needs are not necessarily the only reasons for eating and drinking in the way that we do. Most of the time we eat and drink because we enjoy it and because it fulfils our need for security, excitement and group acceptance. Every time we buy a drink or select a meal we paint a picture of ourselves. Do we feel a need to conform, or to be a strong individualist? Are we feeling adventurous or "stay-at-home"?

Meal patterns reflect our complex psychology. Different meals and meals in different places fulfill different psychological needs. Most of us choose the same food for breakfast every day of the week, if not all through the year. Imagine our irritation, though, if our wives served the same evening meal twice running, let alone *every* day. Perhaps this particular difference in attitude can be explained by the fact that we feel at our most insecure and unadventurous first thing in the morning, as well as having little time to prepare or even eat a meal, whereas by the evening we crave something more exciting.

In the same way where we eat answers different types of need. When we have dinner at home we do not notice the meal very much, for whilst we are eating we are talking about what we have been doing during the day and how the children have been getting on at school. We may even be watching the television or reading the newspaper.

Our situation is very different when we are eating out. It may be an anniversary or a special event. We are looking at the table cloth, the cracked plate, and thinking about the good or bad food; we are savouring a different and perhaps fairly novel situation; we are eating perhaps for eating's sake, with the added plus of different surroundings and unusual circumstances.

But how does all this affect catering in the restaurant or canteen? The object of this research is to try and explain how people react to the whole business of eating out and to analyse where and why they go and what they choose to eat. We hope it may help the caterer to provide better service to his customers. If he understands a little more clearly why they want what they want, then he ought to be in a better position to meet their needs and so increase his own skill and profitability.

The psychology of the consumer determines his ultimate meal choice, and can be governed by a number of factors that some caterers might regard as merely incidental. We consider below some of these factors and then see how they are related to the statistics, revealed by recent research, shown in the Tables in this supplement.

The first part of this study comprised a series of group discussions conducted in Bristol and Newcastle. During these discussions the men and women involved were allowed to talk freely over the whole issue of choice of meals, how they pick upon a restaurant and so on. Direct quotes from what they said are included in this report. The letter before the age and sex signifies their class grouping as defined by Research Bureau Ltd. who undertook the research on behalf of the sponsors. These class groupings are defined in Appendix B.

WHY GO OUT TO EAT?

The first National Catering Inquiry revealed the somewhat startling fact that only 3 per cent of the population eat out for pleasure more than once a week and that a third of the population eats out only once every few months. For most of these people a meal out is to celebrate a wedding anniversary, a birthday, a new job, or a similar special event. The first objective of this current research was to try to find out why it was that people ate out so infrequently and on very special occasions only. The hope was that if some clear reasons for not eating out more frequently emerged the caterer might be able to meet the needs of his "target group" more effectively.

The answer lies perhaps in a series of negatives. People do not eat out frequently, it seems, because

- (a) they cannot afford it;
- (b) they do not enjoy it, or
- (c) they cannot find someone to look after their children.

This last point demonstrates the physical impracticability of eating out with your husband because you cannot find anyone to look after the children and is a major source of complaint among young married people. Often husbands and wives are only able to get out together to the pictures or for a meal about once every six months.

"I never get out with my husband—there's just nobody to leave the children with"—D1 female, under 35.

"My wife and I would love to get out for a meal together but what about the children"—C male, over 35.

"We had a meal out together just over a year ago."—D2 female, under 35.

"We try to get out together now and again but it's not easy to get friends to sit and babysitters are expensive"—AB male, under 35.

"It's a jolly expensive way to spend an evening"—C male, over 35.

"We just couldn't afford to do it very often"—C female, over 35.

"If you have got a night out you just have to decide how you can best make the most of it"—AB female, over 35.

"It's just not worth it—we would rather have a meal at home and go out to blow our spending money later"—D1 male, over 35.

Cost is quite naturally an important issue not only with this group but with everyone. However, it is not simply a question of money not being available. Most people could afford a meal out once a week if they wanted to give it priority over bingo, dancing, or a night at the local. Frequently in fact, it is not simply that people cannot afford to eat out; it is much more likely that they do not think it is worth it.

One of the reasons why eating out comes low on a list of priorities is that Englishmen always like to think they are getting a reasonable bargain, and with meals they feel this is easy to assess. The housewife knows how much it would cost to make sausage and chips at home and the difference between this figure and the cafe price is seen as sheer and exorbitant profit. Likewise men bitterly complain about the cost of a bottle of beer or wine in a restaurant because they know only too well the retail price. Not surprisingly the average person does not remember the scale of wage and laundry costs, and indeed why should they?

“Well I know what it costs for a joint of roast beef and I can tell you we should have got the whole joint for that price”—C female, over 35.

“The food prices are just too exorbitant—how much does a packet of soup cost I ask you”—D1 female, over 35.

“It’s a pity you cannot take your own bottle of wine with you—it would reduce the cost a great deal”—AB male, over 35.

“It’s on the alcohol they make their profits”—C male, under 35.

“We had one round the four of us—18/6—and not a bottle of wine under a pound—you just cannot keep up with it”—D1 male, over 35.

“We like to have a meal but only before going to the cinema or the dogs”—D1 male, under 35.

“We never eat out just on its own—this wouldn’t be good enough for the evening”—C female, over 35.

“We like to linger and talk the evening away over the dinner table”—AB male, over 35.

“My husband—he just won’t go out for a meal”—D1 female, under 35.

“He always says he is too tired or it’s a waste of money or something”—C female over 35.

Cost is important too because, for a large percentage of the population, a meal out is seen only as part of the evening’s entertainment to come before or after a visit to the cinema, the theatre, greyhound racing or a dance. Yet its cost can be out of all proportion to the enjoyment and time it involves. The cheaper (and equally sociable) answer is often a visit to the public house for a few rounds of drinks and a sandwich.

Perhaps it is partly as a result of all this, and especially because he has to pay the bill, that *the male frequently claims that he doesn’t like to eat out and rigorously opposes his wife’s attempts to go out for a meal*. This seems particularly the case among older people.

“When I get home I just want to sit in front of my own fire, take my coat off and put my feet up—not go gallivanting out again”—D1 male, over 35.

“I don’t want to go rushing out again after a hard day’s work”—AB male, under 35.

“It’s the wife, she is the one who likes to go out”—C male, over 35.

“It’s such a change from being at home all day”—AB female, over 35.

“You feel tired and depressed and an evening out with a meal and no cooking and washing up just cheers you up a lot”—C female, over 35.

These attitudes reflect the different psychological needs of the male, away at work all day, and the full-time housewife. The male has probably seen enough of the outside world and wants only a seat by his own fireside, the solace of a glass of beer and watching the telly. His wife, having been tied to the home and children all day, is more anxious to be out and about, enjoying newer and wider horizons. This conflict is likely to be common to all social classes, but particularly strong among those for whom eating out is not a normal activity.

There is another relevant belief, beginning to be apparent amongst the younger higher social class groupings, that it is very “non-U” to take your friends out for a meal. Rather you should take the trouble to prepare something for them to eat at home. Eating out is “easy” and certainly shows little regard or thought for the people you have invited. If this attitude developed it would clearly not be a happy trend for the caterer.

It was also possible to detect another issue from the group discussions. Except on wedding anniversaries and similar occasions, husbands and wives are not too happy about eating out alone together. Sadly, but yet in a way understandably, they find each other’s company a little boring in such situations. With the passing of romance, husbands and wives find their interests tied to discussing budgets, the garden, and next year’s holiday.

But these things are discussed easily and perpetually at home. The gayer, more exciting, more romantic image of the restaurant, whether it is a speciality bar or a top London hotel, is not the right atmosphere for such talk. The gaiety and artificiality that ideally go with the surroundings require other people with whom you are less involved and whose outlook is less predictable, people who provide bright and witty conversation and even mild flirtation. Perhaps this is the reason why most people said they seldom ate out with their partner alone, but more frequently in a group. Yet this in itself may present problems because the number of suitable people you would care to be out with for such an evening, who are free at the same time as you, and who can afford it, may be quite small.

“Oh, we wouldn’t go out just the two of us for a meal unless it was an anniversary or something—we wouldn’t know what to talk about”—D1 male, over 35.

“I can see my husband any time—I like to have a few different faces around”—C female, under 35.

“We find it’s best if there are a few of us—there’s more to talk about, it’s more fun, and we don’t end up having a row or thinking how we are going to pay bills”—AB male, under 35.

“A night out reminds you of when you were young and single with several men in tow. Lots of excitement and flirting—you try and put a bit of the glamour back”—C female, under 35.

“My wife’s always better company if there are some more men around”—C male over 35.

“Mind you, it’s not easy to find the right sort of people to go out with”—AB male, over 35.

“It’s quite an operation trying to get six of you out together for an evening, what with eight children to deal with and husbands working late, etc”—C female, under 35.

We must, of course, be careful not to generalise about all this. In the last few paragraphs we have been referring mostly to married couples with some degree of freedom from their children and with sufficient income. For those mentioned earlier who are tied by insufficiency of money or baby-minders, dinners out with anyone and best of all with your husband would be accepted with alacrity.

Likewise, young unmarrieds eat out much more frequently and often alone with their “steadies”, as do young married, but as yet childless couples. Indeed this may be a growing trend. It can be explained as partly a question of attraction, partly a question of ready cash, and partly a question of easing the burden upon wives who are trying to run homes and do jobs as well.

It is in fact possible to portray a cycle of eating out.

When young, gay, and fairly prosperous, people eat out a lot. There follows a trough based on a high mortgage, slender means, and a lack of people to mind the children. Later there is a steady re-emergence of dining out when couples are once more freed from such restrictions by the children’s growing up and the financial position’s easing.

“There’s nothing I like better than taking out my best girlfriend for a slap-up meal in a good restaurant”—C male, under 35.

“My boyfriend and I tend to eat out quite a lot”—AB female, under 35.

“We eat out a lot—well my wife works and so, on the one hand we can afford it, and on the other it takes the effort off of her preparing a meal”—C male, under 35.

“I get home tired and I don’t want to start making a meal so we often go out for a meal”—C female, under 35.

“You cannot afford to take a risk—it costs too much”—D1 male, over 35.

“We always go back to the same place—when it’s an anniversary or a birthday and we want to be sure we enjoy ourselves”—C female, over 35.

“It’s hard enough to find a good place so when you do find one you stick”—AB female, over 35.

In reality the choice of a place to eat is governed by predictability. We have already demonstrated that people eat out only very occasionally, and then usually because it is a special event or an anniversary. Under these circumstances they want to be sure they enjoy themselves. People therefore tend to go to places which they know will give them what they want or to which they have been given a personal recommendation. It is this which in essence sends people time and time again to the same restaurant. The next place might not provide the quality of meal or attractiveness of surroundings. It may also be very difficult to assess in advance what it will cost.

Many people complained that there was no menu outside to give some guide to cost or, even if there was, it was still a complex matter to judge the approximate cost of a complete meal.

It is for these reasons that for so many a steak bar solves the problem. The meal, the time involved, the service, the cost are all clearly understood and predictable. Nevertheless, it was possible to detect a feeling of dissatisfaction about the rigidity of the menu in the speciality bar. For example, you always have to have chips and cannot have new potatoes, and the number of dishes you can choose from is often very small.

There is one other point which warrants discussion at this stage. Caterers are always urging people to complain if the food and service is not up to the required standard. This shows some lack of understanding of the issues involved in eating out. The meal is a special event to be savoured over the next few weeks or months and will be used to brighten up so many rather dull days of routine, even boredom. *Better by far to grin and bear it, or even pretend some fault does not exist, than to mar the evening by some quarrel or scene.* The Englishman, the caterer should remember, never likes to make a fuss and under these circumstances he finds it quite intolerable. Thus it is for the waiter to perceive the cause for possible complaints, and to act accordingly.

Of course, some people are always searching for “new” restaurants and for “new” dishes. The inspiration may come from publicity in the Press or even a casual remark in the bus queue. But personal experience and individual recommendation seem to be the basis upon which most people decide where to eat.

“You hear about these nights out for months afterwards so you don’t want it to go wrong”—D1 male, over 35.

“I always go by personal recommendation”—AB male, over 35.

“You like to know you have enough money in your pocket”—C male, over 35.

“You have a budget—how can you tell how much it will cost if there’s no menu outside?”—C male, under 35.

“Even if you have a menu you can never tell the cost. There’s two bob for this, vegetables are extra and so on”—C male, over 35.

“With the steak bar you know exactly what the cost will be and how long it will take to get a meal”—C male, under 35.

“You can rely on it”—D1 male, over 35.

“It’s all very well as long as you want the exact meal, but they will not give you boiled potatoes instead of chips for example”—A male, over 35.

“The choice just is not big enough and you get bored”—B female, under 35.

“You don’t want to spoil your evening by making a fuss”—B male, over 35.

One feature remains. This is concerned with eating out for pleasure in the middle of the day, especially on Saturdays. A number of complaints emerged about lack of facilities for children: caterers did not provide high chairs or appropriate small cutlery; there was nowhere to park a pram. Perhaps most important of all, there was too much rigidity over size of portions. It was bad enough on occasions to have to pay for an adult's portion, but for a child to be given a similar plateful of food was thought absurd!

There was a hint (*perhaps not far from the truth*) that in reality the caterer did not really welcome children in his restaurant. The Chinese restaurant was often seen to be the exception to this rule. But self-service, which enables the customer to get a meal quickly and so reduce the time available for boredom and naughtiness, with hard-topped tables so there is no trouble in case of accidents, was seen as the ideal answer to eating out with children.

"There is just nowhere to take the children"—A female, over 35.

"It's not so much the cost, but a massive plateful just puts the child off completely"
—B female, under 35.

"They just seem to think children are not worth the trouble. I asked for a small glass of milk. She said they did not do one. So I said, well just fill the big one half full but she said she wasn't allowed to"—B female, over 35.

"Self service, with hard topped tables, is just about the best for children"—C female, over 35.

CHOOSING A PLACE TO EAT

Having decided to go out for a meal, how do people decide where to go? The first National Catering Inquiry report listed some of the most important considerations. In this research we have tried to look a little deeper at what people mean by cleanliness, good service, friendly atmosphere and so on. *It seems that the initial choice in terms of price range is determined by the husband, but that within this range the wife has a fairly free hand.*

We have already discussed price as a factor inhibiting more frequent eating out. The first report went on to remark that there seemed to be a strange anomaly between two views. On the one hand the majority said they would like to eat out more often if the food were less expensive; the other people put price low on the list of factors which affected their choice of a particular restaurant.

Perhaps now we have the explanation. *People put cost so high among their priorities that they only consider realistic alternatives.* Thus the young man earning £15 a week taking his girl out for a meal does not think about the Dorchester or the Savoy, but thinks only in terms of restaurants which fit his means. In the same way the husband (and wife for that matter) knows the price he can roughly afford to pay for dining out in an evening. He therefore allows his wife to select on the basis of other qualities from within the appropriate price range.

“Well you know how much you can afford to spend and so this limits your choice quite a bit”—C female, over 35.

“We know we couldn’t eat with the nobs”—D1 male, under 35.

“My wife decides where we will eat, but of course she knows she has to be reasonable”—C male, over 35.

“It’s got to be within the budget”—AB male, under 35.

Good cooking is another key priority, especially when choosing a new restaurant. The new research also confirms other issues raised in *The British Eating Out*.

Amongst the first usually mentioned is *cleanliness*. People dislike seeing stained tablecloths, dirty ashtrays or chipped cutlery or china. Similarly, women find an attractive powder room a desirable attribute.

“You take it as read that the food must be good”—AB female, over 35.

“You expect to be able to have a good nosh-up—this is most important”—D1 male, over 35.

“Well we wouldn’t go anywhere where the food was doubtful”—C female, under 35.

“Well I think cleanliness is very important. I hate dirty ashtrays, stained tablecloths, etc”—AB female, over 35.

“Chipped china is terrible”—D1 female, over 35.

“It’s a special occasion so you want the place to be attractive and give the right atmosphere”—C female, under 35.

“A nice powder room helps”—C female, over 35.

Service is obviously another key factor, but one about which it is difficult to generalise. Different people have very different ideas on what they regard as good service. Members of the CD social grouping, if they eat out at all, do so as part of an evening's entertainment, whereas higher up the social scale the meal represents the summit of the evening's entertainment. Consequently there is a different attitude towards speed of service. The first group would expect prompt delivery and clearing of the different courses, with only a very limited interval between courses. Yet the other group might complain that this would be "hurrying" them, not allowing them to enjoy their meal fully.

"Good service is very important"—AB male, over 35.

"You don't want to be kept waiting all night"—C1 female, under 35.

"Some waiters see you waiting and they just turn the other way"—D1 male, over 35.

"We sat there a quarter of an hour before they came to see what we wanted to order"—D1 male, under 35.

"I cannot stand being rushed"—AB male, over 35.

"Some places just want to get you in and out as quick as possible"—C male under 35.

"We like to make an evening of the meal with a pause and a cigarette between each course—this is no good at all in some places, they just seem to want to get your money and get rid of you"—AB female, over 35.

These differences in attitude influence the sort of attention the waiter is expected to give. The lower social groupings prefer an approachable, fairly friendly attitude, whereas the higher groups prefer something a little more aloof.

Gastronomes tend to scoff at the suggestion that certain groups of the community do not visit high-class restaurants because they are overawed. But time and time again in our research it became clear that it was this very feature, rather than cost, that was keeping large sections of the community away. Thus people spoke of snooty waiters and of flamboyant, incomprehensible menus they could not understand. They even complained of too complex a set of cutlery they did not know how to use and of feeling that the other people in the restaurant, and the waiters especially, were trying to make them look small. It is evident that a reduction of flamboyant procedure and appearance, demonstrated by the new steak bars and chicken houses, is a real answer to these problems.

"You like them to be a bit friendly—not too snooty"—C male, over 35.

"They come up to you and speak in a high falutin' French accent and then go and yell down the flap—'Here Joe, two soups and one tomato juice'"—C male, under 35.

"Some waiters, you just cannot talk to them and if you haven't got a Jaguar they just don't want to know you"—D1 male, over 35.

"You get this enormous menu—what does it mean all in French, and you don't like to ask the waiter"—C female, over 35.

"I was away with my bosses—the menu was terrible in the hotel—I couldn't understand it at all so I just had what they did"—C male, over 35.

"I wouldn't eat in a hotel like this myself—you have to know your place"—D male, over 35.

"You never know which knife to use and then they come with the vegetables and you are afraid of taking too much"—C male, under 35.

"It's not the cost—it's just you're not at home"—C female, over 35.

"You cannot enjoy yourself—you always feel you might make a mistake. It's like having a party at the bosses' house or dining with his wife"—C male, under 35.

"It's a special occasion so you go where you know you will have a good time"—AB male, over 35.

CHOOSING THE MEAL

In the first National Catering Inquiry report, one question dealt with the food you would choose from a three-course menu. In this study there was no reference to price or to variations in choice between men and women. In order to extend this knowledge, a further survey was undertaken in which 420 people were interviewed, half in London and half in Leeds. Each respondent was asked if he or she ate out fairly often (i.e. at least once a month) and if so whether it was in the 5/-, 12/6, or the £1 price range. He or she was then given the appropriate menu for the price range and asked to choose a meal. In the accompanying tables you will find details of these three menus, together with a summary of the full results.

In the text which follows we shall be examining the 12/6 menu in detail, with reference only to the other menus. The 12/6 menu has been chosen because it most nearly matches the average price of 13/2 paid for a meal eaten away from home for pleasure as established in the last study.

The First Course

As the first Inquiry clearly demonstrated, soup is the most popular first course, even though less popular than caterers assumed, followed by prawn cocktail and fruit juice. But it is at once of interest to examine the breakdown within the averages. Thus, soup is much more popular with men than with women, and vice versa for fruit juice—perhaps a reflection of weight consciousness. Among the social classes, fruit juice was more popular with the DE's and melon and grapefruit cocktail with the ABC. Again, regionally soup seems to be much more appreciated in Leeds than London. (see Table 1 below).

Table No. 1

CHOICE OF FIRST COURSE—12/6d. Menu.

	Total %	Sex		Class		Area	
		Male %	Female %	ABC %	DE %	London %	Leeds %
Soup	43	49	36	37	48	31	54
Prawn Cocktail	18	17	19	19	16	21	14
Fruit Juice	14	8	20	9	19	20	9
Melon	11	10	12	15	7	13	9
Grapefruit Cocktail	9	8	10	10	8	11	7
Shrimp Cocktail	6	7	4	9	3	4	7

At every level of comparison between the menus at different prices one would expect difference, if only because of what is available. But we also have an opportunity to see the influence that price has over free choice. As we move from one menu to the next the choice widens, and we can see what people like to choose if not inhibited by cost at all.

When comparing first courses, it becomes clear that soup is an early loser as we move to the more expensive menus. Melon and grapefruit cocktail are static, whilst fried scampi and smoked salmon move up the chart (see Table 2).

Table 2

CHOICE OF FIRST COURSE—Showing influence of price and availability % OF SAMPLE

	5/- MENU	12/6 MENU	£1 MENU
SOUP	76	43	20
FRUIT JUICE	19	14	4
PRAWN SHRIMP COCKTAIL	N.A.	24	25
GRAPEFRUIT COCKTAIL	N.A.	9	9
MELON	N.A.	11	9
SMOKED SALMON	N.A.	N.A.	6
FRIED SCAMPI	N.A.	N.A.	12

Perhaps the most remarkable thing about the first course in a restaurant is that we eat it at all. We have argued that a meal out is a very different affair from a meal at home, and this is certainly true when we look at first courses. At home few people have anything before the main course at all. Let us compare the position with the normal meal at lunch time or in the evening. At home, only one person in ten at lunch time, and one in twenty in the evening, have a first course, and then it is almost exclusively soup.

Why this variation? There seem to be both positive and negative factors involved. Positively, when eating out people say they "want the lot". It is a special occasion and they want to go through the menu from A to Z, savouring every aspect as fully as possible.

At home, however, a first course presents all sorts of problems. You have to keep the main dish hot whilst the soup, or whatever it is, is consumed. There is also the time involved in preparing yet another course, to say nothing of extra washing up. Equally, a consideration is that you may be short of the appropriate utensils for cooking and from which to eat.

The Main Course

In the earlier study it was found that meat was by far the most popular first choice for the main dish. This finding was strongly confirmed in the current study. Fillet steak was very popular, chosen by twenty-nine per cent of those having the 12/6 menu. This was followed by roast beef (eleven per cent), chicken (ten per cent) and, perhaps surprisingly, halibut (eight per cent) (see Table 3).

Table No. 3

CHOICE OF MAIN DISH—12/6d. Menu.

	Total %	Sex		Class		Area	
		Male %	Female %	ABC %	DE %	London %	Leeds %
Fillet Steak	29	34	25	31	27	31	27
Roast Beef	11	14	7	6	15	13	9
Chicken	10	7	13	12	8	10	10
Halibut	8	7	9	7	8	3	13
Rump Steak	7	7	7	1	12	6	9
Roast Lamb	7	7	7	4	10	4	10
Roast Pork	6	3	9	3	8	6	6
Duck	5	6	4	9	1	4	6
Curry	5	3	7	9	1	9	1

Again there were interesting sex and class variations. Thus steak was more popular with men than women, whilst the converse was true of chicken. It is interesting to conjecture on whether this is because steak has a strong “manly”, “beefy” taste, but at the same time has no frills—thus essentially a masculine appeal—whereas chicken is less pronounced in taste but more intricate (with sauces etc.) and is therefore more attractive to women. For class, the order is much the same, but with a few intriguing variations. Steak, if you add rump steak (twelve per cent of DE’s against one per cent of AB’s) is more favoured by the lower groupings, as is roast beef (fifteen per cent as against six per cent). However, duck and curry have a strong ABC class bias. Perhaps these “more exotic” foods follow the general pattern of suspicion that working class groups seem to have of intricate foods.

The analysis across the various price ranges also presents differences. The cheaper menu with its more “solid” foods reveals a strong interest in steak and kidney pudding and the roasts. However, steak dominates the other two as soon as it appears on the menu. Even with a very wide menu, steak, duck and chicken are the favourites. Perhaps it is this attitude which favours the growth of the speciality bar with only a few choices, for over half the people in each group chose one of four dishes. *It is perhaps ironic that those people who eat at the most expensive places, and who would be expected to demand the widest menu, in fact place the most emphasis on four main dishes* (three if you couple rump and fillet steak) (Table 4).

Table 4

TOP CHOICES FROM EACH MENU

Ranked	5/- menu	12/6 menu	£1 menu
1st	Steak and Kidney Pudding 24%	Fillet Steak 29%	Fillet Steak 23%
2nd	Roast Lamb 17%	Roast Beef 11%	Duck 17%
3rd	Roast Beef 15%	Chicken 10%	Chicken 14%
4th	Chicken 10%	Halibut 8%	Rump Steak 14%
Total choosing one of four main dishes	66%	58%	68%

How does this picture compare with meals at home? At lunchtime, meat of course is the major protein (sixty-seven per cent of households using meat either hot or cold), but it is not quite so important as it is on the 12/6 menu (seventy-four per cent). Fish is similar (eight per cent in each case), but poultry is consumed much more in restaurants (fifteen per cent as against three per cent).

Turning to particular types of meat and their preparation, the comparison depends a little on the day. On Sunday at home, well over half the community has a roast, but on other days of the week the figure is around five per cent. Steaks are generally a rarity, appearing in only three per cent of households each day.

Why this much greater interest in steak and chicken in the restaurant? Steak is expensive—it is therefore a food for treats, and, as we showed earlier in the study, “a treat” exactly describes most visits to a restaurant. It is therefore quite natural to choose steak on such occasions. There is also a belief that the caterer has certain advantages in the purchase and preparation of steak. He can get better cuts; he has the right equipment for cooking it; he knows exactly how to prepare it. We are back again to the concept of predictability.

When people go into a restaurant they are naturally anxious to choose something that they like; it would be both an embarrassment and a waste of money to select something which they could not really enjoy and at worst could not eat. Most people therefore choose something which they predict they will enjoy. The one uncertainty that enters the mind at this stage is in the interpretation of what customer and caterer mean by “rare”, “medium” and “well done”. But compare this with the doubt surrounding beef curry—one cannot be sure it’s beef, let alone how hot it will be!

“Steak is a real treat”—D1 male, over 35.

“Oh it’s special”—C female, over 35.

“It’s too expensive to have at home”—C male, under 35.

“I love it—and they can buy and cook it better”—B female, over 35.

“You know it will be alright”—C male, over 35.

“It’s always my choice”—B male, over 35.

“The only trouble is you ask for it medium but no two people cook it the same”—B female, over 35.

“You know what you are getting”—D male, over 35.

Vegetable Choice

Turning to vegetables for these main dishes, the picture is one of predominance for a small number of vegetables: brussels sprouts, peas, and mushrooms. There are only small class and sex variations in choice and the “top vegetables” are fairly constant for all three menus (see Table 5 below), although peas are ahead of brussels sprouts on the 5/- one.

Table No. 5

CHOICE OF VEGETABLES—12/6d. Menu.

	Total %	Sex		Class		Area	
		Male %	Female %	ABC %	DE %	London %	Leeds %
Brussels Sprouts	29	31	26	27	30	23	34
Peas	22	23	22	21	23	26	19
Mushrooms	10	11	9	13	7	14	6
Cauliflower	8	7	9	7	8	7	9
Green Beans	7	4	10	9	5	7	7
Broccoli	4	3	4	1	5	1	6
Celery	4	6	3	6	3	3	6

Naturally, as the menu widens, the spread of choice grows, but most people still concentrate on two or three main ones (Table 6).

Table 6

CHOICE OF VEGETABLES—Showing the influence of choice and availability % OF SAMPLE

	5/- MENU	12/6 MENU	£1 MENU
BRUSSELS SPROUTS	22	29	21
PEAS	29	22	19
MUSHROOMS	N.A.	10	14
CAULIFLOWER	17	8	9
GREEN BEANS	4	7	9
BROCCOLI	N.A.	4	5
CELERY	N.A.	4	4
GREEN SALAD	N.A.	3	7
ASPARAGUS	N.A.	N.A.	5
CABBAGE	14	N.A.	N.A.
CARROTS	10	2	4

Roast potatoes remain the most popular potato choice for both men and women of all classes. Mashed potatoes appear to be less popular in London than in Leeds (see Table 7).

Table No. 7

CHOICE OF POTATOES—12/6d. Menu.

	Total %	Sex		Class		Area	
		Male %	Female %	ABC %	DE %	London %	Leeds %
Roast	35	31	39	35	37	36	34
Mashed	19	21	16	15	22	10	27
Sauté	14	10	17	15	12	19	9
Chipped	14	18	10	16	12	14	14
Potatoes in Jackets	6	7	4	7	4	9	3
Boiled	5	6	4	3	7	6	4
Croquettes	2	4	—	4	—	3	1

One has always been led to believe that the “chips with everything” concept had a distinctly non-U, plebeian image, and was much associated with the north. Yet these results show that chip consumption rises as we go to the more expensive menus and is almost as high amongst the ABC group as the DE group, and is in fact greater in London than in Leeds (see Table 8 overleaf).

Table 8

CHOICE OF POTATOES ON DIFFERENT MENUS

	% OF SAMPLE		
	5/- MENU	12/6 MENU	£1 MENU
ROAST	38	35	21
MASHED	24	19	15
SAUTE	N.A.	14	21
CHIPPED	17	14	21
POTATOES IN JACKETS	N.A.	6	N.A.
BOILED	19	5	10
CROQUETTES	N.A.	2	6

Sweets and Desserts

Cheese and fruit pie are jointly top choice. However, the trend to cheese is much greater with the ABC and London groups. Conversely, trifle is much favoured by the DE and Northern groups, and ice cream is surprisingly low on the list (see Table 9).

Table No. 9

CHOICE OF DESSERT—12/6d. Menu.

	Total %	Sex		Class		Area	
		Male %	Female %	ABC %	DE %	Leeds %	London %
Cheese	18	17	19	24	12	11	24
Fruit pie/tart	18	23	13	19	16	17	19
Fresh fruit	17	16	19	16	18	21	13
Trifle	15	14	16	7	22	10	20
Tinned peaches/fruit salad	12	13	12	16	8	11	13
Ice Cream	9	7	12	7	11	11	7
Pancakes	9	11	6	6	11	13	4
Mousses	1	—	3	1	1	3	—

The choice of sweet or cheese, especially in the more expensive restaurant, may well be dependent upon the attractiveness of the display on the sweet trolley. In no other course does the eye have so much influence as it does over choice of dessert, and we are surprised that restaurants do not make more use of this obvious appeal. The greater the attractiveness and variety of sweets and fresh fruit on display, the greater is the likelihood of something being selected.

“Well it’s a special occasion so you want everything—all the trimmings”—D1 female, over 35.

“I like to go right through the menu”—C male, under 35.

“Well, you don’t have it at home—think of the time and the washing up”—B female, over 35.

“You cannot keep both dishes hot”—C female, over 35.

“It’s too much worry”—D1 female, under 35.

Comparison among the menus shows the 5/- one favouring the heavier steamed pudding and the £1 one fresh fruit salad (see Table 10).

Table 10

TOP SWEET CHOICES FROM EACH MENU

Ranked	5/- menu	12/6 menu	£1 menu
1st	Steamed Pudding 24%	Cheese 18%	Fresh Fruit Salad 26%
2nd	Fruit Pie 23%	Fruit Pie 18%	Cheese 21%
3rd	Tinned Peaches Fruit Salad 21%	Fresh Fruit 17%	Melba peach/pear 14%
4th	Ice Cream 16%	Trifle 15%	Trifle 8%

EATING OUT AT WORK

The basic objective of the supplementary parts of our study was to look at the factors affecting eating out for pleasure. We did also take the opportunity, however, to look briefly at eating out whilst at work, either in a restaurant or in the works canteen.

It is clear that the two factors of vital importance in deciding where to eat and indeed whether to eat a meal at all on these occasions are cost and speed of service. We must realise that the need to be fulfilled in eating out at work is very different from that of eating out for pleasure. You eat to stop yourself feeling hungry or uncomfortable, and to enjoy a brief release from the pressure of work. Consequently you are not particularly concerned with attractive surroundings or the social graces. You want to satisfy your hunger for as little money as possible, and since you may only have three-quarters of an hour for lunch and there is shopping to get, you want the food served as quickly as possible. If these two basic criteria are not satisfied, then you may not eat at all, or bring sandwiches, or have a beer.

There is one other issue of interest, however, which should be discussed in some detail. The phenomenon of boredom, or what we might appropriately call the *law of diminishing interest*, must have been noticed by anyone involved in institutional feeding of one sort or another. By this we mean that people are initially very interested in the food provided and pass favourable comments about the quality of the meals. But as time goes on they become more and more critical. Similarly, students in a hostel are quite pleased with the food at the beginning of a term, but twelve weeks later they are almost throwing it at each other. This feeling may be as true of the restaurant visited too frequently for pleasure as for the works canteen or hostel. Probably with this problem we are really back again to the concept of predictability, but now it is working in the reverse direction.

Compare this with meals at home. The housewife probably uses only a small number of basic dishes. But here, of course, you are not concentrating so much on the food alone, and your attitude to the end product is much less critical than it would be if the same thing were provided in a canteen.

Also, we must realise that the end product which the housewife provides is less standard and predictable than that of the caterer. One Yorkshire pudding at the works canteen is quite likely to be exactly the same size, shape, colour and texture as all the previous Yorkshire puddings provided in the canteen over the last year. But the Yorkshire pudding at home is much more variable. Perhaps there is an element of excitement and uncertainty provided in the average home meal which helps to sustain interest. It may be felt that this last example takes the issue too far, but we are certain that it is important for caterers to try and produce an element of variety and surprise in the food provided if the law of diminishing interest is not to have a major effect.

"It's got to be quick and cheap"—D1 male, over 35.

"I cannot waste more than half an hour on lunch"—C male, under 35.

"We don't worry about the surroundings as long as the meal is good and filling"—C male, over 35.

"It's funny—you eat at the same place over a period of time and you begin by thinking it's good but you end up finding more and more wrong with it"—B male, over 35.

"I find a restaurant loses its appeal over a time"—A male, under 35.

"At the beginning of the term you think the food's great, but goodness how it falls off"—B male, under 35.

CONCLUSION

A MARKETING 'BLUEPRINT' FOR CATERERS

One main purpose of a study such as this is to help the caterer to identify his customers, and to know a little more clearly the factors which affect their attitudes towards the services he has to offer. Caterers are just as much involved in marketing as any other industry with a product to sell, and one of the first principles of marketing is the identification of the target group. If the product is wrong, it is this rather than the group itself which has to be changed. With this supplementary report before us, it might be *useful to try and present what might be called a "blue-print" for marketing action on the part of the caterer*. In other words, in what ways can a study such as this help in attracting the customer and in providing the sort of atmosphere he might enjoy and return to? Our recommendations, in summary are as follows:

1. Try and find out what appeals to young people especially and then set out to provide it. Establish the habit of eating out for pleasure among the young and they will be frequent customers.
2. Find out what makes older people want to leave their firesides. A little thought about this problem should work marvels with this group—they need to feel themselves treated as something special.
3. Try and provide better facilities for children. Even if at the time this appears a nuisance, remember that it is these same parents, if they find the restaurant appealing, who will return and spend more money with their friends on 'evenings out'.
4. Try and cultivate the meal out as an evening's entertainment in its own right. One appreciates it may not be economically possible to allow people to remain at their table for the whole evening, but perhaps it would be possible to provide another room where they can dance or just sit and talk. Remember they might want to drink as well during this time.
5. Try and create a balance between excitement and glamour on the one hand, and club informality on the other. This will provide the atmosphere of an evening that is different but also generate something which has warmth and puts your customers at their ease.
6. Design the menu for the particular target group you have chosen as your customers—even if it means putting it all in English.
7. Watch very carefully the service your customers require and invite comments whenever possible. Remember that the mistake that your head waiter spots before it affects the customer makes everyone happier.
8. Try and maintain a steady, predictable standard of food and presentation, but always with originality to avoid boredom.
9. Place menus outside restaurants so that they can be seen before the customers enter, and so make it easy for them to assess what the total cost of the meal will be.

APPENDIX

The social groupings assigned to speakers whose comments are reprinted and groupings referred to in the text are as follows. These assessments are abridged, and the distinction between the first four categories are based upon the occupation of the head of the household and the property type of dwelling.

	<i>Category</i>	<i>Typical Occupation of Head of Household</i>	<i>Residence</i>
AB	Upper and Upper Middle Occupational Group	Professional or senior managerial or living on private income or investments	Own (large to medium sized) house with garage or rented house with garage.
C	Lower Middle Occupational Group	Lower managerial and supervisory grades	Own smaller House/flat or rented house/flat sometimes with garage.
D1	Skilled workers Occupational Group	Skilled workers (mainly manual) or craftsmen	Council house/flat or rented house/flat or own small house/flat
D2	Semi-skilled Workers Occupational Group	Semi-skilled, unskilled, labourers, agricultural workers	Council house/flat/terraced house
E	Unemployed and those at the lowest level of subsistence.		

CHAPTER 3

CONCLUSIONS

As has already been indicated, the specific findings of each research project are embraced within that individual paper. Moreover as I move forward chronologically, each new paper derives from, and builds upon, earlier research. Thus in the case of nutritional knowledge the findings of the papers, initially considered as far back as 1963, are clearly embraced within the interpretation of the latest paper to be published in 1980.

Equally within each Section of Chapter 2, I have attempted to draw together the key findings that have emerged from the specific papers within that Section.

However, there are wider findings that can be derived from an analysis of the papers as a whole. This may best be demonstrated with reference to three papers that respectively reflect my views towards the beginning of the study; at the end of the 1960's; and at the present time. The papers concerned are:-

- Paper 1: Conspectus - Co-jointly with John Yudkin
(Chapter in Changing Food Habits, edited by
Yudkin and McKenzie, 1964).
- Paper 2: Overcoming Resistance to new Food Products (in
Proceedings of the Nutrition Society, Volume 28,
1969).
- Paper 3: Potential for Change in the Food Habits in the
U.K. Population (in Proceedings of the Nutrition
Society, Volume 36, 1977).

Beyond this, the University regulations require that the Candidate must indicate how far the work "embodies the result

of his own research or observation, and in what respects his investigations appear to him to advance the study of his subject". Moreover "that it must be suitable for publication, either as submitted or in an abridged or modified form" and must form "a distinct contribution to the knowledge of the subject and afford evidence of originality, shown either by the discovery of new facts, or by the exercise of independent critical power". As such in this concluding section, I must attempt to identify the extent to which I have satisfied these regulations, and indicate the contribution I believe my research has made.

The publication requirement would seem to be satisfied by the very fact that the work has been included in the following reputable journals and books:-

Journals

British Journal of Nutrition;
Chemistry and Industry;
Human Nutrition;
Nutrition;
Nutrition Abstracts and Reviews;
Proceedings of the Nutrition Society;
Proceedings of the IXth International Congress in
Dietetics;
Proceedings of the VIIth International Congress in
Nutrition;
Rehabilitation;
Transactions of the Lancashire and Cheshire Antiquarian
Society;
World Review of Nutrition and Dietetics.

Books

Biological Efficiency of Protein Production, edited by
J.G.W. Jones, 1973;
Catering Management in the Technological Age, edited by
J. Fuller, 1968;
Changing Food Habits, edited by J. Yudkin and J. McKenzie,
1966;

The Concept of Poverty, edited by P. Townsend, 1969;
National Catering Enquiry, 1970;
Lifestyles and Nutrition, edited by M. Turner - in
the press;
Our Changing Fare, edited by T.C. Barker, J. McKenzie
and J. Yudkin, 1966;
People and Food Tomorrow, edited by D. Hollingsworth
and E. Morse, 1976.

I would also submit that such acceptance and publication is of itself evidence of a direct contribution to the knowledge of the subject; or originality; and the demonstration of independent critical powers.

In terms of the development of the subject, I believe my research has contributed to the development of knowledge of the subject in a number of ways. This would include the following:-

- The isolation of the data that needs to be collected before attempts at changing food habits are made;
- The isolation of the problems that will emerge in attempts to change food habits, and an indication of the ways in which changes are most likely to be achieved;
- An indication of the level of nutritional knowledge and attitudes to food amongst the public and specific groups over a period of some 15 years;
- An analysis of the extent to which this nutritional knowledge/food imagery influences choice; the reasons for the level of influence achieved; and the ways in which this influence may be increased;

- An examination of specific sub-groups, both historically and in the 1960's and 1970's; an explanation of the factors influencing their choice of food; the ramifications of their diet upon their economic and social status; and the isolation of data from within these groups that may aid our understanding, and ability to change, food habits on a wider basis;
- A critical review of the influence of price upon choice;
- The development of appropriate techniques for examining both historical and contemporary data in the context of food consumption studies.

I began this thesis by reference to the Conference on Malnutrition and Food Habits held at Cuernavaca in 1960. Above all, I would trust that in some small way my research has dealt with some of the problems isolated there. In particular I would hope that my work has helped to make people aware of the significance of the study of social and economic aspects of nutrition; to understand why and how these subjects are important; and to develop from this a broader base of knowledge upon which to build attempts to successfully influence food choice.

I would hope also that I have been able to begin to show that Social and Economic Aspects of Nutrition can emerge as a separate discipline in its own right and which embraces a wide range of subject. And that it is such an integrated approach which is necessary if we are really to begin to be able to understand what influences the consumer's food choice and how this may be changed in the interests of improved nutritional status.

CONSPECTUS

J. C. MCKENZIE AND JOHN YUDKIN

WE all tend to bring into discussions of food habits our own ideas of what we think is good to eat. The contributions in this book, and the discussion at the symposium to which they were given, were less influenced in this way than many other discussions on the subject. We can nevertheless perhaps best begin this chapter by stating quite categorically that there is no such thing as *the* ideal diet; a person's physiological needs can be supplied perfectly well by any one of a vast number of combinations of foods. We do however still meet the opposite view, that what we eat is right, what others eat is wrong, and this is often expressed unconsciously when people use such phrases as 'food prejudice'. This view led us once to say that 'food prejudices are the ways other people eat'.

DEFINITIONS

We made this definition of course in order to underline the need to avoid as much as possible bringing our own prejudices into our studies. And it would help to clarify our minds if we attempted to define some of the other terms we use. For example, we tend to regard as synonymous the phrases food choice, food preference, and food habits. We think it is possible to distinguish between these in some such way as the following:

Food preferences: the particular foods an individual likes or dislikes

Food choice: the foods selected by an individual at a given time.

Food habits: the sum of the food choice of an individual, constituting his total diet.

These definitions need expanding and qualifying somewhat. Thus, it is possible to use these phrases to apply not only to an individual but also to a family or a population, provided we remember that the emerging patterns will represent an average, within which there can be an extensive range of individual variation. Again, it is not meant to imply that food preferences are static; there are often changes during a person's lifetime, and

during a period of social change both as it affects a population and as it may affect the individual.

The factors which determine an individual's food preferences thus include the culture in which he lives, the prestige value of the food, religious injunction, and palatability. By palatability, we mean the appearance, texture, smell, colour and flavour of a food.

When we refer to food choice we must appreciate that the choice can be at different levels (Yudkin, 1956). At one level, it may be between one brand of frozen peas and another, or between frozen peas and tinned peas: a choice which would have little or no significant nutritional implication. At another level, it may be between peas and beans, or between beef and mutton: nutritionally this too is usually of little significance. At the next level, one might be choosing between maize and rice, or between meat and eggs: here, the nutritional significance may be small, but in diets which are generally poor, it could be great, determining whether one develops pellagra or beri-beri. At the final level, one might choose between meat and spaghetti, or whether an infant should be given rice or fish: the nutritional significance of such a choice may well be considerable.

Food choice is, amongst other things, affected by food preference, and so by changes and fluctuations in food preferences. Other factors also play a part. One is ease of preparation, which may determine whether a young man living on his own, or an old-age pensioner, will eat potatoes or bread. Availability of fuel may also determine food choice. Another determinant might perhaps be nutritional value. Our own observations suggest that nutritional knowledge – correct or incorrect – does not affect the choice of many people other than those unusually preoccupied with their health. Nutritional value is more commonly used as a rationalization for a choice which has already been made; for example, that sweets and sugar are especially good sources of energy.

But the overriding determinant in food choice most frequently is availability, usually economic availability. That is to say, we usually eat what we like, provided we can get it and can afford it. Unexpected restrictions in availability are beginning to be seen in the wealthier countries, with the growth of super-markets and their tendency to reduce the number of brands of particular foods which they offer. However, at the nutritionally more important

levels of choice, availability is on the whole increasing. With increasing use of food preservation and improved transport, restrictions imposed by geography and season matter less and less. Restrictions imposed by economic availability are also decreasing, even in the developing countries. For these reasons, it is important to understand the factors other than availability which determine food choice. The purpose of this book is to underline the need to increase our understanding of these factors, and the methods by which desirable change in food habits may be promoted.

In the absence of economic restriction, one might say that people eat what they want, even though what they want is determined by external factors such as custom and religion, as well as by internal factors such as palatability. But what people want is not necessarily what they need: we can well say that the theme of this book is how to ensure that wants should coincide with needs. By needs we mean the physiological necessities of the cells and tissues of the body for optimal health. By wants we mean the psychological desires, the satisfaction of which gives pleasure to our minds and our bodies. In the first chapter of this book, it is suggested that these may be interlinked, in that the pleasurable satisfaction of our psychological wants in terms of hunger and appetite led to the satisfaction of our physiological needs – at least, so long as man was living as a hunter and forager. The effect of many of the concomitants of civilization, notably the recent ability to separate palatability from nutritional value, makes it possible to satisfy our wants without necessarily satisfying our needs.

A great deal has been said about the effect of advertising on food choice. The magnitude of these effects is believed to be considerable by nutritionists and doctors, who usually express fears as to its harmful consequences. It is interesting, however, to find that the advertisers themselves, and their advertising agents, are far less certain of the effect of this sort of persuasion on changing food habits. Moreover, when we discuss the effects of advertising, we are mostly discussing choice at its lowest level: the attempt to increase the consumption of one particular brand as against another. For we believe that there is little evidence that the total consumption of a commodity, such as processed peas, has been increased by brand advertising, or the total consumption of a commodity like milk or apples or cheese by the advertising of promoting boards or councils.

TYPES OF CHANGE

When we speak of inducing a change in food habits, we may mean one of several different things. We may mean the increased consumption of a food which is already consumed. Mostly this has been at the level of increasing the consumption of a particular brand of food, though as we have seen bodies like the Milk Publicity Council are attempting to make us drink more milk, and similar bodies to make us eat more bacon or fruit. There is some evidence that this type of change has been achieved in, for example, increasing the consumption of fish, though it is not possible to isolate which were the effective factors – nutrition education, cooking instruction, maintenance of price levels or any of the other many methods which were used simultaneously in the campaign (Fridthjof, 1962).

Change may also imply the persuasion of people to eat a food which was not previously consumed. This is the problem which confronts us in many of the developing countries, and includes the examples of high-protein vegetable foods like *Incaparina*. If properly promoted, the introduction of a completely new food such as *Incaparina*, or dried milk, which has not previously been seen, may be more successful than the persuasion of people to eat a food which already exists locally but is not normally eaten. If it has not been eaten hitherto, it is clearly not considered as a food, or as a suitable human food, by the people, and attempts to convert them are likely to meet with greater opposition and resentment than attempts to introduce a quite new food with no *a priori* antipathies.

However, we may wish not only to increase the consumption of a nutritionally desirable food, but to decrease the consumption of a nutritionally undesirable food. It may be that this is a far more difficult problem. It is true that in the developing countries many of these nutritionally undesirable foods are undesirable only because they are consumed as a large proportion of the diet; it is also true that they are not very palatable. Thus, with increasing prosperity foods like plantains and cassava tend increasingly to be replaced by other more palatable foods, and these are often, though not always, nutritionally better foods. But in the wealthier countries, highly palatable foods are often rich in sugar and of poor nutritional value. And we all agree that a most important deter-

minant of food choice is palatability; people eat the foods they want, and they want the foods they like. The problem of making people give up foods which they like seems to be of a different order from the problem of making people eat more of the foods they already eat, or of making them eat the foods they do not eat because they have not met them before.

Quantitatively, there is of course a limited range of possible food intakes. There is a minimal amount of food needed for life itself, whilst even for the most gluttonous there is a limit to the amount one can eat. For a given degree of physical activity, the range for one individual is probably not very large. Thus, a sizeable increase in the amount of one food in the diet may cause a reduction in the amount of some other food or foods. But it is at present very difficult, if not impossible, to forecast which foods will be affected by this reciprocal relationship. The effect might be seen at any one of the levels of choice we have discussed earlier. Thus, if we are persuaded to eat more beef, this may very well be at the expense of mutton, lamb or pork, but not necessarily so. If we are persuaded to eat more cheese, will this mean that we eat less meat, or less fish, or fewer eggs? Again, one can imagine, perhaps rather fancifully, that the effects of the current simultaneous promotion of milk, fish, eggs, cheese, lamb and pork just about cancel each other out – an effect which some of the more sceptical critics maintain is a feature of the advertising of different brands of very similar products. But in so far as the increased consumption of particular foods may be due to the increased availability of highly palatable manufactured products, the 'substitution effect' may well be nutritionally undesirable. As indicated in Chapter 1, we believe we have evidence that the increased consumption of sugar-containing foods may reduce the consumption of meat and fruit.

METHODS OF INDUCING CHANGE

It is recognized that attempts to increase consumption of particular foods are likely to be successful if they fit in with existing currents of change. The converse is also true; so long as there is for example a high and increasing demand for sweet foods, it is unlikely that attempts to reduce their consumption will be successful.

However, our techniques for recognizing trends which may affect food patterns are at present not very effective. Usually, we

recognize them only when they are fairly advanced, as for example the trend towards increased consumption of convenience foods. We are better, that is, at the recognition of existing trends and predicting their continuation, rather than in predicting the trends themselves. Moreover, it is difficult to visualize a specific situation in which such predictions could be utilized for the deliberate modification of food habits instead of simply for the acceleration of impending change.

There is still a widespread opinion that people will change their food habits once they have been taught the advantages, in terms for example of nutritive value. Thus, the United Nations agencies, understandably concerned to use any method which might promote desirable change in food habits, have undertaken extensive programmes of nutrition education. The Food and Agriculture Organization has said:

'... People tend to eat what they like. . . . People also eat what they believe to be good for them. . . . Middle-class families of Western Europe and America have been brought up to respect science and value its results. Once the facts have been presented to them, these families tend to accept a new food or a new concept about food and its relationship to health. Thus . . . education, and particularly science education, will aid the application of new scientific knowledge to the improvement of diet' (F.A.O., 1962).

There is now in fact a large body of evidence against this naïve view, and for the more sophisticated and realistic view that persuasion requires a series of consecutive steps. First, people need to know that a new pattern of eating is better than their old pattern; second, they need to have the wish to change; third, they need to make the change. Persuasion, that is, consists of imparting information, of changing attitudes, and finally of altering behaviour.

We may then well ask what one can reasonably expect from continuing nutrition education in terms of the vitamins or proteins of milk or fruit, unless it is combined with other methods of persuasion. To those who still believe in the efficacy of nutrition education in changing food habits, we can only plead that they put their views to the test, and evaluate the result not in terms of nutritional knowledge, but in terms of food habits. It may well turn out that some methods of nutrition education do indeed

induce change in food habits, but we need a great deal more work on evaluation before we can decide (McKenzie and Mumford, 1964).

We must agree however that we are lamentably ignorant of the techniques needed to persuade people to the point at which they change their behaviour. It may be that we can only persuade by the methods of individual investigation and study as described, for example, in Chapter VI. If so, we are in for a most elaborate, time-consuming and expensive job. It may be on the other hand that these methods, laborious though they are, are required only for an initial appraisal of methods, from which we can learn simpler and more practical techniques. Whether this is so will no doubt emerge as more research is promoted along these lines. We look forward too to further work being done along the lines indicated in Chapter V; if they prove as successful as they are plausible, we shall perhaps, for the first time, be on the way to developing an effective and realistic method of persuasion.

In our introduction, we referred to the deliberate ambiguity in our title *Changing Food Habits*, which is meant to imply both the direction in which food habits are changing, and the methods by which we can deliberately change them. This ambiguity is reflected in the statements sometimes made – almost in one breath – that people are very conservative in their food habits, and that food habits are in fact constantly changing. Certainly food habits change; witness the large part which potatoes play in the British diet, and the general acceptance of grapefruit, tomatoes and breakfast cereals. On the other hand, everyone who has had to do with the deliberate introduction of new foods knows the enormous difficulties of persuading people to eat in a substantially different way from their usual way.

Thus, quite large 'spontaneous' changes do occur, whilst apparently quite small 'induced' changes are often greatly resisted. But this contradiction is only apparent. The fact is that people are prepared to make changes in their pattern of eating for reasons which we mostly do not know, or are unable to measure quantitatively. If we could identify and assess these reasons, we might well have much better success in our attempts to induce change.

Because of this, we believe that it would be useful to study the changing food habits of people who have moved into new conditions, with prevailing food habits different from their own. We

have ourselves begun such a study with West Indian migrants in London, and hope to extend this. It would be useful too to see whether and to what extent the indigenous population itself changes its food habits when brought into contact with the new foods of the migrants.

BASIC RESEARCH

We have sometimes been asked whether we believe it is possible to do worthwhile work on changing food habits in a wealthy country like Britain, when the main nutritional problem is in the larger populations of the poorer countries. We believe that there are two answers to this question. Firstly, as is pointed out in Chapter 1, the problem of encouraging a change in food habits exists in the wealthier countries as well as in the developing countries. Secondly, we believe that the general factors that motivate people to choose a particular dietary pattern are likely to be universal, although their specific manifestation and their relative weight will no doubt differ in different cultures. In addition, the techniques for studies on food habits are also likely to be of universal applicability. It is worthwhile, then, to pursue our work in the more favourable conditions for research that exist in this country, although it is hoped that we shall be able to test our hypotheses in other countries without excessive delay.

One can appreciate the imperative nature of the problem of the proper feeding of people, especially children, who are likely to suffer malnutrition or even death because of incorrect feeding. One's inclination to believe that nutritional instruction will inevitably result in the alteration of nutritional behaviour thus reinforces the wish to press forward with immediate programmes, rather than devote even a proportion of limited resources to the study of basic problems of food choice! We suggest, however, that the success of the efforts to change food habits which have been made for fifteen years or more has been disappointingly limited. The time has come to ask whether we should by now not have done better if we had spent time in assessing the effectiveness of these efforts, and more particularly in studying the fundamental determinants of food habits and their relative importance, and then in examining the ways in which one or more of these determinants could be used to promote change.

Especially, we need to know very much more on both the psychological and physiological levels. How do we account for individual differences in food preferences; for example, do they reflect individual differences in physiological requirements for the various nutrients? What is the extent of 'addiction' to food as shown by the apparent increasing demand for sweet or salt tastes with increasing consumption? And what is the extent of satiation, the decision that one has had enough of a particular food, whilst retaining an appetite for a different food? Through what mechanism are addiction and satiation brought about? Why is it that, in countries like Britain, where most people have an extremely wide choice of foods, we tend to have exactly the same menu for our breakfast, whereas we complain if we are given the same menu for our main meals on two or three successive days? Not only do we not know the answers to these questions: we have not yet begun to ask some of them.

It is evident from what we have said and from several of the earlier chapters that we are still seeking an appropriate methodology. It might then be argued that talk of basic research should wait until we have evolved such methodology. Whilst we do not at all minimize the importance of discussions on method, we nevertheless believe that it would be wrong to postpone research until agreement has been reached. We believe that we can in fact help the achievement of this agreement by undertaking small pieces of empirical research, in order to answer specific questions; in due course we hope that the answers will help us to formulate wider questions and at the same time direct us towards more precise methodology.

ETHICAL QUESTIONS

One area which we have hardly begun to examine is that of the ethical problems involved in making and promoting a wide range of foods, some of which are perhaps undesirable within the context of the total dietary pattern. The essential point is that the food industry has increasingly the power to manufacture foods in ways which appeal to our eyes, nose and palate. It is unnecessary to labour the point that the commercial success of a food manufacturer depends on his inducing people to buy his product, and he can only do this in proportion to the attractiveness of this product. He has now a considerable and growing ability to make

attractive products without reference to their nutritional value. What incentive has he, for example, to concern himself about the nutritional value of ice cream, a fizzy drink or a chocolate biscuit? No one demands anything of these foods other than that they should be palatable. And since, as we have seen, there is a limit to the number of calories we can ingest, the probability exists that the consumption of such manufactured foods can produce a distortion of our diet in ways which may be nutritionally undesirable.

Can we then continue to rely upon the principle of *caveat emptor*? How can the consumer know whether he is getting the nutrients his body needs, if he is sufficiently persuaded by flavours and colours to eat foods which do not provide them? It is one problem to ensure that a drink which looks and tastes as if it is made from fruit should contain the nutrients which are found in fruit; it is quite another problem to ensure that such drinks are not consumed in quantities which encourage the excessive intake of calories, or which displace foods providing other essential nutrients.

We make no attempt to answer this question. Let us however be sufficiently realistic to acknowledge that the problem exists, and that a discussion on changing food habits is incomplete which does not include a serious consideration of the overall effects of modern trends in food patterns upon health.

We have, it will be evident, raised many more questions than we have answered. Our only hope of producing at least some of the answers lies in the closest possible co-operation between workers from the academic world and the commercial world. Today, no scientist has the right to live in an ivory tower, least of all the nutritionist. And no food manufacturer, nor those who work with him, can afford to ignore the work and opinions of the nutritionist.

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Overcoming resistance to new food products

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Introduction

Selling new food products is seldom easy. Of those conceived by the food industry in any year the proportion which are finally found acceptable by the public in terms of the only true criteria of success, namely continuous purchase, is relatively small. But when we turn to products conceived and marketed under the auspices of the international agencies and of the philanthropic bodies of the world the success rate falls to virtually zero.

It is not my intention to examine in any detail the reason for the high failure rate amongst commercially conceived products, although in practice some of the points I will make in relation to social and psychological aspects of change, have their relevance in this field. My main concern is to try and indicate why nutritionally desirable foods created for the developing countries and sponsored by these well-intentioned organizations have a failure rate a good deal worse than the commercial world. If it were only possible to achieve the modicum of success normally obtained in commercial operations, it could at least be argued that we were making some satisfactory attempts to solve the world food problem.

The reasons for failure

What are the reasons for these almost total failures? I would see three basic causes. Firstly, there is the problem of the climate sometimes engendered by the type of recruitment and the work environment established by the international agencies. Secondly, there is the frequent unwillingness of scientists to appreciate the nature and extent of social and psychological attitudes to food and their impact upon the behaviour of the ordinary individual. Thirdly, and perhaps the most important of all, there is the intricacy of the problem to be solved; influencing major changes in food habits is seldom easy.

The climate of the international agencies. The problem here seems to be a complex one. Partly the specification laid down by some agencies may lead to poor recruitment: partly the atmosphere of the job once attained may 'soften up' the individual. Let me elaborate. Recruitment in some instances is based upon two dubious criteria. Firstly, there is the quota system by which it is promulgated that the proportion of staff recruited from any one country as against the whole, should broadly reflect the financial contribution of that country in relation to that of the rest of the world. Intrinsicly this system means that ability is by no means the sole criterion determining employment. Secondly, there is often the myth of experience coveted to a degree almost unbelievable in the commercial world. The philosophy sometimes suggested is that the only person who can work for an international agency in a developing country is the man already with experience of working in such an area.

The great dilemma of this philosophy is that virtually the only way to get experience is by working for an international agency. It is also, of course, questionable whether experience should be so narrowly defined. Certainly in the commercial world no such specific standards are usually set up. Often it is recognized that the man who is able in pharmaceuticals will also probably be good in electronics or fit to run a nationalized industry. The new Chairman of Beechams, one of the great growth companies of this decade, has previously been Chairman of the Central Electricity Council, a university lecturer and professor, and a professional accountant. In reality, perhaps if any criterion of experience is required it is the experience of being successful.

Also unfortunately, once they are inside such an organization the atmosphere encourages some to adopt the quiet life. Frequently in commerce high salaries and luxury living are matched by high risk levels and the essential order is to be successful or get out. No such criteria are required of the international civil servant. He lives both richly and in comparative security. The atmosphere chokes rather than encourages activity especially of a controversial kind; he is secure providing he does not offend. He possesses all the qualities imbued in national civil servants; he must always speak for himself, not for the organizations, and he must be the soul of tact. Yet he has the mandate to take decisions at a level which no national civil servant possesses.

To some extent I have painted a caricature of reality but the message is clear. The international agency must attract the top men of industry and Government to their ranks. These men must be allowed to take forthright action to achieve success. Essentially, a climate must be established where it is intrinsically more attractive to succeed than to fail and in which the success and failure are rewarded in totally different ways.

Attitude of scientists. The basic problem in this area seems to be the inability of the scientist to maintain the high level of critical objectivity and analysis in the market place that he achieves in his laboratory. Frequently in the past the products that he has tried to persuade people to eat and his methods of marketing them have lacked finesse. All too often the products have been unpalatable and expensive; the attempts at persuasion have been based simply on a demonstration of the product's nutritional superiorities; the marketing efforts have not been handled by the professional food manufacturer but by the scientist playing at selling his product.

But times are changing. Much greater use is now made of business firms and people. It is fairly widely accepted that nutritional value is not a major factor determining the individual's choice of food, and the emphasis upon this particular issue has been modified. Moreover, marketing is now usually preceded by taste acceptance tests and the product is sold at a reasonable price.

However, we must not be encouraged too quickly by all this. On the one hand many scientists remain unconvinced and unsophisticated in this area and continue to argue that whilst protein from new sources may lack immediate appeal it becomes accepted when people become accustomed to its texture and appearance. Such views imply a latitude in the behaviour and feelings of consumers which is often far from

reality. By analogy it is the same as suggesting that someone who likes Beethoven will necessarily like Schubert, or somebody that likes whisky will equally like gin. On the other hand, even if we are able to establish fairly closely that taste and price are satisfactory for the consumer, even this does not provide total assurance of success. All we indicate by such activities is a *prima facie* case for consumption. It does not demonstrate that in a competitive market the consumer will choose this product in preference to another. This in reality leads us directly to an analysis of the very nature of the problem of implementing changes in food habits.

*Social and psychological problems involved in changing food habits.** I believe we frequently continue to fail to influence food choice because we have not overcome man's social and psychological resistance to the products we have tried to sell, or demonstrated in acceptable terms their superiority over food at present being consumed. Such a view is of course often equally true for the commercially produced and marketed product.

In trying to establish a place in the consumer's budget, a series of complex social and psychological resistances have to be recognized. Firstly, food has a profound psychological role to play in society. It is one of the very first means by which we demonstrate our mood and individuality; thus a baby demands food and then perhaps rejects it; it comes to assert its personality by demanding particular foods and rejecting others. As we grow older, simply because we eat three meals every day, we come to regard ourselves as experts on the subject. In the same way food asserts itself as an integral part of our culture and many social events in our lives take place round the meal table. More than this, every aspect of our lives is related to it and the intricate network surrounding food is as great whether we live in a sophisticated Western society or in a slowly developing poor community.

This is the outward display of food in relation to social functions. But there are also deeper inbuilt psychological issues. Food helps to satisfy hidden needs for all of us. These needs include security, reassurance, adventure, pleasure, maternal satisfaction and paternal pride, individuality, group acceptance, and prestige. Thus the traditional and long-established meals that we eat at particular times of the year or on particular meal occasions each week reassure us that all is well in the world and both that our food supplies are secure and that life is going on quite normally. The creative skill of an intricate dish well cooked and served and enjoyed by the family provides immense material satisfaction. A dinner for two in soft candlelight provides immense individual pleasure and background for romance.

Similar responses may be evoked for specific foods. To some fillet steak represents the extreme in palatability and symbolizes the excess of gluttony whilst at the other pole potato will stand for blandness and moderation. A cup of tea may provide immense reassurance to the British housewife in times of duress, and for many sugar and sweet foods generally serve as compensation for lack of affection in life.

Secondly, it must be recognized that if change involves anything more than

*This and the following section of this paper are based on a lecture *Social and Psychological Factors affecting the Acceptance of New Protein Sources* given at Massachusetts Institute of Technology in October 1967 (McKenzie, 1968).

a switch of two identical brands of a particular type of food, then it sets off a series of complex interrelated movements. In essence all foods are competitive with each other. At a physiological level once in terms of bulk we have enough to eat, increased consumption of one food tends to lead to the reduction in consumption of another.

Similar interrelationships exist both in economic and socio-psychological terms. Most people have a relatively fixed amount of money which they are prepared to spend on food, at least in the short run. A change in the amount spent on one set of food products automatically leads to a change in the amount of money available for other food products. Similarly, a change in one food may change the whole meal pattern because only certain foods are regarded as acceptable in combination with others.

The marketing implications of the two issues outlined are clear. To sell a product it must be shown to satisfy needs at least as effectively as foods already consumed. In addition, because one item in the diet cannot be changed without a whole series of repercussions on overall choice, some support must be provided to justify these resultant total responses. This is why commercial involvement is so important—these sorts of problems frequently face the businessman. He is always working in competitive situations. Most cigarettes marketed at a given price and using a particular type of tobacco have a similar appearance and taste. Most tins of canned fruit will have the same basic constituents as each other. Thus once price has been settled and the taste found to be acceptable, the job of selling has only just begun. Complex advertising themes will be required to encourage the consumer to believe he needs these products and that this packet of cigarettes or that tin of canned fruit is the best brand to buy. When the problem involves a totally new type of product the task becomes of even greater importance.

It has to be recognized, however, that this war of commercial persuasion is not always successful. Sometimes the battle is just badly fought but on other occasions, especially with totally new products, the social and psychological resistances are too strong to be overcome. Hence the incredibly high failure rate of new products in the United States and the United Kingdom.

Nevertheless, I believe that if we carry out a post-mortem on attempts to sell nutrient supplements or change food habits, it is evident that even the businessman has often not studied the social and psychological problems involved when planning his marketing strategy. Perhaps this has been partly due to the false assumption that these problems are less significant and these patterns are less complex in developing society. Perhaps it is that some salesmen have for the first time become really convinced that the products they are trying to sell are really good and that in these circumstances they imagine they will be successful without persuasive encouragement. Whatever the reason, it seems that in this context too often the marketing men have at worst left at home or at best skipped a couple of pages in their text book on how to sell products.

In consequence, whether the scientist or the marketing man or both have been involved, information has seldom been obtained as to why people should want to buy this product, what is an appropriate name to sell it under, what are likely

to be its basic competitors, what needs does it fulfil more effectively than other products, what are the basic problems it will have to overcome. Yet it is these very factors which should influence the marketing scheme and will be vital issues in determining success or failure.

Acceptability of food products from new sources of protein

What will be the resistances to new foods based on sources of protein as yet unused by man and which increasingly attract the scientist? Because such products will be based on materials previously not regarded as a source of food, such as grass, oil or cellulose, it is likely that there will be some initial objections. Nevertheless, such disadvantages should not be over emphasized. If properly promoted, the introduction of a completely new food may be achieved with less difficulty than a product which involves the straightforward consumption of an existing local food which for one reason or another has been rejected and is consequently surrounded with emotional antipathy.

However, there is no doubt that, if possible, probably one of the best solutions would be to include the new protein sources as supplements in foods which are already extensively consumed by the community. There is nothing new in this approach. For example, in the United Kingdom bread and margarine are still fortified. The only requirement must be that it should involve a food which is at present, and is likely to continue to be, a basic staple of the community, particularly of the poor, and that the addition of the supplement should not intrinsically change the taste or appearance of the product. It should also not add much to the cost. If these requirements are fulfilled, no major social or psychological problems should emerge.

If a new protein source is to sell in its own right either as a supplement to be consumed with other foods or as a basic new type of food then, as has already been indicated, it will be essential to establish its likely role in the consumer's food pattern, the nature of the difficulties to be overcome, and methods of dealing with these difficulties. The key areas to be examined are listed in Table 1. Armed with such information it should be possible to obtain more rational and effective marketing decisions.

The other area in which new protein sources might be utilized would be as parts of a new synthetic food which set out to 'imitate' as closely as possible existing foods. Probably this is the only way in the foreseeable future by which new protein sources might be directly used by the consumer in Britain or America. Such products would be likely to further enrage consumers who already deplore the increasing 'manufacture' of foods. There tends to be an inherent belief in the mind of the public that fresh foods untouched by artificial fertilizers and in no way forced in their growth are of supreme quality. Such views also extend into adverse attitudes to processing and preserving.

Nevertheless, however much people grumble, most continue to consume processed food produced by the most advanced techniques, and in practice of course the nutritional value of these foods is usually just as good if not better than the 'natural'

Table 1. *Key information required before initiating sale of new product*

Area	Type of information required
1. Product usage	When is the product likely to be used, and with what foods will it be combined? Will it blend well with these foods?
2. Product competitiveness	With what other foods will the product effectively be competing? Can it successfully demonstrate some acceptable superiority? If the product is a supplement to be added to existing foods during preparation, then can methods of justifying this addition be substantiated?*
3. Impact on food habits	Does its acceptance require any major or minor modification in eating habits? If so, can these changes in consumer behaviour be successfully achieved?
4. Equipment required	Is any new equipment or cooking procedure necessary? If so, can the housewife be easily persuaded to make this change?
5. Storage	Does the product require any different type of storage arrangements? If so, will these special facilities be available and acceptable?
6. Advertising copy	How can advertising copy be designed to indicate effectively the fulfilment of a need, overcome competitive products, and justify changes in behaviour†
7. Name	What from the consumer's viewpoint would be a suitable name for the product?
8. Packaging	What sort of packaging would be most acceptable to the consumer?

*The superiority or justification will not be in health or nutritional terms but in terms of appeal based on taste, better fulfilment of psychological needs, etc.

†This will imply general knowledge of the consumers' motivations.

product. However, if new imitation foods emerge on the market it is clear that the same type of attitudinal criticisms will arise on an even greater scale. Whilst at a political level pressure to have these foods banned may be great, it is unlikely that the general public will refuse to purchase them on these grounds. Providing the new product looks and tastes exactly like an existing food but is cheaper, most people will buy it. Appearance will be just as important as taste because slight variation in colour or texture will tend to increase suspicion and deter people from the initial tasting of the product. Such problems are now being found in the sale of total accelerated freeze-dried meats where the initial product before reconstitution often looks like a piece of cardboard and this tends to upset the housewife.

Conclusion

Human beings seldom react like machines. They do not begin work at the touch of a button or provide formula type responses to given stimuli. But most of us are manageable. The better we get to know someone, the more easily we can predict his reaction to situations and the more we know how to influence his behaviour. In reality this is probably all we need in terms of persuading man en masse to change his food habits.

Thus the answer lies firstly in accepting that to change food habits social and psychological problems have to be overcome and secondly in obtaining enough basic data to deal with particular problems. It is vital that these data should be obtained

with such specific problems in mind and not as at present is so often the case gleaned from hotch-potch general studies. Secondly, we need to develop an increasing band of skilled personnel who not only have an overall understanding of nutrition and food habits, but also of the behavioural sciences. They must also be market-orientated. Thirdly, we must create an effective environment in which such a group of specialists can work.

If such developments can be achieved I am confident that within 10 years, perhaps even less, we shall almost as if by instinct know how to persuade people to change their food habits. But the plain truth is, and I cannot stress this too strongly, that in order to get the right answers to the problems that confront us today, we have to be sure that we have the right people asking the right questions!

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Potential for change in food habits in the United Kingdom population

By J. C. MCKENZIE, *Department of Business and General Studies, London College of Printing, London SE1 and Department of Nutrition and Food Science, Queen Elizabeth College, London W8*

One of the definitions of 'potential' given in most standard dictionaries is 'existing in possibility, but not as yet in reality'. In terms of an assessment of the possible ways in which food habits may be changed in the future in the interests of better nutrition, this is a pretty fair summary. To date, food habits have not changed to any extent as a result of health requirements, but there is a significant possibility that they may be changed to this end in the future.

This is not of course to suggest that for a multiplicity of reasons food habits have not changed to any extent in the past; there have for example been fairly dramatic developments both in the substance and style of food patterns in this country since the war. Thus if we look at the total food consumption per head in the United Kingdom over the last 10 years we find significant changes (Table 1).

Table 1. *Food moving into consumption in the United Kingdom (kg/head per annum)*

	1965	1975
Cheese	4.6	6.3
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Eggs (no.)	250	232
Wheat	70.4	64.3
Tea	4.1	3.5
Coffee	1.3	2.2

Again if we look at meal patterns we find that within the last 20 years there have been significant changes, for example in the breakfasts we eat. In 1956, 47% of adults ate a cooked breakfast, today this figure is less than 20%.

Twenty-five years ago tea bags had not yet been introduced and frozen foods comprised only a small market. Today, the 'tea-bag' market is worth over £50 000 000/annum and the 'frozen-foods' market is worth over £350 000 000/annum.

Equally, it is doubtful that there would be much argument if it were suggested that food habits will continue to change in the future.

Where the problem really arises is in the capacity of the scientists to influence these changes in the direction of improved nutritional status and consequent better health. Attempts to develop change and influence intake to support the 'dietary goals' referred to in detail by Truswell (1977), are bound to be full of difficulties.

However, my concern in this paper is to suggest that should we seek to harness change for nutritional purposes in the future, our chances of success should be considerably better than they have been in the past.

The 'do-it-yourself' food change guide

To begin with it might be worth summarizing a set of 'basic rules' or at least guidelines which have been built up over the last few years as various groups have attempted change and which would now appear to be necessary prerequisites to success. These are:

(a) Since for a multiplicity of reasons consumer food habits are changing of their own volition, any recommendation which recognizes these changes and works with them is more likely to succeed than one that attempts to go against them.

(b) If one can identify consumer attitudes and needs and their ramification on future choice, then there should be opportunities to devise appropriate new products that take cognisance of these criteria and reflect that climate.

(c) If real changes have to be recommended, then if these can be concealed within existing food patterns (e.g. the fortification of bread, or the reduction of the fat content of milk) this is by far the best way.

(d) If to deal with the problem actual food habits need to be changed, then it is essential to analyse what is likely to be the effect on over-all behaviour patterns, food habits and cooking procedures, and the extent to which the social and economic framework will require change.

(e) Every attempt must be made to work within the current environment and to avoid out-right clashes with the existing fabric of society or its food patterns.

(f) Government regulations in terms of import controls, price manipulation and rationing will be of great importance if fundamental changes are required.

(g) It is essential to ensure that products are available on shelf in the shops at a price that can be reasonably afforded.

(h) It is equally necessary to ensure that the approach is viewed and marketed as a realistic commercial operation.

Improved understanding of the bases of change

What has been said so far is really a straightforward summary of current thinking and experience rather than an identification of anything new and original. This is simply because growth in fundamental knowledge is a slow business. However, what is very rapidly evolving in knowledge terms is our underpinning of most of the criteria to which reference has been made, i.e. a detailed analysis of consumers, their patterns of behaviour and the criteria which influence their choice.

In consequence, it may be argued that the commercial food industry is becoming a good deal more effective in achieving success. This may be justified by the fact that 84% of new products launched nationally in 1974 are still on the market today (Kraushar, Andrews & Easie Ltd, personal communication).

In part this may be attributed to a greater level of caution; the costs of launching

a new product are so great that most are now checked in small test markets before they reach the national market. And in consequence, failures are often isolated at an earlier stage.

But this is not the whole story. In part, at least, the basis for the improved success rate lies in the growing recognition that to succeed one has to have an understanding of the consumer as much as of the particular product to be launched. This has led to very detailed examinations of the consumer by the commercial world. The following are examples.

Perhaps there is no place better to begin than with the economic crisis of the last 2 or 3 years. Certainly this took most food manufacturers by surprise and led to a very detailed analysis of the housewife and how she was behaving. In some fields, such as the consumer 'durables', purchase decisions were deferred. Respondents simply kept their television, or piece of furniture, or car for an extra year.

However, in a crisis, people still have to buy food, but often they turn to different items. This is simply because as budgets are squeezed, more money has to be found for items that can not be constrained, for example rent, rates, electricity, gas. As such, the pressure is very much on the grocery budget. It is perhaps, therefore, not surprising to find that between 1973 and 1976 there was a decline in such 'in-essential fripperies' as 'dietary' bread (42% decrease), pastry mixes (40% decrease), and complete meals (29% decrease). Conversely basic essentials such as flour (23% increase), pastes and spreads (18% increase), and cereals (7% increase) flourished (Ramsbottom, 1977).

By a detailed examination of such changes we can begin to understand consumer behaviour patterns. Thus for example it has been possible to identify the steps by which the housewife may constrain her purchase of a particular brand or type of product (Fig. 1) (Ramsbottom, 1977).

Material such as this helps us to predict behaviour of the consumer in the short term. But longer-term basic trends in food patterns may very well be dependent on

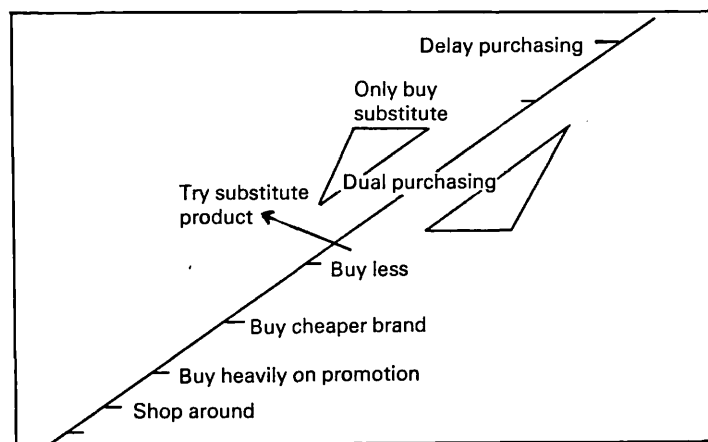


Fig. 1. Modification of purchasing behaviour (after Ramsbottom, 1977).

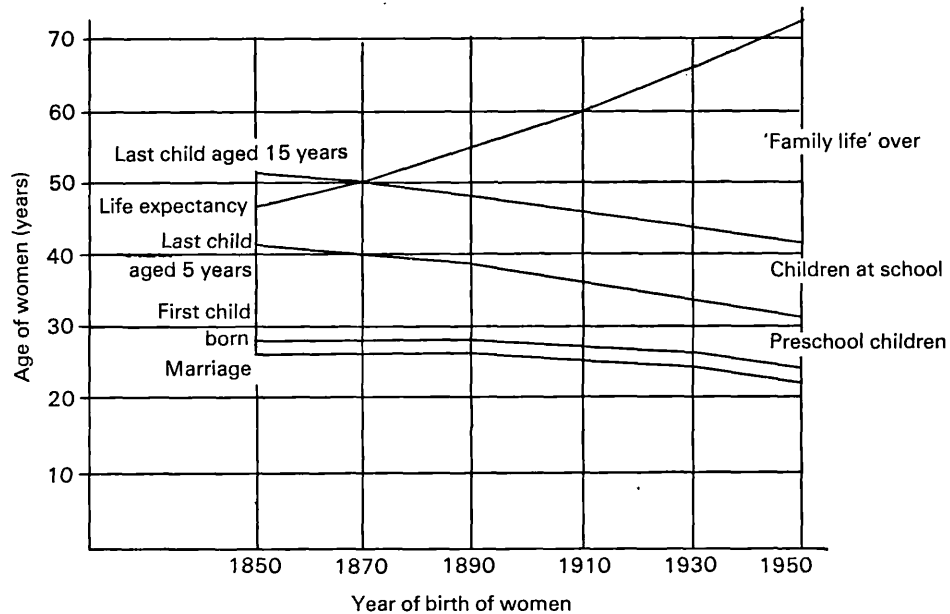


Fig. 2. Changing position of women resulting from the decrease in the size of the family, age of women at childbirth and increase in life expectancy of infants (based on the expectancy at the age of 1 year to eliminate the main effects of infant mortality). Estimates based on reports of Registrar-General (J. Walter Thompson Ltd, 1976).

the profile of the community: the size of family, the age-distribution within the family, the nature of the jobs held by the various members of the family and the proportion of women who are working. In particular the changing position of women resulting from a decline in the size of the family, the age of women at childbirth, and their attitudes to work, has had a profound effect on our over-all life-style. This may be demonstrated by Fig. 2. It will also help to explain the variations in the proportion of married women of different age groups at work in 1951 and 1971 (Fig. 3) (J. Walter Thompson Ltd, 1976).

Again it should not be suggested that now that our total population is virtually static that our society is not a dynamic one. This could hardly be the situation when in each year the following occur: 800 000 births take place (half being first-borns); 600 000 teenagers leave school; 4 000 000 people change their jobs; 1 500 000 people move home.

Food patterns will be influenced not only by all these changes, but by the domestic equipment we possess. In 1950 only 6% of households had a washing machine; today the corresponding figure is approximately 75% of households. Even less had a refrigerator whereas today there is over 80% ownership. Today, 40% of households have a food mixer and 28% of households have an electric toaster; items of equipment almost unheard of 25 years ago.

There is also another area of fundamental importance to be considered. Future behaviour will not be entirely based on the sort of developments so far identified; rather it will be manifestly influenced by attitude dimensions at the widest possible

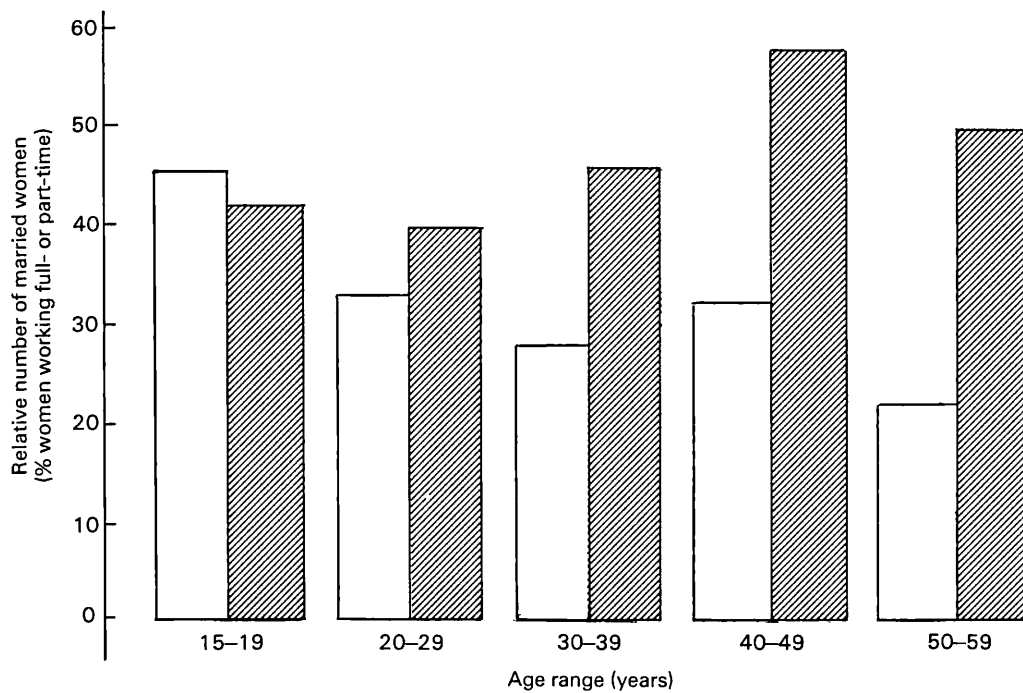


Fig. 3. Comparison of the relative numbers of married women in the United Kingdom (% women working full- or part-time) who were at work in 1951 (□) and 1971 (▨).

level. And here, it is believed, it is possible to isolate three underlying themes of direct relevance to future food patterns (McKenzie, 1976).

The first theme suggests that the consumer will become increasingly involved with knowledge (not necessarily accurate) of nutrition and medicine and related matters (Fig. 4).

The second theme is based on a growing division in attitude-terms between foods for nourishment and foods for fun, with resultant ramifications on food choice (Fig. 5).

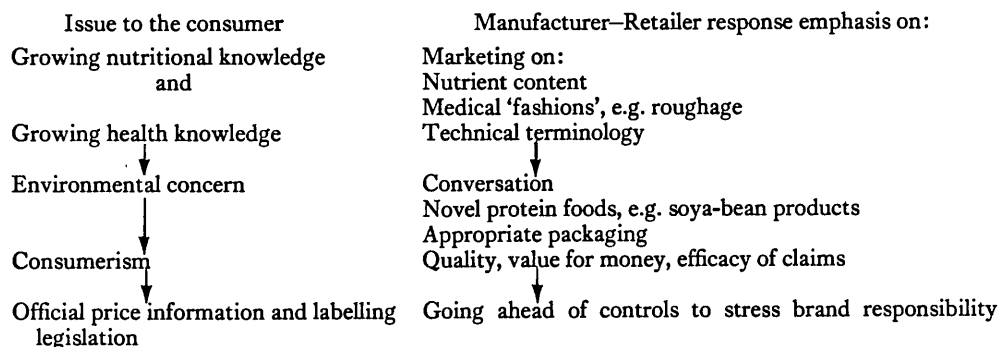


Fig. 4. Trends in information and knowledge of nutrition and medicine and related matters.

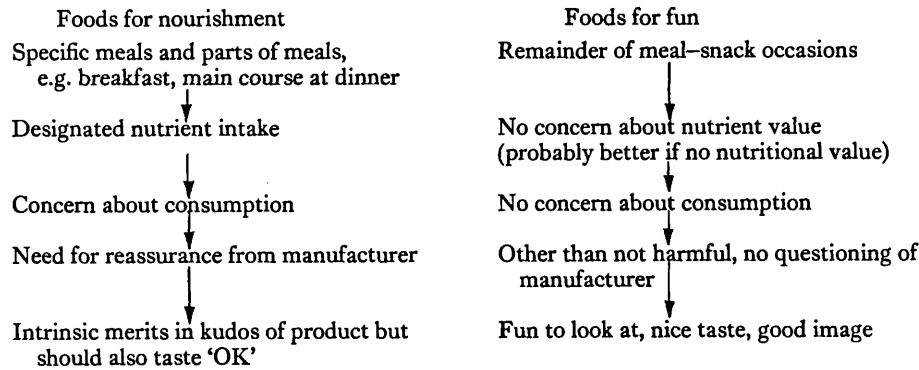


Fig. 5. Trends in food perception.

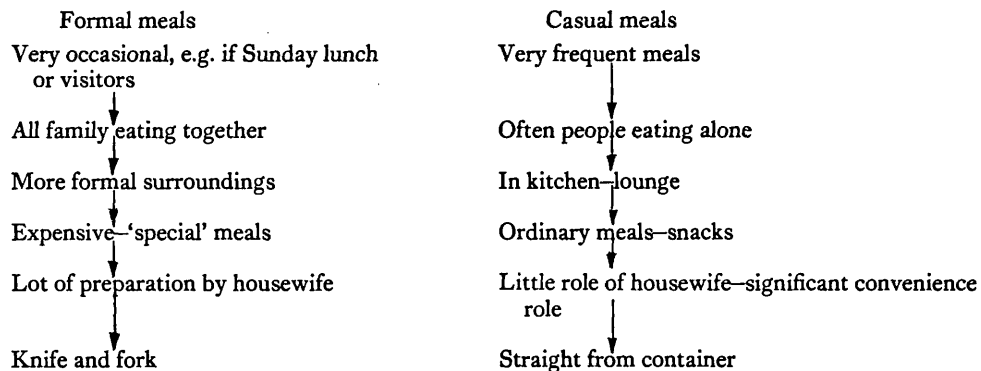


Fig. 6. Distinction between formal and casual meals.

The third theme suggests a growing distinction between formal and casual meals (Fig. 6).

Armed with varied information of the sort given in this paper food manufacturers have become much more efficient at both predicting long-term food trends and isolating new products to satisfy growing needs.

Conclusions

All this information suggests not only that food habits will be changing over the next few years, but that we have the potential to influence change in the interests of better health and nutrition should we so desire.

But, regrettably, this paper cannot end on quite such an optimistic note. In order to influence food choice we must have clear policies to pursue. Unfortunately, I have yet to be convinced that either the nutrition-medical world, or the government is likely to accept the responsibility of deciding what the desired nutritional parameters for the 80's should be.

On the one hand, as a body, the academic nutritionist and clinician has to be made to realize that decisions on nutrition policies will have to be based on 70 or

80% levels of scientific certainty rather than waiting for 100% proof (this is of course with regard to foods to be avoided, not in any reduction of the screening stringency for new foods or additives). On the other hand, government may have to take controversial and unpalatable decisions; nothing of their attitude to date with regard to the cigarette industry suggests that they will easily take such decisions.

Yet if these decisions were to be made I am certain that the food industry would be only too happy to respond to new guide-lines; given a reference point for desired goals, they would rapidly direct their skills to creating an appropriate product range and selling it to the consumer.

Perhaps it is only if bodies like the Nutrition Society and the British Nutrition Foundation take the responsibility for identifying these fundamental guide-lines for nutrition and lobbying the government to force action, that we shall be in a position to ensure that potential for future changes is moved forward to a state of healthy actuality!

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Potential for change in food habits in the United Kingdom population

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This is not of course to suggest that for a multiplicity of reasons food habits have not changed to any extent in the past; there have for example been fairly dramatic developments both in the substance and style of food patterns in this country since the war. Thus if we look at the total food consumption per head in the United Kingdom over the last 10 years we find significant changes (Table 1).

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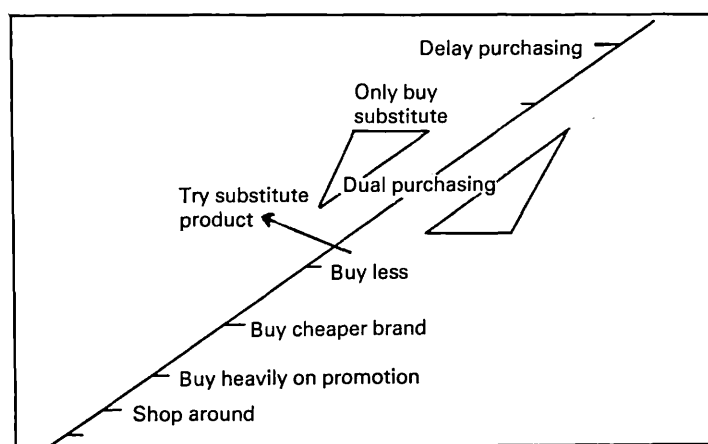


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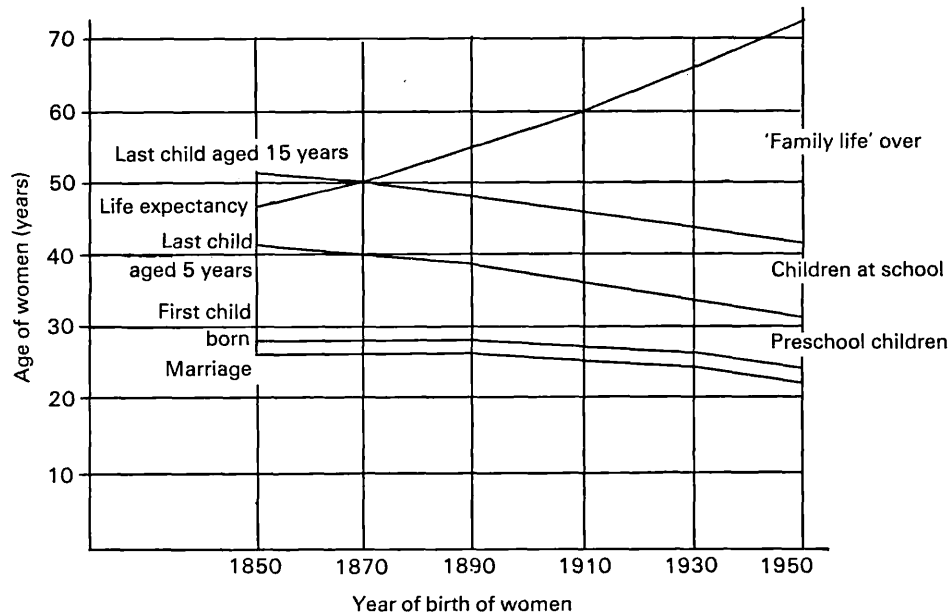


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the profile of the community: the size of family, the age-distribution within the family, the nature of the jobs held by the various members of the family and the proportion of women who are working. In particular the changing position of women resulting from a decline in the size of the family, the age of women at childbirth, and their attitudes to work, has had a profound effect on our over-all life-style. This may be demonstrated by Fig. 2. It will also help to explain the variations in the proportion of married women of different age groups at work in 1951 and 1971 (Fig. 3) (J. Walter Thompson Ltd, 1976).

Again it should not be suggested that now that our total population is virtually static that our society is not a dynamic one. This could hardly be the situation when in each year the following occur: 800 000 births take place (half being first-borns); 600 000 teenagers leave school; 4 000 000 people change their jobs; 1 500 000 people move home.

Food patterns will be influenced not only by all these changes, but by the domestic equipment we possess. In 1950 only 6% of households had a washing machine; today the corresponding figure is approximately 75% of households. Even less had a refrigerator whereas today there is over 80% ownership. Today, 40% of households have a food mixer and 28% of households have an electric toaster; items of equipment almost unheard of 25 years ago.

There is also another area of fundamental importance to be considered. Future behaviour will not be entirely based on the sort of developments so far identified; rather it will be manifestly influenced by attitude dimensions at the widest possible

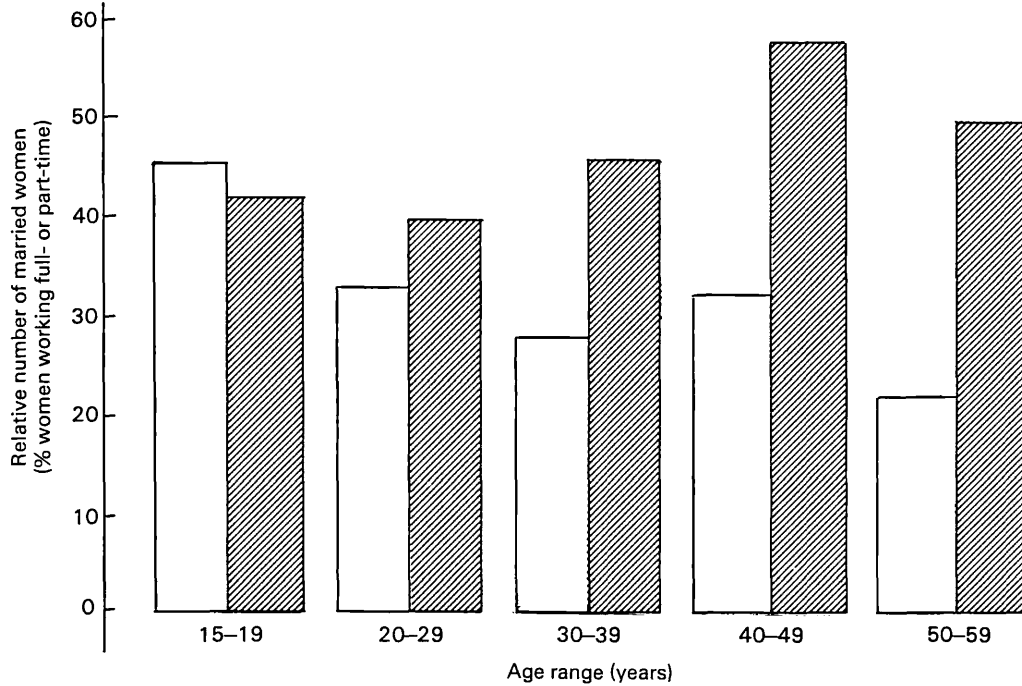


Fig. 3. Comparison of the relative numbers of married women in the United Kingdom (% women working full- or part-time) who were at work in 1951 (□) and 1971 (▨).

level. And here, it is believed, it is possible to isolate three underlying themes of direct relevance to future food patterns (McKenzie, 1976).

The first theme suggests that the consumer will become increasingly involved with knowledge (not necessarily accurate) of nutrition and medicine and related matters (Fig. 4).

The second theme is based on a growing division in attitude-terms between foods for nourishment and foods for fun, with resultant ramifications on food choice (Fig. 5).

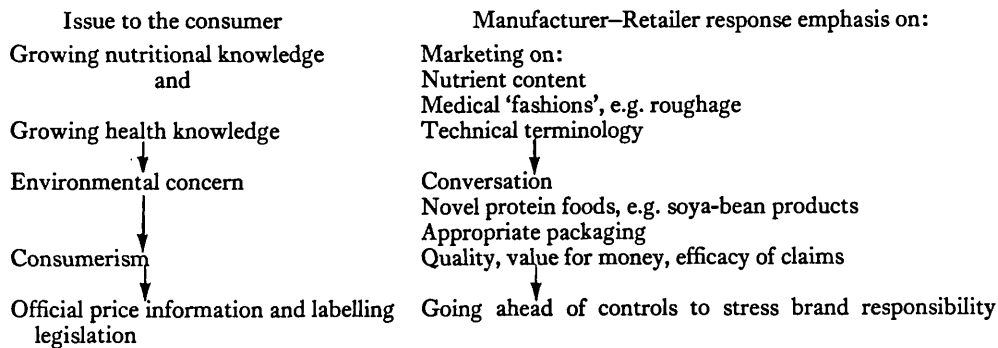


Fig. 4. Trends in information and knowledge of nutrition and medicine and related matters.

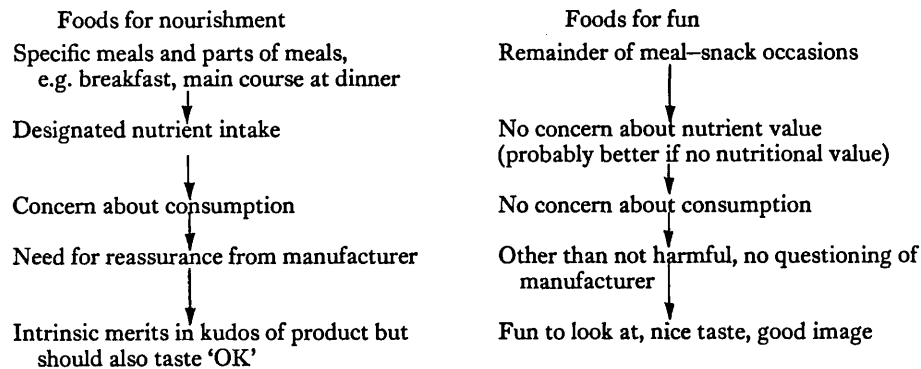


Fig. 5. Trends in food perception.

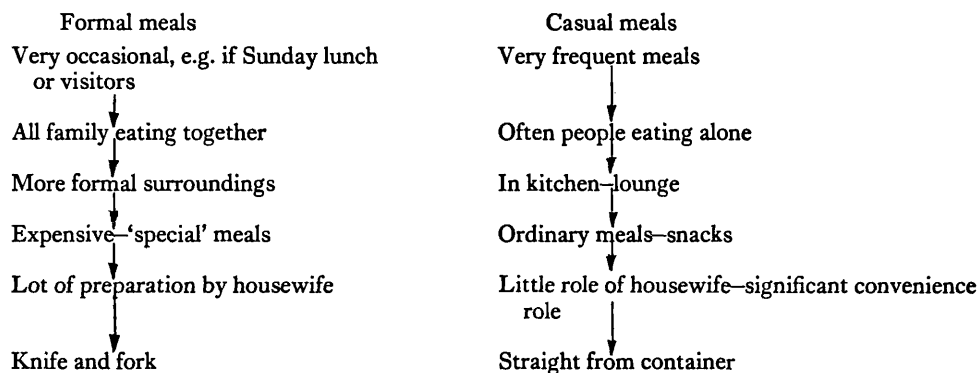


Fig. 6. Distinction between formal and casual meals.

The third theme suggests a growing distinction between formal and casual meals (Fig. 6).

Armed with varied information of the sort given in this paper food manufacturers have become much more efficient at both predicting long-term food trends and isolating new products to satisfy growing needs.

Conclusions

All this information suggests not only that food habits will be changing over the next few years, but that we have the potential to influence change in the interests of better health and nutrition should we so desire.

But, regrettably, this paper cannot end on quite such an optimistic note. In order to influence food choice we must have clear policies to pursue. Unfortunately, I have yet to be convinced that either the nutrition-medical world, or the government is likely to accept the responsibility of deciding what the desired nutritional parameters for the 80's should be.

On the one hand, as a body, the academic nutritionist and clinician has to be made to realize that decisions on nutrition policies will have to be based on 70 or

80% levels of scientific certainty rather than waiting for 100% proof (this is of course with regard to foods to be avoided, not in any reduction of the screening stringency for new foods or additives). On the other hand, government may have to take controversial and unpalatable decisions; nothing of their attitude to date with regard to the cigarette industry suggests that they will easily take such decisions.

Yet if these decisions were to be made I am certain that the food industry would be only too happy to respond to new guide-lines; given a reference point for desired goals, they would rapidly direct their skills to creating an appropriate product range and selling it to the consumer.

Perhaps it is only if bodies like the Nutrition Society and the British Nutrition Foundation take the responsibility for identifying these fundamental guide-lines for nutrition and lobbying the government to force action, that we shall be in a position to ensure that potential for future changes is moved forward to a state of healthy actuality!

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APPENDIX A

OTHER RESEARCH PAPERS

In this appendix are included the following papers which have involved research work by the Candidate alone or co-jointly with another in other fields of study.

- Paper 1: The Potato: with special reference to its use in the U.K. - Co-jointly with G.R. Wadsworth (in Nutrition Abstracts and Reviews, Volume 33, 1963).
- Paper 2: The Mood of General Practice and the Need for Professional Leadership - Co-jointly with John Fry (in Journal of the Royal College of General Practitioners, Volume 16, 1968).
- Paper 3: The Economics of Rehabilitation (in Rehabilitation, Number 67, 1968).

**THE POTATO, WITH SPECIAL REFERENCE TO ITS USE IN
THE UNITED KINGDOM**

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THE POTATO, WITH SPECIAL REFERENCE TO ITS USE IN THE UNITED KINGDOM

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INTRODUCTION

The potato has been the subject of intensive study and of extensive reviews (Burton, 1948; Salaman, 1949). Much is known about its botanical characteristics, chemical composition, metabolism and history. To present yet another review on this food might seem superfluous, but while it is true that little of a basic nature can be added to what has already been described, it is justifiable in view of the importance of the potato in the diet in the United Kingdom to take a fresh look at its use and at least to indicate new information not previously discussed. Such information arises from three main sources: the availability of new analytical techniques, especially chromatography, whereby constituents of the potato can now be separated and examined in their natural state: the increasing use of fertilisers, insecticides and other chemicals in the production, preservation, and processing of the potato: and the remarkable growth of commercial processing of potatoes in recent years.

COMPOSITION OF THE POTATO TUBER

The composition of the potato is given in all standard food composition tables; Table 1 is taken from the recent one of Leung and Flores (1961).

The potato tuber is a living structure and has a complex chemical composition, including many enzyme systems, which have been reviewed by Schwimmer (1953). The potato is a rich source of enzymes that hydrolyse phosphate esters; there are at least five phosphatases. Anaerobic glycolysis leads to formation of ethanol and lactic acid; another

TABLE 1

COMPOSITION OF TUBERS OF THE POTATO (*Solanum tuberosum*) AND SOME PRODUCTS, VALUES PER 100 g EDIBLE PORTION
(From Leung and Flores, 1961)

Nutrient	Whole	With- out skin	Dried after par- boiling	Flour	Frozen*
Energy, kcal	79	75	323	320	180
Moisture, g	77.9	79.2	14.4	10.1	54.5
Protein, g	2.8	1.8	8.3	6.4	1.7
Fat, g	0.2	0.1	0.5	0.3	0.6
Total carbo- hydrate, † g	18.2	17.9	73.4	78.0	42.3
Fibre, g	0.6	0.4	1.8	2.1	2.0
Ash, g	0.9	1.0	3.4	5.2	0.9
Calcium, mg	10.0	6.0	57.0	72.0	58.0
Phosphorus, mg	50.0	40.0	192.0	162.0	54.0
Iron, mg	1.0	0.8	3.7	3.4	2.8
Carotene	Trace	Trace	0	0	—
Thiamine, mg	0.11	0.09	0.17	0.18	0.07
Riboflavin, mg	0.04	0.03	0.10	0.09	0.20
Nicotinic acid, mg	1.5	1.5	5.3	3.8	1.6
Ascorbic acid, mg	20.0	16.0	—	9.0	1.0

* By Indian method in Peru

† By difference

pathway for breakdown is by the tricarboxylic acid cycle, almost all the enzymes for which have been detected in the potato tuber. The potato contains also a lecithinase and a phospholipase which metabolise lecithin and choline, respectively (Ducet, 1952). Another enzyme, of importance for discoloration of the potato, is a phenol oxidase known by several names, of which tyrosinase is one. That enzyme contains copper, and indeed accounts for half the copper found in the potato (Todd, 1953). Schwimmer (1953) suggested that phenol oxidase could account for the alleged value of applying raw potato to the skin to counteract the effect of contact with poison ivy. A polypeptide has been obtained from the potato which may be similar to the proteinase inhibitors found in Lima and soya beans (Werle and Maier, 1952).

Although starch is by far the largest component of the dry weight of the potato tuber, and of its carbohydrate fraction, the presence of many other constituents has often been demonstrated. Le Tourneau (1956) pointed out that little was known at that time of the polysaccharides of the potato other than starch and sugar, and that few values for pectin and crude fibre had been published. He found 80 per cent of the polysaccharide of the potato tuber to be starch, and identified other fractions: araban-galactan soluble in 50 per cent ethanol, araban-galactan extracted during pepsin hydrolysis, pectin, hemicellulose and cellulose. In contrast to starch, those fractions were made up primarily of galactose and arabinose, with smaller quantities of other sugars. He confirmed previous conclusions that little, if any, of the pectin is present in the water-soluble fraction.

Potato starch consists of two components, amylose, a long straight-chain polymer of anhydroglucose units, and amylopectin, a branched-chain compound (Schwimmer, 1953). Electron microscope studies show that much of the starch is organised into microfibrils, 22 to 32 $m\mu$ in diameter and at least 400 $m\mu$ long, disposed radially (Sterling and Pangborn, 1960). When Cowie and Greenwood (1957) dispersed and fractionated starch from different potato varieties under oxygen-free conditions, the amylose obtained consisted of 3000 to 4000 glucose units. Banks and Greenwood (1959), studying whole starch granules isolated from freshly dug potatoes, found that they had an average diameter of about 40 μ and contained about 20 per cent of amylose and 0.093 per cent of phosphorus. Starch from sprouting tubers had much the same physical and chemical properties, but only 0.071 per cent of phosphorus.

Reducing sugars and sucrose have been reported in varying quantities in the potato tuber. Burton and Hannan (1957) found in fresh tubers a total sugar content of 0.96 g per 100 g, of which 0.76 g was in the form of reducing sugars. Gooding and Hubbard (1956) found, per 100 g dry weight, 1.27 g reducing sugars, expressed as glucose, and 0.55 g sucrose after about two months' storage in sacks.

Attention has been given over many years to the nitrogenous constituents of the potato. As early as 1879 Rubner had been puzzled by the ability of the potato to maintain nitrogen equilibrium although at least half of the nitrogen is in a form other than protein. The work of Chick and Slack (1949) sug-

gested that the nutritive value of the non-protein nitrogen complements that of the protein. Lindner, Jaschik and Korpáczy (1960) measured the relative amounts of different proteins in the potato and found that, of the total, tuberin accounted for 76.4, globulin II for 1.4, albumin for 4.0, prolamin for 1.8 and glutelin for 5.5 per cent. The amino acid components of some of the protein fractions are given in Table 2. Some of the results are compatible with those of

TABLE 2

AMINO ACIDS IN THREE PROTEIN FRACTIONS OF THE POTATO, G PER 100 G PROTEIN
(Lindner, Jaschik and Korpáczy, 1960)

Amino acid	Tuberin	Albumin	Globulin
isoLeucine	12.5	12.5	13.4
Glutamic acid	12.1	10.7	8.9
Lysine	8.7	9.8	9.9
Aspartic acid	9.4	10.8	8.3
Proline	6.3	5.0	5.7
Serine	5.9	4.6	4.2
Valine	5.0	3.5	5.8
Threonine	4.9	4.4	9.4

other workers, but others differ considerably (see Block and Bolling, 1951). Apart from technical reasons, variability in concentrations of amino acids is to be expected because those acids play a part in protein metabolism, which is active in the potato tuber (Fowden, 1962). A useful table comparing the amino acid composition of the potato with that of some other staple foods, given by Hughes (1959), is reproduced in Table 3 (p. 327).

Talley, Carter and Porter (1958) found that about half the total nitrogen of the potato tuber was extractable with ethanol. The extract contained several amino acids present in very small amounts, the identity of which was not established. Among the components estimated were γ -aminobutyric acid, 3.67, and ammonia, 4.17 μ moles per g fresh weight.

A number of acids have been identified in the potato. Schwartz, Greenspun and Porter (1962) have recently estimated the major acid components. They found in fresh peeled potatoes glutamic and aspartic acids 0.07 and 0.05, malic and citric acids 0.045 and 0.34, phosphoric and oxalic acids 0.07 and 0.02 per cent. Unidentified acids were present to the extent of 1.85 m-equiv. per 100 g.

By chromatographic techniques two insoluble components, starch and phytic acid, have been shown to account for as much as half the total phosphorus of the potato tuber (Schwimmer, Bevenue and Weston, 1955). The concentration of phosphate in the potato increases as phosphate is added to the soil. Schwimmer *et al.* (1955) separated the acid-soluble phosphates in potato by chromatography. In one variety, Russet Burbank, spots corresponding to orthophosphate, glyceryl phosphate, pyrophosphate, nucleotides, and phytic acid were demonstrated, orthophosphate giving the most intense. An equal

number of spots, one of them as intense as that of orthophosphate, were found which did not correspond to any of the known phosphate compounds tested. The pattern of phosphate compounds separated from another variety of potato, White Rose, was quite different. Furthermore, the phosphate fractions varied according to the temperature at which the tubers had been stored. Thus in Russet Burbank glyceryl phosphate was absent at 4.4° and present at 21°C.

TABLE 3

AMINO ACID COMPOSITION OF FOUR STAPLE FOODS, G PER 16 G N (Hughes, 1959)

Amino acid	Potato	Whole wheat flour	Whole maize	White rice
Arginine	5.2	4.3	5.0	8.0
Cystine	1.3	2.0	2.1	1.6
Histidine	1.5	2.1	2.4	2.3
isoLeucine	4.4	3.9	4.0	4.7
Leucine	4.7	6.4	12.0	8.5
Lysine	5.0	2.7	3.0	3.1
Methionine	1.6	1.6	2.0	2.1
Phenylalanine	4.1	4.6	5.0	4.8
Threonine	3.6	2.8	4.1	3.8
Tryptophan	1.2	1.2	0.9	1.4
Tyrosine	2.9	3.2	3.9	4.9
Valine	5.1	4.3	5.6	6.5
Alanine	4.2	3.3	9.9	5.6
Aspartic acid	17.1	4.9	12.3	4.4
Glutamic acid	23.8	27.7	15.3	10.7
Glycine	1.9	3.9	3.0	6.6
Proline	2.5	10.1	8.3	4.5
Serine	2.7	4.8	4.2	4.9

The influence on the potato of the natural phosphate content of the soil and of added phosphate was included in the studies of Dainty, Verma and Simpson (1959) with labelled phosphate. In tubers at the start of development, 8 weeks after planting, in the middle, 12 weeks, and at the end, 17 weeks, amounts were 0.32, 0.35 and 0.33 per cent P₂O₅ on low-phosphate soil and 0.60, 0.50 and 0.39 on high-phosphate soil. Phosphatic fertiliser raised values at 8 weeks to 0.45 and 0.77 per cent on the low-phosphate soil when 0.5 and 2.0 cwt P₂O₅ was applied per acre (about 62.5 and 250 kg per hectare) and to 0.85 and 0.89 per cent, on the high-phosphate soil, but had little or no effect at 12 or 17 weeks. Clearly, when comparisons of content of phosphate, and perhaps of other constituents, are being made between batches of tubers it is important to standardise the conditions under which tests are conducted.

Simpson (1960) showed that application of superphosphate to soil decreased the rate of emergence of potato shoots, but that the rate of emergence was increased by irrigation. Uptake of phosphate by tubers seemed to be maximum with 2 cwt superphos-

phate per acre. In terms of total uptake of phosphate, yield as well as phosphate content being taken into account, the effect of superphosphate was considerable.

Phytic acid is present in the mature potato tuber as a mixture of dicalcium monomagnesium salts of inositol hexa- and pentaphosphoric acids (Schwimmer *et al.*, 1955; Schwimmer, 1956). In the earlier stages of development phosphorus is preferentially incorporated into starch, but two-thirds of the increase found between 80 and 120 days after planting appears as phytic acid phosphorus. Between two-thirds and four-fifths of the total organically bound acid-soluble phosphorus is present in the tuber as phytic acid phosphorus (Samotus and Schwimmer, 1962). Although phytic acid forms less than 0.1 per cent of the fresh weight of the potato tuber, they suggest that with starch it may serve as a reservoir for phosphorus accumulated in the maturing tuber; high concentrations of inorganic phosphate would thus be prevented, and that might limit the metabolic activity of the tuber and so prepare it for the dormant state. They found, in fact, that changes during storage for 6 weeks at 0° or 25° were slight.

Another important constituent of the potato tuber is potassium, which occurs to the extent of 400 to 500 mg per 100 g fresh weight (Bills, McDonald, Niedermeier and Schwartz, 1949; Franz, Kiecker and Phelan, 1959). Sodium is present in much smaller amounts and may not reach 1 mg per 100 g in the raw peeled tuber (Bills *et al.*, 1949).

Of the trace elements, fluorine, of special interest for preventing dental caries, varies widely according to the fluorine contents of the soil and water, ranging from 7 to 640 µg per 100 g edible portion (McClure, 1949).

Much interest is attached to the ascorbic acid in potatoes, which usually contain about 20 mg total ascorbic acid per 100 g. Considerable variations have been recorded, especially in the older literature; some can be explained on grounds of technique, but with better standardisation of methods important real differences are being demonstrated. Barker (1950) showed that ascorbic acid content of the tuber varied with the stage of maturity of the plant, rising during growth to a maximum in August to September. During storage at 10° it fell steadily to about 10 mg per 100 g fresh weight in May. The rate at which ascorbic acid disappeared was greatest in potatoes lifted earlier and therefore less mature. For example, by May tubers lifted in July contained 6 mg per 100 g, but those lifted in October 11 mg. If the temperature of storage varied, there might be an initial rise of ascorbic acid (Barker and Mapson, 1950).

Potatoes as purchased may, because of differences of variety, origin or storage, show considerable variation in content of nutrients.

Livak and Morse (1962) estimated reduced ascorbic acid and dehydroascorbic acid in potatoes bought in a local supermarket twice a month from the end of October to the end of April. Range of values was relatively much greater for reduced ascorbic acid than for dehydroascorbic acid, 3 to 17 mg per 100 g against 9 to 13 with one exceptional value of 19. The low values for reduced ascorbic acid were at the end of the period.

Potatoes are relatively poor as a source of tocopherols, pyridoxine, pantothenic acid, biotin and folic acid (McCance and Widdowson, 1960), and much may be lost during cooking. Most of the folic acid is in the skin and is lost on peeling (Toepfer, Zook, Orr and Richardson, 1951).

EFFECTS ON COMPOSITION OF ENVIRONMENT, STORAGE, PROCESSING AND COOKING

The bulk of the potato tuber consists of cellular inclusions, particularly starch, rather than basic cell structures; a good deal of variation in composition is therefore to be expected according to the environmental conditions under which the plant is grown and its stage of maturity. Further, much of the potato crop destined for human consumption is stored, sometimes for many months, and both commercial processing and cooking may affect composition.

Gooding and Tucker (1958) made a detailed study of changes in potato tubers lifted in October and stored in clamps, or stacked in an unheated brick building with protection against draughts so that the temperature never fell below 7°C, and treated to prevent sprouting. Some of their results are shown in Table 4.

Potatoes, like other roots and tubers, and unlike cereals, take up little cooking water, but considerable changes in chemical composition can occur because of leaching and disintegration of components by heat. Fisher and Dodds (1952) studied the effect of cooking potatoes for different times and with different amounts of water in stainless steel containers without salt. With cooking water 60, 150 or 240 g and cooking time 18, 15 or 14 minutes for about 300 g potato, the ash content fell from 0.8 per cent to 0.76, 0.70 or 0.65 and total ash from 2.54 g to 2.31, 2.16 or 2.01.

Reduction of ash content implies reduction of

TABLE 4

SUGAR AND ASCORBIC ACID CONTENT OF STORED POTATOES LIFTED IN OCTOBER

(Gooding and Tucker, 1958)

Date of removal from store, 1957	Method of storage	Sugar, g per 100 g dry matter			Ascorbic acid, mg per 100 g dry matter
		Glucose	Fructose	Sucrose	
29 January	clamp indoor	3.9		0.6	90
		2.6		0.6	90
26 February	clamp indoor	3.9	0.8	0.4	98
		2.5	0.5	0.5	98
26 March	clamp indoor	2.1	1.4	0.4	82
		1.5	0.8	0.3	87
25 April	clamp indoor	3.3	1.9	0.3	66
		1.7	0.8	0.3	58
31 May	clamp indoor	5.0	1.6	0.6	45
		2.8	0.8	0.5	57

Changes in sugar content are influenced by temperature during storage. Schwimmer, Bevenue, Weston and Potter (1954) found that there was very little sugar in fresh tubers, but that it increased on storage at 40°F up to a maximum at about four weeks, thereafter falling slightly to a constant level. Total sugars, and especially reducing sugars, increased when the temperature was lowered to 34°F, but decreased considerably when it was raised to 70°.

The ascorbic acid content of potatoes differs according to variety and storage (see, e.g., Allison and Driver, 1953). The possibility of breeding new varieties richer in certain nutrients is of practical importance. Quisenberry (1956) reported a new variety which maintained an ascorbic acid content of 30 mg per 100 g during 4 months' storage. It is well known that ascorbic acid content of potatoes falls during storage; changes in sugar content occur

individual mineral constituents: thus raw potatoes may contain 568 mg potassium per 100 g but boiled potatoes only 325; for iron the corresponding values are 0.75 and 0.48 (McCance and Widdowson, 1960). Baking in the skin leads to appreciable loss of water so that the concentration of nutrients rises; the moisture content of the flesh without skin is 71 per cent and the concentrations of potassium and iron rise to 680 and 0.90 mg per 100 g. When potatoes are mashed with milk and butter or margarine, the main changes are in fat and calcium contents. The fat content of mashed potatoes can be as much as 30 per cent. Mashed potatoes can provide 120 kcal per 100 g, and 11.7 mg calcium, compared with 8 and 4.3 from boiled potatoes (McCance and Widdowson, 1960).

Cooking with fat to produce roast potatoes, chips or crisps considerably increases the fat content of the

food, with loss of much water. Those products therefore provide much more energy for a given weight than boiled, mashed or baked potatoes. Roast potatoes, chips and crisps can provide, respectively, 123, 239 and 559 kcal per 100 g and 745, 1020 and 1350 mg potassium (McCance and Widdowson, 1960).

Teply and Derse (1958) investigated changes of nutrient content after baking commercially-frozen French fried potatoes. They included estimations of protein, carotene, thiamine, pyridoxine, pantothenic acid and folic acid. With allowance for variation between packets, changes of total nutrient content after frying were negligible except for ascorbic acid, of which 60 per cent. was lost.

Wertz *et al.* (1956) estimated amino acids in duplicate samples of potatoes cooked in different ways, when ready for eating. The results are shown in Table 5; variety and previous treatment of the potatoes are not known.

TABLE 5

AMINO ACID CONTENT OF COOKED POTATOES, MG PER G

(Wertz *et al.*, 1956)

Amino acid	Boiled potatoes	Chips	French fried	Mashed potatoes
isoLeucine	0.89	3.46	2.89	1.21
Leucine	1.09	4.21	2.25	1.54
Lysine	1.10	3.66	2.03	1.31
Methionine	0.26	0.92	0.47	0.35
Phenylalanine	0.86	2.79	1.57	1.04
Threonine	0.76	2.48	1.47	1.02
Tryptophan	0.24	0.57	0.45	0.22
Valine	1.19	4.22	2.48	1.25

The concentrations of nutrients in commercial potato products seem to vary considerably both between samples and by comparison with fresh tubers. Bills *et al.* (1949) found canned potatoes processed without addition of salt to contain 350 mg sodium and 240 mg potassium per 100 g, in contrast to 0.8 and 410 mg per 100 g in raw potatoes without skins. Hanning and Mudambi (1962) showed that the thiamine and ascorbic acid contents of canned potatoes were about the same as in the fluid, so that if the fluid were discarded half would be lost. There was considerable variation between samples, for thiamine from 0.23 to 0.61 μ g per g and for ascorbic acid from 4.4 to 26.5 mg per 100 g. The ranges were considerable in dehydrated potatoes also, for thiamine from 0.04 to 2.93 μ g per g, and for ascorbic acid from 3.3 to 24.2 mg per 100 g.

Most studies of nutrient loss in cooking have been concerned with ascorbic acid. Because of the number of variables involved, actual loss is difficult to predict. Ascorbic acid may undergo oxidation by the process of auto-oxidation catalysed by copper or other metal complexes, or by enzymic oxidation in systems involving peroxidase, polyphenolase, ascorbase or the cytochrome system. Cooking on a large scale can result in loss from other causes such as

leaching or destruction by heat. The possible extent of such loss and of the procedures to which potatoes may be subjected are illustrated by the results of a small study (Wadsworth and Couchman, 1962) in the kitchen of a training college. At 9.45 a.m. potatoes were washed but not peeled and a sample was found to contain 27.3 mg ascorbic acid per 100 g. They were left standing until 10.30 a.m. and were then boiled in water for 10 minutes and left to cool. By then ascorbic acid had fallen to 17 mg per 100 g. The cooked potatoes were peeled and ascorbic acid in the flesh remained at 21 mg per 100 g until they were heated up ready for serving at 1 p.m. At the time of serving immediately afterwards, ascorbic acid had fallen to 16.2 mg per 100 g. Macy (1946a) reported the following values, mostly from single samples taken at time of serving: baked potatoes, 5.3 to 15.0 mg per 100 g; boiled, just after cooking, 11.7; boiled in skins, 12.7; mashed with different amounts of milk and kept for $\frac{1}{2}$ or 1 hour, 0.05 to 6.6; mashed and kept on steam bath for 1 hour, 1.3, 3.1; "duchesse" (left-over mashed potatoes browned) 0.2.

Potatoes which have undergone commercial processing may lose still more ascorbic acid when finally prepared in the home. For instance, mashed potato taken from a frozen meal had 7.3 mg per 100 g but after being heated in the oven only 5.0. Mashed potato in a polythene bag had 2.9, but only 2.1 after boiling in the bag. Dehydrated potato had even less (Eddy and Pellett, 1962).

CONSUMPTION OF POTATOES IN THE UNITED KINGDOM

The estimated quantities of potatoes moving into consumption in the United Kingdom during the present century show that demand varies. An average of 243 lb per head per annum in the years 1909-13 fell to 230 lb in 1924-28; a revised estimate for 1934-38 is 190 lb (National Food Survey Committee, 1951; 1962). Crawford and Broadley (1938) explained the downward trend since the years before the war of 1914-18 by increasing mechanisation of industry, resulting in less physical exertion and therefore lower energy requirement; the rising standard of living, which permitted a greater variety of foods; the public's increasing knowledge about the special value of protective foods; and avoidance of "starchy" foods by women desiring to be slim. The downward trend was reversed during the war of 1939-45 when the acreage under potatoes was increased and the Government undertook an advertising campaign with such slogans as "Save bread, eat potatoes instead". In June 1943 a survey was made (Wagner, 1943; undated) in the course of which 2269 housewives were questioned. Thirty per cent said they had eaten more potatoes, but 19 per cent said they had eaten more of other vegetables, 10 per cent more fish, sausage or luncheon meat, 3 per cent more cheese, 3 per cent more breakfast cereals and 3 per cent more dried milk; 41 per cent said they had eaten no more of anything. Of those who had eaten more potatoes 23 per cent said they had done so because of the scarcity of other foods. Only 3 per cent gave a reason which could have been a result of the publicity campaign.

Consumption fell from a peak in 1946-47 (Potato Marketing Board, 1955) (Table 6). The fall of nearly 50 lb per head per year in 1947-48 was due to a very poor crop, but war-time levels were never reached again. The amounts for 1959 and 1960 were 211 and 220 lb per head per year (National Food Survey Committee, 1962).

TABLE 6

HUMAN CONSUMPTION OF POTATOES IN UNITED KINGDOM FROM JULY TO THE FOLLOWING JUNE, LB PER HEAD PER ANNUM

(Potato Marketing Board, 1955)

1941-42	185	1948-49	242
1942-43	219	1949-50	246
1943-44	256	1950-51	234
1944-45	254	1951-52	227
1945-46	252	1952-53	223
1946-47	282	1953-54	207
1947-48	239	1954-55	219

Some information about the household use of the potato as reported by the National Food Survey Committee (1962) is given in Tables 7, 8 and 9. From the amount spent on potatoes and the quantities consumed it appears that prices vary according to the socio-economic class of the purchaser; the average price per lb was 3.49d. for class A1 (gross weekly income of head of household £34 or more), 3.52d. for class B (£12 to £20), and 3.24d. for class D1. (under £8, with earners). The variations may have been due to cheapness of certain varieties, place of purchase, and proportion grown in gardens.

A survey in August 1955 and February 1956 of 4557 representative subjects (Warren, 1958) showed the proportion of the population eating potatoes. At the midday meal in summer or winter potatoes were eaten by men and women in equal numbers. For all adults there was a change with the day of the week at both times of the year; in summer the percentages taking potatoes on Monday to Friday, on Saturday and on Sunday were 59, 65 and 78 while in winter they were 65, 73 and 83. At the principal evening meal in each season more men than women took potatoes.

Further details on the use of the potato, obtained by Unilever (1962), are given in Tables 10, 11, 12, 13 and 14 (pp. 331-333).

The consumption of potatoes has not declined as rapidly as that of bread, and remains higher than before the war. This may partly be due to the increasing use of cooked meals, but there are probably other reasons. In a recent inquiry (McKenzie and Yudkin, 1962) it was found that the housewife includes potatoes in the family meal for a variety of reasons, such as belief in their "filling" and "nourishing" properties. On the other hand, potatoes are widely believed to affect bodyweight (Table 13) (Brown, McKenzie and Yudkin, 1963; McKenzie and Yudkin, 1962).

Consumption of potatoes varies with the region: in 1960 people in the North Midlands, Scotland and the South West ate over 60 oz per person per week, those in Eastern Counties about 53, and those in the East and West Ridings of Yorkshire only 48 (National Food Survey Committee, 1962).

A growing commercial interest in potatoes has influenced the form in which they are eaten. The fish-and-chip trade has a long and interesting history. Fried fish was already on sale in the London of Dickens but Oldham in Lancashire has been given the credit

TABLE 7

DOMESTIC CONSUMPTION AND PURCHASE OF POTATOES IN UNITED KINGDOM: ALL HOUSEHOLDS, 1960, OZ PER HEAD PER WEEK

(National Food Survey Committee, 1962)

Form	Consumption					Purchases
	1st quarter	2nd quarter	3rd quarter	4th quarter	Average for year	Average for year
Old potatoes, 1959 crop	57.12	27.45	0.07		21.16	19.86
Old potatoes, 1960 crop*	--	--	21.50	61.87	20.84	18.14
New potatoes*	1.50	21.38	33.24		14.03	11.88
Chips	0.96	1.07	1.20	1.04	1.07	1.06
Crisps	0.08	0.11	0.11	0.08	0.10	0.10
Total	59.66	50.01	56.11	62.99	57.20	51.04

* Potatoes from 1960 crop classified as "new" until 31 August

TABLE 8

DOMESTIC EXPENDITURE ON POTATOES IN UNITED KINGDOM: ALL HOUSEHOLDS, 1960, PENCE PER HEAD PER WEEK

(National Food Survey Committee, 1962)

Form	1st quarter	2nd quarter	3rd quarter	4th quarter	Average for year	Percentage of all households purchasing each type during survey week
Old potatoes, 1959 crop	10.26	4.89	0.01	—	3.79	56
Old potatoes, 1960 crop*	—	—	2.81	8.92	2.93	
New potatoes*	0.75	9.32	5.46	—	3.88	32
Chips	1.02	1.09	1.41	1.10	1.16	22
Crisps	0.29	0.41	0.41	0.29	0.35	7
Total	12.32	15.71	10.10	10.31	12.12	

TABLE 9

DOMESTIC CONSUMPTION OF VEGETABLES IN UNITED KINGDOM BY SOCIAL CLASS, 1960, OZ PER HEAD PER WEEK

(National Food Survey Committee, 1962)

Social class*	A1	A2	All A	B	C	D1	D2	D O.A.P.	All households
Potatoes, including chips and crisps	40.35	50.20	47.92	57.96	59.90	61.30	57.70	47.15	57.20
Fresh greens	21.79	16.87	18.02	15.92	15.28	12.58	18.55	16.36	15.81
Other vegetables	17.49	17.39	17.44	17.47	17.30	17.22	18.14	15.05	17.30
Total	79.63	84.46	83.38	91.35	92.48	91.10	94.39	78.56	90.31

* Defined by gross weekly income of head of household :

- | | | | |
|----|-------------|----------|---|
| A1 | £34 or more | D1 | Under £8, with earner(s) |
| A2 | £20 to £34 | D2 | Under £8, without earner |
| B | £12 to £20 | D O.A.P. | Under £8, solely or mainly from old age pension |
| C | £8 to £12 | | |

TABLE 10

HOUSEHOLDS SERVING HOT POTATOES AT MIDDAY AND EVENING MEALS, PERCENTAGE OF 4000 HOUSEHOLDS INTERVIEWED

(Unilever, 1962)

Meal	Daily average over one week	Monday	Tuesday to Thursday	Friday	Saturday	Sunday
Midday	63	59	57	57	71	85
Evening	27	34	36	33	12	5

TABLE 11

HOUSEHOLDS USING POTATOES AND OTHER VEGETABLES AT MIDDAY MEAL, PERCENTAGE OF 4000 HOUSEHOLDS INTERVIEWED (Unilever, 1962)

Vegetables	Daily average over one week	Monday	Tuesday to Thursday	Friday	Saturday	Sunday
Any hot vegetable	67	59	61	61	76	86
Potatoes only	15	17	15	21	18	4
Potatoes + one other vegetable	34	30	31	29	38	48
Potatoes + two or more other vegetables	12	8	10	6	12	32
No potatoes but other hot vegetables	5	5	6	6	7	3

TABLE 12

HOUSEHOLDS USING DIFFERENT TYPES OF COOKED POTATOES AT MIDDAY MEAL, PERCENTAGE OF 4000 HOUSEHOLDS INTERVIEWED (Unilever, 1962)

Type of cooked potatoes	Daily average over one week	Monday	Tuesday to Thursday	Friday	Saturday	Sunday
All kinds	63	59	57	57	71	85
Creamed or mashed (specified)	24	19	21	18	24	28
Boiled or steamed (not specified)	24	20	21	18	24	28
Roast	10	4	4	3	7	44
Baked-in-skin	n*	1	n	n	n	n
Fried (chips or sauté)	12	13	11	20	16	2
Home-fried	10	13	10	16	13	2
Shop-fried	2	n	1	4	3	—
Cakes, croquettes, mashed-fried, bubble-and-squeak	1	2	n	n	n	n
Unspecified	1	1	1	1	1	1

* n = less than 0.5 per cent

TABLE 13

HOUSEHOLDS USING POTATOES AND OTHER VEGETABLES AT EVENING MEAL, PERCENTAGE OF 4000 HOUSEHOLDS INTERVIEWED (Unilever, 1962)

Vegetables	Daily average over one week	Monday	Tuesday to Thursday	Friday	Saturday	Sunday
Any hot vegetable	32	38	41	39	17	7
Potatoes only	8	10	9	12	5	2
Potatoes + one other vegetable	14	17	19	16	5	2
Potatoes + two or more other vegetables	4	5	6	4	1	1
No potatoes but other hot vegetables	6	7	7	7	6	2

TABLE 14

HOUSEHOLDS USING DIFFERENT TYPES OF COOKED POTATOES AT EVENING MEAL, PERCENTAGE OF 4000 HOUSEHOLDS INTERVIEWED

(Unilever, 1962)

Type of cooked potatoes	Daily average over one week	Monday	Tuesday to Thursday	Friday	Saturday	Sunday
All kinds	27	34	36	33	12	5
Creamed or mashed (specified)	8	10	11	8	2	1
Boiled or steamed (not specified)	8	10	11	8	2	1
Roast	2	2	3	2	1	1
Baked-in-skin	n*	—	—	—	—	—
Fried (chips or sauté)	10	11	10	16	6	2
Home-fried	9	11	10	13	6	2
Shop-fried	1	1	1	2	1	n
Cakes, croquettes, mashed-fried, bubble-and-squeak	n	1	n	n	n	n
Unspecified	1					

* n = less than 0.5 per cent

TABLE 15

BELIEFS ABOUT FOODS CAUSING OVERWEIGHT,* EXPRESSED AS PERCENTAGE OF TOTAL ANSWERS

District	Bromley†	Hendon‡	Shepherd's Bush‡
No. of answers	81	81	78
Potatoes	55	54	78
Bread	49	63	53
" Starches "	25	31	9
Sugar	22	29	42
" Carbohydrate "	18	4	0
Cakes	16	27	32
Sweets	16	27	6
Fat	10	12	9
Butter	4	4	0
Biscuits	9	6	1
Puddings	5	4	3
Pastry	6	0	0
Fried foods	0	4	3
Milk	2	0	3
Rice	2	0	3
Peas	0	0	3
Other foods mentioned once	Cheese "Liquids"	Cheese Ham Salad dressing Jam Syrup Spaghetti Mutton	Biscuits Meat Salad cream Oil Tinned foods Macaroni Stews

for associating fish with chips. Chips, or " French fried ", had been introduced from France in 1880. At that time John Rouse, an Oldham cotton mill engineer, developed a mobile chip-making machine called the " Dandy ". To popularise the sale of fish he gave away free chips with the fish bought in Oldham Market (*Sunday Times*, 1960). The fish-and-chip industry to-day involves at least 14,000 retail shops and has an annual turnover of nearly £50 million. The industry uses 1000 tons of fish daily and accounts for more than 80,000 tons of oil and fat and at least half a million tons of potatoes annually (*Fish Friers' Review*, 1962).

Just after the war there was a rapid expansion of the potato crisp industry and about 4000 firms came into existence. They have now been reduced to about 40. The market is expanding rapidly and the potato consumption of that industry, now 170,000 tons per annum, has doubled in the last 3 years. The annual turnover is between £15 and £20 million.

The frozen-potato industry is gaining ground only slowly; it uses about 6000 tons a year. It produces what is essentially a convenience food, which is still expensive. Increasing amounts of frozen fried potatoes are being used in the United States, and sales there now exceed those of frozen peas (United States Department of Agriculture, 1961; Simmons, 1962).

Sales of pre-packed potatoes are rapidly increasing in the United Kingdom (Haswell, 1957). It has been

* Answers by random samples each of 100 housewives in different London districts to the question, " If a friend wanted to slim, what foods would you suggest she leave out of her diet? "

† Brown, McKenzie and Yudkin (1963).

‡ McKenzie and Yudkin (1962).

estimated that a quarter of the potatoes sold in 1960 were pre-packed, and the proportion will probably rise with the spread of self-service stores.

NUTRITIONAL SIGNIFICANCE OF THE POTATO

Nutritionally the potato tuber seems to be important mainly as a source of energy and of ascorbic acid, but figures given by Salaman (1949) imply that, even when the consumption of the potato was at its highest, in England and Wales it probably never provided more than about 300 kcal per head of total population per day. At the present time, potatoes, including chips and crisps, supply only 5.7 per cent of the total energy of the British diet, 5.0 per cent of the protein, 0.5 per cent of the fat, 9.6 per cent of the iron, 7.8 per cent of the riboflavin and, allowing for loss in cooking, 33.7 per cent of the ascorbic acid (National Food Survey Committee, 1962). In order to maintain an intake of 2500 kcal it would be necessary to eat about 7 lb of potatoes daily, if no other foods were eaten. That would supply 60 g protein and about 20 mg iron, but it would not provide any vitamin B₁₂, or enough of several other nutrients. Furthermore, the amino acid composition of potato protein suggests that it would not be adequate to maintain health during growth or pregnancy. That conclusion is supported by unpublished findings (Miller, 1962) according to which the standardised net protein utilisation (Platt and Miller, 1959) of potato protein, measured with rats, was 59 per cent, with a supplement of lysine or methionine 61, with tyrosine and methionine 64 but, with fish or meat supplying one-twentieth of the nitrogen, 72 and 73. Nevertheless, typical dishes containing potatoes, for example, sausage and mash, fish and chips, Cornish pasty, supply protein of satisfactory biological value (Table 16).

TABLE 16

PROTEIN VALUES OF TRADITIONAL DISHES CONTAINING POTATOES

(Miller, 1962)

Dish	Protein kcal per cent*	Net protein utilisation (operative)*	Net dietary kcal per cent*
Fish and chips	18.5	47	8.7
Sausage and mash	17.3	55	9.5
Cornish pasty	10.6	65	6.9
Haggis and potato	15.0	56	8.4
Egg and chips	14.1	68	9.6

* For explanation of the specialised terms see Platt, Miller and Payne (1961) in "Recent Advances in Human Nutrition", Ed. J. F. Brock, p. 360.

More extensive study of the nutritional value of potato protein seems worth while in view of the need to improve protein consumption in many parts of the

world. It should not be technologically impossible to remove some or all of the starch from the potato, thereby increasing the concentration of protein. Potatoes are a valuable source of a number of essential amino acids, and yield considerably more essential amino acids per acre than, for example, milk, oats, beef or lamb (MacGillivray and Bosley, 1962).

It has long been accepted that in the British diet the potato is a valuable source of ascorbic acid, and that is still true. Some other foods, e.g., citrus fruits, are higher in ascorbic acid, but are eaten in much smaller quantities, and are sometimes so dear that all cannot afford them.

According to Davey, Dodds *et al.* (1956), 50 mg ascorbic acid is supplied by 123 g cooked cabbage boiled for 7 minutes, 96 g canned orange juice, 247 g frozen peas boiled for 4 minutes, 164 g raw tomatoes, 370 g baked potatoes, or 87 g frozen broccoli boiled for 19 minutes. Respective cost in pence in a district of London in December 1962 was 1.5, 3.2, 20.2, 8.6, 4.2, 9.5.

Tests on human subjects in which about 60 mg ascorbic acid was supplied from different foods showed that the potato compared favourably with other foods in maintaining serum ascorbic acid values (Davey, Fisher and Chen, 1956). Of the foods just mentioned peas gave the lowest values and cooked cabbage the highest, for the same intake of the vitamin.

There is no evidence that deficiency or excess of potassium occurs in man as a direct result of too low or too high an intake. It is interesting, however, to note the enormous differences in intake of potassium, especially relative to that of sodium, from diets in which roots or cereals predominate, as shown in Table 17, based on the results of analyses by Cannon and Leon (1959). Highland Papuans provide an extreme example of high intake of potassium relative to sodium (Oomen *et al.*, 1961).

There is a relation between protein metabolism and potassium (Eckel and Norris, 1955). Barnes, Kay and Valyasevi (1961) made a detailed study of potassium balance in babies fed on a preparation of whey and milk and concluded that simultaneous availability of potassium is important for maximum utilisation of protein. Potassium requirement appeared to increase when the quality of protein was improved, e.g., by supplementation with lysine. Others have shown that nitrogen retention can be affected by potassium (Kornberg and Endicott, 1946; Mahline and Stanbury, 1956; Frazier, Hughes and Cannon, 1956). Miller and Payne (1962) in controlled experiments on rats were able to demonstrate a decrease in the biological value of casein when potassium was removed from the diet.

We may speculate on how far the potato and other foods rich in potassium play an essential part in maintaining adequate utilisation of protein. That is a part of a wider subject, the effects of the chemical and physiochemical nature of the diet as a whole, including constituents not usually thought essential, some aspects of which have been discussed elsewhere (Wadsworth, 1962). This was the topic for a special Joint Committee on "Diet as Related to Gastrointestinal Function" of the American Dietetic Association and the American Medical Association.

(1961). Their discussions revealed how little is known, and drew attention to some interesting points.

The Committee quoted findings by Schmidt and Strasburger (1901) for amount of faeces produced with different diets. With a meat diet the amount of which was 1435 g, the dry weight of faeces was 17.2 g in 24 hours; corresponding values for other diets were for white bread 1237 and 28.9 g, for dark bread 1360 and 115.8 g and for potatoes 3078 and 93.8 g. The results show the extent to which increase of the amount of indigestible residue increases the dry weight of the faeces.

The results got by Macy (1946b) for lignin, cellulose and hemicellulose in different foods showed considerable variation. For three samples of white bread the mean amounts in mg per 100 g were 71, 92 and 494 and the ranges 68 to 76, 0 to 275, 444 to 534. For whole wheat bread, also three samples, they were 451, 627, 1362 with ranges 290 to 592, 470 to 740 and 1060 to 1723 and for peeled potatoes, nine samples, 31, 246, 110 with ranges 7 to 72, 0 to 417, 33 to 273. It

It is often stated that gelatinisation of starch in the potato accounts for its high retention of ascorbic acid on cooking. If that is so, the potato may have a special significance in the gut, because of its physico-chemical properties, in regulating the availability of nutrients present in the diet as a whole. Furthermore, if starch remains undigested along an appreciable length of the gut it could perhaps significantly influence biosynthesis by bacteria, and also favour persistence of worm infestation (Read, 1959).

In view of such possibilities the nutritional significance of the potato should not be assessed solely on the basis of the more obvious nutrients which it provides.

COMMERCIAL IMPLICATIONS OF POTATO COMPOSITION

The decline in the use of the potato in the United States of America has been ascribed to the occurrence of blackening (Smith and Muneta, 1954). Whether

TABLE 17
CONCENTRATION OF SODIUM AND POTASSIUM IN STAPLE FOODS
(Cancio and Leon, 1959)

Food	Sodium mg per 100 g			Potassium mg per 100 g			m-equiv. K as percentage of m-equiv. Na
	Min	Max	Average	Min	Max	Average	
White bread, enriched	543	644	580	109	115	112	11
White rice	19	23	21	88	90	89	241
Cassava	7	37	19	144	399	260	804
Yam (<i>Dioscorea alata</i>)	13	17	15	417	457	437	1723
Potato, without skin	5	22	10	298	540	444	2414

is unlikely, therefore, that the relatively large amount of faecal dry matter after ingestion of potatoes could be due to the amounts of lignin, cellulose, and hemicellulose in the original food. The difficulty of digesting raw or cooked potato with acid *in vitro* suggests that an appreciable proportion may pass through the intestinal canal undigested, especially if large amounts are eaten. That would lead to increased multiplication of intestinal bacteria, which would add further to faecal bulk. Faecal bulk and per fatty acid content are greatest with a diet high in carbohydrate (Williams and Olmsted, 1936). The fatty acids may be the result of bacterial degradation of hemicellulose, but Aylward and Wood (1962) have drawn attention to the complexity of factors determining the pattern of faecal lipids. They include unabsorbed food residues, material derived from absorbed food lipids subsequently eliminated through bile or intestinal secretions, compounds produced by biosynthesis and then excreted, products of bacterial biosynthesis, and the results of bacterial modification of intestinal lipids. Aylward (1958) made the interesting suggestion that body lipids are influenced by intestinal excretion of fats, which in turn is influenced by the nature of the diet.

or not that is true, discoloration and other conditions which spoil the appearance of the tuber are of concern in commerce, particularly where wide choice of foods is possible.

Discoloration of potatoes as they cool after boiling or frying is known as "stem-end blackening". It is thought to be due to formation of a complex between iron and *o*-dihydroxyphenols; the principal substances involved may be chlorogenic and caffeic acids (Harrap, 1960). In the raw potato the complex is in a colourless form, but on keeping after cooking the iron becomes oxidised. There seems to be interrelation between potassium and iron (Bolle-Jones, 1955; Cowie, 1955-56); potassium deficiency leads to increased concentration of iron in the tuber. Such tubers contain much less citric acid than normal, and that may cause more iron to become available for combination with *o*-dihydroxyphenols, because iron is normally bound to citric acid (Mulder, 1949). Potassium appears to affect the concentration of *o*-dihydroxyphenols and of citric acid (Harrap, 1960), and the distribution of blackening in potato tubers may be governed by competition for iron between citric acid and the chlorogenic acid group of phenols (Hughes, 1958; Bate-Smith, Hughes and Swain,

1958). Nevertheless, the effects of soil and climate appear to be more important in producing blackening than the rate of application of potassium fertilisers (Harrap, 1960).

Discoloration is observed when potatoes peeled by machine are kept under water before cooking. They may become pink, red or purple. The red hues change to brownish grey after cooking. This kind of discoloration is influenced by variety, and does not appear after hand peeling (Longrée, 1956).

Discoloration of raw potatoes on exposure to air and on bruising is known as "bruise blue". It is directly related to the concentration of tyrosine, which is converted to melanin by tyrosinase (Mulder, 1949; Ophuis, Hesen and Kroesbergen, 1958). Like stem-end blackening, bruise blue is increased by potassium deficiency. When potassium oxide formed 1.8 per cent. of the dry weight of the tuber all the tubers were discoloured after handling; with 3.4 per cent potassium oxide only 60 per cent of the tubers showed discoloration.

Colouring of potatoes on frying is due to caramelisation of reducing sugars. The sugar content of the potato is therefore of particular importance in manufacture of potato crisps and chips. Sugar concentration usually increases during storage (Gooding and Hubbard, 1956).

The starch and sugar contents of potatoes in relation to processing and to carbohydrate metabolism have been extensively studied since the pioneer work of Müller-Thurgau in 1882 (Schwimmer *et al.*, 1954), but only with the advent of chromatographic techniques has it been possible to study certain sugar components. For example, Williams and Bevenue (1951) have demonstrated the presence of ketoheptoses and melibiose in potato extracts. Trace sugars detected according to variety and storage temperature are fructan, raffinose, a heptulose, melezitose and inositol (Schwimmer *et al.*, 1954). The significance of those constituents for the characteristics of the potato is not known, but quality, especially colour, of many potato products is closely related to the reducing sugar content of the raw tuber.

Gooding and Tucker (1958) showed that browning of dehydrated products was associated with high content of reducing sugars, although there was no evidence to show whether glucose or fructose had the greater influence. Burton and Hannan (1957) found that exposure of potatoes to γ -rays suppressed sprouting during storage, but increased the accumulation of sugar. For example, 27 weeks after treatment tubers contained 0.73 g reducing sugar per 100 g, compared with 0.12 g in untreated tubers. Browning of fried potatoes, however, involves amino acids as well as sugars (Shallenberger and Treadway, 1959), and therefore affects the biological value of the protein.

PRODUCTION OF POTATOES IN THE UNITED KINGDOM

The potato growing industry is predominantly made up of small-scale producers (Sykes and Hardaker, 1962). In 1959, 50 per cent of producers had less than 5 acres under potatoes and together 10 per cent of the total potato acreage, and 47 per cent had less than 50 acres and together 61 per cent of the

total acreage. There is, however, a movement towards larger holdings; 32 per cent of the main crop was grown on holdings of less than 100 acres in 1948, but in 1960 only 24 per cent.

Producers registered with the Potato Marketing Board in 1962 had about 479,080 acres under potato cultivation in England, 14,640 acres in Wales and 131,500 acres in Scotland (Potato Marketing Board, 1962). Regions with over 20,000 acres of potatoes were Essex (25,320), Isle of Ely (34,410), Kent (20,170), Lincolnshire (Holland) (35,540), Lincolnshire (Kesteven) (24,740), Lincolnshire (Lindsey) (46,770), Norfolk (31,000), and West Riding of Yorkshire (28,800). Total production (Table 18) has fallen since 1949 (Ministry of Agriculture, Fisheries and Food, 1962).

TABLE 18

ESTIMATED ACREAGE, YIELD, AND TOTAL PRODUCTION OF POTATOES IN THE UNITED KINGDOM

(Ministry of Agriculture, Fisheries and Food, 1962)

Year	Acreage thousand acres	Yield tons per acre	Total production thousand tons
1949-50	1308	6.9	9035
1950-51	1235	7.7	9507
1951-52	1050	7.9	8284
1952-53	990	7.9	7848
1953-54	985	8.4	8260
1954-55	945	7.8	7325
1955-56	874	7.2	6278
1956-57	921	8.2	7533
1957-58	811	7.5	5691
1958-59	821	6.8	5556
1959-60	816	8.5	6916
1960-61	829	8.6	7158
1961-62*	703	8.9	6258
1962-63*	735	—	—

* Provisional figures

The proportion of potatoes imported fluctuates with the size of the home crop (Sykes and Hardaker, 1962). About 9 per cent of total supplies for human consumption were imported in 1960-61 as against 16.8 per cent in 1958-59.

The proportion of homegrown main crop potatoes used on farms also depends on the size of the harvest. In 1956, when crops were very heavy, it accounted for just under one-third of total production; in the next year, when crops were less, only one-fifth.

The demand for potatoes is inelastic, that is, there is little change in demand with change in price. During the last seven years the total quantity of potatoes entering into human consumption each year has varied by less than 3 per cent (Sykes and Hardaker, 1962). In any one year the supply of potatoes is fixed, but there are considerable fluctuations of

supply from year to year, which favour wide variations in price.

Many schemes have been adopted to ease fluctuations of potato prices. The first potato marketing scheme was approved by Parliament in 1933. As with later schemes, the main concern was to maintain prices for the producer. The Potato Marketing Board (1955) stated quite reasonably that "A grower's net income per year was often lower in a year of heavy natural yield than in a poor crop year". But in commenting on the fact that before the war a low price at the farm had not resulted in a correspondingly low price to the housewife, they said "nor could it do so, since demand would not have been much stimulated and the over-head costs of transport and distribution are themselves fairly rigid". This seems an inadequate analysis; if prices at the shop do not follow those at the farm, then unreasonable profits are being made somewhere.

The 1933 scheme imposed a levy on acreage planted in excess of an agreed amount and was able to control supplies reaching the market. By 1938, experience had shown that amendments should be made to the scheme to clarify and strengthen the position of the Potato Marketing Board, but the outbreak of war forestalled such changes. During the war potato production policy was entirely changed. Regulation of acreage gave way to a drive for greatly increased production, and price incentives were introduced.

Direct government control of the industry was terminated at the end of the 1954-55 season and administration of the potato crop became once more the responsibility of the Potato Marketing Board. Each producer with more than one acre under potatoes is allotted a basic acreage by the Board and told what proportion of that acreage he may farm in any one year. A farmer going beyond his quota is fined. The scheme is intended to stabilise output and prevent people moving rapidly in and out of the industry. The Board also attempts to guarantee minimum prices to the producer, and undertakes research and advertisement on behalf of the industry.

The potato shortage in 1962, however, illustrates the inability of the Potato Marketing Board to stabilise prices and year-to-year fluctuations of production. An acreage of 742,000 for Great Britain in 1961 had been excessive and the Board therefore recommended producers to reduce it in 1962 by 10 per cent. But very wet conditions in the autumn of 1961 delayed potato planting in 1962, and in districts with heavy soils made it impossible. Poor financial results in the previous two seasons further encouraged reduction of potato acreage. In the end only 628,000 acres were planted, about 6 per cent less than the Board had wanted (*Hansard*, 1962). The yield per acre was, however, so high that it seemed that a crisis could be averted. For a number of reasons, it was not. Prolonged cold weather increased the demand for potatoes; continuous bad weather, especially heavy frosts, damaged potatoes in the clamps, causing serious and unexpected losses; seed potatoes were scarce and ware potatoes had to be used for planting; there was a simultaneous shortage of other vegetables; partial crop failures in Belgium, West Germany, France, Holland and Sweden prevented importation of extra supplies. Potato prices rose rapidly and for

several months retail prices were considerably higher than in 1961.

The repercussions of the potato shortage were widespread. Problems affecting the school meals service present an interesting example. Local authorities are required to submit estimates to cover the cost of food for the midday meal on a yearly basis; it is expected to be about 10d. per head daily. Budgets were upset by the rapid rise of prices and the amount of potatoes used had to be reduced to well below the usual 9 oz per child per day. Alternatives such as macaroni, spaghetti and bread were tried, but were not popular. A smaller serving of potatoes with one of those other foods was often the most satisfactory solution. Use of dried potatoes in schools, as indeed in the country as a whole, increased appreciably.

The fish-and-chip trade was seriously affected. The amount of chips served over the counter had to be reduced and on occasion sale of chips alone had to be stopped. The fishing industry was secondarily affected; the British Trawlers' Federation stated that early in June 1962, during 5 days at Grimsby and Hull alone, unsold fish amounted to 30,000 kits (1875 tons) and the cash loss was calculated to amount to £150,000 (*Trawling Times*, 1962). The potato crisp industry also had difficulty in getting its raw materials.

USE OF CHEMICALS IN PRODUCTION AND PROCESSING OF POTATOES

With the ever increasing demand for food by a world already suffering from the effects of malnutrition the maintenance and improvement of food production in all forms are a matter of importance. That is true even for an affluent society where requirements at present seem to be adequately met. The farmer has still to contend with his old and powerful enemies, weeds, which have flourished in Britain for the past 42,000 years (Coope, Shotton and Strachan, 1961), and with parasitic and infective disease.

Virus infection of potatoes can be universal without causing obvious harmful effects (Hitchborn and Thomson, 1960), but some kinds of infection lead to considerable loss. Blight caused by the fungus *Phytophthora infestans*, which had catastrophic results throughout Europe in 1845, was one of the main reasons for increased commercial and public efforts to control plant diseases (Miles, 1957). Yet it has been estimated (Large, 1958) that the average avoidable loss due to blight in England and Wales between 1947 and 1956 was 7.8 per cent of the potato crop, or 350,000 tons. The present importance of potato blight is emphasised in a recent extensive review by Cox and Large (1960).

The potato crop is affected by disease more than any other crop; in West Scotland, for example, 28 per cent of the potato harvest is lost from that cause. The effects of infection are illustrated by pot experiments of Watson and Wilson (1956), who found that leaf-roll virus decreased yield by about 10 per cent in the most tolerant varieties, and in the most susceptible varieties by as much as 95 per cent. Infection caused a decrease in size and number of tubers on each plant. For plants given no nitrogenous fertiliser the mean

dry weight of tubers per plant was 22.8 g when they were healthy and 6.6 g when they were infected with virus. With nitrogenous fertiliser the yields rose to 56.7 and 24.5 g, the fertiliser having raised the yield in infected plants to just above that for healthy plants given no fertiliser. For healthy and infected plants given no potash the values were 23.8 and 8.8 g, and with potash 55.7 and 22.3 g. Virus infection may spoil potatoes for commercial use by causing small brown spots deep in the tuber, or arcs near the surface (Harrison, 1960). The spots are due to formation of corky tissue (Frank, 1897).

Control of aphids may be expensive, but it has been estimated that losses of all world crops due to them may exceed £100 million (Jones and Edgar, 1961). For the potato grower aphids are of particular importance because they convey virus infections. The method of control is to use seed grown in areas where aphids are few. In 1960, 352,000 tons of seed potatoes were exported from Scotland to England and Wales.

Infection with potato-root eelworm (*Heterodera rostochiensis*) is not so much a cause of present loss as a great potential danger. Present policy is to avoid planting infested ground, but available eelworm-free land is diminishing very rapidly. According to Gough (1961), infection has been detected in a high proportion of fields in all the main potato areas. The results of breeding resistant strains of potato have so far been of limited practical value (Cole and Howard, 1962). In illustration of the harmful effects of infestation by potato eelworm, Stone (1956) has shown that on untreated experimental plots mean yield was 4.2 tons per acre; but on plots previously treated with chlorophenol 8.5 and with cresols 7.8 tons per acre.

Satisfactory measures for controlling most of the virus diseases affecting crops of economic importance have still to be devised (Broadbent and Martini, 1959). Insects that directly or indirectly cause disease may develop resistance to chemical agents (Potter, 1961), and attempts to develop disease-resistant types of potato have not so far been entirely successful (Lapwood, 1961). Finally, the situation is made more serious by the possibility that new kinds of infection may emerge. In 1962, for example, an apparently new disease appeared in some crops of the Redskin variety. Yield is affected and the tubers are misshapen, elongated and coarse, with numerous prominent eyes. There is apparently no risk to the consumer.

The actual and potential effects of disease on potato production make the increasing use of chemicals a necessity. Such use seems to have had an appreciable effect in increasing food supplies generally since the war (Noone, 1958).

In addition to their use as fertilisers and in control of disease during growth, chemicals may be used in other ways on the potato. Potatoes from Mediterranean ports are sometimes infested with the tuber moth and on arrival in the United Kingdom are fumigated with methyl bromide, but the residues are well within the limits of safety for man (Lubatti and Bunday, 1958). Herbicides used to control weeds in potato fields are not particularly toxic to animals, and much attention is paid to their nature, use, and

effects by official bodies such as the Agricultural Research Council (Woodford, 1962). During storage that potatoes evolve volatile substances which tend to suppress sprouting (Burton, 1952). Nevertheless, and sprouting commonly results in considerable loss of dry matter (Wilson and Dawson, 1953) and chemicals are widely used to prevent it. They are also used commercially to prevent discoloration of peeled potatoes.

For many years sulphuric acid has been used to defoliate potatoes so that the tubers can be easily harvested. During a temporary world shortage of sulphuric acid in 1951-52, increasing use was made of Resi sodium and potassium arsenite sprays for that purpose, especially because they were cheaper and in many ways more convenient. Concern was felt about the use of a highly poisonous material in association with a food. Attention was drawn (*Lancet*, 1957) to the observations of Hill and Fanning (1948) that exposure to arsenite seemed to predispose to cancer. Workers who used arsenic sprays were particularly at risk and in fact, one investigation showed that they persistently excreted excessive amounts of arsenic in the urine (Whitehead, 1957), but possibility of poisoning was more widespread. During harvesting children accompanying potato pickers might ingest arsenic from contaminated fingers, or by eating blackberries growing in sprayed areas; water supplies might be contaminated; and cattle, which are strongly attracted by the smell of the spray, might make special efforts to get at haulms treated with arsenic. It is difficult to measure contamination of potatoes by arsenic precisely, since arsenic can occur naturally to about 40 p.p.m. in soils, and potatoes on sale may have been imported from abroad. The Ministry of Health (1959) found that 1.3 per cent of 450 samples contained more than 1 p.p.m. of arsenic in the flesh and 4.7 per cent more than 1 p.p.m. in the peel. About 20 per cent contained 1 p.p.m. or less in the flesh, and about 79 per cent contained none. Samples, however, included potatoes from areas not sprayed. Lisk (1960) found an average arsenic content of 1.2 p.p.m., but that was independent of previous spraying, so that the major factor seemed to be the original arsenic content of the soil. The Food Standards Committee has set a limit of 1 p.p.m. for arsenic in foods. Early in 1960 the Minister of Agriculture announced that the Advisory Committee on Poisons and Substances had recommended that the use of alkali arsenites be voluntarily banned, and that the commercial interests concerned had agreed to withdraw them from agricultural use. The last year in which arsenites were to be used for weedkillers or haulm destroyers was 1960.

It is by no means so easy to control the use of other chemicals, particularly because their effects on man and animals are much less widely or definitely known. Gutenmann and Lisk (1960) showed that when ethyl *N,N*-di-*n*-propylthiocarbamate (EPTC) was used on soil, together with DDT and other chemicals before emergence of potatoes, no residue was detectable in the tubers after harvesting. Tubers treated by dipping or spraying with isopropyl-*N*-(3-chlorophenyl)carbamate (CIPC) as a 0.5 per cent emulsion to prevent sprouting had residues of about 0.1 p.p.m., an amount reduced by peeling. Potatoes

crisps prepared from treated tubers contained less than 0.05 p.p.m. (Gard, 1959). Zweig, Archer and Raz (1962) showed by means of gas chromatography and ultraviolet spectrophotometry that methyl-naphthalene acetic acid (MENA) used for the same purpose decreased considerably during storage. The amount on the day of application was 132 p.p.m.; in potatoes stored for 30 days 43, for 60 days 8.6 and for 90 days 2.8 p.p.m. Burt, Broadbent and Heathcote (1960) found that although systemic insecticides had biological effects on the potato tuber, residues were insufficient to be dangerous to the consumer. Residues of tetrachloronitrobenzene (TCNB) are unlikely to decrease to less than 1 p.p.m. during storage. With residues of 2 p.p.m. on the surface, a person eating normal amounts of potatoes would ingest extremely small amounts of the chemical (Wilson and Dawson, 1953), very much less than amounts known to be safe for pigs (Abrams, Scorgie and Willis, 1950). Dipping peeled potatoes in sodium bisulphite to prevent discoloration had little effect on ascorbic acid content after cooking, diminished thiamine content only slightly, and left a residue of SO_2 of 1.6 mg p.p.m. or less (Mudambi and Hanning, 1962).

Evidence of the effect on flavour of chemicals applied, e.g., to the soil is conflicting, owing perhaps to the complexity of factors influencing taste and the difficulty of measuring it (Kirkpatrick, Linton, Mountjoy and Albright, 1955); an abnormal flavour from TCNB, for instance, may disappear during prolonged storage (Wilson and Harries, 1954).

Present evidence suggests that there is no immediate danger to man through ingestion of chemicals contaminating the potato. Barnes (1959) concluded in a review on the toxicity of pesticides that with proper precautions "vast quantities of these materials can be safely used to the immense benefit of mankind".

OTHER RISKS FROM POTATOES

In addition to chemicals purposely added, the potato carries other potential dangers for the consumer. Zinc has been known to enter potatoes from cooking utensil, although outbreaks of poisoning from that cause are rare. In 1954, 18 people out of 70 at risk developed vomiting a quarter of an hour after eating mashed potatoes which had been cooked in a galvanised container (Ministry of Health, 1957), but recovery was rapid.

Potatoes cool slowly after cooking, and during the cooling period bacteria can grow on them with extreme rapidity (Miller and Smull, 1955). Cooked potatoes should therefore be cooled as quickly as possible when they are to be used cold, as in salads. Application of salad dressing was found effective in reducing bacterial counts on potatoes inoculated with *Micrococcus pyogenes* (Longrée, White, Cutlar and Hillman, 1959). Food poisoning can occur as a result of eating potatoes, although it is rare. Davies and Parry (1955) described an outbreak of abdominal pain and diarrhoea in 54 of 140 people who had eaten a meal in a restaurant from 3 to 12 hours previously.

Some of the potatoes had been boiled two days earlier, stored at 55° to 60°F and reheated.

Polyphenols, such as flavonols, cinnamic acid derivatives, and coumarins, accumulate in healthy tissues in many types of plant material, and appear to be a non-specific response to injury (Craft and Audia, 1962). Chlorogenic acid, scopoletin, scopolin, aesculetin, and caffeic acid have been found to accumulate in the potato tuber as a result of wounding (Johnson and Schall, 1957) or of presence of pathogens (Kuc, Menze, Ullstrup and Quackenbush, 1956; Andreae, 1948). Such reactions are important in connection with handling, storage, and production of the potato. Solanine, which accumulates in that way, is toxic to fungus spores at pH 7.6. It increases progressively, as has been shown by McKee (1955), who found 21, 108 and 120 mg per 100 g fresh tissue on the second, fourth and sixth day after wounding. A small number of tests by Baker, Lampitt and Meredith (1955) showed that steaming had little or no effect on the solanine content of potatoes, but since solanine is soluble in water, part may be lost during cooking in water. It is usually accepted that although solanine is poisonous to man, there is little danger of untoward effects at concentrations below 20 mg per 100 g. There appears to have been only one important outbreak of solanine poisoning in the United Kingdom, in Glasgow in 1917 (Harris and Cockburn, 1918). There was one death among 61 persons affected; the solanine content of the potatoes eaten by the victim was 41 mg per 100 g. Wilson (1959) reported poisoning of 4 adults in one family. The potatoes had been baked without peeling, and the batch from which they came contained 50 mg solanine per 100 g. Vomiting, abdominal pain, and diarrhoea began about 8 hours after the potatoes had been eaten. The highest concentration of solanine is in the skin and immediately under it. One member of the family removed the skin before eating the potatoes and escaped. The two who each ate one potato were mildly affected, one who had two potatoes moderately, and one who had three very severely.

CONCLUSIONS

The potato contributes little to the energy value of the British diet, and although it supplies a third of the average intake of ascorbic acid, there are alternative, and sometimes cheaper, sources. Nevertheless, it has become an essential part of the diet in the United Kingdom, and seems likely to remain so; people choose to eat food, not nutrients.

The present review may serve to emphasise once again that many factors influence production, use, availability, and retail price of even a simple food. The structure and composition of any natural food are complex. The complex characteristics of the potato tuber no doubt are essential to the plant from which it is derived, but they may have implications beyond those attributable to known nutrients for the wellbeing of those who eat it.

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THE MOOD OF GENERAL PRACTICE AND THE NEED FOR PROFESSIONAL LEADERSHIP

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THE present is a period of impending change for general practice. As a result of operational studies (College of General Practitioners 1965), the present state and future needs have been defined and if the Royal Commission on Education (1968) recommendations are implemented there will be a sound educational foundation for the practice of general medical care. Statements by the Minister of Health and his colleagues (Cohen 1968, Royal College of General Practitioners 1967) foreshadow a bright distant future for general practice with health centres, health teams and paramedical staff, full diagnostic and therapeutic tools and a re-establishment of a closer association between hospitals and local general practitioners.

The current dilemma is how to achieve the steps from the present to the immediate and foreseeable future. The distant utopia that has been painted will be there for our sons and grandsons but how can the present generation of general practitioners take actions to improve its state? In order that efforts may succeed account must be taken of the present mood and climate in general practice, so that the feelings and opinions of general practitioners may be recognized and acted upon.

To obtain such views and opinions a research study was undertaken in 1967 and we now report its disturbing findings.

Method

There were two phases in the study.

The *first* consisted of a series of group discussions and interviews with general practitioners carried out by one of us (J.McK) in various parts of the United Kingdom. The objective was to establish hypotheses which could then be tested.

The *second* phase was a national study on a random sample of 856 general practitioners in England and Wales.

Personal interviews by trained interviewers were carried out with

454 of these (a 53 per cent response rate) and these doctors also completed a structured questionnaire.

The main questions relating to the present mood of general practice were:

1. How well did the general practitioner consider that the National Health Service was working?
2. In what ways, if any, they would like to see it improved?
3. Whether there was anything that general practitioners felt should be done specially to help them with the care of patients?
4. To what extent, if at all, did patients abuse the National Health Service?

The present study was similar to others carried out for the office of Health Economics in 1962 and 1964. Certain questions were asked in each study and comparisons can therefore be made.

Results

Satisfaction with National Health Service (N.H.S.)

The quantified study found that just over one half (55 per cent) of general practitioners considered that the N.H.S. was working well.

Not only is this figure lower than it ought to be but also it is considerably lower than the rates in 1964 (62 per cent satisfaction) and 1962 (79 per cent satisfaction). (Table I)

TABLE I
GENERAL PRACTITIONER—SATISFACTION WITH N.H.S.

	1962	1964	1967
Percentage of general practitioners expressing satisfaction with N.H.S.	79	62	55
Number of general practitioners answering questionnaire ..	264	245	454
Percentage response rate ..	59	53	53

Attempts were made to analyse the causes of this growing disapproval.

In the group discussions criticisms were made both of the system and of patients. A frequent complaint was that much of the doctor's time was spent in non-professional activities such as writing certificates.

Many doctors considered that the image and status of the general practitioner were lower than in the past. Patients were more insistent and demanding over treatment with certain drugs and over referrals to a specialist. The doctors considered that they were being treated as state employees and public servants.

In discussion these issues reflected the doctors' attitudes to

payments for drugs and medical services. Payment by patients for drugs (prescription charges had not yet been re-introduced) were believed generally to inhibit patients with "nothing wrong or minor complaints" from visiting their doctors and "wasting their time". A few doctors, however, were concerned that such barriers would interfere with early diagnosis of major diseases. It was felt also that the public would regard the doctor in a better light and appreciate the value and nature of professional service provided if a fee was paid for each service.

Almost all doctors who participated in the group discussions considered that the previously high social level of the medical profession had declined, never to return. "Only the middle class maintained any respect for professional training".

Suggestions for improvements

Many of the views expressed in the group discussions were confirmed in the quantified study (of interviews and replies to questionnaire).

When asked to say how they would like to see the N.H.S. improved and to suggest ways of providing better care for their patients, the spontaneous suggestions were in three groups—conditions of service, factors involving medical care in general, and actions by patients. (Table II).

It appears that following the new arrangements over remuneration general practitioners are now more satisfied with their *pay* than in 1964 and 1962.

Overwork is a major problem in general practice and this is reflected by suggestions for 'more doctors' and 'fewer patients' alongside creating barriers to reducing patient demands through 'token fees' for services and 'prescription charges'.

Proposals for improving the *quality of care* are following realistic trends with 'more use of ancillaries', more hospital facilities, working from health centres and better co-ordination and administration of N.H.S., as the leading suggestions.

However, it is disturbing to note that 22 per cent of the questioned had 'no comments' or 'no ideas' on improving the care for their patients.

Abuse by patients

Altogether 82 per cent (369 out of 454 questioned) of general practitioners considered that 'patients tend to abuse the N.H.S.'.

Of these 16 per cent considered that abuse happened 'very often', 29 per cent 'fairly often' and 37 per cent 'not very often' (and 18 per cent 'not at all').

TABLE II
DOCTORS' SUGGESTIONS FOR IMPROVEMENTS IN NATIONAL HEALTH SERVICE AND
BETTER CARE OF PATIENTS

	<i>Improvements in N.H.S.</i>			<i>Better care for patients</i>
	<i>1967 Percentage</i>	<i>1964 Percentage</i>	<i>1962 Percentage</i>	<i>1967 Percentage</i>
<i>Conditions of service:</i>				
Reduce numbers of patients and retain same level of remuneration ..	15	14	13	9
More doctors	14	5	—	5
More pay for doctors ..	6	16	11	6
<i>Care:</i>				
Insufficient hospital facilities	17	13	—	7
Bureaucracy—'too much red tape'	14	7	17	4
Work from health centres	9	5	—	8
Better co-ordination of services	12	8	16	8
More use of ancillaries ..	8	10	—	29
<i>Patients:</i>				
Token fees by patients ..	17	9	8	3
More 'education of patients'	10	12	12	7
Prescription charges ..	8	—	—	1
<i>No comments or no ideas</i> ..	6	8	12	22
Base numbers ..	454	245	264	454

Footnote:

Questions asked:

In what ways if any would you like to see the N.H.S. improved?

Do you think there is anything that specifically needs to be done to help doctors in their care of patients?

Young doctors (under 45) were more critical in this respect than those over 45 years—the proportion recording abuse being 86 per cent and 78 per cent respectively.

This suggests that those whose professional lives have been spent entirely within the N.H.S. are less tolerant than their elders with some experience of pre-N.H.S. general practice or alternatively that age brings a wide appreciation of psychosomatic illness.

The nature of the abuses complained of are recorded in table III.

TABLE III
ABUSES OF THE NATIONAL HEALTH SERVICE MENTIONED BY DOCTORS

<i>Nature of abuse</i>	<i>Percentage</i>
Calling at surgery too often for trivialities	53
Unnecessary request for home visits	24
Prescriptions for trivia	18
'Malingering'—trying to get put off work when not unfit..	16
Late requests for home visits	10
Over-demand for drugs	7
Others	1
Don't know	5
Base numbers	369

Footnote:

Question asked:

What would you say are the main abuses? (asked if doctor answered "yes", in your experience do patients tend to abuse the N.H.S.?)

The responses in table III can be separated into two groups—there are those that relate to the inherent nature of general practice, namely, complaints about trivia and unnecessary requests for home visits and those concerned with relations between the doctor and his patients, such as 'malingering', late requests for visits and over-demands.

With regard to the first group the reason for the feeling of abuse must arise from a lack of appreciation by the doctor at the receiving end of the patients' dilemma in seeking advice at this first level of medical care. Since general practice is characteristically a field where common and less serious (trivia?) conditions predominate, the general practitioner must accept that a large part of his work will be concerned with these.

What appears as a triviality to the doctor may not necessarily be

considered as such by the patient. There is need for better education of prospective general practitioners to understand their situation and for better public education to appreciate the doctors' point of view.

The other group of 'abuses' relating to difficulties in management of patients reflect the doctors' dilemma in modern medical care. The question arises as to who is in command of the situation, the doctor or the patient? Is the doctor in the N.H.S. not in a good position to deal with 'malingering' 'late requests for home visits' and 'over-demand for drugs'? It is significant that the young doctors (under 45) had more difficulties (20 per cent complained of malingering) than their older colleagues (12 per cent complained of malingering).

These and other dilemmas were prominent in the group discussions. There was uncertainty over the role of the modern general practitioner. One view was that what the public were seeking was for 'a shoulder to lean on', for someone who would advise on social and economic problems, discuss marital problems and difficulties with children and in-laws and offer guidance even on how to raise a loan.

This group accepted social aspects of disease as important and believed that much ill-health was of a psychosomatic nature. Their only regret was that the pressures of work meant that they could not provide time to deal more adequately with such problems. They also complained of a lack of training and experience to cope with the issues raised.

To other doctors the whole social concept was a major source of irritation. They were more concerned with technical advances and saw themselves as an arm of the hospital service available to deal with specific physical ailments. Their interests lay in some particular disease field or more generally in the whole spectrum of physical disease. Time spent on dealing with emotional and social problems was regarded as time wasted and detracted from dealing with more serious (physical) illnesses. They thought that such 'non-medical' problems should be the province of psychiatrists or social workers.

A major problem arises from the diversity of these opinions. If some general practitioners feel themselves mis-used through being asked by their patients for advice on these sort of problems then a major crisis exists for they account for between ten and 20 per cent of their work in general practice. Again the blame for such a situation must be laid at the doors of our medical schools in failing to prepare students and young doctors to meet the needs of general practice.

Remedies for abuses

What weapons or ideas did the doctors questioned have for dealing with their stated abuses? The chief suggestion was to impose financial barriers or penalties in order to protect the doctor: put forward by 49 per cent of those questioned.

Education of patients was put forward by 22 per cent. This hopeful endeavour was not supported by any confirmatory experience but was by way of a suggestion that someone (the Ministry?) should inform the patient as to what his conduct ought to be in relation to the use of medical services. No details were put forward as to the nature of this educational process. Ten per cent felt that it really was up to the doctor to control the so-called abuses and to 'educate' his patients, and 18 per cent were uncertain what to do (table IV).

TABLE IV
SUGGESTIONS MADE BY DOCTORS FOR METHODS OF REMEDYING ABUSES

<i>Remedies</i>	<i>Percentage</i>
Token charges for doctor's services	32
Educate patients	22
Prescription charges	17
Solution is up to the doctor	10
Don't know	18
Base number	369

Footnote:

Question asked:

What if anything do you think can be done about them?

Discussion

This study of a sizeable and random sample of general practitioners raises certain fundamental and disturbing facts in relation to the future development of general practice and highlights the need for leadership from within the profession.

It is disturbing that only half of those questioned were satisfied with their work under the N.H.S., and ominous that this proportion of satisfied doctors has decreased appreciably during the past five years.

Attempts to define the causes of this dissatisfaction demonstrate a confusion of ideas on the roles and nature of general practice and its needs for the future. Together with confusion goes a lack of realism and understanding of the current situation of medical care.

There seems to be, amongst general practitioners, a lack of appreciation that there is a relative shortage of medical resources and a definite unattractiveness of work in general practice for the young doctor. It is unrealistic to expect there to be more doctors and fewer patients in general practice for the next ten years at least. It is unrealistic to expect politicians to impose financial barriers or penalties for patients seeking medical care, when the public really is well-satisfied with the N.H.S. system.

More reassuring is the evidence that increasing proportions of general practitioners (although these do not yet constitute a majority) are beginning to consider improvement such as working with ancillaries, and from health centres, and the needs for better co-ordination of N.H.S., and closer liaison with hospitals.

This is a crisis situation crying out for leadership from within the profession. There is a need for a medical messiah to lead general practitioners from their wilderness to a future where their skills can be given fuller opportunities. The Royal College of General Practitioners with its traditions based on education and research and academic emphasis is in a position to exercise such a role.

For success, however, careful attention must be paid to the current mood within general practice and the need for careful planning. Such planning must include attention to the future roles and functions of the general practitioner, to the ways in which his skills might be used better and the ways in which changes of present and traditional techniques might be altered and ways in which the set goals might be evaluated continually.

Summary

A report is presented of a survey carried out in 1967 of a random sample of 454 general practitioners in England and Wales (53 per cent response rate) whose views were sought on the problems, faults and remedies of their work in the N.H.S.

Only 55 per cent expressed approval of the way in which the N.H.S. was working. This figure compares with 79 per cent in 1962.

Suggested improvements included the following recommendations—more doctors (suggested by 14 per cent of those questioned), fewer patients (15 per cent), fees for service and other charges (25 per cent), education of patients (10 per cent), more use of ancillaries (29 per cent), work from health centres (9 per cent), better hospital facilities (17 per cent) and improved efficiency of N.H.S. (26 per cent).

Eighty-two per cent of doctors considered that their patients abused the N.H.S.—the rates were higher in younger doctors. The nature of the abuses were attending for trivia (53 per cent), unneces-

sary home visits (24 per cent), malingering (16 per cent) and over-demands for drugs (7 per cent).

Remedies for abuses suggested included financial barriers (49 per cent) and education of patients (22 per cent). Ten per cent considered that it was up to the doctor to deal with the situation and 18 per cent had no idea what to do.

It is considered that a crisis situation exists requiring professional leadership such as the Royal College of General Practitioners is capable of giving.

Acknowledgements

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1. Introduction

In May 1944 the Coalition Government in looking to post-war policy in Britain issued a White Paper stating that "the Government accepts as one of its primary aims and responsibilities the maintenance of a high and stable level of employment after the war." Such a statement reflected not only an emotional desire to build a better land following a World War and to avoid the social hardships of the twenties and thirties, but also the recognition by economists that the growth of national income and a general rise in the standard of living was dependant on the maximum utilisation of available resources.

In spite of the ravages of inflation, successive governments have adhered to this principle and maintained a very high overall employment rate. However, employment amongst the disabled has not been so satisfactory. In April 1967 97.8 per cent of people throughout the country seeking work were able to find it. This compared with 91.1 per cent of the people on the Ministry of Labour Disabled Persons Register.

There is no doubt that there is great sympathy for the disabled. However, the fact that they have fared less well than the rest of the community from a full employment policy probably also reflects a feeling that they should be regarded as incapacitated and given pensions and other benefits rather than exhorted to find employment. In economic terms it is suggested that the community must support them because of their disability but that they have little in the way of economic gain to contribute to the country as a whole.

Such a view has never been validated. Little time or effort has been expended on trying to assess the costs of rehabilitation and the economic benefits accruing from such retraining. While many studies have demonstrated the psychological and sociological gains of rehabilitation its economic implications have been virtually ignored.

2. Potential Employees

There are approximately one million people of working age in the United Kingdom who are disabled. At least 100,000 of these are unemployed and it is likely that many more have found work only after great difficulty.

These calculations are perforce tentative and approximate. There are no accurate figures available to indicate the number of people suffering from disability. Moreover, the definition of disability is itself by no means easy. Should it for example include a long-term bronchitic or someone suffering from severe coronary heart disease? These sorts of problems also reflect on any attempt to discover what proportion of the disabled wanting work are in fact employed. The employment rate needs also to take into account whether or not work is a feasible proposition in the light of a particular disability. Theoretically almost everyone disabled could do some work, but this may not necessarily be an economically productive activity. As a result of all this I have been compelled to fall back on rather arbitrary official definitions and make only tentative conclusions. My calculation is based on a number of sources, these are : -

a) The Ministry of Labour Disabled Persons Register

This is a voluntary register. The requirements for joining are that the persons should be substantially handicapped in obtaining employment

but willing to be employed and having a reasonable prospect of obtaining and keeping employment. This would suggest that there is not the same hard core of unemployables as there is in the general employment field, but with adequate placing all persons should be capable of making a contribution to society through employment. There were in April 1967, 655,400 disabled persons on the Register, and about 580,000 of them were of working age. About 280,000 out of the total are ex-servicemen, mostly from the Second World War. The proportion of women to the total is very low. Fourteen per cent of the Register are females as compared with thirty-six per cent in the whole working population. The Register is split into those persons who are considered capable of competing in the open employment market and those who are considered capable of working only in sheltered conditions. The assessment as to which group a person belongs to is made by the Ministry of Labour's resettlement officers, one of whom works at each Labour Exchange. Some feel that the responsibility should not rest so obviously with one individual. The Ministry does not split the total Register between these two groups, but only gives a split in the unemployment statistics.

b) The Local Authorities Register

This again is a voluntary register and reflects the number of persons who benefit from local authority services. The Register is heavily weighted by blind and deaf persons, but mentally ill persons are under-represented since the services they receive from local authorities do not necessitate registration. There were 336,000 persons on the Register in 1966. 153,000 of these were of working age and the number of females to males was approximately equal.

c) Recipients of War Pensions

The number of war pensioners has been declining since 1947. It then stood at over 1 million; it was down to 435,000 in 1966. Approximately 275,000 of these are under 65, but of this number practically all will be over 40. About 212,000 of 275,000 under 65 will be on the Ministry of Labour Register, plus about 67,000 war pensioners over 65.

d) Recipients of Industrial Disablement Pensions

In 1966 there were 198,000 industrial disablement pensions in payment 153,000 of these go to people under retirement age.

e) Supplementary Benefits

Supplementary benefits are in payment to 144,000 persons who are sick or disabled and are living at home and are not receiving any other insurance benefits. Most of them are of working age and most are incapacitated from birth or early childhood and are living with their parents.

3. The Economics of Rehabilitating an Individual

A calculation of the economic costs involved and the benefits accruing from the rehabilitation of an individual involves collating a number of types of data. When an individual becomes disabled a number of direct costs are involved in caring for him both in hospital and at home during his illness, in providing additional care for the rest of his life, and for providing certain aids such as invalid chairs. Other direct costs possibly involved will be sickness benefit for an industrial disablement pension together with various supplementary allowances. However, account

must also be taken of the indirect costs involved, that is the economic loss to the community if he is not retrained and is unable to work for the rest of his life.

It may be helpful to look at a particular example - an unmarried man aged 44 who has one leg amputated as the hip. We will assume that he is industrially injured and that the amputation results from an accident taking place at his work.

Table I Costs and Benefits of Amputation and Retraining 44-year old Man (assuming he is unmarried, industrially insured, and accident occurs at work)

A - The direct costs of amputation and Rehabilitation in First Year

	£	s.	d.
32 days in ortheopaedic hospital	174.	0.	0.
32 days in rehabilitation hospital	83.	0.	0.
Health visits at home	7.	0.	0.
Visits by GP	5.	0.	0.
Out-patients visits to orthopaedic hospital	52.	0.	0.
	<hr/>		
	321.	0.	0.
+ Re-training	260.	0.	0.
	<hr/>		
	581.	0.	0.
	=====		

B - Indirect Costs and Benefits per year resulting from Rehabilitation

	1. Direct Medical Cost re- lating to Disability	2. Social Security Payments	3. Earnings	4. Direct & Indirect Tax	Government Credit 4 - (1+2)	Man Credit (2+3) - 4
	£	£	£	£	£	£
Man Reha- bilitated	69	312	1000	358	- 23	954
Man Not Working	69	629	0	96	-602	533
Difference = Net Benefit	(0)	(-317)	(1000)	(262)	+579	+421

As can be seen from these calculations this results in medical costs amounting to £ 320 during the year of his accident. Assuming his life expectation does not change, and he does not die until he is 72, further direct costs of about £69 a year will be involved, or £1,860 over the period. If he is not rehabilitated and is unable to work again, he will receive total benefits of £ 11. 5s.Od. a week, which over the twenty-year period during which he would have been working will cost another £ 11,700. Thus the total direct cost to the community over the period of one individual losing his leg in an accident at work amounts to some £ 14,000.

However, let us assume for the moment that he were to be retrained at a cost of £260, and that as a result of this he is able to earn a normal average industrial wage of £ 1,000 p.a. If he works to 65 he will earn £ 20,000. This will reflect not only in an improvement in his own standard of living, of £ 420, p.a. to say nothing of his emotional feelings of independence, but also in a positive saving on Government expenditure of £ 580 p.a. All the calculations are made on current price levels.

4. Industrial Rehabilitation Service

The Ministry of Labour has now 20 Industrial Rehabilitation Units providing some 2,100 workshop places which are usually occupied to about 85 per cent capacity (1). There is no set syllabus for courses which are arranged to meet individual need and which usually last about seven or eight weeks; the maximum is twenty-six weeks. Since the first Unit opened at Egham in December 1943 some 200,000 have been admitted. In 1966 about 82 per cent who entered IRUs completed their courses satisfactorily. The level of employment following training is less satisfactory and the position has been deteriorating. In 1965 the percentage being satisfactorily settled in employment after training was 70 per cent, in 1966 it was down to 65 per cent. There are also variations according to the disability group. For example, resettlement is higher for those with eye and ear defects (71 per cent) and lower for those with organic nervous diseases (52 per cent). (Table 2)

Letters of enquiry about progress which are sent after about six months to people completing courses also show that only just over half have been satisfactorily settled (Table 3)

Some difficulty is experienced in calculating the cost of retraining because the Ministry of Labour does not audit the cost of rehabilitation units for the disabled separately from their other general retraining units. However, we estimate the cost to be in the region of £260 per person.

5. National Estimates

What are the overall national costs of disability? I have already indicated that any calculation must be tentative. However, it is possible to make some broad estimates which are related solely to persons of working age. Sickness benefits, supplementary allowances, war pensions, industrial injury and disability payments amount to £270 million p.a. Approximately another £10 million goes for appliances, and £30 million for identifiable health and welfare expenses through local authorities. In addition there will be NHS costs for the General Practitioner and pharmaceutical services and for hospital services costs. These could well reach £70 million p.a. Thus direct costs of disability of people of working age amounts to about £400 million each year.

The nearest one can get to estimating loss of production through unemployment amongst disabled, is by an examination of the Ministry of Labour Disabled Persons Register and data on those unemployed on this Register. A limitation of this List is that it does not represent all the disabled has already been indicated. In addition the following calculations are restricted to men, since it is extremely difficult to assess whether women will continue to seek work over a long period. Again, many of the men listed as currently unemployed would in any event work for short periods in the future. My calculations are therefore based on changes in the permanency of their employment and the size of their salary, as a result of retraining, and they are confined to these persons on the register that are known to be unemployed. This total may only amount to about half of the actual number of disabled men seeking employment in the U.K.

The accompanying table shows the economic benefits of retraining those disabled persons at present on the Ministry of Labour, who are considered to be capable of open employment and are at present unemployed.

As is indicated it is probable that even if as a result of retraining only some sixty per cent (this is the current percentage of workers gaining further employment after retraining) gain permanent employment, the present value of profit resulting from the retraining would, over the lifetime of the people involved, reach £130 million. This profit could be repeated over subsequent years as a different group of disabled becomes unemployed each year. The possible profit will

Table 2 Participants in Retraining During 1966

Disability Group	Number of Entrants during Calendar year 1966	Number of Entrants in each group as a percentage of all entrants	Number of Entrants who completed the course	Resettlement position within three months of completion of course		
				Percentage of column 4 accepted for Employment	Training	Total
No obvious disability	433	3.7	342	46.2	21.1	67.3
Amputations	286	2.4	252	41.3	24.6	65.9
Arthritis and rheumatism	281	2.4	240	43.3	20.0	63.3
Diseases of :						
Digestive system	374	3.2	302	41.1	25.8	66.9
Heart & circulatory system	963	8.2	831	45.5	18.4	63.9
Respiratory system (other than TB)	703	5.9	574	47.2	15.0	
Eye and ear defects	398	3.4	348	51.4	19.6	71.0
Injuries of head & trunk injuries						
diseases and deformities of :						
Lower Limb	965	8.2	832	43.8	25.0	68.9
Upper Limb	613	5.2	514	44.5	25.1	69.6
Spine (incl. paraplegia)	1,260	10.7	1,050	39.0	24.2	63.2
Psychoneurosis	1,598	13.5	1,254	54.8	16.3	71.1
Psychosis	947	8.0	748	51.7	8.7	60.4
Mental subnormality	285	2.4	247	56.3	1.6	57.9
Epilepsy	533	4.5	464	46.8	11.6	58.4
Other organic nervous diseases	796	6.7	719	45.3	7.0	52.3
Respiratory TB	285	2.4	234	45.7	22.7	68.4
TB - other forms	64	.5	52	44.3	19.2	63.5
Other diseases	579	4.9	483	48.7	21.1	69.8
Left before medically examined	163	1.4	-	-	-	-
All disability groups	11,807	100.0	9,710	46.8	17.9	64.7

Table 3 Success Rate of Training 1965/66

IRU entrants in half year ended	December 1965	June 1966
Effective replies received	3,398	3,679
	%	%
Regarded as satisfactorily resettled	57.6	54.9
In employment, but not to their satisfaction	6.9	6.3
Not in employment but some work since leaving the IRU	12.8	16.1
Not in employment and no work since leaving	22.7	22.7

diminish each year as the stock of disabled persons in need of retraining dwindles. It may be seen therefore that it is possible to calculate substantial economic gains resulting from the retraining and employment of individuals whom the Government themselves calculate to be not so impaired as to be able to take further work.

Table 4 The Economic Rewards of Rehabilitation

Age	Number of disabled unemployed	(1) Cost of Retraining	(2) Increased Value of Earnings	(3) Reduction in Social Security Benefits	(4) Increase in tax	"Profit" to Men £ million 2 = (3+4)	"Profit" to Government £ million (3+4) = 1
15-24	2,688	0.7	7.6	7.6	2.8	2.1	4.8
25-39	9,003	2.3	34.4	15.5	12.5	6.4	25.7
40-49	12,603	3.3	50.5	23.3	17.4	9.8	37.4
50-54	6,841	1.8	21.4	8.6	7.7	5.1	14.5
55-64	17,811	4.6	30.1	12.1	10.8	7.2	18.3
		12.7	144.1	62.2	51.8	30.6	100.7
		=====	=====	=====	=====	=====	=====

However, no overall assessment can be categorically made on the basis of these figures. It is possible that if disabled persons are offered jobs in open employment they may cut down on the productivity of their colleagues. Equally they may utilise capital resources inefficiently. Thus an examination of the accounts of Remploy, the largest employer of severely-disabled persons (employing about 6,800 mostly severely disabled persons) shows that their operational loss was £ 2,800,000 in 1966-67 from sales of just under £ 7,800,000 (2). It could be argued in straight financial terms that with a wages bill of £ 3,400,000 it would almost have paid to close down the factories and still give the employees an amount of money per year equal to their wages. What of course is not clear from these results is whether the failure is inherent for organisations of this sort, whether it is a result of the type of individuals employed, or whether it is due to specific difficulties peculiar to this company.

However, similar results were commented on on the report of a working party on workshops for the blind (3). Whilst suggesting causes of inefficiency in such organisations this report showed that in 1962 the net cost of providing employment was actually greater than the amount the blind received in pay.

Townsend also suggests that the work given to the disabled is very unattractive in status, pay and conditions (4).

"The disabled tend to be given light assembly work, packing, filling, cleaning and storekeeping. Some are in so-called designated employment, as car park attendants and lift attendants. The average wage of the men in the sample in full-time employment in 1965 was £14 compared with £19 at that time in London and the South East.

"A disproportionately large number of those in employment were in unskilled and semi-skilled jobs. Some who had accepted paid work at home, making up rosettes or flower-holders and packing toys by the gross, for example, had to work extremely long hours for very little money. In all the instances we came across

the average earned was less than three shillings an hour. The local authorities play little role as protective or referral agents for the disabled and most homework is contracted privately.

Disabled persons tend to be thought of as low cost labour, and this may explain why disabled women, who are prepared to accept lower wages than men, find it easier to gain employment than disabled men. Around 13 per cent of disabled women on the Ministry of Labour Register are found employment each month compared with only 8 per cent for men.

Perhaps these contrasts reflect variations between those severely disabled and only capable of sheltered employment and those capable of competing in the open market. But what is not clear is whether or not their respective incomes reflect their true economic worth.

6. Conclusion

It is evident that at present there is insufficient data available to provide categorical answers to many questions concerning the economic value of rehabilitation. However, the tentative calculations made in this paper lead to the belief that there may be very real gains to the national economy resulting from rehabilitation. Lord Beveridge in his book "Full Employment in a Free Society" said that "Failure to use our productive powers is the source of an interminable succession of evils" (5). We owe it both to the disabled and the community at large to spend a good deal more time and effort in establishing an accurate cost-benefit analysis of the economics of rehabilitating the disabled.

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APPENDIX B

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