Diarrhea is defined as an increased frequency, fluidity, or volume of fecal excretion. The feces may contain blood or mucous and be smelly. The color of the feces may be abnormal. However, it is not possible to definitively determine the infectious organism by looking at the color, consistency, or odor of the feces. A definitive identification requires a sample for microbiological analysis.
In livestock, diarrhea is called scours. There are many causes of diarrhea: bacterial, viral, parasites, and diet.

**Flystrike risk**
Sheep that have diarrhea are more prone to flystrike (blowflies or maggots). To help prevent flystrike, it is recommended that lambs be docked. However, the tail should not be docked too long nor too short. Feces will accumulate on long tails. On the other hand, the dock should be left long enough to cover the vulva of the ewe and an equivalent length on a ram lamb. If a lamb can "wag" its tail, it will be able to use its tail to project away feces. Otherwise the feces will run down the lamb's back end. It is usually not necessary to dock the tails of hair sheep or rat-tailed breeds.

**Diarrhea in young (neonatal) lambs and kids**

Despite improvements in management practices and prevention and treatment strategies, diarrhea is still the most common and costly disease affecting neonatal small ruminants. A study at the U.S. Sheep Experiment Station (Dubois, ID) showed that diarrhea accounted for 46 percent of lamb mortality. Diarrhea in lambs and goats is a complex, multi-factorial disease involving the animal, the environment, nutrition, and infectious agents. The four major causes of diarrhea in lambs and kids during the first month of life are *E. Coli*, rotavirus, *Cryposporidium* sp. and *Salmonella* sp. *E. coli* scours are most common.

**E. Coli**

*E. coli* scours is an opportunistic disease associated with sloppy environmental conditions and poor sanitation. It is seen in lambs and kids less than 10 days of age, but is most common at 1 to 4 days of age. It usually presents itself as an outbreak in lambs and kids between 12 and 48 hours of age. It is also called "watery mouth," because affected lambs salivate and have a cold mouth. Fluid therapy is the mainstay of therapy. Antibiotics are used for both treatment and prevention of *E. coli* scours in lambs. Spectinomycin oral pig scours medicine is commonly used, though it is not approved for sheep and goats. Ewes and does can be vaccinated with bovine *E. coli* vaccine before they give birth to increase passive immunity. The use of neomycin in lambs that appear normal may stop the progression of the outbreak. Adequate ingestion of colostrum by newborns decreases the incidence of the disease.

*E. Coli* Scours - "Watery Mouth" - Michigan State University (Dr. Joe Rook)
Protection of lambs against enteric colibacillosis by vaccination of ewes [abstract]
### Infectious causes of diarrhea in sheep and lambs

<table>
<thead>
<tr>
<th>Category</th>
<th>Causes</th>
</tr>
</thead>
</table>
| **Bacterial**  | *E. coli*  
*Salmonella sp.*  
*Clostridium perfringins* |
| **Viral**      | Rotavirus  
Coronavirus |
| **Protozoa**   | Cryptosporidia  
*Coccidia (Eimera sp.)*  
*Giardia sp.* |

### Non-infectious causes (or contributing factors)

<table>
<thead>
<tr>
<th>Category</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parasitic</strong></td>
<td>Gastro-intestinal worms (not <em>Haemonchus</em>)</td>
</tr>
</tbody>
</table>
| **Nutritional**               | Dietary changes  
Overfeeding  
Simple indigestion  
Poor quality milk replacers  
Inadequate intake of colostrum  
Poor quality colostrum  
Poor quality or stagnant water  
Lush or wet pasture  
Inadequate dry matter intake  
Plant and fungal toxins  
Allergies |
| **Management (Poor environment)** | Overstocking/Overcrowding  
Poor sanitation |
| **Stress**                    | Weaning  
Handling  
Weather extremes  
Shipping/Transportation |

## Rotavirus
Lambs and kids are infected with a group of B rotaviruses, whereas most other animals and humans are infected with group A rotoviruses. Rotavirus generally causes diarrhea in lambs and kids at 2 to 14 days of age. Young animals become very depressed and dehydrated. Rotavirus is treated with supportive care. Vaccinating ewes and does with bovine rotavirus vaccines before they give birth will increase passive immunity. Viruses tend to be less a cause of diarrhea in lambs and kids than calves.

### Cryptosporidium
*Cryptosporidium parvum* is a protozoa that can cause diarrhea similar to that of rotavirus infection. *Cryptosporidia* can cause diarrhea in lambs and kids 5 to 10 days of age. Affected animals are often active, alert, and nursing. The diarrhea is usually very liquid and yellow. No consistently effective treatment for cryptosporidiosis in ruminants has been identified. Anecdotal reports suggest that decoquinte (Deccox®) and monensin sodium (Bovatec®) may be useful in the control of Cryptospororosis. Ammonia and formalin seem to be most effective at removing *Cryptosporidium* from the environment. The best control of cryptosporidiosis comes from lambs and kids getting adequate immunity through colostrum soon after birth.

Cryptosporidiosis and Kid Care [Gary Fredericks/Washington State University]

### Salmonella
The bacteria *Salmonella* has thousands of serotypes and all can potentially cause diarrhea in animals. *Salmonella* can cause diarrhea in lambs and kids of any age.
Animals less than 1 week of age are more likely to die without clinical signs, whereas animals older than 1 week are more likely to have diarrhea. *Salmonella* also causes outbreaks of diarrhea in late gestation and is frequently associated with abortion. Bleach is an effective disinfectant to use during an outbreak. Vaccine efficacy is questionable, and to date vaccination has not been thoroughly evaluated in sheep and goats.

**Giardia**
Giardia-induced diarrhea is more commonly, but not limited to 2 to 4 week old lambs and kids. The diarrhea is usually transient, but infected animals can continue to shed cysts for many weeks, providing a source of infection for other animals and possibly humans. Infected animals can be treated effectively with fenbendazole (SafeGuard®, Vabazen®).

**Nutritional**
Infectious agents are not the only cause of diarrhea in neonates. Nutritional problems can result in diarrhea. Nutritional diarrhea is most common in orphaned animals as a result of poor quality milk replacers, mixing errors, and overfeeding. Consumption of lush pasture or high-energy diets can also result in diarrhea in young lambs and kids.

A scouring lamb or kid loses large amounts of fluids and electrolytes, such as sodium and chlorine. Usually the cause of death in scouring lambs and kids is dehydration and acidosis, or increased body acidity. Whatever the microbial cause of scours, the most effective treatment for a scouring lamb or kid is rehydration by administering fluids.

**Diarrhea in older lambs and kids**
The most common causes of diarrhea in older lambs and kids are coccidiosis and gastro-intestinal parasites (worms). Other major causes of diarrhea in older lambs and kids are *clostridium perfringins*, rumen acidosis, and nutritional.

**Coccidiosis**
Coccidosis is a protozoan parasitic disease that is a common cause of diarrhea in lambs and kids. It may also cause subclinical production losses. Lambs and kids are most susceptible to the problem at 1 to 4 months of age, although younger animals may be affected. Lambs are resistant to the disease in their first few weeks of life. Exposure to the protozoa during this time confers immunity and resistance to later infections. Clinical disease is common after the stress of weaning, feed changes, or shipping. The diarrhea of lambs and kids is usually not bloody, but it
It is not uncommon for sheep or goats to scour when they are grazing lush or wet pasture.

Coccidiosis in Lambs [PDF] - Michigan State University (Dr. Joe Rook)

Gastro-intestinal worms
The Barber pole worm (*Haemonchus contortis*) is the major worm species affecting sheep and goats in warm, moist climates that experience summer rainfall. It is not characterized by diarrhea. However, heavy loads of other gastro-intestinal worms can cause diarrhea in sheep and goats: *Ostertagia circumcincta* (medium or brown stomach worm), *Trichostrongylus* (bankrupt or hair worm), *Coopera sp.* (small intestinal worm), and *Nematodirus sp.* (threadneck worm). Control of gastro-intestinal parasites is best achieved via good pasture, grazing, and animal management, and strategic and/or selective deworming of affected individuals with effective anthelmintics.

Internal Parasite Control: A Beginner's Guide to Raising Sheep

*Clostridium perfringens*
*Clostridium perfringens* types A, B, C, and D can all cause diarrhea in lambs and kids, though type D is the most common agent. With type D, the onset of neurologic signs followed by sudden death is more common in sheep, whereas goats are more likely to show signs of diarrhea before death. Treatment is rarely effective but consists of aggressive supportive care and administration of the antitoxin. *Clostridium perfringens* type C tends to affect very young lambs (<2 weeks of age) and presents itself as bloody diarrhea, hemorrhagic enteritis, and bloody scours. Clostridial diseases are easily prevented in the young by vaccinating pregnant dams about three weeks prior to delivery and subsequent vaccination of offspring. Consumption of adequate, high quality colostrum is important.

*Enterotoxemia in lambs*
Vaccinating for Overeating Disease

**Rumen Acidosis**
Acidosis is caused by too much grain or concentrate, which causes a change in rumen acidity and bacteria population. The increase in acid causes an inflammation of the rumen wall and a reduction in the bacteria needed to digest fiber. Symptoms may include depression, off feed, bloat, founder, scours, and occasionally death. Treatment includes drenching with mineral oil or antacids. Acidosis is prevented by proper feeding management. Concentrates (grain) should be introduced to the diet slowly and increased incrementally to give time for the rumen to adjust.

**Nutritional**
Nutritional scours can be caused by anything that disrupts normal habits. It can also be the result of low intake of dry matter to fluid ratio. A lamb needs to consume at least 2.5 percent of its body weight in dry matter daily. Young or fast growing lambs turned out to pasture must eat large quantities of grass to satisfy their nutritional needs. Green grass is high in moisture. They may develop diarrhea if they aren't getting enough dry matter in their diet.

**Diarrhea in adult sheep and goats**
Adult-onset diarrhea is less common than in lambs and kids, but nevertheless is possible. Parasitism can cause diarrhea in adult sheep and goats. Coccidiosis can occur in adults under extreme stress or due to lack of immunity. The ingestion of toxins, of which the list is long, can also cause diarrhea. It is not uncommon for sheep or goats to scour when they are grazing lush or wet pasture.

**Johne's Disease** (pronounced "Yo-nees")
Unlike cattle, diarrhea is not a common symptom of sheep and goats infected with Johne's disease. A USDA-APHIS study showed than less than 20 percent of sheep and goats with Johne's show diarrhea. Johne's disease is an incurable, contagious bacterial disease of the intestinal tract. It occurs in a wide variety of animals, but most often in ruminants. Johne's is most commonly reported in dairy cattle, but probably underrated as a problem in small ruminants.

**Treatment Strategies**
Diarrhea should not be considered an illness in and of itself but rather a symptom
of other more serious health problems in sheep and goats. It can be the symptom of many different illnesses, e.g. bloat, acidosis, enterotoxemia, and polio. Diarrhea is not always the result of an infectious disease. It can be induced by stress, poor management, and nutrition.

Before treating an animal for diarrhea, it is essential to determine why the animal is scouring. Take the animal’s temperature using a rectal thermometer. If body temperature is above the normal range (102-103°F), fever medications and antibiotics can be used to control the infection.

Many of the common causes of diarrhea are self-limiting, and the major goals of treatment are to keep the animal physiologically intact while the diarrhea runs its course. A variety of oral antidiarrheal medications have been used in sheep and goats. They may be helpful, but no trials have ever been reported.

The most effective treatment for a scouring lamb or kid is rehydration by administering fluids. Pepto-Bismol (Bismuth Subsalicylate, Bismusal) is commonly used to treat livestock with diarrhea. Pepto Bismol contains bismuth which coats, soothes, and relieves the irritated lining of the stomach. Kaopectate (Kaolin-Pectin) can be used to treat non-infectious causes of diarrhea. Drugs which decrease gut motility (e.g. Immodium AD) should not be used. Oral yogurt or probiotics are often given to restore a more normal gut flora.

Antibacterial drugs tend to be very overrated in the treatment of diarrhea but they are sometimes indicated. Treatment with antibiotics is usually not useful when animals are infected with viruses or protozoa. However, antibiotics are useful when bacterial infections are the primary infective agent or where the risk of secondary bacterial infections is high. Sulfa-antibiotics or amprolium should be used in the case of coccidia.

***It is important to note that many of the organisms which cause scours in livestock can cause disease in humans.
More Web Resources
Young Ruminant Diarrhea
Calf Note #42: What are Scours?
Calf Note #22: Feeding Scouring Calves
Scours in Hand Reared Animals - NZ Lifestyle Block
Drugs (Anthelmintics) Used to Control Internal Parasites in Livestock
Products Used to Treat and/or Prevent Coccidiosis in Livestock
Antibiotics Commonly Used in Livestock Production
Johne's Information Center
Sheep May Not Be an Important Zoonotic Reservoir for Cryptosporidium and Giardia Parasites (PDF)