Books, Book Reviews, Extracts

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Sheep CRC Update seminars held in eight locations across Australia between February and May 2010 provided a valuable summary of progress achieved by the Sheep CRC and our Participants in our first three years of operation. The Sheep CRC publication '2010 Sheep Focus' captures key messages and results presented in the seminars in a form that provides an easy reference document. It should be cited as:

Sheep CRC/David Pethick – *2010 Sheep Focus – Prime Lamb Production*

PRIME LAMB PRODUCTION

Tender, nutritious & high yielding lambs

Photo: Sheep CRC

Professor David Pethick, Program Leader, Meat

The Sheep CRC is working on meat traits to help position lamb as a premier meat that is highly valued by consumers. Key factors are lamb's lean meat yield, eating quality and nutritional value.

Lean meat yield (the amount of saleable meat as a proportion of the carcase weight) is very important for profitability, as leaner carcases are more efficient to produce on-farm, and in abattoirs require less of the wasteful and costly fat trimming. It is also important for consumer satisfaction, as people prefer to eat meat, not bone and fat.

However, increasing lean meat yield in other animal industries has shown that its increase can have detrimental effects on eating quality and nutritive value.

The Sheep CRC is using its Information Nucleus flocks to measure new meat traits and identify the relationships between traits and their management.

Consumers desire meat that is lean, tender, juicy and flavoursome as well as having good nutritive value with iron, zinc and essential omega-3 fatty acids. So how does lamb stack up against beef and chicken?

Despite 80% of families agreeing that 'Lamb is loved by Australians' (compared to beef at 65% and chicken at 53%), only about half as many lamb meals are served compared to chicken or beef (MLA survey* 2005).

Mums also rated lamb similar to beef and better than chicken for being 'normally juicy and tender', but chicken clearly outranked both lamb and beef on

Photo: Deb Maxwell

ABOVE: Prime lambs with higher lean meat yield are more profitable for the entire supply chain.

* Meat and Livestock Australia (2005) *Marketing Australian red meat in Australia and around the globe.*

Photo: Industry & Investment NSW

ABOVE: Edwina Toohey, Industry & Investment NSW, testing a carcase

the perception that they 'make healthy meals'. Beef was more strongly believed to contain a 'wide range of vitamins and minerals' than either lamb or chicken.

A final point from the survey that illustrates why lamb is served less is its cost, with 58% considering lamb 'expensive' compared to 46% for beef and only 19% for chicken. Unfortunately, lamb is expensive. Take a typical Trim Lamb Rack at about $38/kg; once it is boned out to leave only the lean meat, the price is really $56/kg for what is actually eaten. Therefore, it is vital that for lamb to maintain its market position and price, consumers must be made aware that lamb not only tastes great, it is also good for them.

To assist, the Sheep CRC is measuring many new and traditional meat traits (from its Information Nucleus flocks), including skin traits, pH, fresh colour, tenderness (shear force and connective tissue), muscle fat phenotypes (omega-3 and intramuscular fat), Meat Standards Australia (MSA) consumer eating quality, and iron and zinc. The results of the research will be available via new ASBVs and indexes from Sheep Genetics combined with the management knowledge to improve trait performance.

Selecting and breeding for improved meat traits is successful because they are heritable.

Fat depth, hot carcase weight, dressing percentage, intramuscular fat and tenderness are highly heritable, while lean meat yield, eye muscle depth and growth are moderately heritable.

The king of traits in prime lambs is growth, providing more weight for age, earlier turnoff, more valuable feeder lambs and greater feed efficiency. Growth can be identified by looking for a higher post weaning weight (PWWT) ASBV, which is often related to higher hot carcase weights in all breeds. However, as higher PWWT can also be associated with higher birth weights (which can lead to more lambing difficulties) ram buyers should also look for a moderate birth weight (BWT) and high lambing ease (LE) ASBVs.

Less fat will also increase lean meat yield and the amount of fat boned from a carcase is closely related to GR fat depth (the depth of fat under the skin, over the 12th rib, 110 mm from the back midline). Fat is wasteful for all with little return for the processor, extra labour to trim off fat and extra feed cost to the producer.

The key to growing lamb carcases with a high lean meat yield is firstly higher PWWT to get large animals, combined with moderate to lower post weaning fat depth (PFAT)—this is especially important to reduce the carcase fat. Also, increase post weaning eye muscle depth (PEMD) to increase the size of the most valuable loin muscle cuts. These trait combinations are well managed using the LAMBPLAN indexes—Carcase Plus and the newer 2020 index.

Unfortunately, increasing lean meat yield has a tendency to decrease intramuscular fat, which reduces juiciness, tenderness and flavour. However, the relationship between these traits is far from complete, so producers will be able to identify and select animals with higher lean meat yield as well as higher intramuscular fat. Such outcomes have indeed been delivered in the beef industry by forward looking seedstock producers.

ASBVs are now also being calculated for dressing percentage (DR% is the proportion of carcase weight to live weight). Dressing percentage has a high heritability and value; every 1% increase in DR% equals about $2 more per carcase (assuming 1% = 480 g hot carcase weight @ $4.50/kg and 48 kg live weight). These animals also tend to be heavier, with more muscle.

To maintain and improve tenderness and eating quality, producers should ensure lambs are well finished at high growth rates.

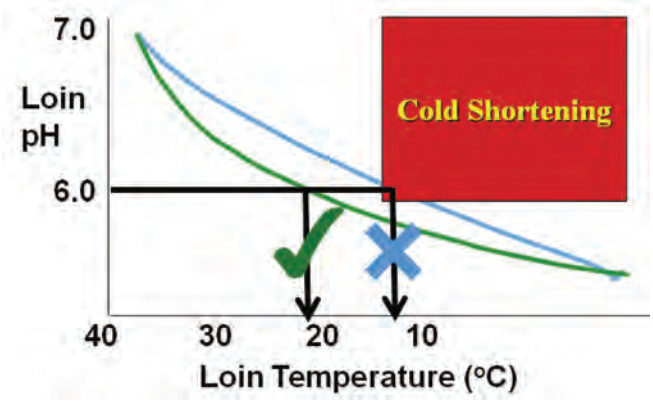
Merinos should be growing at least 150g/hd/day and practices and handling should minimise stress. Processors need to use an appropriate electrical stimulation system if they are to avoid cold shortening in the majority of carcases, with the aim being a slower rate of carcase temperature drop after slaughter to reach a pH of 6.0 at 20°C.

When lamb carcases from the Sheep CRC were processed through a number of abattoirs, the need for electrical stimulation systems to be correctly set was highlighted. It reinforced the need to manage and audit abattoirs, which is best undertaken by joining the Meat Standards Australia (MSA) Lamb system. Collaborating abattoirs are now operating well and some will adopt MSA systems.

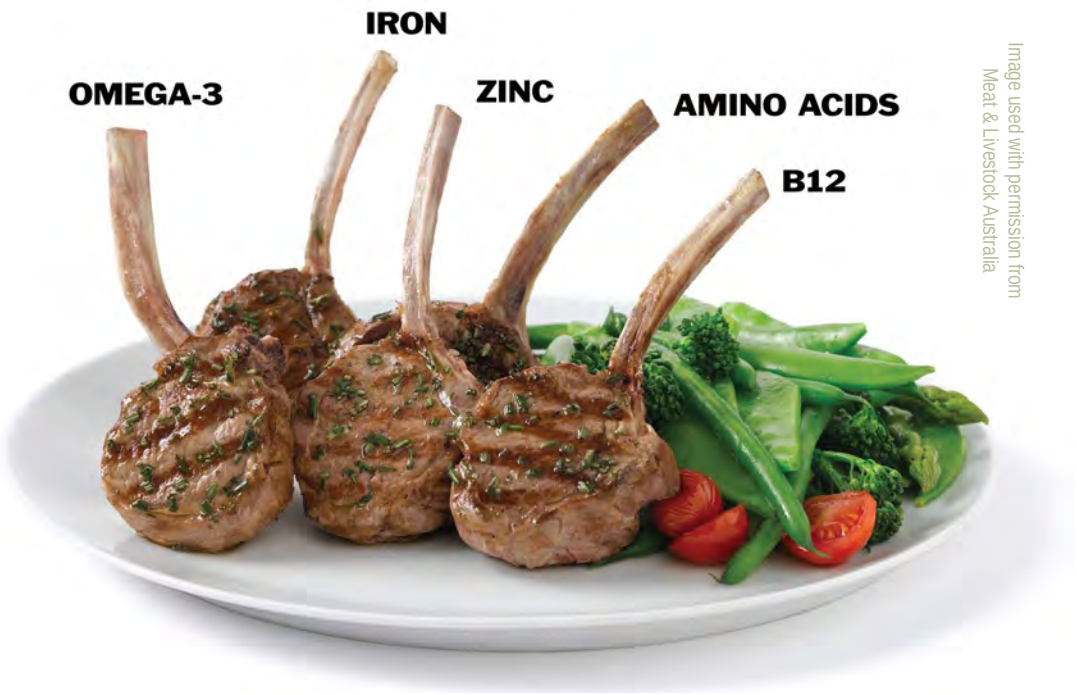
With consumers' increasing demands for healthy foods, Meat & Livestock Australia has been running campaigns to highlight the nutritive value of lamb. Australian lamb must meet the health claims and take care not to decrease nutritive values while increasing lean meat yield.

Nutritionists allow a food to be claimed as a 'source' of a nutrient if a standard serve (135g for meat) supplies 10% of the recommended daily intake. It can be a 'good source' if it supplies 25%. The old (and limited) data states that lamb is a good source of both zinc and iron (with iron just above the claim level), whereas both pork and chicken are low in both zinc and iron.

Source: *Improving lamb & sheepmeat eating quality, a technical guide for the Australian sheepmeat supply chain*, 2003, Meat & Livestock Australia



ABOVE: Carcases that chill too fast can become tough



ABOVE: Lamb is a source of essential nutrients

Sheep CRC's very extensive and recent data shows Merinos always meet the good source claim for iron (as Merinos are older when slaughtered and have accumulated more iron). Terminal and maternal crosses reach the claim level 91% of the time, though they always achieve suitable zinc levels. For these breeds it may be possible to use genetics to prevent a decline in iron levels, as both iron and zinc levels are moderately heritable. Early indications suggest that sires that are extreme for PEMD are also low for iron, however data from subsequent Information Nucleus flock slaughters is needed to confirm this tendency.

Fatty acids are another nutrient essential for life and the beneficial n-3 and n-6 omega-3 fatty acids are found in lamb. On average, lamb can be claimed as a source of these omega-3s, but there are many lambs under the claim level, especially if finished on grain without green feed, as the chloroplasts in green feed help to make these fatty acids. Again, genetics may be a possible solution as sire effects have been isolated.

The lamb industry is in a great position to design lamb to be the 'premier meat on the planet', with the new ASBVs soon to be released. While lean meat yield is very important, it must be balanced against eating quality and nutritive value when choosing sires.

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