

Good practice can reduce animal stress and shrinkage for increased profits

FACTSHEET 6

Animal stress is one of the major causes of shrinkage. Good practices required by conformance and quality management programs can reduce shrinkage by addressing the main causes of animal stress.

Key points

- Shrinkage is the amount of weight an animal loses between leaving the property of origin and slaughter.
- Stresses such as transport, sorting, weighing and standing for long periods all contribute to shrinkage.
- Shrinkage can be in either excretory or tissue form.
- Loss of weight due to shrinkage translates directly to reduced income.
- Following the practices prescribed by a conformance or quality management program can significantly reduce shrinkage and increase returns.

Why shrinkage is an issue

Shrinkage is the amount of weight an animal loses between leaving the property of origin and slaughter. Shrinkage occurs in two forms: **excretory shrinkage** and **tissue shrinkage**. As shrinkage increases, net returns decrease. This loss can be minimised by understanding how shrinkage occurs and what causes it and by following conformance or quality management program practices and marketing strategies that help reduce shrinkage.

- **Excretory shrinkage**
Excretory shrinkage is the loss of contents from the rumen, digestive tract and bladder. A degree of this type of shrinkage will occur during the first few hours of transport, or when cattle are taken off food and water and is unavoidable during the pre-slaughter period. Small amounts of excretory shrinkage do not harm animals. Acceptable levels of excretory shrinkage are from two to six per cent of initial live weight. Livestock usually recover quickly from excretory shrinkage once provided with rest, food and water.

- **Tissue shrinkage**

Tissue shrinkage occurs when the rumen, digestive tract and bladder are empty and the animal is dehydrated. Animals will then start compensating for the loss by drawing moisture and nutrients from tissues (muscle and fat). Tissue shrinkage can occur as a result of extensive sorting, standing, trucking or when cattle are held off feed and water for long periods of time (>12 hours). Tissue shrinkage causes:

- 1) A detrimental effect on the immediate health of ruminants. After 24 hours off feed and water, rumen microbes die resulting in animals not able to digest feed and a long recovery to pre-handling weights. This recovery period can be from 3-30 days.
- 2) Lower carcass weights and lower dressing percentages. The loss of water from fat and muscle tissue during the pre-slaughter period causes carcasses to be lighter, reducing the quantity of product that can be sold and impacting net profits.

When animals are exposed to stress, both excretory and tissue shrinkage starts to occur at the same time. Combined shrinkage of over 6% is preventable and costly.

Factors that impact shrinkage

Many factors impact the degree of shrinkage that livestock may experience including:

- **Time-off-feed:** Longer periods of time-off-feed will increase excretory and tissue shrinkage.
- **Feed type:** The type of feed consumed will affect the rate and amount of shrinkage. There is a negative relationship between high moisture feeds (green grass) and excretory shrinkage. Sudden changes in diet can also influence the amount of excretory shrinkage.
- **Time-off-water:** The time-off-water will impact on the hydration and bladder fill of the animals. Hence longer time-off-water will increase excretory and tissue shrinkage
- **Age:** The age of the animal has a direct relation to the percentage of body weight that will be lost due to shrinkage. Young animals are most susceptible to shrinkage due to possible reliance on milk, rumens still developing and their naivety to new surroundings leading to stress.
- **Weight:** Heavier lambs shrink more but heavier cattle shrink less.
- **Weather:** Extremely high or low temperatures will cause stress and shrinkage.
- **Facilities:** Good facilities for handling livestock will reduce stress and shrinkage in livestock.
- **Animal handling:** Quiet and calm animal handling reduces animal stress and physical activity helping to reduce shrinkage.
- **Loading and unloading:** Loading and unloading are stressful. Loading and unloading quietly and calmly as well as avoiding overloading trucks help reduce shrinkage.
- **Mixing:** Stress and increased physical activity is caused when animals are grouped together with unfamiliar animals, leading to increased shrinkage.
- **Transit time:** Transit time and the duration of stationary confinement should be minimised to limit animal shrinkage.
- **Temperament:** Naive, unsettled or undomesticated livestock regardless of age will have relatively greater shrinkage.

Good practices required by conformance or quality management programs to improve welfare and reduce shrinkage

Conformance or quality management programs can reduce shrinkage by ensuring the following good practices are maintained:

- Cool, clean water is available and accessible to all animals at all times including throughout lairage.
- Feed of sufficient quality and quantity is provided to all animals held for longer than 12 hours in lairage.
- Animals are handled to minimise stress.
- Vehicles used for animal transport and facilities are designed and operated to minimise stress.

Reducing stress will minimise shrinkage and maximise earnings

Benefits of good practice

The economic benefit of reducing animal shrinkage comes in two forms:

- 1) Reduction in live weight lost due to implementation of good practices recommended through conformance or quality management programs.
- 2) Increased carcass yield and dressing percentage by reducing time-off-feed to less than 12 hours and having constant access to water.

*The daily cost saving due to increases in carcass yield = Daily kill number * Reduction in hours of curfew * Increase in yield per hour * Average carcass weight * c/kg sale price.*

Example of increased production income due to reduced lairage time of sheep from 36 to 12 hours:

$$= 800 * 24 * 0.1\% * 23\text{kg} * \text{AUD } 6.50\text{c/kg}$$

$$= 800 * 0.024 * 23 * 6.5 = \text{AUD } \$2,870.40 \text{ per day}$$

Example of increased production income due to reduced lairage time of cattle from 48 to 12 hours:

$$= 500 * 24 * 0.02\% * 250\text{kg} * \text{AUD } 7.10\text{c/kg}$$

$$= 500 * 0.0048 * 250 * 7.1 = \text{AUD } \$4,260.00 \text{ per day}$$

Further reading

- *Factsheet 1: Good practice can reduce dark cutting for better meat quality and higher returns*
- *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 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*
- Parish J. A. and Rhinehart J. D. (2017). *Understanding and managing cattle shrink*. Mississippi State University. Access online:
<http://extension.msstate.edu/publications/publications/understanding-and-managing-cattle-shrink>
- Thompson, J. M., O'Halloran, W. J., McNeill, D. M. J., Jackson-Hope, N. J., May, T. J. (1987). *The effect of fasting on liveweight and carcass characteristics in lambs*. *Meat Science*. 20: 293-309.
- Shorthose, W. R., Wythes, J. R. (1988). *Transport of sheep and cattle*. In *Proceedings of 34th International Congress of Meat Science and Technology*, pp. 122-129, Brisbane, Australia.