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Centre for Agricultural Strategy

University of Reading

Grassland Research Institute

Grassland in the British economy

Edited by J L Jollans

Published as
CAS Paper 10 January 1981

Jollans, J L (Ed) (1981) *Grassland in the British Economy.*
CAS Paper 10. Reading: Centre for Agricultural Strategy.

9 The influence of nutrition on the future demand for grassland products

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INTRODUCTION

The main grassland products under discussion are milk, other dairy products, beef, mutton and lamb. Any influence that nutritional knowledge has on the demand for these products depends upon the prevailing nutritional opinion among experts, and the extent to which that opinion has influenced and is likely to influence the food buying habits of the public. Expert nutritional opinion has developed during the last half century with increasing understanding, both scientific and social, of the complex nature of the problem of how best people can be satisfactorily nourished. It was my job for nearly 30 years, first as head of Nutrition Branch at the Ministry of Agriculture, Fisheries and Food and later as Director-General of the British Nutrition Foundation, to try to interpret current nutritional knowledge, either in terms of government policy or as information for the public. From this standpoint I am attempting to trace the growth of nutritional opinion in Britain from the late 1930s onwards and to suggest why the public is now confused in its nutritional understanding.

DEVELOPMENT OF NUTRITIONAL OPINION

When war broke out in 1939, sufficient knowledge was available to put into operation a food policy which, in its essence, ensured that all people got sufficient food energy, that the mixture of foods available provided adequate amounts of nutrients and that foods were distributed so that those most vulnerable to nutritional damage got what they needed. There is general

agreement (eg, American Journal of Public Health, 1947; ARC/MRC, 1974) that the policy succeeded. I have discussed elsewhere (Hollingsworth, 1977; 1979a) why it was successful and have concluded that among the reasons for success were: throughout the war adequate, but not excessive, supplies of food energy were available; the mixture of foods available was nutritionally well balanced; food supplies were distributed more or less according to physiological requirements; people could afford to buy the food rations to which they were entitled; there was not too much choice of foods; the message to be delivered to the public was relatively simple and there was a concerted national effort to deliver that message. Success led to the belief that, because wartime nutritional problems could be overcome in spite of food shortage, the unknown problems of peace and plenty could be solved without any particular research effort.

Food supplies remained fairly restricted after the war and rationing was not finally removed until 1954. As soon as supplies allowed, consumption of sugar and fats started to increase and, by the middle 1950s, nutrition authorities were concerned about reductions in the intake of protein and calcium (associated with increases in the consumption of the so-called 'empty calorie' foods, sugar and fats). For example, the Report of the Interdepartmental Committee on Milk Composition in the United Kingdom (1960) states (para 21) 'that consumption of sugar and fats continues to increase and that, until about 1956/57, there was a gradual decline in intakes of protein and calcium. This decline now appears to be stopping: if it were prolonged, health would eventually suffer'.

At about the same time, concern was expressed about the kind of fat that people were eating in increasing amounts. For example, the Annual Report of the National Food Survey Committee for 1956 (MAFF, 1958) contains an Appendix D on *Sources of Fat in the Household Diet.* The covering text gives an indication of the state of contemporary knowledge:

> 'When arrangements were made for the analysis of the National Food Survey records for 1956 it was thought that the total quantity of fat consumed and also the proportions of this obtained from animal and vegetable sources might be of nutritional importance . . . It was at first intended to present the results in terms of total fat consumption from animal and vegetable sources respectively by the several household groups. Since these plans were made subsequent research has suggested that, with the types of fats eaten in Great Britain, totals of this kind might not provide very meaningful information. It now seems likely that the actual fatty acids constituting the fats eaten by various groups of the population may be of greater interest and importance'.

At the same time I wrote (Hollingsworth, 1957):

> 'Changes in the consumption of fats have been very striking and in total

have been markedly upward, except for temporary set-backs in both wars, with the result that the consumption of visible fats per head in 1954 was probably more than twice that in 1909–1913 and may have been about four times that in 1880. The total contributions to the diet of fat from dairy produce, meats and fish have not varied much during the twentieth century: the great dietary changes are the result of the introduction of margarine towards the end of the nineteenth century . . . and the introduction after the First World War of the method of manufacturing both margarine and cooking fats from hardened oils'.

During and since the 1950s there was considerable, and often acrimonious, controversy about the nutritional role of fats. Keys (1953), one of the first to enter the international debate, attempted to correlate death rates from ischaemic heart disease with the total fat in the diet and asked

'whether the current nutritional and dietetic teaching in this country (USA) is as completely on the right track as some may suppose. Complete indifference to the amount of the fat in the diet is the attitude currently expressed by both technical and popular books and articles on diet'.

He showed that the amount of fat in American food supplies had increased from 32% of total food energy in 1910 to 40% in 1950 and that nearly half of the supply in 1950 came from fats and oils (excluding butter). He suggested that any attempt to reduce the total fat intake should start with cooking fat and oils. Sinclair (1956), in a memorable letter to the Lancet, postulated that deficiency of essential fatty acids was common in modern prosperous communities and contributed to the production of degenerative disease, especially of the arterial wall. In the words of a well-known textbook (Davidson & Passmore, 1966): 'This view received much publicity, but little experimental support'. At the same time Yudkin (1955; 1957) started questioning the fat theory, suggesting that other factors, such as lack of exercise, could be important. He showed that death rates from ischaemic heart disease in different countries correlated better with the consumption of sugar than with the consumption of fat in total, or of any particular sort of fat; he also showed a closer relationship over time in the United Kingdom with signs of prosperity, such as the number of radio and television licences, than with the consumption of any particular food.

This public expression of differing views was associated with a gradual change in opinion on the nutritional value of fats. For example, the 1955 edition of *Manual of Nutrition* (MAFF, 1955) states that the food value of all common fats is roughly equal. By the time the 1959 edition was published the statement was:

'It is now recognised that certain fatty acids cannot be synthesised by the body and appear to be required for normal health. Because they cannot be synthesised they are called the *essential fatty acids.* In the past, linoleic,

linolenic and arachidonic acids have been called essential fatty acids, though it seems that arachidonic acid can be made in the body from linoleic acid'.

The statement was made again in the 1961 edition, made more precise in the 1970 edition and even more so in the 1976 edition, which included a discussion on the ratio of polyunsaturated to saturated fatty acids and gave the recommendation that 1–2% of the energy intake should come from essential fatty acids. Yudkin pursued strongly his doubts about the danger of high fat consumption and pressed his growing conviction that eating too much sugar is harmful to health. He has demonstrated the close relationship between fat and sugar consumption (Yudkin, 1964) and, more recently, advised in a general book on nutrition that a reduction in sugar consumption is sensible and at least as likely as any other dietary change to reduce the risk of heart attacks, besides having other benefits (Yudkin, 1977).

However, the fat controversy continues. Throughout, there have been doubts about hardened fats, hinted at by myself (Hollingsworth, 1957) and then more strongly by Enig, Munn & Keeney (1978). McMichael (1979) has expressed fears about the safety of polyunsaturated fatty acids and hardened fats.

Taylor (1980), reviewing recent evidence on diet and coronary disease, has pointed out that, while the linoleic acid, arachidonic acid series of fatty acids and the linolenic acid series have similar lowering effects on plasma cholesterol concentrations, they have different effects on blood clotting and thus on thrombosis, which is probably the cause of the increase, over the last 30 years, in mortality from coronary heart disease. The linolenic acid series, of which fish oils are rich sources, may help to prevent blood clotting. Taylor has concluded in view of this evidence 'There can be no justification for recommending the widespread substitution of ω-6(ie, linoleic)rich polyunsaturated margarines for ordinary margarine and butter'.

In the 1970s concern began to be expressed about the lack of dietary fibre, or roughage, in the food supplies of affluent communities. This subject was discussed throughout the last decade and much of the argument has been recorded by Burkitt and Trowell (1975). Doubts have been expressed, for example, by Sharman (1975).

Gradually it became clear that, as a nation or a class becomes more affluent, its dietary pattern changes. As people become richer they tend to increase their intakes of food energy compared with their energy expenditure – and so run the risk of obesity: they tend to increase the proportion of their food energy derived from fat, at the expense of that from carbohydrate, and, within the carbohydrate group, to displace starch by sugar. Little change occurs in the percentage of total energy derived from protein, though animal protein tends to displace vegetable protein. These changes are likely to be

associated with a reduction in the amount of dietary fibre in the food supply. These facts were analysed by Périssé, Sizaret & François (1969), and were given a nutritional interpretation in the Joint FAO/WHO report on energy and protein requirements (FAO/WHO, 1973). This report cast doubts on the nutritional desirability of the trends towards the affluent pattern, saying

> '. . . we may rightly wonder – in face of the growing incidence of nutrition-related disorders (obesity, diabetes, cardiovascular diseases) – whether they are not, in the long run, harmful trends. It is, in any case, certainly not necessary to take the diet of the developed countries as a model of a satisfactory state of nutrition'.

DIET AND CORONARY HEART DISEASE

At the centre of the fat controversy and indeed also as part of the concern about sugar consumption, lay, and continues to lie, the international anxiety about the increasing number of relatively young people, mainly men, who die of sudden heart attacks. Nutritional scientists in Britain were not easily convinced that it would be worthwhile to consider whether national nutritional measures could help to stem this epidemic. In other countries (Hollingsworth, 1979a) earlier steps, starting in 1968 in Scandinavia, were taken to promote what were thought to be healthier diets. Serious national consideration started in Britain in the early 1970s and led to the report of the Advisory Panel on Diet in relation to Cardiovascular and Cerebrovascular Disease of the Committee on Medical Aspects of Food Policy (DHSS, 1974). Two years later a Joint Working Party of the Royal College of Physicians of London and the British Cardiac Society (1976) issued a report about the prevention of coronary heart disease (CHD).

The dietary advice given in the two reports is similar. The majority of members of the DHSS Advisory Panel and all the members of the Joint Working Party recommended a reduction in the amount of saturated fatty acids in the diet. The Advisory Panel agreed unanimously (para 12.4)

> 'that they cannot recommend an increase in the intake of polyunsaturated fatty acids in the diet as a measure intended to reduce the risk of the development of ischaemic heart disease' because they did not find convincing 'the available evidence that such a dietary alteration would reduce that risk in the United Kingdom at the present time'.

The Joint Working Party recommended (para 4.9.1) partial substitution of saturated fatty acids by polyunsaturated fatty acids on the grounds that

> 'a reduction in saturated fat sufficient to produce a significant fall in plasma cholesterol level is likely to be unacceptable unless there is a measure of substitution by polyunsaturated fats' because we 'have become accustomed to a diet rich in fat'.

Both Committees recommended an avoidance of, or reduction of, obesity and both mentioned fats and sugar. The Joint Working Party mentioned alcohol in this connexion. Both mentioned salt in relation to high blood pressure, a risk factor for ischaemic heart disease, and both indicated that it might be beneficial for some individuals to reduce their salt consumption, if this was high. Thus, the advice in these two reports differs in one relatively minor aspect, whether there is likely to be any benefit, in regard to coronary heart disease, from increasing the consumption of polyunsaturated fatty acids (ie, most soft margarines and vegetable oils) at the expense of saturated fatty acids (ie, butter fat, hard margarines and cooking fats and most meat fat). There is no disagreement that small quantities of polyunsaturated fatty acids are essential for health, though there are fears about excessive consumption (McMichael, 1979). The point at issue is whether or not some increase in present consumption would be generally beneficial and particularly beneficial for middle-aged men. The Joint Working Party stated (para 4.8.3) that

> 'The focus for lowering plasma cholesterol levels and controlling hyperlipidaemia should be in the middle years (30 to 50 years) where the risk of CHD is most enhanced by raised lipid levels. We recommend that no attention should be paid to plasma lipid levels in healthy subjects over 60 years of age'.

I take this to mean that no effort should be made to change plasma lipid levels by dietary or other means in people over the age of 60.

The report of the DHSS Advisory Panel carries, as an appendix, a note of reservation by Yudkin which sets out some of the reasons for his 'belief that the Report has exaggerated the possible role of dietary fat in causing ischaemic heart disease, and has minimised the possible role of dietary sucrose'. Thus, the differences of emphasis continue, though there is general agreement that sucrose has many nutritional disadvantages.

Recently, in a two-year study, a panel of the American Society for Clinical Nutrition has assessed the quality of all published scientific evidence on dietary fat, cholesterol, carbohydrate, alcohol, excess food energy and salt in relation to coronary heart disease and has published its evidence and conclusions (Ahrens *et al.* 1979). Ahrens (1979) has published a summary of the panel report and has concluded that the matter of dietary fats and coronary heart disease is still unfinished business and that important practical questions should be settled before the public can be 'assured that a low-fat diet will lead to a reduced risk of coronary heart disease'.

DIET AND CANCER

The effect of diet on the incidence of cancer is a subject of increasing

concern. Different dietary factors appear to be partly responsible for cancer of the gastrointestinal tract (mouth, oesophagus, stomach, colon and rectum), of the liver and possibly the urinary bladder. There may also be an indirect association between the plane and type of nutrition and cancers of the breast and endometrium. Overnutrition, particularly of fat, may predispose to breast cancer by changes in the balance of hormones, such as oestrogens. Cancer of the large intestine appears to be related to the affluent type of diet, particularly high fat consumption. A likely hypothesis is that dietary fat increases the production of bile acids, degradation products of which may favour carcinogenesis. Dietary fibre may be protective, but the evidence on this is not yet clear. Other items in the diet may be involved in the causation of cancers of other parts of the body but do not enter into consideration of grassland products. Hill (1978), points out that diet plays a varied role in cancer and that, while most of the dietary-related cancers are diseases of affluence and associated with overnutrition, the same diet

> 'is associated with low infant mortality and appears to be protective against the more severe effects of virus infections'. He warns that 'we should not be hasty in modifying our diet and should first ensure that the benefits that accrue from our current diet are not lost in the change' (p 245).

Enig *et al.* (1978) suggested that the role of processed vegetable fat should be carefully investigated in relation to carcinogenesis.

PRESENT NUTRITIONAL OPINION

I have tried to trace the major fluctuations in nutritional opinion during the last quarter of a century. In addition, to the gradual developments outlined, there is a growing awareness of the need to provide adequate nourishment for the very young and considerable agreement on the benefits of breastfeeding. The Health Departments (1978) have expressed the consensus of opinion about healthy eating. In an attempt to delineate what we know and believe about diet, it was concluded (Hollingsworth, 1979b; p 65) that

> 'Many people would benefit by increasing their consumption of starch, and including with that starch more cereal fibre (ie, more wholegrains) and decreasing their consumption of sugar, alcohol and saturated fats, whether or not they compensate partly for this by increasing their consumption of polyunsaturated fatty acids. There could also be benefit from increased consumption of vegetables and fruits and decreased consumption of salt . . . For everyone it would be better to avoid obesity by increasing exercise rather than reducing energy intake'.

Passmore *et al.* (1979), in prescribing for a better British diet, made

specific dietary recommendations to: decrease the total consumption of fats and oils, sugar and meat, each by 15%, and of alcohol by 25%, and to increase consumption of potatoes, other vegetables and fruit, each by 15%, and of grain products by 20% and to make no change for dairy products (other than butter), fish, eggs, pulses and nuts. On meat, it is specifically stated (p 529) that

> 'present consumption by most sections of the community may be considered as a luxury that is becoming increasingly difficult to justify in terms of the world's resources, especially of food and animal feedingstuffs. Although total meat at present provides a quarter of the saturated fatty acid content of the British diet, it is a rich source of many minerals, especially iron, and of B vitamins'.

No change is recommended in consumption or composition of milk (including the fat) in the recommended 15% reduction in fat consumption. This is in line with the views expressed 20 years ago by the Interdepartmental Committee on Milk Composition (1960) which considered evidence on the question whether the kinds of fat present in cows' milk may, more than other fats, lead to changes

> 'which are thought to predispose to atheroma and thrombosis', accepted that 'a great deal of research is urgently needed to clarify the relationship between atheroma and/or coronary thrombosis and lipids of different kinds' (para 19) and concluded (para 23) that 'no reduction seems to be called for in the fat content of milk; indeed it may never be. Were it necessary to reduce the total amount of milk fat consumed, butter would be the obvious foodstuff to be considered first. The fat of milk has a definite indirect nutritional importance, because people prefer to drink whole milk rather than the skim milk, great though the nutritional value of the latter may be. We are aware of the increased consumption of fat-reduced and separated or skim milk in some parts of the world, but do not discern any similar movement in this country. The maintenance of milk fat at about its present level does, therefore, serve to ensure that milk, as well as being nutritious, remains an esteemed article of diet'.

APPLICATION OF NUTRITIONAL KNOWLEDGE

There is an inevitable lapse of time between the establishment of nutritional facts and their application. Even when facts are established, people often ignore them (Brown, McKenzie & Yudkin, 1963). The advice given by both experts and the popular media, about fats, has been controversial and often contradictory during the last quarter of a century, an almost inevitable consequence of the conflicts I have summarised. The consensus opinion which is now developing, on the need to reduce the consumption of

saturated fatty acids, is only just beginning to get through – for example a most enlightened lesson on fats was given on 16 January 1980 on the BBC TV programme on home economics for schools and colleges, which taught relevant physiology and nutrition as well as how to cook satisfactorily and tastily, using lower fat recipes.

This opinion is not, however, yet reflected directly in the national statistics for fat consumption. Until a relatively simple and agreed message on the complex subject of fat metabolism and the composition of fats can be put out widely, the public is likely to remain confused and to distrust nutritional experts.

The picture for sugar is less complicated and there is evidence that consumption of sugar has fallen since the late 1950s and may fall further.

RECENT TRENDS IN CONSUMPTION OF GRASSLAND PRODUCTS

This paper is attempting to relate nutritional knowledge and the consumption of milk, cheese, butter, beef and lamb. The total annual supplies per person of these foods and also, for comparison, of eggs, margarine and sugar are shown in Table 1. Between 1955 and 1978, the most obvious trend was the steady decline in the supply of mutton and lamb (from 11 kg to 7 kg per head per annum) accompanied by almost no change for beef and an increase of 8% in the total supply of meat. The total supply of milk solids hardly changed,

Table 1

Total supplies of grassland products and other foods moving into consumption (kg per head per year)

	1955	1965	1975	1976	1977	1978
Liquid milk	147.6	145.7	146.3	144.3	139.2	137.1
Cheese	4.1	4.6	6.3	6.1	5.5	5.8
Total milk solids	23.9	25.1	26.7	25.5	24.7	24.4
Beef	21.2	20.1	23.6	21.1	21.1	22.0
Mutton and lamb	11.1	10.4	8.3	7.6	7.0	7.0
Total meat (edible weight)	53.4	58.6	57.0	55.1	56.2	57.9
Butter	6.7	8.8	8.4	8.3	7.8	7.5
Margarine	8.0	4.4	4.3	5.4	5.4	5.9
Total fats (fat content)	21.8	22.4	21.8	22.4	22.4	22.4
Sugar	47.9	47.5	40.6	40.8	40.5	40.6
Eggs (number)	229	271	246	248	248	251

Sources: MAFF (1968); MAFF (1979).

but those of liquid milk fell by 7% while cheese supplies rose by 29%. The total supply of visible fats rose by 3%, while supplies of butter and margarine fluctuated roughly inversely. The decline in sugar supplies occurred mainly during the 1960s. Egg supplies reached a peak in 1970, since when the pattern of supply has been mainly downward and has paralleled that for bacon and ham, suggesting, along with other evidence, that breakfasts of bacon and eggs have become unusual. The total supply of fats was estimated to be 139 g per head per day in 1955 and 130 g in 1978, the 6% reduction being due to a reduction in the fat content of the type of meat eaten, not to any conscious change by the population in the amount of visible fats or other fat-containing food eaten. The proportion of the total food energy supply derived from fat was 40% in 1955 and in 1978, having hardly changed in the intervening years.

In response to current interest in saturated and polyunsaturated fatty acid, the MAFF, both for its estimates of total food supplies and in relation to the results of the National Food Survey, has published calculations of the amounts of saturated, mono-unsaturated and polyunsaturated fatty acids available. Both series indicate that, since 1972, 45–48% of the total fat came from saturated fatty acids, 36–40% from mono-unsaturated fatty acids and 9–11% from polyunsaturated fatty acids with no consistent trends. Thus, as yet, recent advice to substitute some polyunsaturated fatty acids for the saturated variety has not been taken.

DISCUSSION OF SPECIFIC FOODS

Dairy products and meat

The report from the Select Committee on Agriculture (House of Commons, 1969) included a memorandum by MAFF on 'Trends in food demand and consumption'. The points made then, about dairy products and meat, appear to be relevant today. The conclusion for milk and milk products was that there

> 'appears to be little shift in the underlying demand, and future demand can be expected to increase more or less in line with growth in population'

– this does not appear to have been happening for liquid milk since 1975, but may have been for total milk solids. On beef, mutton and lamb the Select Committee said:

> The most important single factor governing household demand is the level of beef supplies. But assessment of the relationship between the prices of beef and other meats has been complicated by the tendency for retail prices of different meats to be kept in line as far as possible. The extent to which variation in supplies of beef can be accommodated, without wide variations in retail price, depends on how readily the

alternative meats are available. The underlying demand for beef has so far been very stable and increases in consumption, in line with population increase, could be expected at constant prices. The underlying demand for mutton and lamb, however, suggests that a declining level of consumption could be expected unless the relative price of lamb falls'.

Since then, the trend for beef has been relatively steady and slightly upwards while that for mutton and lamb has been, as shown in Table 1, markedly downwards.

The results of the National Food Survey have recently been analysed by the age of the housewife (MAFF, 1980). Table 2 shows the weekly consumption per person of foods, analysed over a range of housewife ages from under 25 years to 75 years and older. The consumption per head of the foods shown rises generally with the age of the housewife until the older ages, no doubt partly because younger families contain younger children who eat (and need) less food than older children and adults, but the gradient for

Table 2

Household consumption of grassland products and other foods according to the age of the housewife (per person per week)

	Unit	Age of housewife						
		Under 25 years	25–34 years	35–44 years	45–54 years	55–64 years	65–74 years	75 years and over
Liquid milk	litre	2.43	2.46	2.45	2.60	2.65	2.65	2.70
Total milk and cream	litre	2.74	2.69	2.63	2.81	2.89	2.92	2.86
Cheese	g	92	95	94	122	127	113	112
Beef and veal	g	174	192	215	286	290	272	253
Mutton and lamb	g	63	71	92	123	172	202	189
Total meat and meat products	g	931	924	1 034	1 286	1 354	1 252	1 125
Butter	g	93	101	116	153	168	166	160
Margarine	g	82	83	98	107	128	124	100
Total fats	g	258	264	297	352	397	386	340
Sugar and preserves	g	294	307	377	431	525	536	569
Eggs	no.	3.43	3.45	3.69	4.48	4.75	4.46	4.34

Source: MAFF (1980).

mutton and lamb stands out distinctly from that for the other foods with the older groups consuming about three times that of the youngest. This suggests that mutton and lamb is markedly less popular with the young than with the old and that, if this preference holds as the individuals concerned grow older, consumption of mutton and lamb will continue to fall. None of the nutritional opinion discussed above can possibly be involved in this development.

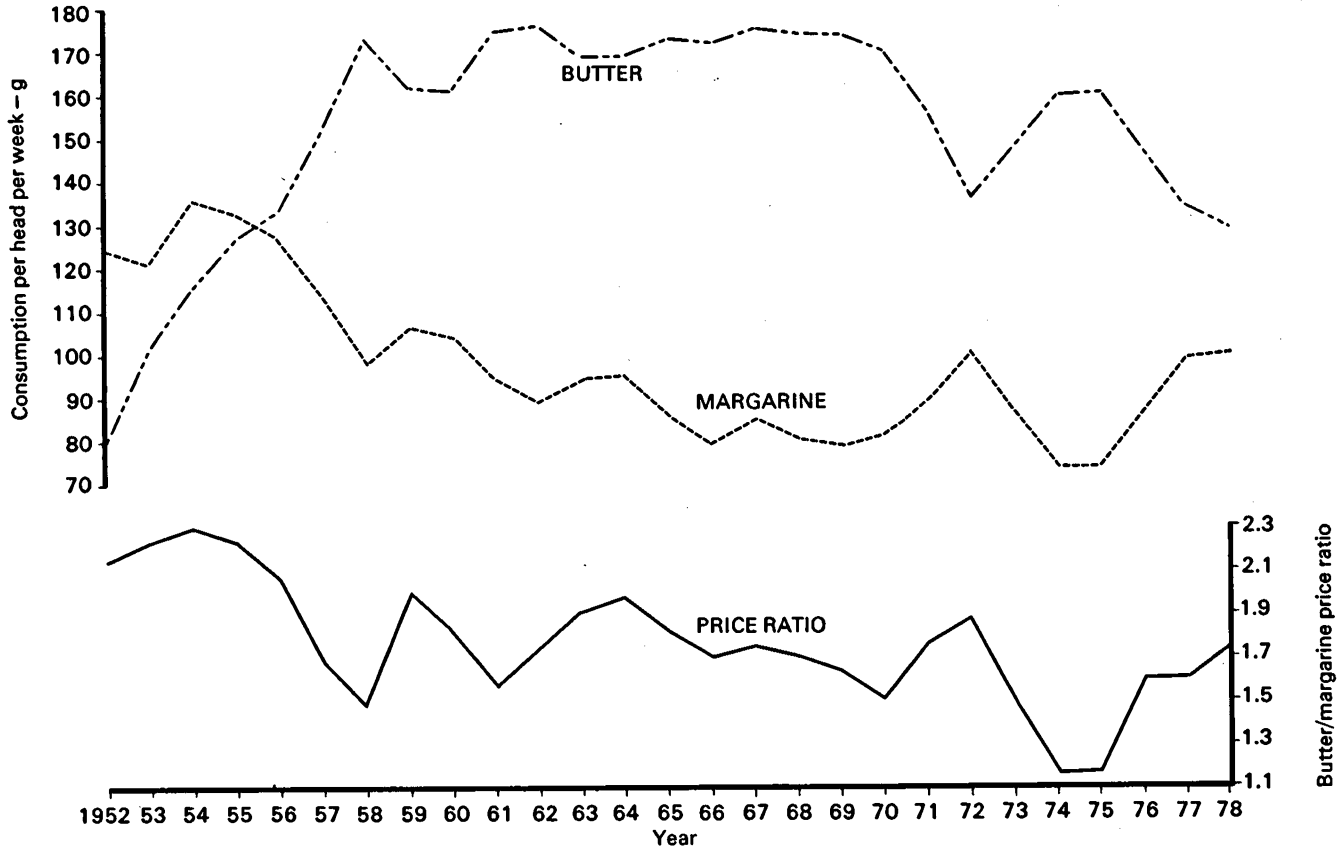
Butter and margarine

These two foods are rivals, both for cooking and as spreads, and are usually implicated in popular dietetic advice about the avoidance of coronary heart disease. However, the relative prices of the two foods have an important influence on consumption (Figure 1).

As rationing was coming to an end in 1953, consumption of both butter and margarine increased. At that time the price of butter was more than twice that of margarine. Rationing of these two foods ended on 8 May 1954 and, since then, consumption patterns for the total National Food Survey sample have been inversely related, though with consumption of butter always greater than that of margarine. The influence of the prices of the two foods can be clearly seen. As the ratio of the prices of butter and margarine approached unity in 1958, 1961, 1966–1970, 1974, 1975 butter consumption rose or remained relatively high, while that of margarine fell or remained low. As butter became relatively expensive and its price approached twice that of margarine, in 1959, 1963, 1964, 1972, 1976–1978, butter consumption fell while that of margarine rose. The nutritional interest, which led to the first special study about the sources of fat in the household diet in 1956 (MAFF, 1958), has no apparent effect on the consumption of either food. It is possible that the specific advice (para 4.9.1), of the Joint Working Party of the Royal College of Physicians of London and the British Cardiac Society (1976), not only to reduce total fat consumption but to 'Use butter sparingly; preferably use a soft margarine high in polyunsaturated fats' may have influenced the downward trend for butter after 1975 and the corresponding upward trend for margarine. It remains to be seen whether future price ratios will have a greater influence.

An indication that advice to switch to soft margarines may be taking effect comes from unpublished results of the National Food Survey to which I have been given access and permission to use. Since 1972, soft margarines have been separately identified in the Survey and this group of spreading fats is mentioned in the Annual Reports of the NFS Committee for 1975 (MAFF, 1977, para 33), for 1977 (MAFF, 1978, para 12) and for 1978 (MAFF, 1980, para 13). The last two reports make the point that most of the recent decrease

Figure 1
Household consumption of butter and margarine: and price ratios



in butter consumption was offset by increased purchases of soft margarine. Average purchases of soft and other margarines and butter for the years 1972 to 1978 have been tabulated for all groups of households classified in the Survey. The separate data for the two kinds of margarine have not all been published and I am indebted to the Ministry of Agriculture, Fisheries and Food for access to them. These data show that the trends for the consumption of soft margarines were upward for the total sample of households and for all income groups, geographical regions, family types and other identified groups from 1975 onwards while the consumption trends for other margarines and butter fluctuated but were mainly downward. Experimental demand analyses, based on these results, indicate an apparent underlying upward trend after 1975 in demand for soft margarine after removal of price and income effects.

A further clue provided by the National Food Survey is that, until 1974, consumption of butter was always greater in Income Group A1 (the richest 3% of the population) than in Income Group C (which contains some 40% of the earning families in Great Britain). In 1975, consumption in the two Groups was equal but, since then, consumption has fallen much more steeply in Group A1 than in Group C so that, in 1978, Group A1 consumed 15% less than Group C. In that year Income Group C compensated for reduced butter consumption by taking more margarine but Group A1 did not (MAFF, 1980). Group A1 is often considered the trend setter, so that reduced butter consumption, unaccompanied by a switch to margarine, may be a pointer to the future. The much steeper gradient for butter than for margarine, with increasing age of the housewife (Table 2) suggests that, while fears about the saturated fatty acids in butter may be getting through to the young, these people are not compensating by taking more margarine.

Sugar

Although sugar is not one of the grassland products under consideration it is of nutritional significance, and nutritional advice to reduce sugar consumption, both to help to prevent obesity and dental caries, and for other reasons, has been fairly united. This advice may be having an impact. Not only has total sugar consumption fallen somewhat (Table 1), but families with young housewives buy only about half as much sugar and preserves as do families where the housewife is old and perhaps unwilling to change old dietary practices which the young may not be learning (Table 2).

CONCLUSIONS

The data which have been discussed suggest:

(i) That nutritional considerations have not in the past influenced demand

for meat and, in spite of recent nutritional advice that meat consumption need not be as great as it now is, people are not likely to moderate meat consumption for this reason.

(ii) Demand for mutton and lamb, particularly in young families, appears to be slackening, but not for nutritional reasons.

(iii) Total average consumption of fat has fallen slightly in recent years, mainly because the type of meat now eaten contains less fat than did the meat of former years.

(iv) Nutritional advice is to maintain the present consumption of milk and cheese.

(v) Demand for butter and margarine seems to be mainly determined by the relative prices of the two foods, though the recent marked fall in butter consumption, coupled with reduced margarine consumption by the richest group of the population, may be a hint that other groups will, in the future, follow this fashion of moderating their intakes of spreading fats. The much smaller butter and slightly smaller margarine consumption in younger, than in older families, supports this hypothesis.

Since 1975 the trend in the demand for soft margarine appears to have been upward.

(vi) The trend and gradient for sugar may be the strongest response to recent nutritional advice though any future reduction in sugar consumption does not seem likely to affect the use of grassland – unless grass can be grown anywhere in place of sugar beet, a development which could be of nutritional benefit.

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