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Opinion Article

The Role of Caseous Lymphadenitis in Adult Sheep Culling

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DESCRIPTION

Corynebacterium pseudotuberculosis causes chronic infections in a wide variety of animal species, including sheep, goats, llamas, alpacas, buffalo, cattle, horses, and even humans. Sheep and goats are the animals most usually afflicted by this microorganisms, and the condition is known as Caseous Lymphadenitis (CLA). Pseudotuberculosis is a Gram-positive pleomorphic bacterium that is facultatively intracellular anaerobic, non-spore-forming, non-capsulated, and non-motile. It has two key virulence factors. A strong phospholipase-D (PLD) exotoxin and a mycolic acid-rich cell wall.

Caseous lymphadenitis in sheep is caused by *Corynebacterium pseudotuberculosis* biovar ovis, and it is a common and economically important disease in the majority in Asian countries due to its negative impact on wool, meat, and milk production, carcass and skin condemnation, and flock reproductive performance. Once C. *pseudotuberculosis* infection is developed in sheep, it results in the production of pyogranulomatous lesions that can be seen in many organs. These pyogranulomatous lesions are made up of a thick white caseated substance surrounded by a thick fibrous wall that grows in size and takes on a lamellated look depending on their location and whether or not the capsule ruptures. Chronic CLA is commonly linked with the "onion ring" appearance. This "onion ring" appearance is created by a process of repetitive necrosis of the lesion capsule induced by pathogen agent multiplication, followed by capsule reconstruction as a protective strategy of the organism to delimit the infection.

Depending on where the pyogranulomas are situated, the sickness has two different clinical presentations. Pyogranulomas develop in the superficial lymph nodes, such as the retropharyngeal, parotid, submandibular, prescapular, precrural, testicular, or mammary lymph nodes, or even in the subcutaneous tissue, in the cutaneous or superficial form of CLA. This outer form typically affects young animals. The visceral clinical manifestation has a significant impact on adult animals. Pyogranulomas are most commonly seen in internal lymph nodes like the mediastinal or mesenteric lymph nodes, or in organs including the lungs, liver, kidneys, brain, or testes. Both clinical kinds may emerge simultaneously in same animal, resulting in a mixed clinical appearance. Although it is a frequent illness in sheep flocks, adult animals typically go unreported since the visceral form has no visible clinical indications. CLA, on the other hand, is thought to produce a chronic wasting illness known as "thin ewe syndrome" by several writers. When faced with malnourished sheep, this condition should be considered in the differential diagnosis.

Because of the rupture or fistulization of the abscesses, animals infected by CLA superficial type might transfer the pathogen microorganism to the nearby environment, where it can persist for several weeks or even months. Shearing is a significant risk factor to be addressed since the flock's animals are exposed to the pathogen in the environment, which can be transferred into the animal through wounds on the skin or mucosae. According to more recent research, aerosol transmission of this organism is conceivable because animals with pulmonary CLA lesions can release the virus through breathed air, infecting free animals in the flock. This idea is supported by epidemiological data collected in Australia. The scientists discovered that in a flock with no surface CLA lesions, the seroprevalence of CLA grew fast. Other research suggests that internal lesions arise as a result of a systemic infection that begins somewhere else in the body. Several experimental infections with C. *pseudotuberculosis*, administered subcutaneously or intravenously, have resulted in the formation of pyogranulomatous lesions in locations other than the inoculation site, such as the lungs and mediastinal lymph nodes.

Caseous lymphadenitis has been documented in the majority of sheep-raising areas across the world; nevertheless, its prevalence is underestimated since only a few nations, if not regions, have done epidemiological studies to determine illness prevalence rates. In Australia, Canada, the United States, Brazil, Iran, and Egypt, studies have revealed a high prevalence of the condition, ranging from 12.60 percent to 61.00 percent. Some studies have been conducted in Europe, with lower frequencies (0-6.4%) reported, with Spain having the highest rates. Iran, Egypt, the Falkland Islands, and Brazil have all recently conducted epidemiological examinations. All of the CLA-positive animals in this investigation had CLA compatible lesions, which were verified when C. *pseudotuberculosis* was isolated from the samples.

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