

# Enterotoxemia (Overeating Disease) in Sheep and Goats

## Introduction

Enterotoxemia, also known as overeating or pulpy kidney disease, is a condition caused by the absorption of a large amount of toxins from the intestines. *Clostridium perfringens types C & D* are bacteria normally found in the soil and as part of the normal microflora in the gastrointestinal tract of a healthy sheep and goats. Under certain conditions, these bacteria can rapidly reproduce in the animals, producing large quantities of toxins.

The toxins cause enterocolitis (inflammation of the intestine), increase the permeability of the blood vessels, and become absorbed in the blood. They circulate in the bloodstream, promoting swelling in the lungs and kidneys, giving the condition the name pulpy kidney disease.

Young animals are most susceptible. Sudden and high mortality rates are concentrated in lambs and kids. Although adult animals are also susceptible to enterotoxemia, they develop immunity due to frequent exposure to these toxins.

## Factors Associated with Enterotoxemia Outbreaks

Sheep and goats are more likely to produce too much *Clostridium perfringens* types C & D in the gut, and suffer from enterotoxemia, during conditions such as the following:

- When kids and lambs excessively consume milk or feed with high quantities of grain
- While recovering from an illness or distress; when natural immunity is compromised
- As a consequence of heavy infestations of gastrointestinal parasites, such as nematodes (worms) and coccidia
- When animals have a diet rich in grains and low in dry matter (hay or green grass)
- When animals have any condition or disease that slows the peristalsis (motility of the gastrointestinal tract)

## Common Signs of Enterotoxemia

- Most frequent in young animals, the peracute form is characterized by sudden death that occurs 12 hours after the first signs of the disease appear. Sudden death occurs only minutes after a lamb or a kid shows signs of central nervous system alteration. These signs are excitement and convulsion, followed by death.
- Loss of appetite
- Abdominal discomfort, shown by kicking at the belly and arching the back
- Profuse diarrhea (watery consistence with or without blood)

## Diagnosis, Treatment, and Prevention

### Diagnosis

Diagnosis is based on clinical signs, and history of sudden death that can be confirmed by necropsy. Diagnosis can be confirmed by positive identification of enterocolitis (inflammation of the intestine), *Clostridium perfringens* types C & D from the feces, and gut content and kidneys cultured and isolated from the affected animals.

The presence of glucosuria (high levels of sugar in the urine) can indicate enterotoxemia.

Postmortem data are important for the diagnosis of enterotoxemia. Therefore, dead animals should be submitted to necropsy and their tissues sent to a diagnostic laboratory for confirmation of the clinical diagnosis. A postmortem examination of the large and small intestines can identify a high collection of watery blood and fibrinous clots, and numerous ulcers on the mucosa (internal layer of the intestines). The brain and kidney tissues may show softening. Specific DNA testing assays can help detect enterotoxemia in postmortem animals.

### Treatment

Recommended treatments include the following:

- Administering C & D Antitoxin according to the manufacturer's recommendation. Kids are normally treated with 5 mL of C & D Antitoxin subcutaneously.
- Administering penicillin.

- Orally administering an antacid.
- Administering anti-bloating medication.
- Reducing pain by applying Banamine (as prescribed by a veterinarian).
- Administering thiamin (vitamin B1) I.M intramuscularly.
- Replacing fluids intravenously or subcutaneously, and using corticosteroids.
- Using probiotics after treatment with antibiotics to encourage repopulation of the microflora in the rumen and guts.

### Prevention

All animals in a herd should be vaccinated against enterotoxemia. Vaccination will reduce the chances that animals will contract enterotoxemia.

### Vaccination Protocol

- Vaccinate pregnant animals with C/D&T vaccines during the fourth month of pregnancy. This procedure will enrich the colostrum (first milky secretion produced between one and three days after birth) with antibodies (specific proteins) that will protect the newborn against enterotoxemia.
- All young animals should be vaccinated at four weeks of age and then 30 days later. Administer another booster dose at the time of weaning.
- Vaccinate bucks and all adult animals once a year.

**NOTE:** Use vaccines labeled for sheep and goats. Some of the vaccines against enterotoxemia are also associated with the tetanus vaccine.

## Vaccination Procedure

- Do not vaccinate goats within 21 days before slaughter.
- Vaccinate animals that appear healthy; avoid vaccinating animals sick with fever or worms. These animals may not respond well to the vaccine because their immune systems may be weakened.
- Keep good records of the herd.
- Use a new needle for each animal.
- Disinfect the injection site with alcohol.
- Avoid causing stress to the animals during vaccination. Handle the herd in a peaceful manner; avoid accidents and noise when working with goats.
- In case of anaphylaxis (body reaction) caused by a vaccine, use epinephrine or its equivalent.
- Refer to label instructions for product use and storage before vaccinating.

**NOTE:** Some products mentioned are not approved by the United States Food and Drug Administration for use in meat or dairy goats. Therefore, their uses are considered extra-labeled. Consult a local veterinarian before using products in an extra-labeled manner.

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