

Nutribio Management Information - Sheet 5

Neonatal Diarrhea or Scours

Neonatal diarrhea or scours is a common problem of young calves. An understanding of the causes, consequences and outcomes of this condition may assist farmers in treating calves affected.

Types of Scours:

1. Nutritional
2. Pathogenic

Can also be classified in how they affect absorption from the intestine.

- (a) Increased Permeability.
- (b) Hypersecretion.
- (c) Osmotic.

Liquids are normally secreted from the blood into the intestine (secretion) and are reabsorbed from the intestine into the blood (absorption). Some research has estimated that up to 100 litres of liquid are secreted from the blood into the intestine of calves every day. When the absorption of these fluids is impaired, or the secretion of liquid into the intestine increases, scour occurs.

Increased permeability of the intestine occurs due to inflammation and /or trauma due to infective agents. The increased movement of liquid (and possibly protein) from blood to intestine can exceed the ability of the intestine to absorb liquid and diarrhea is the result. Common agents causing increased permeability include *coccidia* and *cryptosporidium*.

Hypersecretion occurs when the intestine is **induced** to produce large amounts of fluid. An example of this condition occurs when *Escherichia coli* produce an endotoxin that stimulates the crypt epithelium to secrete fluid beyond the absorptive capacity of the intestine. The epithelium retain their capabilities, that is, they are not destroyed during the infection.

Osmotic diarrhea occurs most commonly when solutes collect in the gut, which cause water to be retained in the intestine. This may be caused by *malabsorption* or *maldigestion*. Dietary imbalances in liquids (eg. excess lactose or protein) or rapid changes in the diet can induce osmotic scours. These are sometimes referred to as '**Nutritional Scours**'.

Malabsorption is a failure of digestion, usually caused by physical destruction of the epithelial cells by invading pathogens. Examples of pathogens that can destroy the epithelium include *rotavirus* and *coronavirus*.

Effects on the Calf

Metabolic effects of scours include:

Dehydration, increased energy requirement, loss of appetite, depression, electrolyte imbalance, acidosis and death.

Dehydration is the most important effect that must be corrected as soon as possible. Calves can lose 5% to 10% of their body weight due to water loss within one day of scouring. Fluid loss above 8% requires intravenous treatment, greater than 14% can result in death.

To evaluate dehydration using skin tenting, pinch a fold of skin and count the seconds it takes to flatten.

Less than 2 seconds indicates normal hydration

2-6 seconds indicates 8% dehydration

Greater than 6 seconds indicates more than 10% dehydration.

Normal gum condition is indicated by pink, damp gums. Dehydration causes white, dry gums, indicating 8%-10% dehydration.

Signs typical of various degrees of dehydration include:

5-6% - dehydration- no clinical signs

6-8%- sunken eyes, loss of skin turgor, dry oral mucus membranes, increased pulse.

10-14% - comatose, cool extremities, poor peripheral pulse.

Treatment of Scours:

1. **Electrolyte** therapy is the most effective, to ensure replacement of lost water and electrolytes. Oral rehydration solutions should contain all of the essential components needed to stay hydrated, including water, sodium, glucose, glycine, alkalising agent, potassium, chloride and gelling agents. Sodium will promote water intake, glucose aids in sodium absorption, glycine has been shown to enhance the absorption of glucose. Alkalising agents reduce metabolic acidosis and provide some energy. Potassium and chloride are required to maintain blood pH for muscle contractions, especially in the heart. Gelling agents can be added to coat inflamed intestinal mucosa.
2. **Identification** of the organisms responsible. Fecal cultures can determine the responsible organism.

Treatment with antibiotics when calves have scours is not useful when calves are infected by viruses (eg. rotavirus) or protozoa (eg. cryptosporidium). Where the primary infective agent is bacteria then antibiotics are useful.

Other Points to consider:

Opinion on feeding discard milk is mixed. As expected, numerous studies have demonstrated higher levels of bacteria and/or antibiotic residues in waste milk. There are concerns that feeding mastitic milk may increase the risk of scours and some research has shown that calves fed infected milk had

mastitis as fresh calves, caused by the same genotype of bacteria. Feeding whole milk also increases the risk of Johnes transmission.

To mitigate against the risk of disease transmission, particularly where whole milk is being fed to a large number of calves, consideration should be given to on-farm pasteurisation. This will reduce the bacterial loading of waste milk and can kill off organisms causing Johnes.

Variation in the quality of whole milk fed to calves should be recognised, butter fat 2.9% – 5.0%; protein 3.0% – 5.0%.

Note:

Many organisms that cause scours in calves are 'zoonotic' - that is they can cause disease in humans. Therefore, it is very important to be conscientious when caring for calves with diarrhea.