TIPS & TOOLS

MEAT STANDARDS AUSTRALIA

MSA requirements for handling cattle

How you handle your cattle affects their eating quality

An important element contributing to predictable eating quality performance is the management of cattle on farm or in the feedlot prior to slaughter. For this reason MSA has produced guidelines to optimise the eating quality potential of the animal.

The long period of care and investment in producing an animal with high eating quality potential is most at risk in the two weeks pre-slaughter and the first few hours post-slaughter. The best meat cuts can be reduced to a low quality, unacceptable product by inappropriate action in this period.

The reduction in eating quality is caused by a reduction in glycogen levels. Glycogen is the predominant storage form of glucose and carbohydrates in animals and humans, and in essence, is the energy reserve of a muscle. The muscle glycogen level is increased by feeding (a process taking days) and rapidly reduced by stress (which may only take minutes) or activity in the live animal. At the point of slaughter, the glycogen is converted to lactic acid that steadily decreases the pH of the muscle.

Handling and good feed is important

The production of MSA graded product is consequently a partnership between the producer and the processor. A processor cannot rectify poor cattle handling practices or nutritional problems. Cattle should be mustered as quietly as possible, as it can take up to 14 days for the muscle glycogen levels to be restored, once they have been depleted. To maximise glycogen levels, and consequently eating quality, it is recommended that cattle are on an increasing plane of nutrition for at least 30 days prior to dispatch.

Key points

Cattle dispatched for slaughter must meet with the following requirements:

- All cattle must reside on the property of dispatch for a minimum of 30 days prior to dispatch.
- Do not consign male cattle exhibiting secondary sexual characteristics.
- Do not consign any cattle of poor temperament or with signs of severe stress.
- Do not consign cattle that have been severely sick or injured.
- Direct consignment cattle must be processed within 48 hours from dispatch to slaughter, with a maximum of 36 hours in road transport, which can also include a rest period of up to 12 hours.
- Cattle transported by sea or rail are processed no later than day after dispatch.
- Cattle sold through an MSA accredited saleyard to be processed within 48 hours of dispatch from farm.

To optimise the eating quality of beef, the following recommendations should be observed:

- Cattle should be managed as a single mob for a minimum of 14 days prior to dispatch for slaughter, this includes no mixing or drafting.
- Cattle should be continually grazed or fed rations to a level that is adequate for growth (at least 0.8kg/hd/day) for a minimum of 30 days prior to dispatch.
- Handle and muster animals quietly to reduce stress.
- Cattle to have access to water outside of transport.
- Provide free access to feed until dispatch, other than a minimum period required for preparation.
- Load cattle quietly, preferably with no use of goads and electric prodders.
- Load cattle at the recommended densities set out in the trucking industry code of practice.

Temperament is also important

Temperament is also an important issue, with work in the United States by Dr Temple Grandin demonstrating that calm cattle show a reduced incidence of dark cutting, defined as carcases with an ultimate pH above 5.70. Cattle with poor temperament can lose more glycogen during the period leading up to slaughter. These cattle also have the tendency to increase stress levels of other cattle in the pen, which can lead to a higher overall incidence in dark cutting meat and high pH carcases.

The benefits of recommended sound practices however are much broader and deserve inclusion in professional property and herd management.

Impact of climate

Other stress factors such as weather should be taken into account when planning mustering and transport to maintain highest standards of animal welfare and minimise risk to eating quality. Dramatic changes in temperature and severe weather conditions can also affect cattle in the lead up to slaughter. Heat stress, cold snaps and wind chill as well as severe rainfall events can impact feed intake in the two weeks prior to slaughter, affecting glycogen levels. Weather can also cause undue stress to animal during transportation and while in lairage.

Damage is irreversible

Once the animal has been slaughtered, pH fall in the carcase is irreversible and continues post rigor mortis to a final value, known as ultimate pH, generally within 24 hours of slaughter, depending on the conditions. The optimum ultimate pH is below 5.71.

Where live animal glycogen levels are very low at slaughter a higher ultimate pH results, which may be accompanied by a dark meat colour. This is referred to as dark cutting and is a major industry problem. Extensive consumer research has shown that meat colour itself has no impact on eating quality and has been removed from the MSA model. Due to visual appeal, it is still often used as a company specification when carcases are graded.

Processors have an important role

In addition to ultimate pH, the rate of pH decline (from around 7.10 at slaughter) in relation to muscle temperature, is of critical importance to eating quality. If the temperature fall is rapid and the pH fall slow, carcases will cold shorten, resulting in extremely tough meat. If the pH fall is rapid and the temperature fall slow, heat toughening results. This also creates slightly tougher and less juicy beef, excessive drip loss and lack of improvement with ageing. The processor has a responsibility to monitor this process. Further information about the rate of pH decline can be found in the *Tips & Tools – The effect of pH-temperature decline on beef eating quality.*

Processing time requirements

In addition to on farm responsibilities, there are processing time frames for MSA cattle.

For direct consignment cattle (road transport):

Slaughter within 48 hours from the property of dispatch providing the following requirements are met;

a. The total truck transport time from property dispatch to arrival at the abattoir is not to exceed 36 hours;

b. Up to a 12 hour rest period can occur during this 36-hour period, however, if a 12-hour rest period is taken then the maximum time cattle can spend on a truck is 24 hours; and

c. This pathway allows for up to 12 hours in lairage prior to slaughter.

For direct consignment cattle (sea or rail transport):

Slaughter no later than the day after dispatch from the property.

For saleyard cattle:

Slaughter within 48 hours of dispatch from property.

Further information
Visit mla.com.au/msa or
contact MSA 1800 111 672

MEAT & LIVESTOCK AUSTRALIA

**Level 1, 40 Mount Street,
North Sydney NSW 2060
P: 1800 023 100
mla.com.au**

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