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Discarded Lead-Acid Batteries Pose a Deadly Risk to Livestock

Abstract

Lead poisoning in livestock, particularly cattle, is a significant yet preventable animal welfare and food safety concern frequently caused by the ingestion of discarded lead-acid batteries. Degraded by weathering, these batteries expose toxic lead plates and sludge that are often palatable to curious or mineral-deficient animals. Clinical signs—including blindness, ataxia, and tremors—often mimic other diseases or plant toxicities, leading to delayed diagnoses. Studies indicate that a single battery can poison up to 20 calves, with lead persisting in the tissues of survivors for over a year, rendering meat and milk unsafe for consumption. This article highlights the critical need for vigilant pasture inspections and the prompt, proper recycling of lead-containing materials to mitigate financial losses and prevent unnecessary animal suffering.

Introduction

Observation of livestock developing unusual, unexplained, and potentially fatal neurological and gastrointestinal symptoms is a concerning issue that prompts investigation. The investigation may initially lead an Extension professional to focus on any poisonous plants that may be growing on a producer's land. However, further work indicates poisonous plants are not present or perhaps, not the source of the symptoms.

Continued investigation through blood analysis and subsequent necropsies, ultimately leads to the surprising diagnosis of lead poisoning. A recent Extension experience serves as a stark reminder that a forgotten danger can be present on farms and ranches, such as discarded lead-acid batteries.

When animals exhibit signs of distress, the first step might be to search the pasture for toxic weeds like poison or western hemlock, or other plants such as larkspur, that can cause ataxia, recumbency, and eventual death. However, the real threat often results from man-made waste, specifically the common car, tractor, or equipment battery left to degrade in the elements. When batteries are degraded by temperature extremes, precipitation, or inquisitive animal behavior, they are a lethal hazard to animals. The consequences are not merely financial, but also a matter of severe, preventable animal suffering that can be fatal. This article provides information on this significant issue and emphasizes the vital importance of prompt and proper recycling of all lead-acid batteries and other lead containing materials commonly found on farms, ranches, and public rangeland.

Observation and Relevance of Study

Lead poisoning in livestock is not rare; unfortunately, it is a common diagnosis in cattle. The problem is often more serious than it appears because some cattle may be asymptomatic yet have elevated lead levels that are too high for humans to safely consume. Additionally, the misdiagnosis is because affected parties point to poisonous weed issues or disease-causing organisms.

As evidence of the problem, one study of a beef herd that grazed on a waste dump containing old batteries, demonstrates how common and serious lead poisoning is (Scrivens et al., 2023). The findings from this report offer sobering numbers:

- About 6% of the cattle that grazed in the dump site died.

- Of the surviving livestock, many became sick. Approximately 16% of the cattle had extremely high levels of lead in their body, three times higher than normal (normal is less than 0.10 ppm) even if they did not exhibit symptoms immediately.

- The study showed that even one and a half years later, 2% of the cattle *still* had high lead levels (n=815), proving that lead stays in the body for a long time. Cattle with high lead levels are not safe for consumption.

Veterinary research indicates that a single discarded battery left to deteriorate in a field can contain enough lead to poison 10 to 20 calves. This research highlights how a small piece of improperly disposed hazardous waste can have devastating consequences for an entire herd. The risk is both immediate and long-lasting, affecting animal welfare and posing potential food safety concerns, as elevated lead levels may be detected in both meat and milk. Additionally, degraded batteries, lead shots, and other lead-based materials can contribute to long-term soil contamination.

Source of Lead Exposure

Hazardous materials containing lead disposed of intentionally or unintentionally in pastures, hay fields, rangeland, and other areas are a primary source of acute and subacute lead poisoning in livestock, particularly cattle. It seems unlikely that cattle would directly consume lead containing materials, however, younger animals like calves and yearlings are naturally curious and non-discriminate eaters. Their grazing and licking behaviors, which are exacerbated by conditions like pica (the consumption of non-food items), are often linked to mineral deficiencies, curiosity, or simple boredom. The sweet taste that lead compounds can acquire through decomposition, combined with the accessible materials within a broken or decaying battery casing, make these materials surprisingly attractive to young livestock.

When batteries are exposed to weather events and temperature extremes, their plastic casings become brittle and degraded. The degradation process leaves the internal

plates and electrolyte sludge, which contain high concentrations of lead and lead salts, exposed and easily accessible for licking, chewing, and subsequent ingestion. The chew marks found on the batteries responsible for livestock lead poisoning are evidence of ingestion.

Once ingested, the metallic lead particles settle in the reticulum (one of the ruminant's stomach compartments). The acidic environment of the stomach gradually converts the solid lead into soluble lead salts, which are then readily absorbed into the bloodstream and soft tissues, triggering acute or chronic poisoning.

Symptoms of Lead Poisoning

The symptoms of lead poisoning (technically called lead toxicosis) can be confusing and mimic other neurological or physical issues, which is why poisonous plants are initially suspected. Lead attacks the central nervous system, causes gastrointestinal upset, blood abnormalities, immunosuppression, and other physiological problems.

Signs of acute lead poisoning can appear within 24 to 48 hours after a single episode of lead ingestion. Watch for these warning signs:

Neurological Signs:

- Blindness - often the first sign.
- Staggering: Technically called "ataxia," this looks like a lack of muscle coordination or walking like they are drunk.
- Twitching: Look for spastic twitching of the eyelids.
- Tremors: Muscle shaking or full seizures.
- Head Pressing: Animals are observed pushing heads against fences or walls.
- Grinding Teeth: Frequent, painful grinding (bruxism).

Gastrointestinal Signs:

- Drooling, excessive salivation.
- Not Eating: A total loss of appetite (inappetence).

Subacute lead poisoning is characterized by anorexia, colic, dullness, constipation followed by diarrhea, blindness, and incoordination. Chronic lead poisoning exhibits signs of acute and subacute poisoning, but may also include impaired swallowing reflexes.

Because these signs can quickly progress to the animal being unable to stand up (recumbency) and death, it is critical to call a veterinarian immediately for a diagnosis and potential treatment.

The half-life of lead is typically more than 9 weeks in cattle. A small percentage of cattle may have concentrations of lead in the body that exceed food safety standards, but never display any symptoms of poisoning. It is critical that cattle owners with confirmed cases of lead poisoning monitor and test all potentially exposed cattle to ensure blood lead concentrations are within the acceptable range.

Discussion and Recommendation

The loss of livestock due to the consumption of old batteries and other lead containing materials is preventable. Always identify, remove, and properly dispose of all batteries and lead containing materials to eliminate the risk of poisoning.

- Immediate Removal and Fencing: Immediately remove all sources of lead such as batteries, old paint and paint cans, grease, machinery parts, linoleum, and other materials of concern from grazing areas. If you cannot remove materials immediately, fence off the area so livestock are not enticed to consume or be exposed to hazardous materials.

- Recycling Program: Never leave a used battery exposed to the weather or discard it in a waste area or on land. The most responsible action is to return the battery to a hazardous waste facility, recycling center, or to the store where it was purchased. Many stores are required to accept old batteries. Lead and plastic materials are recyclable, which prevents them from becoming deadly pollutants in the environment.

- Educate and Inspect: Ensure everyone working on your property knows how dangerous lead batteries and materials are to animals. Inspect your fields and pastures to check for old dumpsites or forgotten waste, especially before turning out new groups of cattle or after individuals have entered your property, which increases the risk of discarded hazardous materials.

Consider adopting strict rules for handling and recycling batteries and lead containing materials. This practice helps farmers and ranchers protect their herds, prevent suffering and death loss, and maintain a clean and healthy environment. The best solution for this preventable tragedy is the management practice of properly disposing of batteries and other lead containing materials.

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