

Future trends in milk consumption and composition

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It is always dangerous to predict how markets could change in the future and what the possible response by the dairy industry to such trends might be. There are, nevertheless, a number of current trends that might, if they continue in their present direction, bring about important changes both in the production and manufacturing sides of the dairy industry. These scenarios are, of course, subject to considerable influence by political forces which, for social or national considerations, may wish to stop or alter the direction of the trends brought about by market forces.

Total milk production in the UK and also throughout the EEC has risen substantially over the last 20 years or so. Current figures for production indicate that there will be an increase of about 6% for 1982-3 over the 1981-2 volumes. The volume of milk sold off-farm in the UK between 1959 and 1982 is shown in Fig. 1.

These increases in production are almost entirely due to increases in yield per cow, as the effects of improvements in feeding (brought about by the better understanding of nutrient requirements), greater feeding-stuff availability and breeding programmes aimed at improving stock become widely established. Cow numbers in the EEC have remained very constant between 1975 ($24\ 801 \times 10^3$) and

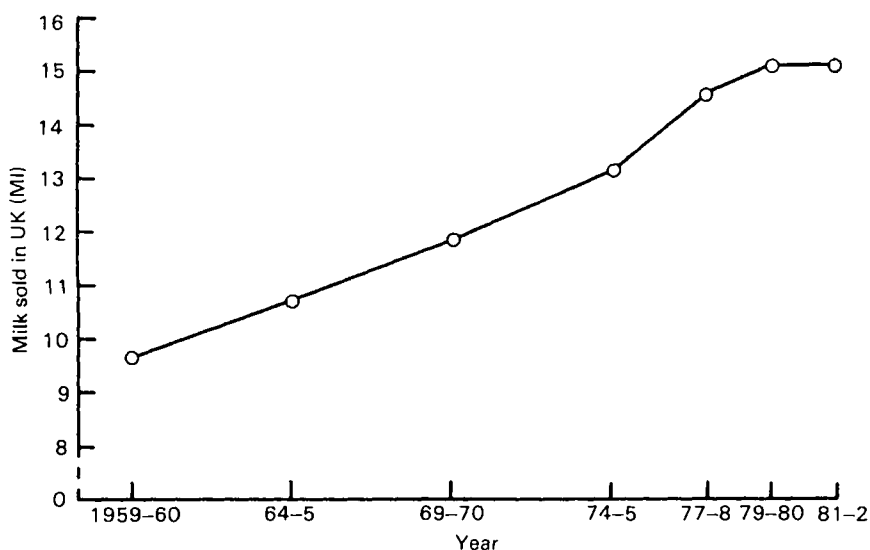


Fig. 1. Total sales of milk off-farm in the UK from 1959-60 to 1981-2.

1981 ($24\,586 \times 10^3$) whilst the average annual milk yield per cow has increased from 3559 l in 1970 to 4042 l in 1981. The over-all increases in average milk yields since 1975 were 13.6% in the EEC and 15.1% in the UK. The yield potential and rate of increase in yield varies between countries and some examples can be seen in Fig. 2.

The figures on production, together with the implication of the potential for increased production particularly in those countries where current yields are relatively low, indicate the underlying problems: in 1981, self-sufficiency factors for the EEC countries minus the UK were 125% for butter and butter oil, 114% for cheese, 205% for condensed milk, 443% for whole and semi-skimmed milk powders and 129% for skimmed and buttermilk powders. The upward trend in self-sufficiency continues and stockpiles are regulated with subsidized sales and gifts of dairy products to the rest of the world. If the present trend in the UK continues, an additional 3000 MI milk per annum could be produced by 1988, a 30% increase over the 1977 figures. This expensive policy cannot be pursued indefinitely and already there is serious discussion as to more effective means of regulating production by dairy farmers, either by reducing intervention prices or by some form of quota system. Any discussion on future trends on consumption and composition must, therefore, take into account the problem of over-production in the EEC and likely over-production in the future for the UK and any possible measures that may be taken to alleviate it.

In the UK the dairy industry has, over the last 10 years, undergone considerable expansion. This occurred because a bigger market for dairy products became available to UK manufacturers for two reasons: first, as a member of the EEC, we were no longer able to obtain low-cost dairy products from the Commonwealth

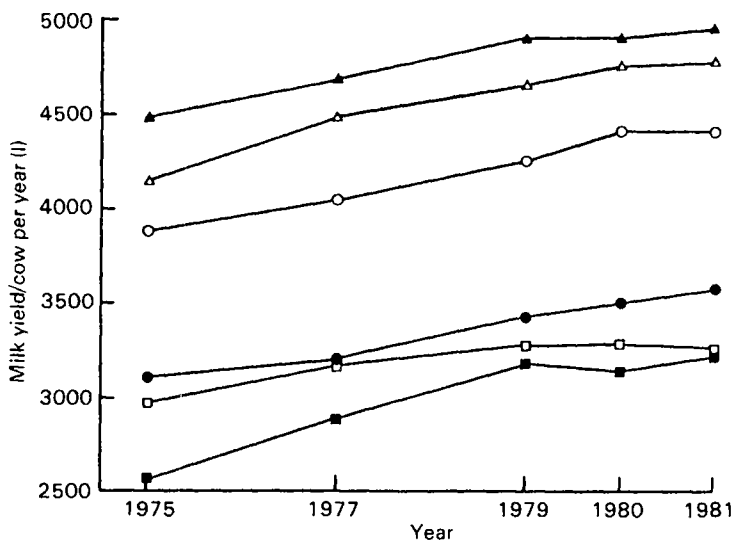


Fig. 2. Milk yield per cow from a number of countries in the EEC from 1975 to 1981. (○) West Germany, (●) France, (△) UK, (▲) The Netherlands, (□) Italy, (■) Irish Republic.

and other world producers and second, more milk was being produced by our dairy farmers for the reasons mentioned above.

Nearly all of the increased milk production in the last decade has gone into manufactured products. A maximum level of liquid milk consumption occurred in 1974-5 and had fallen by about 10% in 1981-2 to a volume similar to that of 1959-60, whilst between 1959-60 and 1981-2 the volume used for manufacturing had increased more than threefold (Fig. 3).

The move towards UK self-sufficiency in the major products of cheese and butter can be seen in Fig. 4: by 1982 these had probably risen to about 75% for

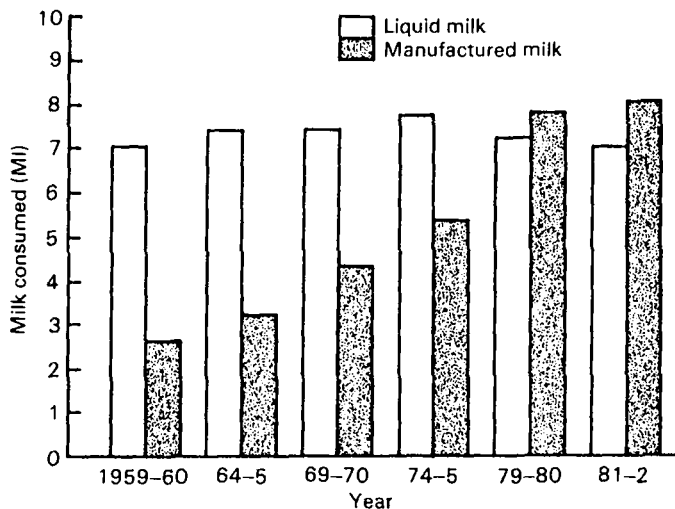


Fig. 3. Milk used in the UK for liquid consumption and manufacturing from 1959-60 to 1981-2.

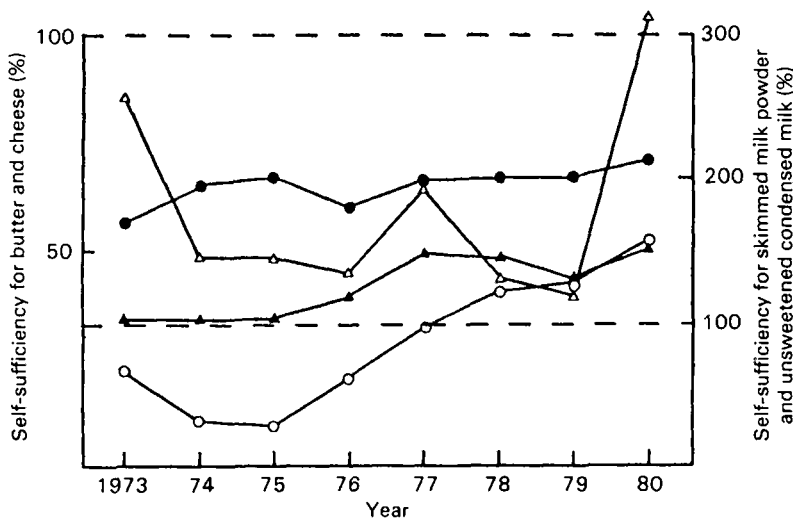


Fig. 4. Self-sufficiency in the UK for (○) butter, (●) cheese, (△) skimmed milk powder and (▲) unsweetened condensed milk from 1973 to 1980. Dashed lines indicate the 100% self-sufficiency for the two sets of products.

cheese and about 60% for butter. Other dairy products, e.g. skimmed milk powder, sweetened and unsweetened condensed milks, are produced in amounts greater than UK requirements and, in 1980, were respectively 313%, 113% and 149% of domestic requirements.

The changes in volume of manufactured products have also been viewed in relation to trends in the domestic market where the consumption per head of dairy products has shown marked changes over the last decade or so. In 1970, 137 l of whole milk were consumed per head in the UK whereas in 1981 this figure had fallen to 129.5 l. Similarly, butter consumption fell from 8.8 kg/head in 1970 to 6.0 kg/head in 1980. However, cheese consumption rose from 5.4 kg/head in 1970 to 8.0 kg/head in 1980. The trends in butter, yoghurt and cream consumption are shown in Fig. 5.

These changes are by no means unique to the UK. In France, for example, whole milk consumption fell during the same period from 72 to 39 l/head and in West Germany from 76 to 51 l/head and butter and cheese consumption followed similar trends.

Although consumption of whole milk has fallen throughout Europe and North America, there has been an increase in the consumption of semi-skimmed, skimmed and buttermilk which in many countries may form a significant amount of total milk sales, e.g. in USA, Denmark, Italy and The Netherlands they form 33% or more. In the UK the percentage is very much lower. However, recent surveys show that twice as many housewives bought low fat/skimmed milk in 1982 as in 1980 and it is likely that sales will also show a steady increase in the UK.

More dramatic has been the fall in butter consumption in the UK which in 1970 and 1975 comprised about 68% of the yellow fats market, whereas by 1980 its

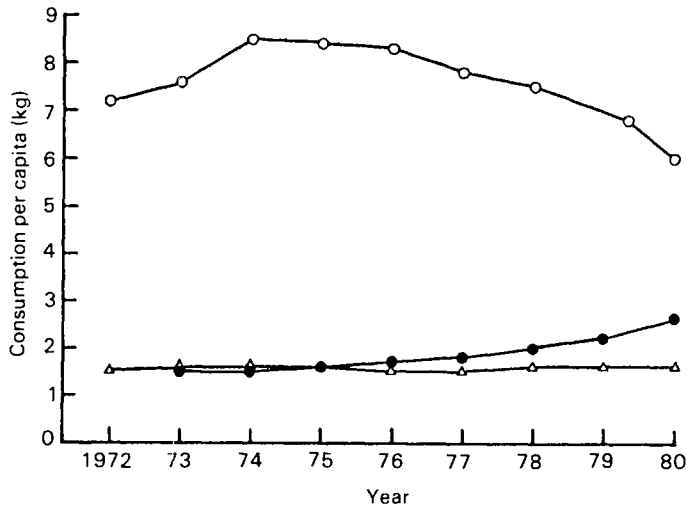


Fig. 5. Consumption per capita in the UK of (○) butter, (●) yoghurt and (△) cream (400 g fat/kg) from 1972 to 1980.

share was 51%. Similar trends and predictions are reported for other countries. Some reasons given for these changes in the yellow fats market, which over the years has been a fairly static market in volume terms are (a) high prices of butter compared with margarine, (b) product innovation in margarine and spreads, (c) inadequate promotional spending for butter and (d) consumer attitudes that butter can be dangerous for your health. Of the reasons quoted, probably the most important in its effect on sales is the price differential between butter and margarine. In 1981, for example, the average price of margarine was 46 to 47% that of butter and the trends suggest that this difference could get wider.

Cheese, as mentioned earlier, is one of the few major dairy products that is showing some increase in sales, although changes in the UK are small compared with those occurring elsewhere. The trends in cheese consumption are shown in Fig. 6 for some of the EEC countries and the USA.

The consumption of cheese per capita is low in the UK compared with most of the countries in the western world and the increase in consumption is also very low compared with many of its EEC partners. Whereas the French consumed an additional 5 kg/head in 1981 compared with 1970 and the West Germans an additional 4 kg, the UK managed an additional 0.6 kg only. Whether the recent increase in promotional activity through advertising, presentation and in the development of new UK cheese types will have any major impact on sales and consumption remains to be seen. It must, however, be borne in mind that for the mass market the most important factor is price and cheese must be competitive with other dietary protein sources, especially animal-derived protein products.

Total consumption of cream has remained constant over the last 5 years or so (see Fig. 5). Promotional activity causes occasional increases but the annual consumption does not differ greatly. There are some trends in types of cream being

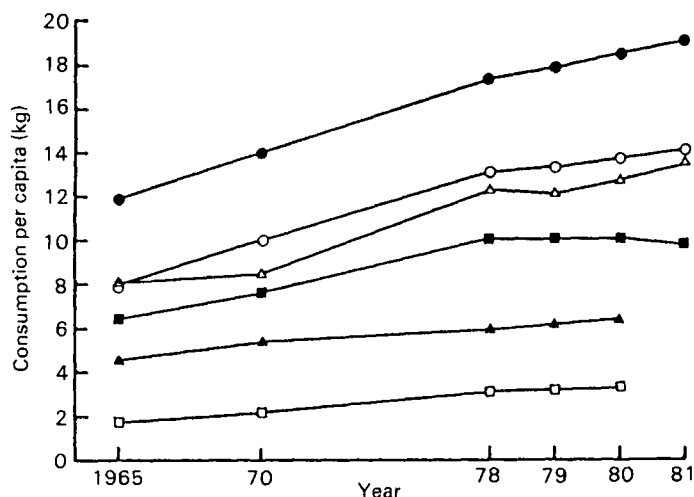


Fig. 6. Consumption of cheese per capita between 1965 and 1981 for (○) West Germany, (●) France, (△) The Netherlands, (▲) UK, (□) Irish Republic and (■) USA.

purchased; the sales of long-life products and whipping creams appear to be increasing slightly but at the expense of other types.

A product that has shown increased sales and consumption over the last decade has been yoghurt in its various forms (see Fig. 5); from a consumption of 1.5 l/head in 1973 to 2.6 l/head in 1980, giving a 73% increase in 7 years. The development of a greater range of fermented products for the UK market could stimulate increased consumption of these dairy products. This market may well be helped by the 'health' image such products have for the consumer.

Another indication of the general trend in the use of milk and milk products is provided by the over-all consumption of milk solids. In 1972, 25.6 kg of milk solids (excluding butter) were consumed per capita; this figure rose to 26.4 kg by the mid-1970s. However, since then there has been a slow decline to the last reported figure of 23.6 kg in 1980. The 1982 figure is likely to be even lower, probably close to a 15% reduction from the peak figure in 1975.

The situation in the UK, if the present trend continues, is that we could be self-sufficient in milk and dairy products by 1984. Indeed, in several commodities such as skimmed milk powder and unsweetened condensed milk, we already produce a considerable surplus which, in the case of milk powder, would be even greater if the UK completely satisfied its own butter requirements.

An interesting approach which might improve the economics of milk production and utilization was suggested a few years ago by the Centre for Agricultural Strategy (1978) in their report *Strategy for the UK Dairy Industry*. The essence of the suggestion was to produce milk containing a balance of milk solids closer to the market requirement. This would involve production of milk of higher fat content by, for example, Channel Island breeds, so that the butter market requirement could be obtained by removing fat for butter manufacture and leaving a liquid milk of a standard fat content. This thesis is demonstrated in Table 1, in which example A gives the situation with the national herd at the time the report was prepared, B the requirement for self-sufficiency by expanding the national herd, and C the situation if a breed of cow producing high-fat milk were used. The position has changed since this proposition was first suggested in that, because of greater yields per cow, almost 2000 Ml more milk is now produced by the national herd than is given in example A. Nevertheless, the over-all concept remains the same. The Centre also calculated the dietary energy needed for each of the three examples. These calculations are shown in Table 2 and it can be seen that the economics of producing milk solids through example C appear very favourable. However, the likelihood of such changes occurring are probably remote as the cost of inducing a shift in breed sufficient to have a significant impact would be very high. Nevertheless, the principle of making more effective use of milk solids is important and the linking of production to user requirement must be good for the industry over-all.

Considerable attention is being given to the problem of making more use of milk solids, in particular to making better use of skimmed milk and skimmed milk powder rather than using it as animal feed. Much has been done in finding

Table 1. *Methods of producing milk solids to meet requirements in the UK (Centre for Agricultural Strategy, 1978)*

	Example		
	A	B	C
Market supplied (tonne $\times 10^3$)			
Fat	520	916	916
Protein	393	403	403
Lactose	469	469	469
Quantity of milk (MI)	13 684	24 105	13 879
Milk composition (g/l)			
Fat	38.0	38.0	66.0
Protein	32.6	32.6	37.0
Lactose	46.5	46.5	46.5
Weight produced (tonne $\times 10^3$)			
Fat	520	916	916
Protein	446	786	514
Lactose	636	1121	645

A, UK national herd in July 1978.

B, expanding the UK national herd.

C, replacing part of the national herd with a breed producing high-fat milk.

Table 2. *Energy costs of producing milk solids to meet requirements in the UK (Centre for Agricultural Strategy, 1978)*

	Example		
	A	B	C
Number of cows (cows $\times 10^3$)	3357	5914	3965
Yield of milk per cow (l/year)	4076	4076	3500
Average live weight (kg)	573	573	370
ME requirements per cow (MJ/year)			
Maintenance	22 062	22 062	15 319
Milk	20 751	20 751	24 759
Total	42 813	42 813	40 078
Over-all ME requirements (TJ/year)			
Maintenance	74 062	130 475	60 740
Milk	69 661	122 721	98 169
Total	143 723	253 196	158 909
Total ME as % of A	100	176	111

ME, metabolizable energy. Milk retained on the farm and ME requirements for herd replacements are excluded.

A, UK national herd in July 1978.

B, expanding the UK national herd.

C, replacing part of the national herd with a breed producing high-fat milk.

additional uses for cheese whey which in the past was often wasted. Whey protein products are now readily available commercially and a dried product, containing 750 g whey protein/kg, is finding increasing uses in the food industry. Some work has also been done on fractionating butter fat, but the high cost of the butter and butter oil means that the cost of any derived fractions is high and this greatly reduces the market potential.

On the basis of the preceding discussion, some likely future trends in consumption and composition of dairy products in the UK can be predicted. These are:

1. Continuing reduction in liquid milk consumption, but with an increasing proportion of low-fat and long-life milks consumed.
2. Decline in butter consumption to about 33% of the yellow fats market.
3. The decline in butter consumption may be partly offset by increased use of butterfats in spreads of lower fat content and in mixtures with cheaper vegetable fats.
4. Some increase in cheese consumption, in part due to the introduction of new UK varieties but also in improvements in consistency of quality.
5. Increase in consumption of fermented products, particularly with the introduction of new products, both curd-based and liquid-based.
6. Increase in consumption of milk solids in a variety of non-dairy foods, as new methods are developed for isolating and modifying milk constituents.

Dairy products accounted for 16.8% of the average household expenditure on food in the UK in 1981 which indicates their relative importance in the diet. Meat, for comparison, accounted for 14%. However, the proportion spent on dairy products has shown a steady decline over the years in part due, no doubt, to the greater variety of foods available and in particular the increase of so-called convenience foods in our modern society. Dairy products can only maintain their present level of contribution to the diet if a high and consistent quality is maintained, a greater variety of products made available and, above all, the price is kept competitive. It is this latter point that will be the overriding factor and is dependent upon the production of milk by the dairy farmer at a price that will enable dairy products to be competitive and maintain their share of the market. This means that any desirable compositional changes in milk required for manufacturing purposes are more likely to be implemented at the factory rather than at the farm level where input costs must be minimized. For example, fat levels can be adjusted by separation and fat composition changed by blending with other fats to achieve desirable properties. Compositional changes can be achieved by membrane concentration or by the addition or subtraction of constituents. Mineral balance can be changed by the addition of components, e.g. calcium, citrate, phosphate, etc.

Production of milk is a relatively efficient means of converting plant energy and plant protein into an animal product. In countries of North-western Europe with a highly advanced system of production, a conversion factor of 19.7 J (4.7 cal) for

each joule of milk and 4.7 g protein for each gram of milk protein has been calculated (Simantov, 1982). The corresponding values for beef are 41.8 J (10 cal) and 8.0 g protein and for eggs 23.0 J (5.5 cal) and 4.0 g protein.

On the basis of the economics of animal production, it is likely that milk will maintain its over-all contribution to the diet and in this it will be helped by the observation that as incomes grow, so the share of animal products in the diet will increase: in the case of milk not so much in the traditional dairy products but in a wider variety of foods.

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