

QUALITY SHEEP MEAT—ACHIEVING A BRILLIANT FINISH TO YOUR LAMBS

Lamb finishing strategies and curfew management can affect producer returns, carcass traits and meat quality.

Vitamin E supplements for two to four weeks prior to slaughter can improve shelf life.

Magnesium oxide supplements for only four days prior to slaughter can reduce the effects of stress on glycogen reserves and may be particularly useful when finishing Merino lambs.

Feeding high quality diets for 14 days pre-slaughter to ensure weight gain can improve meat qualities such as juiciness and tenderness.

Curfew periods should not exceed 24 hours.

Ensuring lambs have access to and experience with water troughs will help reduce carcass weight loss.

Total time off feed prior to slaughter should not exceed 48 hours.

Introduction

Building year round demand for lamb meat requires that consumer acceptance is addressed. The finishing and curfew strategies that you choose can influence carcass traits and the meat quality of your lambs. Optimizing management of the finishing and curfew periods is important for lamb meat value and returns.

How can changes to the finishing diet influence meat quality?

The diet of a lamb has an important influence on meat quality and consumer acceptance. Often only short feeding periods are required to remedy a dietary deficiency that might have occurred under paddock conditions. Feeding supplements late in the finishing period is often all that is required to improve consumer acceptance.



Energy

Lambs need to be growing during the finishing period. This ensures that energy intake is sufficient to keep muscle glycogen reserves at a level that is adequate for premium meat quality. If lambs are losing weight in the paddock, then muscle glycogen reserves can be boosted by feeding a good quality diet for about 14 days prior to slaughter.

A diet with an energy level of 10 to 11MJ/kg (Megajoules per kilogram of Dry Matter) is sufficient to boost muscle glycogen concentration when fed ad libitum. Excessively high energy diets, particularly those that contain high levels of wheat, may cause lambs to scour and the meat to have off flavours and soft fat. Scouring can cause soiling of skins in the feedlot and during transport. These factors should be considered, as well as growth rate, when formulating feedlot ration.

Roughage

If lambs have been scouring when grazing green pasture, feeding hay just prior to consignment can improve faecal consistency and reduce food safety risks. This can be done prior to curfew but should be

restricted to a maximum period of two days. Feeding high roughage diets for longer than two days can lead to weight loss, low muscle glycogen concentrations and reductions in meat eating quality. Ideally, lambs should be growing at the time of slaughter. High roughage diets can reduce dressing percentage and increase effluent output from traveling livestock. Lambs eating highly digestible feedlot type diets tend to produce less effluent during transport.

Reducing carcass fat

Restricting feed intake and quality to reduce fat and achieve a lower fat score is not recommended during the finishing period. Eating quality can be reduced, in particular the juiciness of the lamb meat when applied for a period of 10 days or more before slaughter. Figure 1 shows the difference in juiciness of lambs fed different diets pre-slaughter. Lambs fed straw were less juicy than lambs fed diets adequate in energy.

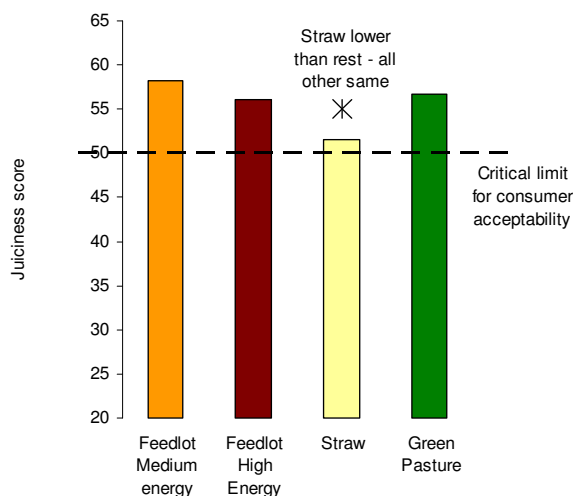


Figure 1 The effect of finishing diet on lamb meat juiciness

Feed additives

Magnesium oxide

Stress during the transport and lairage period can cause a reduction in muscle glycogen concentration and predispose lambs to tough, dark cutting meat. This is particularly so for Merino lambs but less important for crossbred lambs. Whilst rations are rarely deficient in magnesium, addition of magnesium oxide to the finishing ration can help reduce the effect of stress on muscle glycogen reserves. However, this is not an alternative to, and should not be substituted for, good feed and management of lambs. The recommended rate of addition of magnesium oxide to finishing rations is 1%. This should be added for four days only prior to slaughter. The value of this effect will be reduced if magnesium is fed for longer than this period of time.

Vitamin E

In southern Australia dry feed is often deficient in vitamin E and meat from lambs finished in the summer and autumn period can have reduced shelf life as a result. For lambs finished under dry feed conditions that have not been supplemented previously, the addition of vitamin E to the ration will restore meat vitamin E concentration to a level that is adequate for good shelf life. The recommended feeding rate for this is 250ppm for the last 2 to 4 weeks prior to slaughter. As well as improving shelf life, vitamin E supplementation causes meat to be lighter in colour, measured as a higher L value (Figure 2). Light meat tends to be more visually attractive to consumers than dark meat.

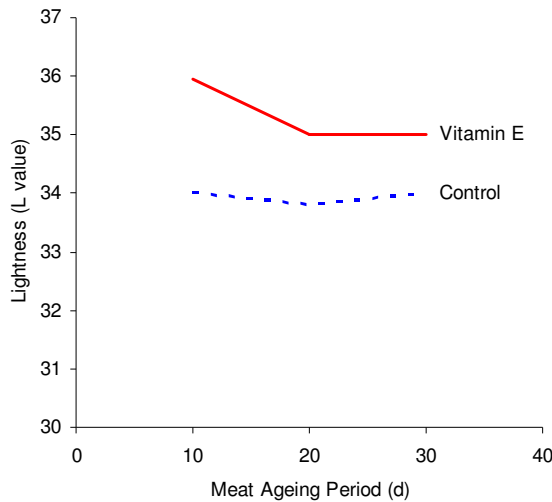


Figure 2. The effect of vitamin E supplementation on lightness (L value) of meat colour (meat packed in carbon dioxide and not electrically stimulated)

Salt and electrolytes

Using salt (sodium chloride) or electrolytes to rehydrate lambs or increase glycogen levels pre-slaughter is not recommended. High salt intake increases urine production, which causes soiling during transport. Experiments with commercial electrolyte replacement products during the curfew transport or lairage periods have failed to demonstrate any clear advantage.

Curfew management

The curfew period is the period on farm where the animals are off food and water prior to transport to reduce the risk of soiling. Delivering lambs that are clean at the time of slaughter is an important food safety requirement. However, care needs to be taken to ensure that food safety considerations do not adversely affect animal welfare, meat yield and meat quality.

Time off feed

Fasting is important for reducing gut contents prior to transport and slaughter. Soiling on trucks is both a food safety and an environmental issue. However, research has shown that most of the reduction in gut contents occurs within the first 24 hours of a fasting period. Little further benefit is gained by extending the fasting period beyond 24 hours.

Fasting reduces carcass weight and fat score, so curfew should be kept as short as practicable. Extending the curfew period to 48 hours can reduce carcass weight by up to 0.5 kg for a 20 kg lamb carcass (depending on fat score and other factors). The cost of this loss to the producer is \$1.50 per lamb when the carcass value is \$3.00 per kg. Total time off feed prior to slaughter should not exceed 48 hours regardless of the pathway.

Water troughs

Dehydration can also reduce carcass weight. Studies have shown that lambs sometimes fail to drink even when water is made available in lairage yards. If they do not drink after transport they will be dehydrated at slaughter. Dehydration will reduce carcass weight and can cause meat to appear darker in colour, and less appealing to the consumer. Providing lambs with water troughs during the finishing period is a way of educating them about the source of water in lairage yards.

Shearing

MSA guidelines recommend that lambs should have greater than 5mm of wool at the time of slaughter.

Take home messages

Lamb finishing strategies and curfew management can affect producer returns and lamb meat quality. Cheap, short term supplementation with Vitamin E and Magnesium Oxide can improve shelf life and meat quality.

Feeding high quality diets for 14 days prior to slaughter can improve juiciness and tenderness.

Curfew periods should not exceed 24 hours and ensuring lambs have access and experience with trough water will help reduce carcase weight loss.

Total time off feed should not exceed 48 hours

Further information

For further information on shearing and time off feed the Tips and Tools: MSA Requirements for Handling Sheep can be found at:

<http://www.mla.com.au/TopicHierarchy/InformationCentre/TipsandTools/MSA/default.htm>

Contacts are:

Dr Robin Jacob, Department of Agriculture and Food, Western Australia on 08 9368 3470, e-mail rjacob@agric.wa.gov.au, or

Dr Graham Gardner, Murdoch University on 08 9360 2264, e-mail g.gardner@murdoch.edu.au

This is one of a series of Practical Wisdom notes available from the Sheep CRC aimed at improving the quality of Australian sheep meat. Other titles discuss a wide range of innovations and improvements that industry can profitably adopt. These can be found at the Sheep CRC website www.sheepcrc.org.au

Acknowledgements

This research was funded jointly by the Sheep CRC and Meat and Livestock Australia.



PW 2007 007
May 30, 2008
© Sheep CRC Ltd
