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Popular Article

Bovine Ketosis: A General Overview

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Introduction

Ketosis is a metabolic disorder of adult recent parturied cattle and buffalo. It commonly occurs in dairy cows in early lactation and is most characterized by hyperoxia and reduced milk production. It occurs in cattle in late gestation rarely. Clinical signs of ketosis are nervous dysfunction, including pica, abnormal licking, incoordination and abnormal gait, bellowing, and aggression. Ketosis is worldwide in distribution; however, it is most common in high yielding dairy cattle after 2 months of parturition due to decreased glucose concentration.

Pathogenesis

The pathogenesis of bovine ketosis includes combination of intense adipose tissue mobilization and a high glucose demand in body. Due to negative energy balance, it leads to adipose mobilization, and milk synthesis creates a high glucose demand. Fat mobilization is characterized by high serum concentrations of fatty acids (NEFAs). During periods of intense gluconeogenesis, a large portion of serum fatty acids are directed to ketone body synthesis in the liver. Ketosis is characterized by high serum concentrations of NEFAs and ketone bodies and low concentrations of glucose. The serum ketone bodies are acetone, acetoacetate, and beta-hydroxybutyrate (BHB).

Clinical findings

- Ketosis occurs at the time of peak milk production (usually around 4–6 weeks after parturition) described as type I ketosis.
- Type first Ketosis associated with underfed cattle experiencing a metabolic shortage of gluconeogenic precursors than with excessive fat mobilization.



- Ketosis in the immediate postpartum period is sometimes described as type II ketosis. Such cases of ketosis in very early lactation (1–2 weeks postpartum) are usually associated with fatty liver.
- Subclinical ketosis is defined as high serum concentration of ketone body without observed clinical signs.
- Subclinically affected cows are at increased risk of clinical (or more severe) ketosis and displaced abomasums and are also less fertile than those with normal serum ketone body concentrations. These cattle also having reduced milk production.

Diagnosis

- Determination of serum or whole blood BHB concentration is considered the best way to detect and monitor subclinical ketosis.
- BHB Concentrations more than 1.0 mmol/L (10.4 mg/dL) or 1.4 mmol/L (14.6 mg/dL) blood or serum BHB are considered diagnostic of subclinical ketosis.
- Rothra's test of urine is commonly used in lab for diagnosis of ketosis.

Treatment

- Oral administration of propylene glycol is line of treatment for ketosis. It acts act glucose precursor for 3-5 days.
- Intravenous administration of 50% glucose is best treatment to overcome from negative energy balance. With dextrose corticosteroids administration is effective.

Prevention of ketosis

Proper supply of glucose to pregnant and parturiated animals it prevent negative energy balance in animals so it helps in control in ketosis.

