

## Taking the mutton out of lamb

### Key points

- Mutton and some lamb can have a distinctive mutton odour and flavour that is unattractive to consumers.
- This odour is caused by branched chain fatty acids.
- Reducing the levels of branch chain fatty acids will increase appeal to consumers.
- Substitution of mutton for lamb occurs and detracts from the reputation of lamb as a quality product.
- Managing nutrition and genetics has the potential to reduce these fatty acids in sheep.

### Introduction

The lamb roast is a favourite meal for many Australian households. However, some lamb and mutton meat can have a distinctive odour during cooking that is not well liked by some consumers both in Australia and Asia.

### What causes the odour?

Branched chain fatty acids have been identified as culprits responsible for the “sheepy” or “muttony” odour and flavour in some sheep meat, which is not attractive to consumers. These fatty acids increase in concentration as the animal matures.



*Figure 1. Eruption of the first adult incisors is used by industry to indicate the change from lamb to mutton.*

### How does odour affect market opportunities?

The Asian consumer is more sensitive to cooking odours associated with branched chain fatty acids and therefore there are opportunities for expanding the Asian market of lamb and sheep meat if the odours can be reduced or eliminated. Current research indicates that high levels of branched chain fatty acids are conservatively estimated to be in 5 percent of lamb and approximately 30 percent of mutton. An increase of 15 percent of sheepmeat exports into Asia translates into \$9.4 million for the sheepmeat industry.

### How can odour be reduced?

Meat odour does not simply become apparent when a lamb cuts its teeth to become a sheep. There is a gradual increase in the amount of branched chain fatty acids in the meat with age, reaching a level (generally 14–24 months of age and above) where many consumers find the resulting meat odours unacceptable. The specific timing will vary depending on breed, gender and nutrition.

Younger animals and ewes generally have fewer branched chain fatty acids. Research that assessed Merinos, Poll Dorsets, Border Leicesters and their crosses found that the Merino x Poll Dorset sheep had higher levels than the other first- and second-crosses.

High-starch cereal grains in feedlot diets can increase levels of branched chain fatty acids and soft fat, however inclusion of approximately 20 percent roughage can reduce the problems associated with the soft fat syndrome, levels of branched chain fatty acids and associated odour issues.

Understanding these concepts will aid in the development of specific strategies for the production of sheep meat with lower levels of branched chain fatty acids, subsequently increasing consumer demand. With appropriate breeding and nutritional management these fatty acids may be minimised in animals of up to two years of age.

A test for the detection of these fatty acids has been developed. Currently, work is underway to investigate whether this test can be used to differentiate between lamb and mutton meat. The dishonest substitution of mutton for lamb can result in poor perceptions of lamb, and hence less repeat purchases, as mutton is generally regarded as inferior in not only smell, but taste and tenderness. Therefore, such a test is hoped to be used to identify lamb cheats and reduce substitution.

### Take home messages

- The ability of a test to identify branched chain fatty acids may be a solution to identify mutton substitution for lamb.
- Current management practices that can reduce branched chain fatty acids are restricted to turning off animals at an earlier age and ensuring feedlot diets include 20 percent roughage.
- Further investigation of genetic and management strategies to reduce branched chain fatty acids is occurring.

### Further information

For further information visit: <http://www.sheepcrc.org.au>

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