

How Low Should Fat Intake Be?

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A number of health agencies in developed countries now advocate a reduction in dietary fat intake; usually as a percentage of energy intake. Although there is general consensus among health care professionals on this point, a number of issues related to it require clarification.

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Energy Intake

There is growing evidence that those with greater energy intakes, especially for a particular bodyweight, are less prone to die prematurely [1,2,3]. The sources of energy also appear to be important with unrefined plant food and fish being preferred [1,2]. It may be desirable for plant food and fish to contribute fat or, indeed, it may be desirable for there to be polyunsaturated fats of animal origin [4]. This seems particularly desirable for children during growth and with increased physical activity and for adults who are physically active or who have wasting states [5]. A number of national bodies in developed countries have recognised the relationship between fat intake, especially saturated fat, and major chronic diseases like cardiovascular disease. Their subsequent dietary recommendations have, however, been to decrease percentage energy from fat. The proposals have been that the current levels of 40 to 45% should be lowered to the vicinity of 25 to 35% [6,7]. At the same time an even more radical approach has been taken by people keen to reduce

the burden of such disease. An example would be the Pritikin Diet which seeks dietary fat intakes of 10% or less of energy intake. The question is, how far should we go?

It may still be that in countries experiencing high rates of coronary heart disease, a reasonable strategy is to reduce total fat intake

Life Expectancy

It is of considerable interest that over the twenty years from 1965 to 1985 life expectancy improved in Japanese men and women such that their's became the best in the world. During this time, although there may have been a slight increase in coronary mortality rates, Japanese life expectancy

remained among the lowest, if not the lowest, in the developed world [8]. In the Japanese diet, the proportion of energy obtained from fat increased from 15% to the vicinity of 25% [8,9]. It would appear that this increase in fat intake was of various kinds, including fish and saturated fat from ruminant sources. It should also be noted that around the Mediterranean and in Scandinavia where life expectancies are among the best, dietary fat intakes are found in the region of 35 to 40% of energy intake. Of course it may still be that in countries experiencing high rates of coronary heart disease a reasonable strategy is to reduce total fat intake. But it would appear that other factors are also likely to be operative in some food cultures which allow a relatively higher proportion of energy obtained from fat without compromising life expectancy. One suggestion has been that quality of the fat might be critical [10]. There are also data from an Hawaiian Cancer Study which suggest, albeit with food methodological difficulties, that low fat intakes may be associated with increased mortality [10].

The Young and the Old

There are special requirements for fat at the extremes of age.

Fat of various kinds is part of normal infant nutrition. For children, data indicate that diet and cardiovascular disease risk factor variables are not well correlated, but that obesity and aerobic capacity are more important determinants of the likelihood of the presence of cardiovascular risk factors [5,12,13,14]. It may be of particular importance that children, with their higher rates of energy expenditure per kilogram of bodyweight and with their play, have the opportunity for an increased intake of energy dense foods including those which are relatively fatty. The Committee on Nutrition of the American Academy of Pediatrics records its views: 'the optimal total fat intake cannot be determined, but 30 to 40% of calories seems sensible for adequate growth and development. Diets that avoid extremes are safe for children for whom there is no evidence of special vulnerability' [15].

As far as the elderly are concerned, the problem of wasting is often seen. For this reason a uniform recommendation that all elderly people should reduce their fat intake may not be advis-

able and individual advice is likely to be preferable. Fortunately, where a reduced intake of fat is replaced by an increased intake of fish, lean meat, low fat dairy products and unrefined plant food, the nutritional quality of the diet is generally improved – a situation of advantage to most elderly people. One reason why the nutritional quality of food can be critical for the aged is that, regrettably, levels of physical activity often decline with advancing years. Recent evidence from the Framingham Study indicates that, after fifty years of age, there is no increased overall mortality with either high or low serum cholesterol levels, with implications for efforts to change the serum total cholesterol with diet [15]. However, other data indicate that lipoprotein fractions, low density and high density, remain predictive of morbidity and mortality into later years [3,17].

Dietary fat modulates various small gut hormone responses

Gut Function

It is quite clear that dietary fat modulates various small gut hormone responses [18,19], aside from effects to delay gastric emptying. It seems likely that at least some fat is required in the human diet for these purposes. The questions are: how much, of what quality, at what times, and in what relationship to other food components?

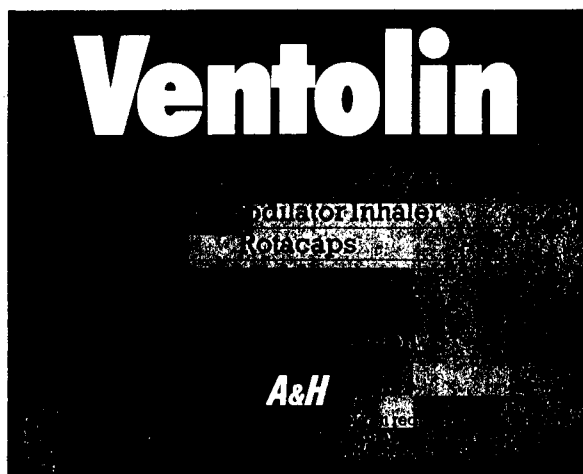
Lipoprotein Transport

Most efforts at dietary fat modification have been directed at manipulating serum LDL or VLDL/chylomicron concentrations. Recent work suggests that at least monounsaturated fat can help maintain HDL cholesterol levels [20]. This may have beneficial effects as far as the peripheral removal of cholesterol is concerned where excess outward transport or endogenous synthesis is a problem. This is yet another reason why care is required in the relentless pursuit of ever-lower dietary fat intakes. Another consideration is that

dietary intakes other than fat, such as coffee, appear to affect the serum cholesterol level [2].

Specific Nutrient Adequacy

Dietary fat must at least provide essential fatty acids of the omega-6 and omega-3 series. The World Health Organization and US National Academy of Sciences have made recommendations that the omega-6 series contribute about 3% of energy intake in adults where energy from total fat is less than 25% [21]. There is now active interest that recommendations for their intake be established [22]. Such recommendations are especially important for children, given the importance of omega-3 fatty acids in brain and retinal development.



Clearly the role of omega-3 fatty acids in platelet function, the inflammatory response and lipoprotein transport also requires that recommendations are made for adults too [23].

There will be limits as to how low fat intake can go before compromising fat soluble vitamin absorption. In developing countries vitamin A deficiency can be seen in association with very low fat intakes (usually less than 10%) despite what appear to be adequate vitamin A intakes. With no absorption of fat, deficiencies are seen of all fat soluble vitamins A, D, E and K. At the present time we cannot say with confidence what levels of fat

intake are critical. More research is required in this area.

Recommendations

1. That, with present knowledge, public health nutrition advice for developed countries should probably not encourage fat intake less than 25% of energy. Where an individual belongs to a food tradition where the proportion is less than 25%, care should be taken to consider how well that tradition is maintained in the face of a majority food culture which is higher in fat intake. Therapeutic nutrition, e.g. for obesity or lipid disorders, may require individuals to have lower fat intakes than 25% of energy intake from time to time.

2. The quality of dietary fat must be considered along with the amount of dietary fat. So also must the overall dietary context in which the fat is eaten.

3. Particular consideration needs to be given to children and adolescents whose fat intake may need to be as high as 30% of energy intake. Elderly persons with wasting may need to be cautious about low fat intakes.

4. Research opportunities need to be taken to further clarify the optimal levels and ranges of fat intake in the human diet.

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