Heart Foundation

Meat &
heart-healthy eating

Position statement

This position statement summarises contemporary evidence on the association between consumption of unprocessed meat and poultry and cardiovascular health and makes recommendations for the place of meat in heart healthy eating. The Heart Foundation commissioned a review[1] of the evidence for unprocessed meat and poultry and cardiovascular health. This informs the Heart Foundation's position on meat outlined here, and the Heart Foundation's broader view on heart-healthy eating patterns.[2] This position statement is complementary to the Heart Foundation's existing food and nutrition position statements.

The Heart Foundation's position on food and nutrition recognises that healthy eating patterns do not rely on one type of food or nutrient to promote heart health.[2] Heart-healthy eating patterns are based on a combination of foods, chosen regularly over time. This optimal combination is outlined in the Heart Foundation's heart-healthy eating principles, which encourage people to eat:

1. Plenty of vegetables, fruits and wholegrains.

2. A variety of healthy protein sources including fish and seafood, legumes, nuts and seeds. Smaller amounts of eggs and lean poultry can also be included in a heart-healthy diet. If eating red meat, make sure the meat is lean and limit to 1-3 times a week.

3. Unflavoured milk, yoghurt and cheese. People with high blood cholesterol should chose reduced fat varieties.

4. Healthy fat choices, including nuts, seeds, avocados, olives and their oils for cooking.

5. Herbs and spices added to flavour foods, instead of using salt.

This style of eating is naturally low in saturated and trans fats, salt and added sugar and rich in unsaturated fats (MUFA, omega-3 PUFA, and omega-6 PUFA), along with wholegrains, fibre, and antioxidants. Eating this way can help to improve the heart health of all Australians by reducing CVD risk factors, such as high blood pressure and blood lipids and decreasing the risk of CVD events and mortality.

Summary

Unprocessed meat and poultry can be included in a heart-healthy eating pattern, but fish and legumes are preferred protein sources, due to their consistent beneficial relationship with heart health.

Based on current evidence, eating unprocessed red meat should be limited to less than 350 g per week. There is currently no recommended intake for unprocessed poultry.

Between 1-3 meals which include unprocessed red meat can be included per week, as part of a heart-healthy eating pattern. This limit encourages the use of other protein sources in meals, including fish and seafood, legumes, nuts, eggs, poultry and dairy.

Processed meat is not part of a heart-healthy eating pattern; it should be limited or avoided.

Background

Eating unprocessed meat provides a source of protein, iron, zinc and vitamin B12 in the diet.[3] The Heart Foundation defines unprocessed red meat to include beef, veal, mutton, lamb, pork, kangaroo, rabbit, and other game meats. The Heart Foundation defines unprocessed meat to include unprocessed red meat, as well as poultry.

The nutritional composition of unprocessed red meat products varies depending on type (beef, mutton, kangaroo), cut (rump steak, etc), fat modification (fat removed or retained), diet of the animal (grass fed, composition of grain feed) and cooking methods (raw, cooked with or without added fat). For example, protein ranges from 21-25 g/100 g of beef, and both iron and fat are slightly higher in lamb and mutton (2-3 mg iron/100 g; 4-5 g fat/100 g) than veal and beef (1-2 mg iron/100 g; 1.5-3 g fat/100 g).[4] Kangaroo meat, widely available in Australia, is a leaner product and includes 0.2-1 g total fat/100 g.[5]

Of the fat content, there is a higher proportion of unsaturated fat than saturated fat in Australian beef and lamb.[4] Around 40-50% of the fat found in the lean and fat components of beef is saturated fat; of that, approximately half of the saturated fat is palmitic (C16:0).[4] Palmitic acid increases total cholesterol, low density lipoprotein cholesterol (LDL-C), and the LDL-C to high density lipoprotein cholesterol ratio, which are risk factors for heart disease.[6] Between 11-30% of fat are polyunsaturated fatty acids (PUFA).

Pasture-fed (grass fed) beef has a higher proportion of omega-3 PUFA than grain-fed.[4] Australian red meat has more omega-3 PUFA than US meat; this is due to the difference in animal diets, with the majority of Australian red meat being pasture-fed, while grain feeding is extensive in the US.[4]

Ruminant trans fat varies, depending on the type of meat, but is usually less than 3% of total fat content. The level of ruminant trans fat is higher in lamb and mutton than in veal and beef.[4] There is wide variation of the amount of fat that can be trimmed from beef and lamb cuts, although, on average, the available meat cuts in Australia are leaner in recent years. This is due to a combination of breeding practices, community demand for leaner products and butchery techniques.[4]

Poultry provides a source of protein, niacin, vitamin A, magnesium and zinc.[7] The nutrition composition of poultry varies, depending on the cut (wing, thigh, breast, skin on or off), composition of feed, age and gender of the bird.[8] Lean chicken breast has a higher proportion of mono-unsaturated fat and PUFA, and a lower proportion of saturated fat and total fat compared to beef and lamb. The protein content of lean chicken breast is comparable to beef and pork (approx. 22 g/100 g).[8]

The role of meat and poultry consumption in cardiovascular health is a topic of interest to the community, health professionals and researchers. Most national guidelines recommend the consumption of protein-containing foods, including fish, seafood, legumes, eggs poultry, and lean unprocessed red meat.[3,9] Current guidelines are universal in recommending avoidance of processed meat, due to the increased risk of developing colorectal cancer.[10]

In Australia, the diversity of protein-contributing foods regularly eaten has increased between the 1995 and 2011/12 national nutrition survey.[11] Australian adult consumption of red meat intake has fallen, while the consumption of fish, legumes and eggs has increased.[11] However, Australians are still eating more red meat than the Australian Dietary Guidelines advise (<455 g cooked red meat per week), with men consuming more than women.[3,11,12]

The Heart Foundation commissioned a review of the scientific evidence relating to unprocessed meat and poultry intake and heart health. The *Evidence Review: Animal sourced protein (meat and poultry) and Cardiovascular Health* (Ndanuko et al 2019)[1] informs the Heart Foundation's position on unprocessed meat and poultry, and the Heart Foundation's broader position on heart-healthy eating patterns.

Evidence for meat & poultry and heart health

Most available evidence relating to the consumption of unprocessed red meat and poultry and the incidence or risk of cardiovascular disease, coronary heart disease and stroke, is made up of prospective cohort studies, and systematic reviews and meta-analyses of these studies. Randomised, controlled trials were available for two cardiovascular risk factors: blood pressure and lipid profile. Most studies compared highest to lowest intakes, with lowest intake defined as <50 g/day. Some meta-analyses were able to report dose-response relationships. For brevity, the most recent studies have been referenced here. The *Evidence Review: Animal sourced protein (meat and poultry) and Cardiovascular Health* (i.e. the evidence review) can be accessed for a full list and discussion of the available evidence.[1]

Cardiovascular disease, coronary heart disease and stroke

In summary, the Evidence Review found that eating white meat (poultry, turkey, rabbit) has relatively neutral effects, and eating unprocessed red meat (beef, pork, veal and lamb) has moderately adverse effects, on cardiovascular outcomes.[1]

Unprocessed red meat

The evidence for unprocessed meat intake and cardiovascular disease (CVD), coronary heart disease (CHD) and stroke was mixed, depending on the outcome and whether studies investigated total red meat intake (i.e. unprocessed red meat and processed red meat reported together) or unprocessed red meat separately.

Evidence from observational studies indicates a higher intake of unprocessed red meat is associated with a higher risk of stroke and CVD.[13-15] The association with stroke appears specific for ischemic stroke, rather than haemorrhagic stroke.[14] Eating 100 g/day of unprocessed red meat increased the risk of stroke by 13% and CVD by 15%.[13,14]

An association was not evident for CHD however, the available data is smaller than that available for CVD, which may limit the evidence of an association with CHD specifically.[13,16,17] Eating processed red meat was significantly associated with a higher risk of CHD.[16]

There is limited evidence for an association between eating higher amounts of unprocessed red meat (exposure ranges observed are up to 60-80 g/day) and heart failure.[18,19]

There is evidence that eating unprocessed red meat is associated with a small amount of weight gain.[20,21]

Studies which did not separate unprocessed and processed red meat, and instead reported associations for total red meat intake, found higher intake was associated with a higher risk for heart failure, CVD and CHD.[22-25] Given the data for both unprocessed and processed meats are pooled in these studies, the association is likely driven by processed meat which, due to higher levels of sodium and other preservatives, appears to be more harmful to cardiovascular health than unprocessed red meat.[1,26]

Intervention studies indicate up to 50 g of unprocessed meat per day can be included in the diet without remarkably increasing the cardiovascular risk factors of blood pressure and lipid profile.[27] This should not be interpreted as evidence that unprocessed meat consumption is beneficial for heart health. These findings, combined with the lower risk observed for unprocessed meat consumption <50 g/day in the observational data, reinforces a limit of 50 g (cooked weight) of unprocessed meat/day (or maximum 350 g/week).

Poultry

There was less evidence available for poultry than unprocessed red meat. However, the studies available were generally consistent.[1] Evidence from observational studies indicates no association between poultry consumption and CVD risk.[13] Eating poultry with skin was associated with a small amount of weight gain, while eating poultry without skin was associated with a small amount of weight loss.[21]

Role of unprocessed meat in healthy dietary patterns

The evidence review investigated if the inclusion of unprocessed red meat moderated the impact of two established healthy eating patterns – the Dietary Approaches to Stop Hypertension (DASH) and Mediterranean dietary pattern. In short term intervention studies, consuming a moderate amount (approx. 100 g/day) did not affect the ability of the DASH and Mediterranean dietary patterns to improve cardiovascular risk factors.[1] The evidence review concluded that the inclusion of up to 1 serve of unprocessed red meat or poultry per day may be reasonable in populations who are achieving healthy dietary patterns. This conclusion should not be interpreted as evidence that unprocessed meat consumption is beneficial for heart health.

Type 2 diabetes mellitus

Evidence is emerging of an association between unprocessed red meat intake and the risk of developing type 2 diabetes mellitus (T2DM). While outside the scope of the Evidence Review, recent meta-analyses and pooled analyses of prospective cohorts have reported an increased risk for T2DM with high, compared to low intake of both unprocessed red meat and processed meat.[28,29] T2DM is an independent risk factor for cardiovascular disease.[30]

Limitations to the evidence base

Studying the relationship between a food or nutrient and health outcomes is complex. Further, the evidence base is mainly observational studies, which bring inherent limitations to understanding the relationships between a food and health outcomes.[31] A food cannot be studied in isolation, without considering the effect of the food replacing it. Observational studies are not able to determine causation and although most observational studies reviewed for this work adjusted for confounders, this inherent limitation is acknowledged. As such only the observed relationship can be reported on for these studies. The available intervention studies are of short duration and unlikely to reflect average eating patterns of the Australian population. Therefore, their findings require careful consideration.

Conclusions

The combined evidence suggests that improving the entire eating pattern, not simply altering one nutrient or food, is required to promote cardiovascular health.

Unprocessed meat and poultry can be consumed as part of a heart healthy eating pattern that includes vegetables, fruits, legumes, wholegrains, fish, olives, seeds, nuts and oils made from them.

The evidence suggests a moderately adverse relationship between unprocessed red meat consumption and cardiovascular disease, suggesting a limit of up to 50 g/day (cooked weight) of unprocessed red meat. The amount of 50 g/day is equivalent to the highest amount reported in the lowest category across observational studies, and the 50 g/day reported in the short-term intervention trials for cardiovascular risk factors (blood pressure and lipid profile). At a practical level, 50 g/day of unprocessed meat would be approximately 350 g per week, across 1-3 meals. Per meal, this would amount to 100-170 g of unprocessed red meat or the equivalent of a small scotch fillet, 2 lamb chops, a medium veal steak, or a medium pork loin steak included 2-3 times per week. Larger amounts of unprocessed red meat, for example mince, leg or shoulder roasts, rump or T-bone steaks can be served in smaller portions across the week, or in a larger portion (<350 g) less frequently (e.g. once per week).

The finding that up to 100 g/day of unprocessed red meat does not remarkably moderate the impact of the DASH or Mediterranean dietary patterns on cardiovascular health does not apply to the general population, as it's not representative of current eating patterns in Australia. This finding should not be interpreted as evidence that unprocessed meat consumption is beneficial for heart health. The conclusion, instead, is that an overall healthy eating pattern may outweigh the potential adverse effects on cardiovascular health of consuming up to 100 g of unprocessed red meat per day.

The evidence suggests a neutral relationship between poultry consumption and cardiovascular disease. This suggests no strong evidence for a maximum limit but should not be interpreted that poultry intake is beneficial to cardiovascular health. Chicken, preferably with the skin removed, can be included in a heart healthy eating pattern, as part of a wide variety of other protein foods (legumes, seafood and fish, eggs, nuts, dairy) across the week.

The emerging evidence for the association between unprocessed red meat consumption and type 2 diabetes is important to note, given T2DM is an independent risk factor for developing cardiovascular disease. This emerging relationship provides added weight to the recommendation to limit unprocessed red meat consumption and to include a wider variety of protein foods in the diet, including legumes, fish, seafood, dairy, eggs and poultry.

The evidence continues to support recommendations to avoid processed meat consumption for cardiovascular health.

Given these conclusions, and the current evidence base in which protective associations are observed for fish, seafood[33] and legumes,[34] and neutral associations for eggs[35] and dairy,[36] the intake of unprocessed meat and poultry should be considered within the broader eating pattern.

Recommendations

Based on the evidence for dietary patterns, unprocessed meats and poultry, and cardiovascular outcomes, the Heart Foundation recommends:

1. Rather than focusing on individual nutrients or foods, we encourage Australians to follow the Heart Foundation's heart-healthy eating principles which includes eating:

   1. Plenty of vegetables, fruits and wholegrains.

   2. A variety of healthy protein sources especially fish and seafood, legumes (such as beans and lentils), nuts and seeds. Smaller amounts of eggs and lean poultry can also be included in a heart healthy diet. If choosing red meat, make sure the meat is lean and limit to 1-3 times a week.

   3. Unflavoured milk, yoghurt and cheese. Those with high blood cholesterol should choose reduced fat varieties.

   4. Healthy fat choices with nuts, seeds, avocados, olives and their oils for cooking.

   5. Herbs and spices to flavour foods, instead of adding salt

   6. Water as the drink of choice.

2. Unprocessed meat and chicken can be included, along with other sources of healthy proteins as part of a healthy eating pattern but preference is for fish and legumes as the beneficial sources of protein.

3. Up to 350 g (cooked weight) per week of unprocessed red meat can be included in a heart healthy eating pattern. If chosen, 1-3 red meat-based meals per week can contribute to healthy meals when eaten with vegetables and wholegrains and when healthy oils are used.

4. Chicken, preferably with the skin removed, can be included in a heart healthy eating pattern, as part of a wide variety of other protein foods (legumes, seafood and fish, eggs, nuts, dairy) across the week.

5. The evidence for unprocessed red meat and poultry does not extend to processed meat products. These foods are consistently linked to adverse health outcomes and are not included in a heart healthy eating pattern. Their intake should be avoided.

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- Members of the Heart Foundation's Nutrition Technical Expert Group

Related documents

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