



How Shrinkage Affects Returns for Feeder and Slaughter Cattle

Alberta Agriculture Market Specialists

Introduction

Many factors are responsible for the loss of weight or ‘shrink’ of calves, feeder and slaughter cattle during marketing. As shrinkage increases, the potential for improving net returns from calves, feeders and fed cattle decreases. Shrinkage directly effects the income of all cattle producers. Shrinkage can be reduced through better handling techniques, attention to environment and diet, market planning and an appreciation of animal psychology. This module discusses how shrinkage effects net return and how producers can reduce losses from shrinkage.

What is Shrinkage?

Shrinkage is the amount of weight an animal loses during sorting, transporting, standing, weighing or any situation that may cause a degree of stress. It is the difference between the gross body weight before handling and the net sale weight. Shrinkage represents a loss in value.

There are two physical types of shrinkage. The first is excretory shrinkage. Excretory shrinkage is the loss of contents in the belly, digestive tract and bladder. This type of shrinkage is common and occurs during the first few hours of transport, or when cattle are taken off food and water. 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.

The second type of shrinkage is tissue shrinkage. Livestock will suffer tissue shrinkage when the belly, digestive tract and bladder are empty and the animal is dehydrated. The body will then start compensating for the loss by drawing moisture and nutrients from the carcass tissues.

Tissue shrinkage occurs as a result of extensive sorting, standing, trucking or when cattle are held off feed and water for long periods of time. This type of shrinkage has a detrimental effect on the immediate health and recovery of the animal. Within 24 hours, important bacteria and protozoa die off in the rumen, rendering it delicate and unable to completely digest food.

When cattle are exposed to stress factors, both excretory and tissue shrinkage starts to occur at the same time. Buyers and sellers of cattle agree that combined shrinkage over six per cent is both costly and unnecessary. Livestock suffering from excessive shrinkage may require from 10 to 36 days to recover.

Factors that Impact Shrinkage

Many factors impact the degree of shrinkage that livestock may experience. Some shrinkage occurs naturally. For example, cattle will lose two per cent of their body weight overnight. Therefore the net sale weight of cattle will be directly influenced by the time of day when the sale weight is taken. Cattle on feed and water will gain weight in their own environment or maintain weight in a new environment, while those away from feed, water, and their natural environment will continue to lose weight. A combination of these and other factors may create a situation where the cattle experience excessive shrinkage. These other factors include:

Age: The age of the animal has a direct relation to the percentage of the body weight that will be lost due to shrinkage. The younger the animal, the faster and greater the shrinkage. Young unweaned calves will shrink rapidly because of their dependence on milk, their physiological state and the psychological trauma they suffer when taken away from their mothers.

Weight: As the age of the animal increases, so should the weight. Cattle that weigh more will shrink less. This is due to their relative age, the amount of flesh they carry and their adaptation to feed.

Feed: The type of feed the livestock are consuming will affect the rate and amount of shrinkage. Young calves on grass will shrink more than yearlings on grass, but yearlings on grass will shrink more than those on dry hay. There is a negative relationship between high moisture feeds and shrinkage. That is, the higher the moisture in the feed the greater the excretory shrinkage.

Water: Excessive amounts of water before sorting, loading and transport will cause unnecessary shrinkage.

Weather: Extreme high or low temperatures will cause livestock a certain degree of discomfort resulting in increased shrinkage. Very hot temperatures will cause rapid and excessive shrinkage.

Facilities: Good facilities for handling cattle will reduce shrinkage in livestock. Cattle that are chased, driven or sorted to excess because of poor facilities will shrink more than cattle that are not.

Personnel: Livestock know when a person is inexperienced. This is apparent in the cattle's actions. A few experienced cow hands will save precious pounds.

Loading and Unloading: Cattle are sensitive to light, movement, and sound. Loading and unloading can be a traumatic experience because of this sensitivity. Facilities should reflect the natural behaviour of cattle to follow and move in a circle. Rough handling must be avoided. Overloading trucks can result in weak or "downer" animals on arrival. Under loading trucks can allow the cattle to circle, kick or slip during transport.

Mixing: Tension is caused when cattle are grouped together with unfamiliar cattle. This is especially true when mixing bulls or introducing females to bulls.

Transit: Transit in itself is not a great contributor to shrinkage unless the cattle are poorly loaded, the roads rough, the weather extreme or the ride excessively long. Trucks should arrive on time with the boxes or liners clean and ready for transporting livestock.

Paperwork: The paperwork that accompanies the livestock is an important part of the sale process. Paperwork that is incompletely or incorrectly filled out may delay the sale or delivery of livestock.

Temperament: Unsettled or wild cattle, regardless of age, will lose weight whenever the environment they are familiar with is changed. Changes to environment include the introduction of new people.

Ways to Reduce Shrinkage

Shrinkage will increase when cattle are handled, transported, introduced to a new environment or feed, delayed or are victims to poor weather. The age, weight, diet, and temperament of an animal will affect shrinkage as will the human environment in which it is handled.

Calves

Young calves are affected the most by shrinkage and take the longest to recover. To prevent unnecessary losses, practice special care when handling young unweaned calves. Calves tend to stick close to their mothers and are easily upset by intervention. Plan the separating of pairs in advance.

The first step is to plan and promote a sale and make the trucking arrangements in advance. Check weather reports and facilities. Repair any escape routes, making sure that gates lock and hazardous materials are removed. Choose a team of people that work well with livestock and attempt a quiet sort. Have dry feed and water available for calves immediately after separating if they must stand for any length of time. Whenever calves must stand, they will lose weight, but they will lose less weight in a familiar environment than in a foreign one. Load carefully, avoid overloading and double check that all the calves are standing in the truck. Have the paperwork done in advance and follow the truck to its destination to ensure care in handling and diet at the point of sale.

Feeder cattle

Feeder cattle, or weaned calves, are less affected by handling and shipping. They are older, heavier and hardier, and will shrink at a slower rate. Yet, the same precautions must be taken for feeder cattle as for young calves. Long, unnecessary stands in poor conditions will result in excessive shrinkage. Diet is an important factor and some shrinkage can be controlled by dry feed before handling them. Watch for temperament problems in older feeders, especially yearlings, and handle them accordingly. Refrain from mixing groups of cattle if possible. Load the animals carefully, avoiding situations that may cause injury.

Slaughter cattle

Slaughter cattle will shrink at a slow rate because of their maturity and complete adaptation to diet. However, there are precautions to be taken, even with heavier cattle. Weather can be a big factor in fed cattle shrinkage. Because of their excess weight, temperature greatly influences shrinkage. Very hot weather, for example, could result in considerable discomfort to the animal. Mixing of livestock before loading and after delivery not only results in shrinkage due to the change in environment but may lead to traumatic injury or dark cutters, both of which reduce the value of the carcass. When fed cattle suffer tissue shrinkage the weight and the quality of the

carcass are affected. Cattle on long hauls or that stand for long periods of time should be provided with feed and water during transit and allowed rest, feed and water on arrival. This is especially important when shipping fed bulls.

How Shrinkage Occurs

When the primary needs of the animal are not met and this is coupled with a change of environment, shrinkage occurs. Young calves and light feeders will suffer a rapid rate of shrinkage. As calves become older or are on feed longer, the rate of shrinkage moderates. Cattle need feed and water during the marketing process and this is evident in the fact that over 65 percent of shrinkage is a result of fasting. Rest is equally important. Those animals that cannot rest will experience an increase in shrinkage of 15 per cent to 25 per cent. Because of the social nature of cattle, they find it very disruptive to be mixed with others. Expect shrinkage to double when mixing occurs during the marketing process.

The majority of shrinkage occurs within the first few hours of handling, sorting, loading and standing. When in transport the degree of weight loss levels off until it is triggered again by unloading, sorting, standing, mixing and fasting.

Cattle have a strong social structure and react immediately when this is disrupted. Even when gathered and sorted in their own environment, the stress of the activity can be measured in the degree of shrinkage. Calves, for example, can lose more than three per cent of their body weight in the sorting and loading process alone. For each one half hour spent sorting calves, expect a one half per cent reduction in body weight. Although all cattle naturally lose two per cent of their body weight at night, an overnight stand without food and water can result in a six per cent loss of body weight.

Shrink, like stress, is cumulative. The more stress factors the cattle are exposed to, the higher the degree of shrinkage. Because cattle are sensitive to light, movement and sound, the constant change of environment and people when marketing is detrimental to the sale weight and long term health of the animal. Any advantage of compensatory gain is lost to the buyer after a nine per cent loss of body weight because of non-performance and increased morbidity and mortality. Sorting, loading, standing and fasting can result in a loss of 12 to 15 per cent of body weight for calves. This lost opportunity is not easily recovered in higher prices.

How to Calculate Shrinkage

Table 1. Effect of Shrink to 600 lbs Initial Weight.	
3% shrink	582 lbs
6% shrink	564 lbs
9% shrink	546 lbs
12% shrink	528 lbs
15% shrink	510 lbs

Table 1 shows the effect of shrink on the saleable pounds of product from a 600 lb calf. Realistically, all cattle will shrink during the marketing process. It is the goal of the owner to minimize that shrinkage to a maximum of six per cent of original body weight. This ensures fair buying conditions and the health of the calf after arrival. The difference between six per cent shrink on a 600 lb calf and 15 per cent shrink on a 600 lb calf is 54 lbs

As shrinkage increases, the net weight of the animal decreases. If payment is based on the shrunk weight, it will reduce returns.

Pencil Shrinkage

Pencil shrinkage is the percentage of the gross animal weight that is deducted to arrive at a sale weight. This mathematical deduction is applied to cattle that are full of feed, displaying too much flesh or fat for their weight range or carrying tag (ice, manure, mud). A buyer uses the pencil shrinkage so he does not have to pay for the excess baggage.

For example, feeder cattle weighed directly out of their home pen may be subject to a full pencil shrinkage of four to five per cent. Livestock that were hauled a short distance to the point of sale may have a three per cent pencil shrinkage applied. A fed steer that is bought on a live weight basis and arrives dirty with manure, mud or ice may have some pencil shrinkage applied even though it travelled a fair distance. Small framed feeders may be subject to pencil shrinkage if they have been fed to a weight too heavy for their frame size.

Pencil shrinkage should not be applied when calves or feeders have travelled a long distance to the point of sale or have had an overnight stand. To charge a pencil shrinkage over an excretory shrinkage is called double shrink. In this case the owner loses the physical shrinkage of the animal and is charged an additional percentage of weight.

How Shrinkage Affects Net Returns

Table 1 showed that the difference between six per cent shrink and 15 per cent shrink on a 600 lb animal was 54 lbs At \$100.00 per cwt and a weight of 564 lbs, the calf nets back \$564.00. The calf that weighs 510 lbs and sold at \$100.00 per cwt brings \$510.00; a \$54.00 difference.

6% shrink	564 lbs	\$564.00
15% shrink	510 lbs	\$510.00

To reflect the value of the 510 lb calf in the market place, the price per pound would slide up to bring the net return back to \$564.00. To return \$564.00 on the 510 lb calf, the price per lb would need to be \$110.75 which equates to a \$0.20 lb slide based on the \$100.00 market. A \$0.20 slide is most unusual and does not reflect industry standards. The financial loss due to excess shrinkage cannot be recovered simply through higher prices. The cost of commission, freight and other expenses are not reflected in these returns.

510 lbs	\$100.00 cwt	\$510.00	\$0.00 slide
510 lbs	\$103.24 cwt	\$526.52	\$0.06 slide
510 lbs	\$104.32 cwt	\$532.03	\$0.08 slide
510 lbs	\$105.40 cwt	\$537.54	\$0.10 slide
510 lbs	\$110.75 cwt	\$564.82	\$0.20 slide

When weight is lost because of shrinkage, the net return is reduced. Cattle that are handled in a safe, quiet and a responsible manner will incur less shrinkage. Livestock will shrink to a much greater degree if they are handled roughly or left to stand for long periods of time in a strange environment without feed or water, especially animals that are young and unweaned. To curtail losses in net return, minimize shrinkage when marketing animals.

Summary

Shrinkage is the most controllable factor in livestock marketing. Net returns on livestock are determined by both the market price and the cost of marketing those cattle. Shrinkage is a physical loss of value and has a great influence on net return. As shrinkage increases, net returns decrease. This loss can be minimized by understanding how shrinkage occurs and following management practices that reduce shrinkage. Cattlemen can add to their income by carefully handling livestock and choosing marketing methods that minimize shrinkage.

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