

# MOOSE JAW ANIMAL CLINIC

1885 CARIBOU ST W, MOOSE JAW, SK S6H 4P5.  
 (306) 692-3622 FAX (306) 693-2798

DR. ALAN GILBERT  
 DR. RAM CHANGAR

DR. CARLA HICKS  
 DR. LISA CUNNINGHAM

DR. MELANIE BLAGER  
 DR. MAGGIE PETZ

## The Scouring Calf

Calf scours is defined as profuse diarrhea that renders a calf dehydrated and weak. Scours can be caused by numerous agents:

	Age of Calf	Signs	Postmortem Findings
<b>Bacteria</b>			
<b>E.coli</b> (enterotoxigenic)	< 5 days	-profuse, watery diarrhea -weakness, may see before diarrhea -septicemia, may lead to septic joints	-affects the small intestine
<b>E.coli</b> (enterohemorrhagic)	1-3 weeks	-diarrhea, dehydration, +/- abdominal pain	-distal small intestine and large intestine
<b>Salmonella</b>	various	-especially seen in dairy calves -septicemia*: dull, listless, fever, profuse diarrhea, +/- colic -may lead to swollen joints -may be zoonotic (spread to humans)	-enlarged mesenteric lymph nodes
<b>Campylobacter</b>		-minor importance -mild diarrhea with blood and mucous	-mild ileitis and colitis
<b>Clostridium perfringens Type C</b>	<10 days	-sudden death -weakness, recumbency, +/- colic, nervous derangement, terminal diarrhea	-hemorrhagic enteritis with necrosis of small intestine -swollen mesenteric l.n. -hemorrhages on pericardium and thymus
<b>Viruses</b>			
<b>Rotavirus</b>	4-14 days	*most common cause of neonatal diarrhea in calves -usually not in very young calves because protected by cow's colostral antibodies -disease is usually self limiting and short lived, but takes time for damage to repair	-small intestinal involvement

	Age of Calf	Signs	Postmortem Findings
<b>Coronavirus</b>	4-30 days	-more likely to be associated with signs of colitis, like straining and passage of mucous or blood in feces	-small and large intestinal pathology
<b>Protozoa</b>			
<b>Cryptosporidium</b>	2-4 weeks	-soft, foamy to watery feces, may contain undigested milk, blood, mucous and bile -may see straining -may get self infection, may get chronic diarrhea and muscle wasting -can be zoonotic (spread to humans)	-distal small intestine and large intestine pathology
<b>Coccidiosis</b>	>3-4 weeks	-fresh blood in feces, straining -especially seen in crowded situations, or when it is warm and wet	-large intestinal, cecum pathology

Initiating factors are usually environmental:

- heavily contaminated surroundings at birth
- heavy concentration of calves in one area
- addition of new calf from another farm (be careful with Holstein calves!!!)
- stressors (weather change)
- low volume/low quality colostrum

Some may be nutritional:

- feeding rich feed to cows, leading to increased milk production and overfeeding by the calf

Generally, the onset of scours is a multi-factorial problem, and thus needs to be dealt with from different aspects. It is important to get control of a problem before it gets out of hand—calf death loss can be significant in some situations!!!

### Assessment:

**1. Dehydration:** It is vital to evaluate the level of dehydration in the scouring calf. When a calf develops diarrhea, the loss of water in the feces often exceeds the level of fluid that the calf can drink. When this happens, the calf will have to be force fed these fluids or else dehydration will develop.

#### Assessing Hydration in Diarrheic Calves:

% Dehydrated	Demeanor	Sunken Eye	Skin Tenting
<6%	Normal	-	-
6-8%	Depressed	+	+/-
8-10%	Depressed	++	2-5 sec
10-12%	Comatose	+++	5-10 sec
>12%	Dead	++++	>10 sec

Skin tenting can be measured over the eyelids and neck. Best results are obtained when the neck is held straight and the skin is tented in the direction of the long axis of the neck to avoid the natural skin folds that run across the neck.

**2. Temperature:** Body temperature should be taken on all sick calves. Hypothermia in calves (below normal body temperature) is generally thought of as less than 37°C. When calves are cold, they lose their suck reflex, and their immune system mechanisms are overwhelmed making them susceptible to infections. It also appears that in severely hypothermic calves, the ability of their gut to absorb fluids and nutrients is hindered. Thus, even if you are administering electrolytes or milk to a cold dehydrated calf, you may not see much improvement in their hydration if the low body temperature is not corrected. Hypothermic calves are also usually low in blood sugar (glucose).

**3. Mental Depression:** This can be assessed by determining if there is a suck reflex present, and how strong this reflex is. The degree of mental depression is often correlated to the severity of acidosis in the calf, and this needs to be taken into consideration when formulating a treatment plan.

**Acidosis:** In the normal calf, there is a balance between acids and bases (electrolytes) in the bloodstream, making the blood a neutral pH.

**Acid = Base**

When a calf develops diarrhea, there is a loss of bicarbonate (a major base) into the manure, depleting the body's reserves. Thus, an imbalance develops where there is more acid than base in the bloodstream and the calf becomes "acidotic"

**Acid > Base**

Acidosis causes mental depression, varying degrees of muscle weakness, loss of suck reflex, inability to stand, and sometimes even induces a comatose state. Heart rate is often very rapid and may cause abnormal rhythms. Some older calves (1-4 weeks old) will be suffering from acidosis but only show minimal signs of dehydration and diarrhea. Affected calves are depressed, weak, wobbly (act "drunk") and may not have a suck or blink reflex. There may be fluid splashing sounds in the abdomen. These calves need to have bicarbonate administered intravenously.

**4. Other Concurrent Infections?** Other common diseases should be ruled out, like navel/joint infections, pneumonia, signs of septicemia (pus in the eye, red eye). Body condition should also be assessed, as an indication of chronicity of the problem.

### **Establishing a Diagnosis:**

Trying to identify the agent involved can be important for several reasons:

- Future planning of vaccination programs
- Identification of zoonotic diseases (Salmonella, Cryptosporidium) that may be spread to humans

There are several ways that we can try to identify what pathogen (infective agent) is causing the disease:

- **Clinical Diagnosis:** age of the calf can be a predictor of what agent is involved.
  - <5 days of age—usually E.coli (bacterial) scours
  - 1-4 weeks of age—usually viral scours (Rota or Corona)
  - >1 month of age—think coccidiosis

- **Necropsy Diagnosis:** best done on untreated calves, as these are best for culture and sensitivity. All organs in the calf should be sampled, and a lot of information can be gathered by this.
- **Fecal Floatation:** can be done in clinic here, and is most useful when diagnosing coccidiosis.

## Treatment of Scouring Calves

**1. Fluid Therapy**—dehydration and acidosis are the most common cause of death in scouring calves, and this is corrected/avoided with fluid therapy. When trying to decide what volume of fluids a scouring calf needs, there are 3 components to consider on a daily basis:

- Replacement deficit: this represents the amount of fluid that you need to give in order to correct deficit created by the dehydration. This is calculated by estimating how dehydrated the calf is and multiplying that by the calf's weight:  
= %dehydration x body weight (kg)

For an average 100 lb (45 kg) calf:

6-8% dehydrated = 2 ½ to 3 ½ Liters of fluid/day  
 8-10% dehydrated = 3 ½ to 4 ½ Liters of fluid/day  
 10-12% dehydrated = 4 ½ to 5 ½ Liters of fluid/day

You can see that when a calf becomes severely dehydrated (ie 10-12%), it is very difficult to get enough fluid into the calf by tubing it, and you may have to resort to IV fluids.

- Maintenance Fluids: this represents the amount of fluid that any normal calf requires in a day for normal body function and to prevent dehydration  
= 50 mL/kg/day (Or 20-30 mL/lb/day)

For an average 100 lb (45 kg) calf:

= 2 - 3 Liters of fluid / day

- On-going Losses: this represents an estimation of the amount of fluid that continues to be lost in the diarrhea as long as the calf keeps scouring, and needs to be replaced in order to avoid dehydration:  
= 1 - 4 Liters of fluid/ day (depending on degree of scours)

Therefore, you can see that depending on the level of dehydration in the calf, the amount of fluid required to maintain hydration can be quite significant:

For example, in an average 100 lb calf that is 10% dehydrated, you need to provide the calf with:

Replacement	= 4 ½ Liters
Maintenance	= 2 -3 Liters
<u>On-going losses</u>	<u>= 2 Liters</u>
	<b>= 9.5 Liters of fluids per day</b>

A calf will normally consume 10% of its body weight in fluid per day (4.5 Liters). Thus, you can see that it becomes an almost impossible task to get a calf that is this badly dehydrated back to normal with oral electrolytes alone, especially if the calf is acidotic and absorbing fluid poorly from its

stomach! These calves require veterinary intervention, and likely an IV fluid hook up.

**A) Oral Fluids:** used for calves that are mildly dehydrated (generally less than 8% dehydrated) If calf will suck, can bottle feed them. For calves without a suck reflex (or if your patience is running thin!), stomach tubing is necessary. (\*Remember, when dealing with scouring calves, make sure to use different bottle/stomach tube than you use for newborn calves!!!)

**Types of Fluids available:**

Type of Fluid	Recommended for	Suggested Feeding Frequency
Balanced Electrolyte Solution -Calf Lyte II -Calf Lyte II HE	-best bet when treating scouring calves because it aims to correct both the dehydration and the acidosis -Calf Lyte II-HE has a higher level of glucose (sugar) than Calf Lyte II, and provides more energy -ok to feed with milk, will not interfere with clotting mechanism	-depends on level of dehydration, but generally 2 L twice a day (12 hours apart)
Milk	-should be given if the calf is in poor body condition -do not deprive a calf of milk for more than 3 days. The intestinal cells need milk in the intestine in order to heal properly and quickly	-Recommended feeding is 1-2 L once a day (ie noon)

There are many types of oral electrolyte solutions available on the market. Be careful which one you choose to use—they are not all the same!!! Some kinds of electrolytes you cannot give with milk, as they will not allow a clot to form and can actually make the diarrhea worse. Talk to your veterinarian about what oral electrolyte solution is best.

**B) IV Fluids:** are necessary when the calf becomes so dehydrated that it becomes virtually impossible to put enough fluids in orally to re-hydrate it. IV fluids may also be necessary with older calves that become severely acidotic, and need a significant amount of bicarbonate to replace this deficit. Sometimes, IV fluids are necessary when a calf simply will not respond to treatment with oral fluids.

IV fluids are administered by a veterinarian. There are options for treating a scouring calf with IV fluids at home, and we can show you how to do this. We recommend that you bring the sick calf into the clinic for an examination and catheterization. This can be done in your truck, without bringing the calf into the clinic. The calf can then be taken home and IV fluids maintained at home, provided that you have a warm, small area to put the calf where he can't move around. Maintaining IV fluids can be a time consuming and tedious job, but can also be very rewarding. However, if you cannot dedicate the time required to do it properly at home, you may want to consider hospitalizing the calf.

**2. Antibiotic Therapy**

Antibiotic therapy is generally initiated on all scouring calves, even though in a viral scour problem, the antibiotics will nothing against these pathogens. However, when the intestine becomes damaged, there is always a concern that bacteria from inside the intestines may leak out into the blood stream, causing septicemia (=bacterial infection in the blood stream that can then affect many different

organs). Thus, even in a viral scour situation, antibiotics are warranted.

It is important to note that some antibiotics (ie sulfa drugs) can damage the kidney in a dehydrated animal. Therefore, it is very important to work to re-hydrate all scouring calves when initiating antibiotic therapy.

### ***Oral Antibiotics: (boluses, etc)***

To be used in calves that are very mildly scouring, and are difficult to catch for daily antibiotic treatment. Most of the scour boluses that are available are sulfa boluses, so again be careful not to use on severely dehydrated calves and do not use them with injectable sulfa drugs (ie Trivettrin or Borgal). Boluses are sustained release, and provide adequate antibiotic levels to last for 3-4 days.

Oral antibiotics are recommended for treating calves with coccidiosis. Cocci-Bol-O-Tabs are the drug of choice. These boluses can be repeated in 24 hours at half strength if needed.

Prolonged use of oral antibiotics may lead to destruction of normal gut bacteria and may actually make the diarrhea worse.

### ***Injectable Antibiotics***

<b>Drug</b>	<b>Uses</b>	<b>Dose</b>
Trivettrin/Borgal	-good general first line treatment	3 cc/100 lbs IM once a day for 3-5 days
Excenel RTU	-another good choice for treating scours	-1 cc/100 lbs IM or SQ once a day for 3-5 days

### **3. Other treatments**

*Flunixin meglumine (Banamine/Flunazine)*                      2 cc/100 lbs IV once a day for 3 days  
-anti-inflammatory  
-may help counteract toxemia in scouring calves  
-decreases abdominal pain, may help appetite return sooner  
-be careful with severely dehydrated calves, may cause kidney problems (important to keep them hydrated)

*Kaopectate/Peptobismol*    60 cc Kaopectate/day (can add to electrolytes)  
-may help protect gut and firm up feces faster

*Probiotics*  
-helps to re-establish normal gut bacteria  
-may actually help to reduce acid production, thereby improving acidosis

*Keeping Calf Warm*  
-helps decrease the demand for sugars from the blood, helping to avoid hypoglycemia  
-helps to fight off septicemia  
-helps absorb fluids from the stomach/intestines

## Prevention of Calf Scours

On average, calf scours accounts for 36% of all death losses between birth and 30 days of age. The economic loss to producers can be higher than \$50 per calf born or \$150-200 per scouring calf. These losses include the cost of dead calves, stunted calves, labor and medication. There are things that can be done to avoid running into a problem with calf scours:

- Place cows on a balanced ration through pregnancy. This keeps the cows in good body condition and will encourage production of good quality colostrum.
- Use a commercial scour vaccine prior to calving to help provide protection via the colostrum
- Move cows onto the calving area 2 weeks before the start of calving: do not winter the cows in the calving area. This will decrease the amount of environmental contamination of pathogens. Remember: the higher the concentration of bugs in the environment, the more likely a calf is to ingest enough of them to become sick.
- Provide plenty of clean, dry bedding and protection from the wind
- Move the cow and calf to a nursing area separate from the cows that have not yet calved within one day of calving. This keeps the environment clean from bugs that may be shed by newborn calves.
- Make sure calves ingest 10% of their body weight of colostrum within 12 hours of birth
  - \* 2 Liters of colostrum within the first 6 hours of life\*
- Fill nursing area with 35-40 cow/calf pairs per 12 acres, then start a new area. This is a good guideline to avoid overcrowding and it keeps the calves that are the same age together, which avoids spreading bugs to the newborn calves.
- Be sure to isolate sick cows and calves right away
- Move cow/calf pairs to clean pasture within 4-6 weeks after calving
- Remember biosecurity!
  - isolate auction mart bought calves for several weeks
  - avoid buying in calves from dairy barns, as they may carry strains of bacteria and/or cryptosporidium that your beef calves may not have seen before
  - clean calving areas each year