

DIETARY FAT

RED MEAT'S CONTRIBUTION

Introduction

The National Nutrition Survey in 1997 showed New Zealanders are obtaining 35% of their energy from fat, with 40% of those surveyed achieving the recommended level of 33% or less^[1,2]. This percentage of energy from fat has reduced over the years, from over 40% in 1977 and 37.5% in 1989^[3,4]. In the latest survey, beef and lamb contributed only 8% of total fat intake, and 8% of saturated fat intake. Sausages and processed meats added 5% to total and saturated fat intakes. The total contribution of all pies and pasties, including meat pies, was only 5% and 6% respectively for total and saturated fat. New Zealanders are eating leaner beef and lamb than ever before. A study published in the New Zealand Medical Journal shows beef and lamb contain 30% less fat and 65% less saturated fat than 10 years ago^[5].



Beef and lamb today

Lean beef and lamb contain less than a fifth of the total fat found in other protein foods such as cheese or nuts. As in all foods containing fat, there is a mixture of fat types, or fatty acids, some of which are more beneficial to health than others.

Fat content of protein foods

Note: Servings in brackets

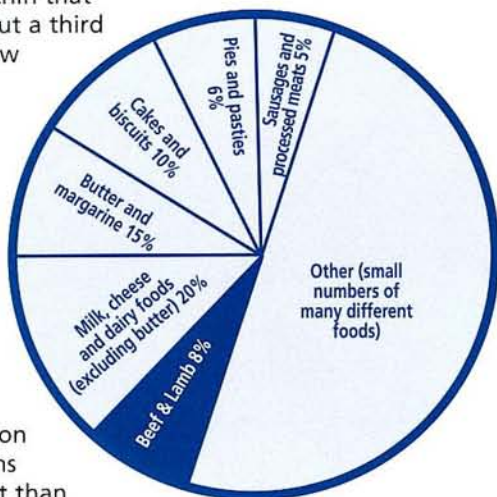
	grams fat per 100g cooked weight	per (serving)
Baked snapper (1 fillet)	3.4	(3.6)
Lean roast beef topside (2 slices)	5.3	(4.4)
Lean grilled rump steak (160g serving)	5.5	(8.8)
Lean stewed mince (1 cup)	6.0	(10.2)
Grilled chicken drumstick without skin (2 drumsticks)	6.8	(6.0)
Lean grilled lamb leg steak (1 steak)	7.8	(4.5)
Boiled egg (1 egg)	11.1	(5.4)
Roasted chicken thigh with skin (1 thigh)	19.8	(23.5)
Canned corned beef (2 slices)	28.4	(16.0)
Cheddar cheese (1/2 cup, grated)	35.2	(20.8)
Peanuts (1/2 cup, raw)	49.0	(38.2)

Source: Reference 6

Which foods contribute saturated fat to our diet?

It is saturated fat that gave all fat a bad name back in the 1980s, as some types of dietary saturated fat are associated with increasing blood cholesterol, which in turn increases the formation of plaque in the arteries and can lead to heart attacks. Only about half the fat in beef and lamb is saturated, and within that saturated fat, about a third is stearic acid^[7], now known to have a neutral effect on cholesterol production. It is not surprising, therefore, lean beef and lamb only contribute 8% of the saturated fat in the New Zealand diet^[1].

In fact, 1 tablespoon of olive oil contains more saturated fat than 2 slices of lean roast beef.



Importantly for New Zealand, beef and lamb from grass-fed animals contain higher levels of these *n-3* fatty acids than meat from grain-fed animals. In one UK study, the beef from grass-fed animals contained two to four times the levels of *n-3* fatty acids found in cattle given concentrate. Similar results were found for lamb^[8].

The ratio of *n-6* to *n-3* fatty acids has been under some scrutiny, with concern voiced about the imbalance of these two fatty acids in the Western diet today. Our eating patterns can show a ratio of up to 20:1, a far cry from the recommended ratio of 4:1 or lower^[9]. Research here in New Zealand has shown our grass-fed beef to have a ratio of below 2, which is not only well within the recommended level, but also below that found in meat from grain-fed cattle^[10].

The other polyunsaturated fat attracting attention at the moment is conjugated linoleic acid – CLA for short. Animal studies have shown CLA to reduce tumour development and atherosclerosis, whilst affecting body composition change, namely reducing fat gain^[11]. CLA is only found in products from ruminant animals – meat and milk, and again, at higher levels when those animals have been raised on pasture. The question at the moment is whether or not meat and milk can contain enough CLA to be effective. So far, the beneficial effects are only seen when it has been given as a supplement. Research here in New Zealand has shown beef and lamb could provide up to 15% of the required daily amount^[12].

Trans fat

The final type of fat found in red meat is trans fatty acids. These, like saturated fat, are known to decrease HDL cholesterol and increase LDL cholesterol. Whilst meat from ruminant animals does contain these fatty acids naturally, there is more concern over processed foods, eg commercially-produced cakes, biscuits and pastries, where the trans fats have been produced as a result of hardening vegetable oils. The naturally

occurring trans fat does not have the same detrimental effect on cholesterol, and is converted into conjugated linoleic acid (CLA) during human digestion^[13,14].

The World Health Organisation recommends trans fat contributes no more than 1% total dietary energy. Current intakes in New Zealand are around 0.7%^[15,16].



Unsaturated fat

When considering the unsaturated types of fatty acids, it is important to remember the two types of cholesterol - LDL (low density lipoprotein) cholesterol, which goes from the liver to the tissues, risking hardened arteries, and HDL (high density lipoprotein) cholesterol, which returns to the liver for excretion.

Monounsaturated fat

Monounsaturated fat has a positive effect by increasing HDL cholesterol and lowering the LDL. Olive oil has become the most recognised source of monounsaturated fat, made popular by the low levels of heart disease seen in Southern European countries, whose use of olive oil is frequent and plentiful. In New Zealand however, 9% of our monounsaturated fat comes from beef and lamb, second only to butter and margarine, and more than from olive oil (5%)^[1].

Polyunsaturated fat

Polyunsaturated fat is made up of two main families: *n-6* and *n-3* (also known as omega-6 and omega-3). One of the *n-3* fatty acids, eicosapentaenoic acid (EPA), found in oily fish and fish oil supplements, is known to help people with heart problems by reducing blood clotting and lowering plasma triglyceride levels. EPA and its 'brother', docosahexaenoic acid (DHA), have also been used in the treatment of depression, as these polyunsaturated fats are important for normal brain function. The small amount of polyunsaturated fat in beef and lamb also contains these *n-3* fatty acids, potentially making a significant contribution to the diets of those who eat little fish.

The role of the red meat industry

So what has the red meat industry done in response to public health messages encouraging a lower fat intake?

Opportunities to reduce fat content of beef and lamb have been maximised throughout the production chain from pasture to plate. Beef and lamb contain 30% less fat than 10 years ago and supply 65% less saturated fat than previously measured^[5]. In addition, about 30% of the total fat on beef or lamb carcase is discarded before sale. This in part, can be attributed to retailers trimming more fat, with some companies having precise standards of trim. This ensures the standards are met irrespective of the original fat level of the meat supplied.

The carcase grading statistics for beef do not show such a clear shift to leaner animals, but because a large amount of beef is sold in a boneless form, fat is trimmed before wholesale.



Retailers then trim more of the fat, with some companies having precise standards of trim. This occurs in-store, ensuring the standards are met irrespective of the original fat level of the meat supplied.

The introduction of the New Zealand Beef and Lamb Quality Mark in 1997 was the industry's response to providing consistent quality beef and lamb. The Quality Mark requires retailers to have written trim specifications to a maximum of 5mm fat, along with the removal of internal fat deposits where practical. At 5mm fat trim, lamb cuts can be as low as 13% fat, with beef even leaner at a lowest point of 7.3%^[7]. These cuts can be trimmed further, and some cuts are sold with almost no external visible fat.



The Quality Mark logo



The Heart Foundation's Tick
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A significant amount of lean beef and lamb, which contains less than 4% saturated fat, qualifies for the Heart Foundation's Tick of Approval. The Heart Foundation states women can include 100-150g of lean meat and men 150-200g of lean meat in their diet per day^[17].

Meat products are also changing

Meat products include sausages, burgers, pies and processed meats. They are traditionally viewed as the fattier forms of meat, but often contain hidden non-meat vegetable fat - for example the pastry in a pie - which increases the total fat content and gives an exaggerated view of the fat derived from meat.

These products are also changing, with several brands of sausages now proudly boasting the Heart Foundation's Tick. The Food Standards Code, introduced at the end of 2002^[18], requires sausages to contain at least 50% fat-free meat flesh, and the fat content to be no more than half the meat percentage. For example, if a sausage contains 50g of fat-free meat, it cannot contain more than 25g fat in addition to the meat.

The code also requires the percentage of a 'characterising' ingredient to be declared on the label of certain meat products, eg pies. In other words, the packaging around a steak and kidney pie will have to state how much steak and kidney is contained in the pie. The percentage of meat has to be at least 25%, based on the total weight of the pie, including the pastry. Processed meat products must contain no less than 30% meat.

So what happens to the discarded fat?

Popular belief is fat trimmed from meat cuts goes back into the food chain in another form, for example in sausages or pies. In reality this happens in far smaller quantities than previously thought. Discarded fat from meat processors can be purified and used, but it is an expensive process. Whilst some becomes margarine, or is used in frying oils and baked goods, most is exported.

Fat trimmed by retailers is not allowed to be used for edible products once it has left their premises, and again, most is exported for use in the soap and cosmetics industry overseas. Retailers can use the fat trim themselves, but as the major retail groups, who sell at least 85% of beef and lamb, have centralised production of small goods, all fat trimmed from meat cuts is sold for disposal.

Even small independent butchers, who may use trim more freely, are limited by the Food Standards Code. The industry estimates up to 90% of trimmed fat is graded inedible, and therefore ends up as soap or in cosmetic products overseas.



What happens in our homes?

The final opportunity for trimming visible meat fat occurs within the home. In Australia, a study on trimming practices revealed 52% of consumers trim most of the visible fat from meat with 29% trimming all the fat and 5% purchasing meat with no visible fat at all^[19].

In an attempt to establish how much fat New Zealand consumers actually eat, a study was conducted by Lincoln University using 170 pairs of steaks.

Participants were asked to pan fry their steaks, collecting all the fat trimmed, and noting any fat added during cooking. They also collected any fat trimmed after cooking, ie plate waste. They were given steaks with two different levels of visible fat. Those with the fatter steaks trimmed more of the fat, but both steaks, as eaten, only provided on average 3.95% and 8.25% fat, depending on the original fat content^[20].



What does this mean for the health professional?

As the incidence of diet-related diseases increased, major scientific reports and expert opinion throughout the 1980s and 1990s made fat the villain, and with it, red meat^[21,22]. The visible fat on meat made it an easy target for criticism. However, the very fact the fat is visible means it can and is removed easily at each stage of the production chain, including on the plate itself. The small amounts of internal fat remaining after trimming allow it to be cooked without the addition of fat – even when frying/stir-frying.

Red meat remains an important supplier of nutrients to the national diet – 35% absorbed iron, 21% zinc, 22% vitamin B₁₂ and 17% protein^[1]. No food should be considered in isolation, and whilst red meat remains a supplier of fat to the New Zealand diet, this should be put in the context of its overall contribution of nutrients in relation to other fat-containing, less nutrient-dense foods.

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