

we have in mind not only the production of the maximum yield of high-grade oil, but also of protein products suitable for human use, instead of the usual type of fish meal suitable only for use in animal feeding-stuffs.

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### **The Fat Required for Good Cooking and to make Food Palatable**

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As practical cooks we are concerned mainly with serving good food, i.e. food that is nourishing, well flavoured and pleasing to the eye. We maintain that the present weekly fat ration of 3 oz. butter, 4 oz. margarine and 1 oz. cooking fat for one person is inadequate for the presentation of food in an appetizing and attractive manner, if all meals have to be provided at home. Weekly reversal of the butter and margarine allowances does not ease the cook's problem, for there is a tendency to enjoy the extra butter for table use, leaving even less fat for cooking purposes.

The larger the number to be catered for, the easier it is to spread out the fat ration in order to spare a reasonable amount for cooking, and it cannot be too strongly stated that the position of the one- or two-person household, particularly where age, infirmity or expense prevent occasional dining-out, is not enviable. When such households do much cooking there is almost no fat left for table use.

It is true that in many families children, adolescents and adults have at least one meal away from home 5 days in the week in school, canteens, restaurants or hotels. Even so, the extra amount of fat consumed in this way does not bring the present allowance of 8 oz. weekly up to the pre-war suggested amount (Hutchison & Mottram, 1936; Macdonald, 1938; Plimmer, 1941) of 3-4 oz. fat daily (made up of visible and invisible fat), even with the invisible fat obtained from the present ration of meat, bacon, eggs, and the visible fat from suet, oily fish, nuts, peanut butter, oils and soya flour. Most housewives will now make use of the trimmings of fat from the meat ration, fat from bacon, fat from sausages, and skimmings from bone stock, but it takes an expert cook to turn these small amounts to good use. Suet is difficult to get, and olive oil and almond oil, occasionally seen in the shops, are exorbitant in price.

Those concerned with large-scale catering generally maintain that ordinary non-priority canteens in category C also find the fat ration inadequate, but that for industrial canteens in categories A and B the fat allowance is sufficient for the preparation of varied, nourishing and attractive meals. Where a fish fryer is installed matters are much easier. The extra ration of cooking fat then allowed makes it possible for a great variety of dishes to be presented. Not only is the food value of the dishes increased because of the small amounts of fat absorbed from the cooking medium, but the food has a

psychological and aesthetic value which should have a good effect on the digestion and result in a sense of satisfaction and contentment in the consumer.

It is generally agreed that the rationing of the last 9 years has caused large numbers of housewives who did their own cooking before rationing began to take a much more intelligent interest in the culinary art. Others, owing to force of circumstances, have had to learn. In fact, the need for a working knowledge of cookery was never so great as now, with limited rations and lack of variety in foodstuffs; it is only the understanding of menu building, time to plan menus, and sound skill in cooking which make the present diet tolerable. Unfortunately, under present conditions very few people, certainly not those with large families, have much time to give to catering and cooking. Because of this, frying, one of the quicker and most acceptable methods, is largely used. Frying gives flavour to the many made-up dishes which must augment the small meat ration for the main meal of the day. Oily fish and bacon can be fried without added fat, but for frying white fish, fish cakes, potato balls, vegetable croquettes and other dishes, a pan of deep or shallow fat is required, the former being much more economical in the long run. May we, therefore, put in a plea for a fat allowance for each household to start a pan of deep fat, parallel to the extra allowance for fish fryers in canteens? This would not materially increase the yearly consumption, for once a pan of deep fat has been started it can be kept going by the addition of scraps of fat, so long as the whole is regularly clarified and strained after use. Fried fish and chips appeal to most palates, and certainly fried, crisp, golden-brown food of all kinds has an aesthetic value which should not be overlooked.

Apart from the nutritional aspect of an adequate fat allowance, it must be realized that the amount desired for good cooking varies in different parts of the country, and that personal desire for food containing fat varies with age, climate, occupation and personal idiosyncrasy. For instance, in the north of England making pastry at home is much more popular than in Scotland. At least half fat to flour is the minimum amount to produce light, crisp, short-crust pastry, and for flaky pastry a slightly larger proportion is desirable. Too little fat results in a hard, chippy pastry. The standard of making pastry is bound to deteriorate, since these proportions cannot be afforded on the present allowance. Certain expedients give the effect or impression of fat in cooking, such as the use of mashed potato in pastry, which helps to give the free texture produced by fat. Such pastry, however, must be used at once, because it loses crispness almost immediately.

At present, owing to lack of fat, bakers are making very few cakes and have little to sell but plain yeast goods. True, yeast is a valuable food, but such buns and cakes must be eaten fresh, for they dry quickly. The housewife is therefore endeavouring to make cakes at home, and many recipes have been evolved in an attempt to produce a palatable cake with a reduced amount of fat. This has resulted in the use of more baking powder, with detrimental effect on food value. Such cakes have surface cracks, poor crust colour and lack of sponginess. They dry quickly and become unpalatable, and are wasted by those who are not thrifty. To make a good cake requires a proportion of half fat to flour, and for a rich cake at least two-thirds fat to flour. The keeping quality of a cake does not, as is commonly supposed, depend on the amount of fruit,

but on an adequate amount of fat, sugar and eggs. In the hands of the uninitiated, dried eggs do not give such good results as shell eggs, though they are a good substitute. The art of home baking, for which many parts of the country were famous, is undoubtedly being lost.

The use of fat in cooking also varies with different living conditions. For instance, those living in one or two rooms may have only a gas ring or an electric plate on which to cook. For them, frying is the simplest and most popular method. When cooking facilities are inadequate more bread is consumed, requiring more butter and margarine if the bread is to be masticated easily. The higher income groups, on the other hand, have always been addicted to 'French cookery'. Such cooking requires more foods of a fatty nature: butter, margarine, cheese, eggs, cream, olive oil. Before the war home-fed beef and mutton, which was considered the best in the world as regards flavour and tenderness, required no addition to increase palatability or aid digestion. Now, not only has meat, especially imported meat, less flavour, but it is short. The menu has therefore to be augmented by foods of less natural flavour, even though their food value may be as good or perhaps better. May we stress the psychological and physiological value of food which pleases the eye, the palate and the sense of smell? Fat goes a long way to fulfil these conditions.

Vegetables of necessity form a large part of our present diet. Both root and green vegetables served as an accompaniment to a main dish are much improved by being tossed in fat after cooking. The fat not only enhances the flavour and texture of the vegetables, but also their nutritive value, in respect of vitamin A and calorie value. If vegetables are to constitute a main dish, they should be served with a well-made sauce, which helps to give flavour and so increases the flow of the digestive juices. Expert cooks realize the value of good sauces, both sweet and savoury, and that these cannot be made without an adequate amount of fat. Raw salads of green or root vegetables are improved by salad dressing or mayonnaise, and these require egg yolk, olive oil, butter or margarine, although many substitutes have been evolved which would not please the epicure.

Purée soups and mixed vegetable soups are more nourishing and acceptable than clear soups, because of their starchy and therefore 'filling' properties. A small amount of fat is an important ingredient in lentil, potato, pea, and white and brown vegetable soups of all kinds, to give the right texture, flavour and consistency and to improve the food value. Dripping or cooking fat may be used, but to obtain the best results butter or margarine is required.

Sir Jack Drummond recently quoted the present consumption of fat as being 15% less than the pre-war level, but still sufficient to provide a balanced diet. Is it possible to have the statement further elucidated, especially in regard to the method by which the figure was obtained? We should also like to know its significance, considering that by pre-war standards of nutrition a large section of the population was generally said to be suffering from malnutrition attributed, in part at least, to inadequate fat.

The practical person is constantly being mystified by the scientist, and we would ask for definite advice which may be translated into practical terms. As practical cooks we maintain that, until a balanced diet can be consumed in capsule form, presentation,

texture, colour, flavour and artistry in cooking are as important as calories, vitamins and mineral salts in the ultimate value of food consumed. We maintain that with the present small allowance of fat the standard of much of our cooking is deteriorating, and a generation is growing up which has little idea of the art of good cooking. We would put in a plea for at least  $1\frac{1}{4}$ – $1\frac{1}{2}$  lb. of fat for each person weekly for cooking and table use.

## REFERENCES

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### The Nutritive Value of Fats, with Special Reference to Butter and Margarine

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It is well known that fats can readily be fortified with the chief fat-soluble vitamins and that the margarine available in this country throughout the year is now usually as rich in these vitamins as summer butter, and much richer than winter butter. In the present paper, therefore, there is no need to deal with the fat-soluble vitamins. The term 'fat' will be used in its true chemical sense, to denote triglycerides of fatty acids. It will be assumed that in all the feeding experiments referred to the vitamin, mineral and protein contents of the experimental diets were adequate, so that it is the nutritive value of the triglycerides themselves which is under review.

For our purpose to-day the fatty acids present as glycerides in edible fats may be regarded as falling into three main groups. First, there are the three fatty acids, palmitic, stearic and oleic. They can well be put in one class because they appear to occur in all edible fats, whether animal or vegetable, and are not likely to be the cause of any differences in nutritive value which may exist. Secondly, there are the more unsaturated acids, linoleic, linolenic and arachidonic, which are rich in double bonds, and tend therefore to be readily oxidized. This class includes the so-called essential fatty acids (Burr & Burr, 1929, 1930). There is no need, however, to deal with these here. If they are essential for man, they are certainly required in very small amounts, and since they are widely distributed in nature they are not likely to be deficient, except perhaps in diets of a very unusual type. Thirdly, there are the volatile fatty acids, butyric, hexanoic and octanoic, which occur as glycerides in butter and which might conceivably give butter some special nutritive properties. In addition to the acids in these three main groups, one other fatty acid has been much discussed in recent years. It is the solid unsaturated acid first isolated from butter by Bertram (1928) and named by him vaccenic acid. It is isomeric with oleic acid, but its one double bond is in the 11 : 12 position instead of in the 9 : 10 position.

The nutritive value of a fat may be affected by its absorbability, and possibly also by its animal or vegetable origin. The main part of the subject will therefore be dealt with under these two main headings.