

Caseous Lymphadenitis

Is It a Problem in Your Flock or Herd?

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Caseous lymphadenitis (CLA)

is a sheep and goat disease that occurs throughout the world. It decreases meat yield through carcass condemnation, hinders reproductive efficiency, causes damage to pelts via abscess scars and may lead to death in severely infected animals.

Infection

CLA is a chronic, recurring disease. It is caused by the gram-positive bacterium *Corynebacterium pseudotuberculosis*, which can survive in the environment for several months to years. Infection usually occurs through skin abrasions or wounds caused by shearing, barbwire fencing or exposed nails, but can result from aerosol infection of the lungs.

One to three months after infection, localized abscesses will develop at the point of entry into the skin or in the regional lymph node (external form, Figure 1). Abscesses gradually will grow in size and number, and eventually rupture and discharge infectious pus. The disease also may spread through the blood or lymphatic system and cause abscessation of internal lymph nodes or organs (internal form, Figure 2).

Clinical Signs

The most obvious sign of CLA in sheep and goats is external abscessation. Animals managed under farm conditions initially will develop abscesses around the head and neck following infection from contaminated feed, feeders and paneling. In animals managed under range conditions, abscesses generally will be limited to the shoulders and neck because of limited contact with feeding facilities and other animals.

If the disease is left untreated, abscesses will develop on the entire body of the animal, including the back, legs and udder. Secondary complications may include pneumonia, breathing difficulties due to abscesses in the neck region, arthritis, mastitis and male infertility following scrotal abscessation. Severe internal abscessation can lead to extreme weight loss, abortion, paralysis and death.

Diagnosis

Diagnosis of CLA usually can be based on flock or herd history, as well as the clinical signs mentioned above. A bacteriologic examination can be performed for definitive diagnosis. An intact abscess can be aspirated using a syringe and needle, and the collected pus should be submitted to the NDSU Veterinary Diagnostic Lab at (701) 231-8307. The University of California at Davis has developed a synergistic hemolysis inhibition (SHI) serologic test for diagnosing caseous lymphadenitis. The test has 95 percent sensitivity and 98 percent specificity based on testing in 100 positive goats.

Chronic cases characterized by walled-off abscesses will result in false negative results, and the vaccine will induce false positive results. Titers greater than 1:256 have a 95 percent correlation with internal abscesses and a peak titer of 1:64 is associated with vaccination. Therefore, the test does provide some indication as to whether the animal is a vaccine positive or has

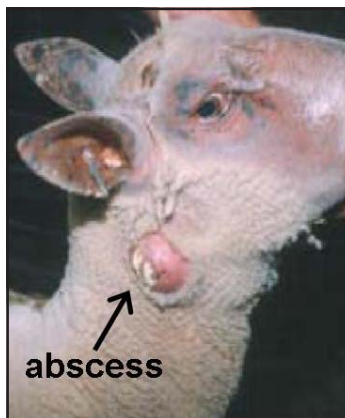


Figure 1. External abscessation in sheep caused by *Corynebacterium pseudotuberculosis* infection. Source: University of Warwick, England.



Figure 2. Internal abscessation in sheep caused by *Corynebacterium pseudotuberculosis* infection. Source: Alabama Extension Service.

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hidden internal abscesses. More reliable results can be gathered based on the SHI serology if multiple samples are collected and analyzed during one or two months. However, all these conclusions have been made using goats; hence, researchers do not know if similar results can be gathered for sheep.

Control

Eradication of CLA is very difficult. Because the bacteria are protected in the abscesses, they cannot be reached effectively by injectable antibiotics. Emaciated animals and those with recurring abscesses should be culled. When an infected sheep or goat is too valuable to cull, external abscesses can be lanced, drained and cleaned with iodine after separation from other animals. Abscesses should not be injected with formalin since this practice is painful to the animal and may leave a carcinogenic residue.

Young animals should be raised separately from older animals that are more likely to be infected. Since the disease primarily is spread through shearing in sheep, younger animals always should be shorn first. If a sheep is diagnosed during shearing, equipment should be disinfected before continuing with the next animal. Furthermore, shearing equipment always should be cleaned and disinfected between flocks.

Prevention

Do not purchase replacement animals from flocks or herds infected with CLA. Regardless of whether the seller's flock or herd is infected with the disease, all purchased animals should be isolated for at least one month. A commercially available vaccine from the Colorado Serum Co., called Case-Bac, provides protection against the causative agent, *C. pseudotuberculosis*. A study published in the Journal of the American Veterinary

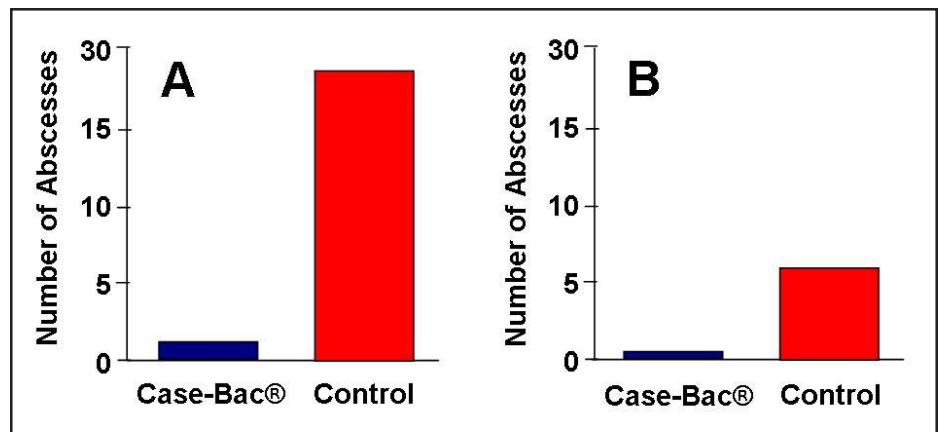


Figure 3. External (A) and internal (B) abscesses after vaccination with Case-Bac and then exposure to *Corynebacterium pseudotuberculosis*. Source: Journal of The American Veterinary Medical Association, June 1, 1998, pp. 1765-1768.

Medical Association (June 1, 1998) demonstrated that primary vaccination with a booster at four weeks significantly reduced the incidence of external and internal abscesses resulting from *C. pseudotuberculosis* infection (Figure 3). Sheep also were challenged at eight months post-vaccination in this study. The vaccinated group showed 90 percent protection against the internal form of CLA and 58 percent protection against the external form of CLA. The non-vaccinated controls showed 100 percent infection with both forms of CLA.

Repeating the vaccination at least annually will help reduce disease prevalence. Vaccinating sheep with high exposure (e.g., infected farm flocks) every four to six months may be most beneficial. Vaccination against CLA is clearly beneficial, yet only 3.1 percent of U.S. sheep flocks received the vaccine in 2000 (Source: USDA APHIS, April 2003 Info Sheet).

As shown in Figure 3, the vaccine does not prevent all new infections. Furthermore, the vaccine does not cure animals already infected with the bacteria. The Colorado Serum Co. does not recommend vaccinating pregnant animals and animals under 8 weeks of

age. Even though the vaccine is a killed bacterin, it will cause a large percentage of animals to develop a secondary lameness since it is administered in the axillary space (front flank) of the animal. Also, a large number of animals will develop a transient fever and become lethargic for one to two days after vaccination. Stress resulting from the latter conditions could result in cortisol release by the dam resulting in premature labor or abortion.

Although no research has been completed to determine the incidence of abortion after vaccinating pregnant animals, according to the Colorado Serum Co., abortion has been observed in pregnant goats. Although the vaccine is not labeled for use in goats, positive results have been reported by producers using the vaccine. Goats do tend to be more susceptible to the adverse reactions discussed above.

Conclusion

Knowing the clinical signs of CLA will help the small-ruminant producer implement an effective control program. Furthermore, producers should remain conscious of the necessary preventative measures for this disease.

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