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Popular Article

Ketosis in Dairy Cattle

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Introduction

Ketosis is the metabolic disorder in dairy cattle in early stage of lactation (first 6-8 weeks). It occurs when energy requirement of the animal exceeds the energy intake which results in negative energy balance. This condition occurs due to low level of blood glucose. During glucose deficiency the body fat is mobilized and processed in liver to meet the energy requirements. When higher quantity of fat gets mobilized, these fatty acids are not properly metabolized in the body leading to increased level of ketone bodies (also called ketonemia) like; acetone (also called acetonemia) acetoacetate acid and β -hydroxybutyrate (BHB) in the blood and accumulate in the liver. In blood, high level of ketone bodies & low blood sugar and presence of ketone bodies in urine are the characteristic features of ketosis. Reduced appetite in later stage of gestation or after calving or due to any disease conditions is one of the causes for ketosis. The condition is highly economically important as it results in reduced milk production during the peak lactation period and delayed conception leading to longer inter calving period.

Classification of Ketosis

It is basically classified into two classes:

- A. Primary Ketosis- Due to starvation, under feeding
- B. Secondary Ketosis- As a result of various systemic or infectious diseases like mastitis, metritis, pneumonia etc. Occurs, when animal do not take sufficient feed due to loss of appetite.



Clinical Symptoms

- Weight loss
- Drop in milk yield
- Slight reduction in feed intake
- Depression / lethargy
- Acetones smell (fruits like odour) in breath
- Fever
- Abnormal gait, humped back posture, head/muzzle pressing
- Pica (Hyporexia) biting of coarse surfaces
- Nervous signs, circling, staggering and falling

Diagnosis

- Laboratory detection of ketone bodies in blood, urine and milk.
- Blood β hydroxybutyrate (BHB) measurement via a cow side meter is the most accurate on-farm test.

Treatment & Management

The diseased animal should be consulted to a vets. Interventions should target quick increase the blood glucose level. Oral administration of jiggery can be done. Intravenous administration of 500 ml of 50% dextrose hypertonic solution is the commonly used therapy. The glucose administration alone cannot prevent relapse of the condition. Administration of glucocorticoids like dexamethasone/triamcinolone along with glucose will help in maintaining blood glucose level. Commercial Veterinary preparations of Propylene glycol can be given orally at 250-400 g/day to improve the glucose level. B-complex vitamins and mineral supplements should be given to improve the metabolism.

Preventive Measures**A. During later part of gestation**

- Adequate feeding.
- Excess feeding of energy rich concentrates should be avoided.
- The animal should be given proper exercise during this stage.

B. After calving when the milk yield increases suddenly

- The animal must be provided with adequate amount of energy rich concentrate feed according to the milk yield.
- Sudden change of feed should be avoided.



- High yielding animals can be fed with Bypass fat to at a rate of 15 - 20g/kg milk yield to prevent negative energy balance.
- Sodium Bicarbonate may be incorporated in feed to prevent development of acidosis due to excess concentrate feeding.
- Probiotics, Vitamin and mineral supplements should be included in the feed during the entire peak lactation period in order to improve feed utilization and metabolism.
- The feed containing high quantity of urea and silage should be avoided in susceptible animals.
- Disease conditions like retention of placenta (ROP), metritis, mastitis and environmental stress etc. should be treated immediately.
- Regular weekly tasting of urine and milk samples up to 2 months after calving can help in early detection of ketosis and immediate treatment should be given to save the animal.

