

# Good practice can reduce dark cutting for better meat quality and higher returns

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## FACTSHEET 1

'Dark cutting' describes meat of inferior quality which is dark in colour and often firm and dry. Dark cutting can be prevented by implementing good practices; the like of which are often required under conformance or quality management programs.

### Key points

- Dark cutting meat is lower quality and costs millions in downgrades or waste.
- Dark cutting is predominately caused by low muscle sugar (glycogen) at the time of slaughter.
- On-farm, the risk of dark cutting can be reduced through good nutrition and handling.
- At the abattoir, the risk can also be reduced through good handling and management.
- Good practices, such as those required under conformance or quality management programs can help reduce dark cutting.

### Causes of dark cutting

- Stress created by poor handling and activities such as the inappropriate use of electric prodders.
- Poor handling facilities which cause stress or injury.
- Poor holding or lairage conditions, including design.
- Poor nutrition, including limited access to quality feed and clean water.
- Mixing with incompatible animals or isolation.
- Pre-slaughter washing.
- Excessive physical activity.

## Why dark cutting is an issue

Dark cutting meat, which often presents as dark, firm and dry, is of an inferior quality compared with bright cherry red meat because it:

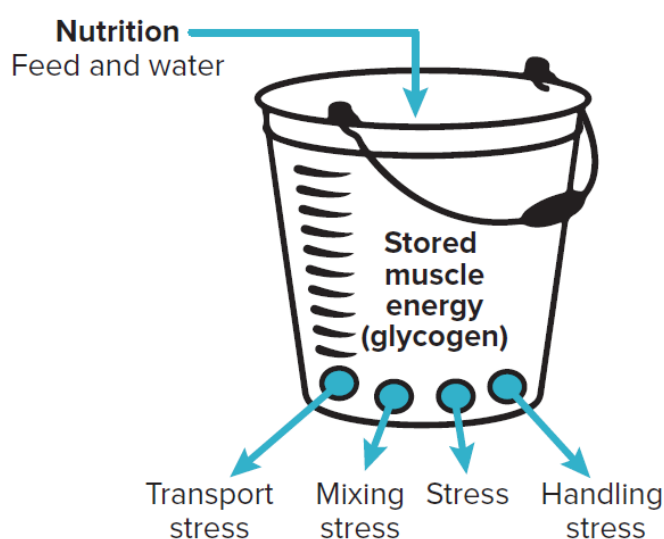
- Is drier than other meat due to an increased water holding capacity.
- Has a higher pH which creates favourable conditions for microbial growth, resulting in reduced shelf life and increased spoilage.
- Doesn't cook at the same rate as non-dark cutting meat, giving dark cutting steaks different degrees of doneness when cooked to the same internal temperature.
- Presents with a darker colour which is often discriminated against by consumers who prefer to buy bright cherry-red coloured meat.
- Has variable tenderness, with consumers perceiving dark cutting meat to be 'tough'.

## How dark cutting occurs

Glycogen is metabolised within muscles post-mortem to produce lactate and hydrogen ions. The formation of lactate lowers the pH of the muscle from a pH of around 7, which is standard in a living animal, down to a pH of around 5.4 to 5.7 within 24 hours.

If there is insufficient glycogen stored within the muscle at slaughter, there is limited formation of lactate resulting in a high pH and dark meat. Therefore it is essential to maintain high levels of muscle glycogen prior to and at slaughter.

### Factors causing glycogen loss



*The process of dark cutting*

Muscle glycogen is muscle energy. Both muscle contraction (physical stress) and adrenaline (emotional stress) need to be minimised on-farm prior to slaughter and during lairage to reduce the consumption of glycogen during the pre-slaughter period in order to reduce the incidence of dark cutting.

## Five practices which reduce dark cutting

There are five practices which help reduce the incidence of dark cutting:

1. Ensure all animals are handled quietly and calmly at all times, including during transport.
2. Reduce stress and exposure to new environments.
3. Ensure access to quality feed and clean water in the lead up to slaughter.
4. Never mix groups of different animals in the 14 days prior to slaughter even if they are from the same property.
5. Minimise the time in lairage.

### Dark cutting meat can be prevented – and it's worth it!

The implementation of well considered operating procedures to improve the management, handling, welfare, nutrition and care of animals can greatly reduce the incidence of dark cutting and improve meat quality. Other benefits such as reduced bruising and weight loss, reduced carcass shrink and increased yield can also occur when good practices are implemented that reduce the incidence of dark cutting.



## Good practices required by conformance or quality management programs to reduce dark cutting and deliver higher returns

While lairage and pre-slaughter practices vary from abattoir to abattoir, the principles of good management remain the same. These principles promote good animal welfare and optimise meat quality. It is recommended that a conformance or quality management program which aims to eliminate stress be actively adopted in your operation. Such programs formally address the following practices:

### Livestock handling

- DO ensure all handling from paddock to slaughter is undertaken by skilled handlers with animals handled as quietly as possible.
- DO use appropriate aides to livestock talkers to assist when moving animals.
- DO ensure livestock avoid vigorous physical activity such as mounting behaviour, running, fighting and excessive handling.

- DO minimise the occurrence of slipping and falling through calm handling practices and well-designed facilities.
- DO NOT use electric prodders.

### **Transport management**

- DO use transport companies with drivers trained and skilled in transporting livestock.
- DO load livestock based on recommended trucking densities.
- DO minimise unnecessary stops and delays in transport.
- DO unload in the shortest possible time.
- DO NOT transport livestock during extreme weather events like heat waves, storms or freezing weather.

### **Lairage management**

- DO assign animals to a lairage pen
- DO supply clean, fresh drinking water.
- DO assign pens which are far from the unloading area and busy laneways to at risk animals.
- DO provide non-slip, well drained surfaces and ensure animals have access to shelter.
- DO provide feed (good quality hay or pellets) to animals held in lairage for long periods (>24hrs).
- DO minimise time in lairage in order to minimise total time from dispatch to slaughter.
- DO NOT move animals from their assigned pens until they are required for slaughter.
- DO NOT mix groups of unfamiliar animals.

### **Assembly for slaughter**

- DO use well designed yards.
- DO eliminate all unnecessary procedures (such as weighing, clipping, washing and hosing) unless codes of practice necessitate their use.
- DO ensure animals are not left in the force pen or race for excessive amounts of time nor left on their own for any amount of time.

### **Source the correct animals**

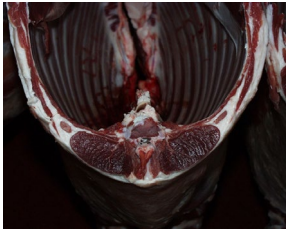
- DO procure animals gaining weight in the weeks prior to slaughter: CATTLE: more than 0.7kg per day, SHEEP: more than 150g per day.
- DO procure animals directly consigned from a property or to slaughter to minimise the number of 'new' environments prior to slaughter
- DO draft animals for slaughter at least three weeks prior to slaughter to allow the re-establishment of social hierarchy.
- DO procure yard weaned or feedlot finished livestock so they are well adapted to human contact and changes in environment.
- DO NOT procure heifers in oestrus due to changes in behaviour.

## Benefits of good practice

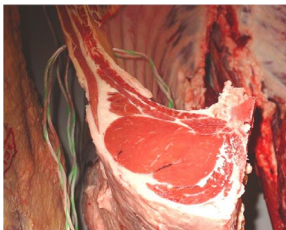
Dark cutting meat usually incurs a discount to cherry red meat in the market place. If this discount is known as well as the percentage of dark cutting carcasses, the daily cost of dark cutting can be estimated. For example, if 250 cattle are slaughtered each day and 25% of these are dark cutting with an average carcass weight of 185kg and a dark cutting discount of AUD 80c/kg.

= 250 x 25% x 185kg x AUD 80c/kg

= AUD \$9,250 per day in discounts due to dark cutting



*Minimising dark cutting through good practices improves meat quality and reduces wastage*  
Photo: Murdoch University



**Minimising dark cutting is simple**  
Ensure muscle glycogen on-farm is high (**provide good nutrition**) and minimise muscle glycogen losses pre-slaughter (**minimise stress and exercise**).

## Further reading

- *Factsheet 2: Good practice can reduce stress and improve eating quality*
- *Factsheet 3: Good practice can reduce acute stress and water loss from meat*
- *Factsheet 4: Good practice can reduce bruising resulting in less trimming and less carcass wastage*
- *Factsheet 5: Good practice delivers benefits from improved infrastructure*
- *Factsheet 6: Good practice can reduce animal stress and shrinkage for increased profits*
- *Factsheet 7: Good practice in the provision of quality feed and clean fresh water can improve growth rates and eating quality*
- *Factsheet 8: Good practice in reducing slipping and falling can improve hide cleanliness and carcass hygiene*
- *Factsheet 9: Good practice avoids mixing unfamiliar livestock which can reduce stress and improve eating quality*
- *Factsheet 10: Good practice in traceability delivers health and safety control and improves management decisions*
- *Factsheet 11: Good practice reinforced through training*
- *Factsheet 12: Support and training in good practice*

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