

Popular Article

Lameness in dairy animals: Causes, type and its preventive management practices

Garima Kansal^{1*}, Hitesh²

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¹Livestock Production Management Division, ICAR-National Dairy Research Institute, Karnal-132001, Haryana, India

²Department of Veterinary Gynecology and Obstetrics, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar-125001, Haryana, India

Introduction

With the emergence of intensive commercial livestock production to meet the growing demand for animal-based products, there has been an increase in food production diseases, subsequently resulting in animal welfare issues. After mastitis and infertility, lameness is one of the three major issues affecting dairy cattle globally, resulting in reduced productivity, economic losses, and animal welfare problems. Lameness is associated with reduced milk yield, lack of weight gain, poor fertility, and frequently, animal culling. Lameness constitutes any foot or leg condition of infectious or non-infectious origin that negatively impacts cow mobility, posture, and gait (Archer et al., 2010). The financial impact of lameness includes losses from decreased production, cost of treatment, prolonged calving interval, and possibly nursing labor. Cows in poor condition have a greater predisposition to lameness. Cows that are lame before breeding have a reduced ability to conceive, and cystic ovaries are much more common in lame cows. Lame cows are less aggressive in their struggle for feed and are more likely to die early or be culled. Prevalence rates of lameness in dairy herds range from 17% to 35% globally, with intensive farming systems having greater prevalence compared to grass-fed cows, who display reduced incidence of disease (Blackie and Maclaurin, 2019)

Causes and types of lameness

Common causes of lameness are:

- **Infection** (i.e. foot rot, digital dermatitis, toe tip necrosis, infectious arthritis)
- **Nutrition** (i.e. laminitis, mycotoxin-related necrosis)
- **Physical injury** (i.e. frostbite, sprain, break)
- **Genetics** (i.e. bad conformation, temperament)

Foot Rot

Foot rot is a painful condition that causes lameness and can affect any class of cattle, whether in a feedlot, corral, or pasture. Foot rot is highly infectious and is caused by bacteria, most commonly *Fusobacterium necrophorum*. The infection originates in between the claws of the hoof and may be characterized by heat and swelling in between the claws, as well as along the coronary band where the hoof meets the skin. If it is not identified and treated promptly, the infection can move elsewhere into bones, joints, or tendons, causing delayed recovery or other complications.

Toe Tip Necrosis

A lameness condition affecting the hind feet of feedlot cattle which develops early in the feeding period, and often occurs within clusters of animals. Sometimes referred to as a *toe abscess* or *ulcer*, *apical white line disease*, It has been associated with improper processing or handling, abrasive flooring, as well as flighty animal behavior.

Digital Dermatitis

Digital dermatitis, also known as *hairy heel wart* or *strawberry foot rot*, is a skin infection that affects the area around the dewclaws, between the claws, and sometimes the heel of the hooves. It is characterized by raised lesions often located between the claws and dewclaws. These lesions are very painful, may appear red and bleed easily if disturbed, and some may have long fibrous hairs. Animals appear to walk on their tip toes to avoid putting pressure on their heels.

Joint Infections and Arthritis

Long term sickness in animals is also a risk factor of spreading infection to bones and joints. *Mycoplasma bovis* commonly implicated in cases of pneumonia and mastitis can also travel through the animal's bloodstream and settle in the ankle, stifle, hock, or elbow joints, leading to painful swelling and arthritis. Animals with joint infections may become chronically ill if they aren't caught and treated in time, or if tissue damage compromises treatment.

Laminitis (Founder)

Laminitis is a condition where the lamellae is weakened or becomes separated. Laminitis is linked to rumen acidosis which is when the rumen pH drops causing rumen bacteria to produce toxins that can pass through the rumen wall. These toxins can cause swelling in the blood vessels of the hooves, leading to founder or laminitis. Laminitis is usually attributed to diets that are high in fermentable carbohydrates such as grain, and it may occur after a sudden or rapid change in rations.

Mycotoxin-related Necrosis

Ergot bodies or other fungi during wet conditions causes release of mycotoxins in feed which can lead to lameness in animals on feeding that contaminated feed material. Ergot restricts blood flow to the hooves and other extremities which can cause severe lameness and even hoof-sloughing or other debilitating health and welfare issues.

Physical Injuries

Animals may sustain physical injuries, including sprains, breaks, sand cracks, or frostbite. Environment, exposure to moisture, or heavy animals may be contributing factors to the incidence of sand cracks. Frostbite most commonly occurs in young animals although older cattle are not immune. When tissue freezes, blood circulation to the hooves is restricted, and tissue damage – either temporary or permanent – occurs.

Genetic Problems

Poor foot and leg conformation can also be a result of genetics. Genetic causes of lameness can be passed down to offspring and are sometimes slow to appear. Because lameness is multi-faceted, cattle that have proper foot and leg conformation will be better suited to withstand poor pen conditions or other non-infectious risk factors for lameness.

Risk Factors

There are several risk factors that may lead to an increased incidence of lameness.

- Poor pen environments, including excessively frozen ground, very dry environments, or extremely wet and muddy conditions may negatively affect the skin barrier, leading to foot rot and other types of lameness.
- Housing cattle in pens where *Fusobacterium necrophorum*-caused foot rot infection
- Poorly designed facilities, including slick surfaces or abrasive flooring,
- Sharp edges, protrusions, or objects like wire, metal, rocks, ice, and frozen manure, can contribute to physical injuries
- Improper or high-stress animal handling practices can increase risk of slipping and physical injury.
- “Flighty” or nervous cattle are more likely to damage or injure their feet and legs.
- Cattle infected with *Mycoplasma bovis* are at risk of joint infection.
- High grain rations, erratic feed consumption (due to weather factors or feed supply problems), and improper feed processing are risk factors for laminitis.
- Heavier cattle or cattle held on feed for too long are at a higher risk for lameness.

Preventive and Management practices

- Accurate diagnosis is important for successful treatment and prevention of lameness.
- Pain management is an important consideration to improve both welfare and production outcomes in a lame animal. Using steroids by vets. such as dexamethasone, as an anti-inflammatory in certain cases. The increased availability of non-steroidal anti-inflammatories (NSAIDs), such as meloxicam (i.e. Metacam®) or flunixin (i.e. Banamine®) have also helped to improve pain management in lame cattle.
- Regular pen cleaning and landscaping to ensure proper drainage, good footing, and to minimize build-up of manure and bacteria that causes lameness.
- Disinfecting and maintaining hoof-trimming equipment and tools.
- Removing sharp objects, such as rocks, ice, wire or metal, that may cause injury.
- Vaccinating/preconditioning cattle to reduce disease and improve overall health and immunity in order to minimize risk of lameness as a secondary ailment.
- Practicing low-stress animal handling.
- Incorporating proper handling facility designs that include adequate traction and comfortable footing.
- Applying lime to barn floors following cleaning between fills to make the environmental pH less friendly to infectious lameness-causing bacteria.
- Consulting with your veterinarian regarding the potential use of a *Fusobacterium necrophorum* vaccine to prevent footrot.
- Incorporating step-up rations for high-grain diets to reduce the risk of acidosis and laminitis.
- Test feeds for potential mycotoxins that may lead to ergot poisoning.
- Carefully inspect feet and legs on breeding cattle to ensure they are fit and sound.

References

- Archer, S., Bell, N. and Huxley, J., 2010. Lameness in UK dairy cows: a review of the current status. *In Practice*, **32**(10): 492-504.
- Blackie, N. and Maclaurin, L., 2019. Influence of lameness on the lying behaviour of zero-grazed lactating jersey dairy cattle housed in straw yards. *Animals*, **9**(10): 829.

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