
National Heart Foundation of Australia

Position statement on dietary fat and overweight/obesity

Key words: dietary fat, overweight, obesity, energy balance, energy density

(Nutr Diet 2003;60:174–6)

The National Heart Foundation of Australia's (NHFA) review of the relationship between dietary fat and cardiovascular disease (CVD) while finding good evidence of a link between the amount of saturated fat in the diet and CVD risk, found little evidence demonstrating that coronary events or death are linked to the amount of total fat in the diet (1). However, it has been suggested that dietary fat intake could increase the risk of CVD indirectly by increasing the risk of overweight and obesity, an independent risk factor for morbidity and mortality related to coronary heart disease (CHD). A review of the relationship between dietary fat and overweight/obesity was therefore conducted to determine whether recommendations on total fat intake were required for the prevention of cardiovascular disease.

Objectives

The objectives of the review of the relationship between dietary fat and overweight/obesity were to:

- Determine whether dietary fat, independent of energy intake, is a risk factor for the development and progression of overweight and obesity.
- Assess the effectiveness of fat reduction strategies relative to other dietary strategies for achieving weight loss in overweight and obese individuals and weight maintenance in normal weight, overweight and obese individuals.

Criteria

The following criteria were used to assess the evidence in this review:

	<i>Good evidence</i>	<i>Moderate evidence</i>	<i>Little evidence</i>
Level of evidence	Consistency across several study designs, including long term intervention studies	Inconsistency across study designs; use of surrogate measures; limited number and type of studies	Inconsistency across study designs; limited number and type of studies
Quality of the evidence	Measurement bias adequately minimised	Limited in quality	Limited in quality
Size of the effect	Statistically significant	Effect possibly due to measurement bias	Effect possibly due to measurement bias
Mechanism	Metabolic studies in humans	Metabolic studies in humans	Lack of metabolic studies in humans

The following summary is based on the evidence contained within the Heart Foundation's background review paper completed in February 2003 (2).

Summary of conclusions

Dietary fat is not an independent risk factor for the development and progression of overweight and obesity (moderate evidence).

Dietary fat may increase the risk of overweight and obesity indirectly by increasing the energy density of the diet, hence facilitating excess energy intake.

The association between dietary fat and obesity reported in cohort studies, conducted in different population groups, was inconsistent (3–10). Inconsistency in the findings can be partly explained by measurement bias, in particular underreporting of dietary fat intake and confounding from physical activity.

The lack of variation in dietary fat intakes in the study populations and the large within-person variation in dietary intake make it difficult to find an association between dietary fat intake and weight gain in cohort studies (11).

Overall, the effect of dietary fat was small compared to other risk factors for overweight and obesity, such as physical activity level. No study reported a dose response relationship between dietary fat intake and weight gain.

Recommendations of the Heart Foundation's Nutrition and Metabolism Advisory Committee.

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It is unlikely that the metabolic effect of dietary fat on energy expenditure and energy storage increases the risk of weight gain. Several controlled trials in normal weight women and men suggest that high fat diets do not result in excess energy intake when confounding factors, such as energy density and palatability, are held constant (12–14). Several controlled trials in both obese and lean individuals have shown that energy intake is dependent on the energy density of the diet, not the fat content. Energy intake was higher with high energy dense diets (above 6 kJ/g) than low energy dense diets (to less than 4 kJ/g) (15–18). Since energy density is mainly determined by the water, fat and fibre content of foods, high fat diets may lead to excess energy intake and hence contribute to weight gain. However, other factors such as palatability, the physical form of food, the amount (portion size) and volume of food consumed as well as behavioural and genetic factors, may also influence energy intake.

Energy balance is the major determinant of weight loss. Dietary fat reduction is a simplistic behavioural strategy to facilitate energy restriction. However, without energy restriction, fat reduction alone is not effective for achieving weight loss in overweight and obese individuals (moderate evidence).

Randomised controlled trials in obese individuals reported no significant differences in short-term weight loss between energy-restricted diets (1000 to 1200 kcal) varying in fat content from 15% to 75% energy from fat (%E fat) (19–21). An interim systematic review concluded that low-energy, low-fat diets are not more efficacious than low-energy diets, which are not low in fat, in terms of weight loss in overweight or obese individuals (22).

Reducing dietary fat intake to 25%E (30 to 35 g/day) appears to be as effective as restricting energy intake to 5040 kJ/day for achieving short-term (six months) weight loss in obese women (23). However, a randomised controlled trial suggests that short-term weight loss achieved with both low fat ad libitum dietary interventions (dietary fat reduced to 25%E fat or 30 to 35 g fat/day) and energy restricted diets (around 5040 kJ/day) in free-living obese individuals is not maintained in the long term, after controlling for confounding factors (24). Other factors, such as physical activity, social support and preference for the dietary regime have been shown to also influence weight loss.

Controlled trials suggest that low-fat ad libitum dietary interventions may reduce energy intake leading to short-term weight loss in overweight individuals (25,26). A meta-analysis of low-fat ad libitum dietary intervention studies, in which weight loss was not the primary aim of the majority of these studies, reported a weighted difference in weight loss between intervention and control groups of 2.55 kg (95% CI: 1.5 to 3.5 kg; $P < 0.0001$) (23). However, few studies separated the effect of dietary fat from other confounding factors such as physical activity, other dietary factors and behavioural influences.

Randomised controlled trials suggest that there is a wide variation in short-term weight loss achieved in obese individuals on low-fat (30%E fat) ad libitum diets (27,28). Differences in the protein content, and to a lesser extent, the type of carbohydrate in the low-fat ad libitum diet resulted in significant (3.7 kg 95% CI: 1.3 to 6.2 kg; $P = 0.0002$) and non-significant differences in weight

loss, respectively. A randomised crossover study found no significant difference in short-term weight loss in overweight women on a low-fat diet (22%E fat) compared to those on a high monounsaturated fat diet (36%E fat) (29). It may therefore be possible that dietary fat intakes of up to 35%E fat can be consumed as long as the overall diet is low in energy density (i.e. less than 5 kJ/g).

Dietary fat reduction alone may be effective for preventing weight gain in normal weight, overweight and obese individuals (little evidence).

Few controlled trials have measured the independent effect of dietary fat reduction on weight maintenance in normal, overweight and obese individuals. A randomised controlled trial suggests energy intake is significantly decreased in normal weight men ($P < 0.01$) and women ($P < 0.0001$) when dietary fat intake is reduced from 35%E fat to 33%E fat, whereas energy intake is significantly increased only in women ($P < 0.01$) when dietary fat intake is increased from 35%E fat to 41.2%E fat (30). Body weight was significantly increased on the high fat diet (40%E or 122 g/day) in both men ($P < 0.001$) and women ($P < 0.01$) but remained unchanged on the low fat diet (33%E fat or 89 g fat/day). Eating behaviour may explain differences in the effect of dietary fat reduction on energy intake and consequent weight change in normal weight individuals (31).

The long-term effect of dietary fat reduction strategies on weight maintenance in normal weight and overweight individuals has not been demonstrated.

It is recommended that public health nutrition strategies for the prevention of cardiovascular disease emphasise reducing saturated fatty acid intake.

Current levels of dietary fat intake in Australia are around 32%E fat (32). Average intakes of saturated and polyunsaturated fatty acids (12.7% and 4.9%E, respectively) are not consistent with the NHFA's policy on dietary fat (? 8%E saturated and 8 to 10% polyunsaturated) (1,33). Intake of total dietary fat and polyunsaturated fatty acids in the Australian diet has decreased since 1983, while intake of total energy and saturated fatty acids has increased (34).

The evidence reviewed suggests that dietary fat intake of 30 to 35%E does not seem to be associated with excess energy intake. Since dietary fat restriction may help to facilitate energy restriction, public health recommendations should ensure that dietary fat intake remains at less than 35% energy from fat.

The emphasis of food-based recommendations for the prevention of CHD, developed by the NHFA, is on reducing intake of foods high in saturated fatty acids, such as full fat dairy products, takeaway meals, pastries, snacks and cakes. Reducing intake of saturated fatty acids is likely to also reduce total dietary fat intake. Furthermore, since many foods high in saturated fatty acids are also high in energy density, restricting their intake also facilitates a reduction in energy intake.

Further research required

Energy density may be a major determinant of energy intake although protein intake may act independently of this. Further research is required to determine the relative

effectiveness of manipulating the dietary macronutrient, fibre and water content of foods on reducing the energy density of the overall diet. Long-term studies are required to determine whether strategies for reducing the energy density of the diet are useful for achieving weight loss in overweight and obese individuals and weight maintenance in normal weight as well as overweight and obese individuals.

Other dietary and non-dietary factors are also implicated in the development and progression of overweight and obesity. Clearly physical activity plays an important role in regulating body weight. Further research is required to determine the combined effect of dietary and physical activity strategies in weight management.

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