

FEEDLOT MEAT IN AUSTRALIA: DESIRABLE OR DANGEROUS?

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Abstract

Cattle feedlots are becoming more common around the world, but what are the implications for human nutrition? Studies are finding that lipid profiles of grain-fed meat may be detrimental to cardiovascular health.

Reference

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Keywords

Cattle; Feedlot; Cardiovascular health; Lipid profile; Grain-fed meat.

Background

The current National Health & Medical Research Council Dietary Guidelines for Australian Adults suggest that adults consume red meat three to four times per week. The rationale given for consuming red meats is that they are a valuable source of dietary protein and the best sources of bioavailable iron in the Australian diet.

Red meats also provide substantial amounts of zinc and vitamin B12. The lean varieties contain 2–5 g per 100 g of dietary fat, with almost equal contributions from saturated and monounsaturated fats and a small amount of polyunsaturated fat⁽¹⁾.

Cattle have grazed on pasture since time immemorial. But animal husbandry practices changed in many ways during the 20th century, particularly in regard to the beef industry with the introduction of feedlots over the past 30 years. Feedlots are defined as ‘a confined yard area with watering and feeding facilities where cattle are completely hand fed or mechanically fed for the purpose of production’⁽²⁾.

Feedlots made their first appearance in the USA in the 1920s, but it was not until the 1950s that Australia began experimenting with the concept. In the mid-1960s, commercial feedlotting started on the Darling Downs in Queensland. This industry within an industry was born out of a demand from overseas customers for a specifically tailored, consistently high quality, year-round product.

As of March 2004, there were 575 feedlots in Australia, with the number expected to rise. Most of the cattle being held on feedlots at 31 March 2004 were destined for the Japanese market (which was expected to consume 356,000 head or 53% of available supply). The next biggest market was the domestic market (which was expected to consume around 249,000 head or 37% of available supply)⁽³⁾.

The change from grazing cattle to grain feeding is generally about improving the yield and quality of meat from the cattle, particularly in order to access the lucrative export markets. An advantage of lotfeeding is the ability to produce animals that are uniform in both weight and fat score. This enhances the capacity for forward selling or contracting as a suitable marketing option⁽⁴⁾.

Trans Fatty Acids

In spite of the advantages, research on grain-fed beef from feedlots has uncovered some changes to lipid profiles which may cause concern to naturopaths and nutritionists. The ratio of trans fatty acids (TFAs) to omega-3 fatty acids has been shown in several studies to have altered to favour TFAs, specifically trans-9 18:1 and trans-10 18:1 fatty acids.

It is important to note that TFAs can occur naturally in meat, but normally as trans vaccenic acid or trans-11 18:1 fatty acids that are converted naturally to conjugated linoleic acid (CLA). These TFAs have health benefits for humans and animals⁽⁵⁾. They are found at low levels (generally 2–5% of fat content) in ruminant-based foods such as dairy products and beef, although the level in lamb may be as high as 8%⁽⁶⁾.

In a PubMed search, a number of studies were found that focus on outcomes for taste⁽⁷⁾, fat content or milk production in cattle on feedlots, as well as experimentation with different fats and supplementary types of feed. There have been very few studies that specifically look at the effect of feeding grain to cattle in feedlots in terms of the results for human nutrition.

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However, one study in particular does target this issue, showing a change in type and amount of TFAs. This study sampled meat taken from grass-fed beef, short-term feedlot beef, and long-term feedlot animals. Meat cuts were taken from eighteen cattle from each feeding regimen, trimmed of visible fat and connective tissue and then minced.

The results showed a significantly higher amount of omega-3 and long-chain fatty acids in the grass-fed beef than in either of the grain-fed types. Moreover, only the grass-fed beef reached the target of more than 30 mg of long-chain n-3 fatty acids per 100 g of muscle, as recommended by Food Standards Australia New Zealand, for a food to be considered a source of omega-3 fatty acids. It is worth noting that this study was sponsored by Meat and Livestock Australia⁽⁵⁾.

A more recent study appears to back up some of these findings. Ground beef and strip steaks were collected on three separate occasions from fifteen grass-fed beef producers from various US states, while control samples (grain-fed) were taken from three states on three occasions. Grass-fed beef was found to have a significantly lower content of monounsaturated fatty acids and a greater content of saturated fatty acids, omega-3 fatty acids, CLA, and trans vaccenic acid than did the control samples of grain-fed beef⁽⁸⁾.

A specific study into the use of maize versus grass silage on the effect of fatty acids in dairy milk also showed the same pattern. The authors found that maize silage significantly increased the trans-9 18:1 and trans-10 18:1 fatty acids, while decreasing the trans vaccenic acid. The authors' conclusion was that the high levels of starchy grain were responsible for altering the fatty acid profile of the milk⁽⁹⁾.

The typical Australian feedlot ration contains more than 50% barley and/or sorghum which is balanced with whole cottonseed and protein meals. Some studies added flaxseed, alfalfa and other additives to the feedlot diets resulting in beneficial or limited effects on lipid profiles in milk or meat^(7,10). However, the cost of such additives needs to be assessed against allowing the cattle to feed naturally in pastures.

Animal Welfare

While feedlot animals are generally regulated, and peak bodies have standards for the care of animals, they can be subject to a range of problems that grass-fed animals either do not encounter, or suffer from only marginally. One problem is the prevalence of *Campylobacter* spp., which are important food-borne pathogens. In one study, samples were taken from the rumen and faeces of both pasture-reared cattle and concentrated grain-fed cattle. The results showed a greater presence of *Campylobacter* spp. in the grain-fed cattle, particularly in the lower gastro-intestinal tract⁽¹¹⁾.

Acidosis is another problem faced in managing feedlot cattle, and this can cause mortality if not managed carefully by dietary supplementation and isolation of particular groups of cattle to avoid variations in feed intake. Sudden deaths have been a problem, and death is thought to be the result of interactions between factors including acidosis, bloat, and endotoxemia⁽¹²⁾. The effects of subclinical acidosis in cattle for human consumption do not appear to have been studied.

How Do We Know What We're Eating?

While it is obvious that much more research into this issue is needed, nutritionists can draw some conclusions about the issue of omega-3 versus trans fats in one of our staple protein sources. Meat & Livestock Australia (MLA) has published a fact sheet which claims that Australians eat on average 460 g of red meat each week. This is qualified by further research by MLA which noted that up to one third of Australians eat less than this, from which the conclusion could be drawn that others are eating a greater quantity⁽¹³⁾.

The issue of dietary trans fats promoting inflammatory disease has received a great deal of attention in research and it is of concern that certain animal husbandry practices may be promoting any form of changed lipid profile which may not benefit human health.

Unless a butcher displays a sign that meat is grain-fed, it is impossible under current laws to determine which meat is grass-fed and which is from a feedlot. Food Standards Australia New Zealand oversees food labelling, and their website states that fresh fruit, vegetables, nuts, lentils, beans, fresh meat and fish do not have to have labelling—this includes food packaged in the presence of the customer, for example at a delicatessen or a take-away food shop⁽¹⁴⁾.

Moreover, if the meat is from a feedlot, there is no way of knowing what feed the animal has received without considerable research. The National Livestock Identification System and other traceability provisions do exist within the industry⁽¹⁵⁾, but for the consumer looking at meat in a supermarket, this is an impractical solution in terms of making a decision about what the family eats.

Clearly, much more research needs to be done in this area, particularly focusing on human health, as many studies to date have dealt with rodent or in vitro experiments. Never has the maxim 'You are what you eat' carried such important implications.

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MESSAGE FOR ATMS MEMBERS

CRITERIA TO REMAIN ON HEALTH FUND LISTINGS

In order to remain on health fund listings, a member must be financial, met the CPE requirement and have their current professional indemnity insurance and senior first aid certificates in the ATMS file. Also, the health funds require a valid street address and telephone number, as health funds do not accept a PO Box address.

If a member lapses their ATMS membership, professional indemnity insurance or first aid, and has not met the CPE requirement, the member will lose their health fund provider status. In order to rejoin the fund, it will be necessary to meet the current criteria. As the criteria changes from time to time, a member who met the old criteria may not be able to meet the new requirement.

Therefore, it is essential for members to ensure that their health fund criteria remains current, otherwise it maybe impossible to rejoin the health funds.