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# **“Glucotrans”**

## **Transport Stress**

### **Physiological & Metabolic changes**

As the consumer continues to demand a consistent quality meat product and the profit margins available to producers become less it is more vital than ever that attention is paid to the fine details in animal production. The move towards the introduction of quality assurance in the industry will not, of itself, ensure a quality product. However, it will help producers ensure that appropriate attention is paid to guaranteeing the consistency and integrity of their product.

The transport and handling of cattle has created problems for many years and these are still occurring to a large extent.

Cattle deaths during the transport, handling and yarding process are still common and largely preventable. Lactating cows and young cattle or cattle in a weakened condition are most susceptible. These animals may die a few days after arrival, or in severe cases, will die on the trucks or within hours of arrival.

We are all aware of the problems associated with bruising, transport shrink in weight, dark cutters, high pH levels and hide damage which lead to loss in carcass value.

Many will be aware of the more subtle losses of production due to decreased disease resistance, poor appetite and extended recovery periods required following stressful transport. Some producers may have experienced the spectacular losses that occur from time to time when cattle die as a result of transit tetany, due to the stress of transport.

Not only are these losses preventable, producers that pay attention to the fine details of cattle handling and transport and ensure that adequate nutrition, as well as water medicated with “Glucotrans” is available, will be rewarded with increased returns and profitability.

### **Losses due to stress of handling and transport.**

It is well known that cattle taken off feed, handled and transported for any distance undergo a series of physiological changes that lead to muscular exhaustion, imbalance in electrolytes and metabolic changes that can take a considerable time to reverse. This is commonly seen in cattle transported to saleyards or feedlots where the transport shrink may be up to 12% and the time taken to reverse the metabolic changes and for cattle to return to normal growth patterns may be 10 days or longer. Some cattle may arrive in a completely exhausted state and may not completely recover. There is also an adverse effect on the immune competence of the animal and this stress will cause an increased susceptibility to disease, particularly virus infections. This is apart from any physical damage to the animal due to poor yard design or inadequate trucks.

From an economic viewpoint, these factors are vitally important since they can impair meat quality and increase carcass loss in cattle as well as causing production

losses in cattle introduced to varying feedlot conditions. Furthermore, there is a growing concern that animal welfare conditions in the transport and handling environment are severely degraded and that this is preventable.

The major conditions that occur during and following handling and transport are :-

- Muscular exhaustion
- Metabolic acidosis
- Subclinical ketosis
- Dehydration
- Tissue Catabolism
- Ruminal atony
- Decreased levels of Calcium and Magnesium ions
- Increased susceptibility to infections due to loss of immune competence

These lead to reduced appetite, slow recovery and increased susceptibility to infections.

Some conditions, such as transit tetany lead to death. Transit Tetany is often seen in cattle transported long distances and is caused by a drop in the calcium and magnesium levels in the bloodstream.

This condition is often made worse by allowing cattle to rapidly drink large quantities of water after periods of deprivation and in such cases cattle may rapidly die following completion of drinking.

The symptoms vary a lot, however, animals are restless, weak and may have a staggering gait. There may be partial paralysis of the hind quarters, muscle spasms, excitability and the

animal may froth at the mouth and lie down. There is paralysis of the rumen and the animal does not eat. Animals may grind their teeth and may show a depraved appetite eating mouthfuls of dirt or manure.

Animals suffering from the symptoms will respond to treatment with Calcium Borogluconate and magnesium sulphate.

To prevent the condition, use glucose and electrolytes in the water of animals pre transport and add additional magnesium and calcium for those animals going long distances. This can be applied by a dosatron in the yards before trucking.

Make sure animals are not transported long distances without adequate provision for food and rest. Use glucose and electrolyte in the water when animals are resting during transport.

On arrival at the destination, have medicated water available to the cattle.

### **Prevention of Transport Stress**

It has been documented that cattle deprived of water during transport suffer from dehydration and loss of body weight (Wythes et al., 1980; 1983). Electrolyte imbalance has also been shown to occur (Schaefer et al. 1990.) The provision of water and water plus glucose and electrolytes has been shown to offer a practical means of alleviating the effects of this dehydration and to help prevent the degradation of conditions related to welfare encountered in the transportation environment (Schaefer et al. 1990; Jones et al. 1992; Gortel et al. 1992; Schaefer et al. 1992). This is an important consideration from an animal welfare point of view, apart from any economic benefits that may accrue from an improved welfare environment and demonstrates a simple and practical need to have water or water plus glucose and electrolytes available to animals at all times during transport and handling.

### **The Symport Pump**

The cells of the intestinal epithelium have an energy source available in the form of the electrochemical gradient of the sodium ion. The symport translocation system involves the simultaneous movement of both a sodium ion and another molecule (glucose) across the cell membrane. The process moves glucose and water across the membrane against its concentration gradient. This process is dependent on the sodium ion and unless the sodium ion is present or regenerated the process will cease. The movement of glucose by this mechanism does not require the expenditure of body energy.

One molecule of glucose is transported with one molecule of sodium. The sodium concentration gradient is maintained by a sodium - potassium transport system that is

energy dependant and regenerates three molecules of sodium for each molecule transported across the cell with glucose.

This is the mode of action of Glucotrans, a glucose and electrolyte mixture designed to assist dehydration in transport cattle.

### **Reduces Sickness in Feedlot Induction Cattle**

It is well known that cattle taken off feed and transported for any distance undergo a series of physiological changes that lead to muscular exhaustion, imbalance in electrolytes and metabolic changes that can take a considerable time to reverse.

### **Glucotrans reduces "Dead Bellies".**

It has been common to see 6 - 8% "Dead Bellies" in cattle arriving at the feedlot. These cattle take a considerable time to recover normal rumen function and represent a considerable loss in the induction period. At one major feedlot the

incidence of "Dead Bellies" has been reduced to 1.2% following the inclusion of glucotrans in the drinking water. (Dr Peter Shakespeare, personal communication).

### **Glucotrans reduces "BRD".**

The value in improving the immune competence of the animals has been seen at one major feedlot where the use of glucotrans has reduced the incidence of Bovine Respiratory Disease by 50% during the past 12 months (Dr Peter Shakespeare, personal communication).

### **Glucotrans helps in "Sick Pen" recovery.**

The visual and clinical response of the cattle to the treatment is such that some feedlots have installed Dosatron units in the induction pens and sick pens and all cattle are treated off the trucks and in the sick pen. Other water soluble materials, such as, antibiotics, soluble amino acids & proteins, minerals, vitamins and carbohydrates can also be administered to sick cattle.

### **Glucotrans reduces reliance on induction treatments.**

The clinical response to Glucotrans is such that one major feedlot has reduced reliance on Vitamin Injections on arrival and this has resulted in considerable savings in materials and labour.

### **Glucotrans provides economic benefits pre slaughter**

Pre slaughter, there has been a reduction in incidence of "dark cutters", improved dressing percentage and increased meat quality. In Canadian studies, carcass weight advantages of up to 36 kg have been recorded. Work in Australia has shown a 4 kg carcass weight (\$9.80 per head) advantage to treated cattle

slaughtered for the local trade. A similar advantage has been seen in Jap Ox, treated cattle dressing 1.3% heavier (\$13.26 per head advantage) than untreated cattle.

## References

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