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### DISTRIBUTION AND CAUSES OF CLOSTRIDIAL DISEASES IN SHEEP

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**Annotation:** This article examines the distribution and causes of clostridial infections (clostridiosis). Clostridia are spore-forming, anaerobic bacteria belonging to the genus *Clostridium*, which are widely distributed in soil, water, animal organisms, and food products. The article analyzes the main routes of transmission, including contaminated wounds, improperly stored food products, uncontrolled use of antibiotics, and failure to observe sanitary and hygienic rules. The findings emphasize the importance of preventive measures and proper hygiene in reducing the incidence and spread of clostridial diseases.

**Keywords:** Clostridia, bradzet, infectious anaerobic enterotoxemia, lamb dysentery, *Clostridium septicum*, *Clostridium oedematiens*, *Clostridium perfringens*.

**Relevance of the topic:** Currently, approximately 220 species of clostridia are known, most of which are saprophytes. Clostridial infections are traditionally divided into two groups: those that activate fermentation and putrefactive processes, and those that cause diseases in animals and humans. The number of pathogenic clostridial species is relatively small; some of them cannot independently cause disease. However, their association with other anaerobic and facultative anaerobic bacteria significantly complicates the infectious process and makes diagnosis difficult. Under natural conditions, sheep become infected with clostridiosis regardless of breed or sex, which is one of the factors leading to reduced production profitability.

**Degree of Study of the Problem:** The term “clostridiosis,” derived from the genus *Clostridium*, unites diseases of warm-blooded animals caused by various species of anaerobic spore-forming bacteria. These microorganisms are characterized not only by spore formation and oxygen sensitivity, but also by their ability to produce highly active specific toxins that exert lethal effects on the macroorganism; therefore, they are often referred to in the literature as toxico-infections. The genus *Clostridium* belongs to the family Clostridiaceae, order Clostridiales, class Clostridia, phylum Firmicutes. According to Bergey's classification, the genus is divided into five groups based on the ability to ferment gelatin and the localization of spores within the cell (central, terminal, or subterminal). All listed clostridial species are widely distributed in nature, especially in humus-rich soils. One of the most распространённых species is *Clostridium perfringens*, which is subdivided into several types according to the toxins it produces. Persistent unfavorable foci formed by soil contaminated with spores of the pathogen are of great epidemiological importance. Anaerobic infections frequently occur as postpartum and postoperative complications. Cases of clostridial infection have also been reported during gastrointestinal surgical procedures, blood collection, and drug administration. Among small ruminants, the most clinically significant clostridial species include *C. oedematiens*, *C. septicum*, and *C. perfringens*, which cause bradzet, infectious anaerobic enterotoxemia, and lamb dysentery. A key biological characteristic of pathogenic clostridia is their ability to produce highly active toxins that disrupt the normal function of specific tissues and organs, leading to severe pathological processes that are often life-threatening. Infectious anaerobic enterotoxemia has been reported in many countries worldwide, including Australia, New Zealand, the USA, Canada, Argentina, Italy, Cyprus, Bulgaria, Hungary, and Turkey. It was first recorded in 1938 among Merino sheep imported into Iran. The disease has also been documented in the Caucasus, Central Asia, and Siberia. In our country, it is most frequently observed in spring. The disease affects sheep of various ages. In some cases, it is especially common among fattening lambs aged 1–6 months, particularly when the diet contains a high proportion of concentrates or when pastures

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are extremely lush. In Western Siberia and the Baikal region, lambs aged 1.5–2 months kept on concentrated feed were more frequently affected, whereas sheep maintained exclusively on pasture were less affected. In unfavorable farms and flocks, the disease often has an acute course and affects sheep of all ages. Both sick and recovered animals serve as sources of infection. In many cases, clinically healthy sheep may excrete the pathogen, and the external environment acts as a significant transmission factor. Disturbances in gastric secretory and motor functions play an important role in disease development. This is especially observed when sheep are suddenly transferred from confined feeding conditions to pasture, particularly in early spring when fresh green grass begins to grow. After winter, hungry sheep eagerly consume large amounts of fresh forage, leading to ruminal tympany, gas accumulation, and the formation of an anaerobic environment in the gastrointestinal tract, which promotes clostridial multiplication. The risk is especially high when young grass is covered with dew or frost. Infectious enterotoxemia is not directly contagious. Bradzot is an acute infectious disease of sheep characterized by severe intoxication, hemorrhagic inflammation of the abomasum and duodenum, degeneration of parenchymal organs, gas accumulation in the digestive tract, and a putrid odor. The primary source of infection is soil. Bradzot is widespread in various climatic and soil conditions. Large epizootics occur particularly in rainy years. In farms where veterinary sanitary regulations are not observed, outbreaks recur annually. Mortality may reach 100%. In peracute cases, animals may die within 10–15 minutes or within 2–12 hours without obvious clinical signs. The source of infection includes diseased sheep and carrier animals. Untimely disposal of carcasses contaminates pastures and water sources. Lowland pastures, areas near lakes and rivers, and irrigated lands are especially hazardous. Infection occurs alimentarily through ingestion of contaminated feed or water. During epizootics, 30–35% of sheep may be affected, and mortality may reach 90–100%.

**Conclusion:** Based on the analysis of the literature and our own studies, we conclude that clostridial diseases in sheep (enterotoxemia, bradzot, malignant edema, and others) are mainly caused by spore-forming anaerobic bacteria such as *Clostridium perfringens* and *Clostridium septicum*. These microorganisms persist for long periods in soil, pastures, feed, and water, and may also exist in the intestines of healthy animals in a conditionally pathogenic state. Disease outbreaks are most commonly observed under pasture conditions, particularly in humid and contaminated areas. Sudden dietary changes, excessive grain feeding, poor-quality or moldy feed, cold and damp weather, stress factors, and failure to comply with sanitary regulations promote clostridial activation. Rapid bacterial proliferation and toxin production often result in sudden death, especially in enterotoxemia. Infection may also enter through wounds or postpartum complications, leading to malignant edema or tetanus. Failure to implement timely preventive vaccination significantly increases the risk of disease spread. Therefore, the main factors contributing to the occurrence and spread of clostridial diseases in sheep include soil and pasture contamination, improper feeding, stress, and inadequate preventive measures. Regular vaccination, provision of high-quality feed, maintenance of pasture hygiene, and strengthened veterinary supervision are essential for effective disease prevention.

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## **Scottish International Conference on Multidisciplinary Research and Innovation – SICMRI 2026**

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