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Calf Note #42 – What are scours?

Introduction

Neonatal diarrhea, or scours, is a common malady of young dairy calves. A thorough understanding of the causes, consequences and outcomes of this condition may assist producers in treating calves that contract scours. This "Calf Note" is designed to provide an understanding of the physiology of scours.

Prevalence

According to the USDA National Animal Health Monitoring System (NAHMS), the following statistics relate to scours on dairy farms:

More information on the 1991-92 NAHMS study entitled "National Dairy Heifer Evaluation Project" can be obtained at the [NAHMS web site](#).

TABLE 1. Percent of preweaned heifer calf deaths by farmer perceived cause. Source: 1992 NAHMS.

	Total deaths	Calves born
Scours	52.2	4.4
Respiratory problems	21.3	1.8
Trauma	2.4	0.2
Joint/navel ill	2.2	0.2
Other	11.7	1.0
Unknown	10.2	0.8
TOTAL	100.0	8.4

Types of scours

The major types of scours cause hypersecretion of feces include:

- increased permeability
- hypersecretion
- osmotic

Liquids are normally secreted from the blood into the intestine (secretion) and are reabsorbed from the intestine into the blood (absorption). Some researchers have estimated that up to 100 liters of liquid are secreted from the blood into the intestine of calves every day. When the absorption of these fluids (and dietary fluids) is impaired, or the secretion of liquid into the intestine increases, then hyperfluidity of feces (scours) occurs.

TABLE 2. Percent of preweaned heifer calf deaths by region and month. Source: 1992 NAHMS.

Region	Total deaths	Month	Total deaths
West	49.9	Jan-Mar	53.1
Midwest	54.8	Apr-Jun	57.2
Northeast	48.2	Jul-Sep	49.8
Southeast	50.9	Oct-Dec	49.4

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 into the intestine can

exceed the ability of the intestine to absorb liquid, and diarrhea results. 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 endotoxin that stimulates the crypt epithelium to secrete fluid beyond the absorptive capacity of the intestine. However, the epithelium retain their capabilities - i.e., they are not destroyed during the infection.

Osmotic diarrhea occurs most commonly when solutes collect in the gut, which causes water to be retained in the intestine. This may be caused by malabsorption or maldigestion. Dietary imbalances in liquids (e.g., excess lactose or protein) or rapid changes in the diet may induce osmotic scours. These are sometimes referred to "nutritional scours".

Malabsorption is failure of digestion, usually caused by physical destruction of epithelial cells by invading pathogens. Some examples of pathogens that destroy epithelium include rotavirus and coronavirus.

Maldigestion may be caused by poor quality ingredients, allergens in feed ingredients, the presence of trypsin inhibitors, or disorders of the intestinal tract. Maldigestion usually leads to malabsorption, increased osmotic pressure, and scours.

Effects on the animal

Metabolic effects of scours include:

- dehydration
- increased energy requirement
- loss of appetite
- depression
- electrolyte imbalance (may include nervous signs)
- recumbency
- acidosis
- death

Dehydration is the most important effect that must be corrected as soon as possible. Signs typical of various degrees of dehydration include:

- 5-6% dehydration: no clinical signs
- 6-8% - sunken eyes, loss of skin turgor, dry oral mucous membranes
- 8-10% - loss of body weight, more distinct sunken eyes, dry mucous membranes, increased pulse
- 10-14% - comatose, cool extremities, poor peripheral pulse

Treatment of scours

The most common (and usually the most successful) treatment for calf scours is hydration therapy. Replacement of lost water and electrolytes can help reestablish homeostasis and allow the calf the opportunity to recover. It is important to note that most calves with scours usually die from loss of

water and electrolytes. Thus, electrolyte therapy is most helpful and effective therapy for treatment of scours.

Treatment of scours usually requires identification of the organism(s) responsible. Generally, fecal cultures can determine the responsible organisms. From there, a proper intervention strategy (e.g., antibiotics) can be selected. Additional steps to treat calves include isolating all sick animals, reducing the exposure to pathogens by proper sanitation and biosecurity. In addition, an audit of feed (especially milk replacer) quality can indicate if the scours is induced by poor quality ingredients.

NOTE: many organisms that cause scours in calves are *zoonotic* - that is, they can cause disease in humans. Thus, it is very important to be conscientious when caring for calves with diarrhea. Treatment with antibiotics when calves have scours is not usually useful when calves are infected with viruses (e.g., rotavirus) or protozoa (e.g., *Cryptosporidium*). However, antibiotics are most useful when bacterial infections are the primary infective agent, or the risk of secondary bacterial infections is significant. It is **always** a good idea to discuss scours treatment with your consulting animal health care professional.

Working closely with the consulting veterinarian or other health care professional is a key component of the treatment of scours on the farm. Usually, causes of scours are multi-factorial, and involve one or more pathogens, management factors, nutrition and factors in the environment. Proper evaluation of the underlying cause of scours is important to determining the best intervention (treatment) and management strategies to implement to reduce the effect of scours on profitability.

For more information on electrolyte therapy for scours, see Calf Note#43 - [Electrolytes for scouring calves](#).

Written by Dr. Jim Quigley (18 September 1998).
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