

Ketosis (acetonemia)

Ketosis in cattle is associated with an inadequate supply of the nutrients necessary for the normal carbohydrate and fat metabolism that is seen mainly in times of high milk production in early lactation. The excessive ketone bodies in the bloodstream come from the breakdown of fat when the animal is forced to draw on its bodily reserves for energy. Although the metabolism of body fat provides energy for cows, the nervous system is dependent on glucose, and the ketones produced as a result of excessive fat metabolism can have toxic effects. The excess ketone bodies are eliminated in the urine, milk and breath of the animal.

Cause

Ketosis may develop from poor diet or periods of stress such as cold, wet weather. It may also affect apparently well-fed cows producing very large volumes of milk. In pasture-fed cows the condition is usually seen when the grass is drying off and green feed is scarce.

The disease is relatively common in lactating cows in Australia but often goes unnoticed in its mild forms. The mortality rate in affected cattle is low and spontaneous recoveries occur in many cases. The disease is usually seen in early lactation (within the first 2 months after calving) and may cause significant production losses.

Five types of the disease are recognised:

- Primary underfeeding or starvation ketosis - feed quality inadequate.
- Secondary underfeeding ketosis - inadequate feed intake due to another disease or condition.
- Ketogenic or alimentary ketosis - from feeds high in ketogenic material.
- Ketosis due to a specific nutritional deficiency - cobalt and possibly phosphorus deficiency have been suspected as causes.
- Spontaneous ketosis - where causes are not able to be established.

Predisposing factors

- Age - cows of any age may be affected but the disease appears more common in later lactations peaking at about the fourth lactation.
- Body condition at calving - over fatness at calving has been associated with increased levels of ketosis.
- Other diseases - secondary ketosis results frequently when conditions such as mastitis, retained placenta and milk fever have previously occurred.

Signs of the disease

In the more common wasting form, there is a decrease in appetite and milk yield. There is an associated loss of weight, firm faeces and the cow becomes depressed. With recovery there is a gradual return to normal milk production.

In the nervous form, affected cattle excessively lick and chew or grind their teeth. The cattle may also walk aimlessly and appear blind and become recumbent.

In sub-clinical ketosis, clinical signs are not seen but ketones are present in the milk and urine.

Diagnosis

A veterinary examination may be necessary to confirm the presence of the disease. Ketosis is characterised by a high blood ketone level and a low blood glucose level. A test is available which will detect the presence of ketones in the urine and this is a good guide as to the existence of the disease.

Treatment

Treatment is best undertaken by your local veterinarian.

The aim of treatment is to:

- correct the energy deficiency in the diet
- reduce the production of ketones
- maintain adequate dietary energy levels to prevent relapse.

Treatment may include:

- Supplying adequate dietary requirements.
- Intravenous glucose (if used as the sole treatment, relapses will occur). Also give repeated drenches of propylene glycol or glycerine.
- Corticosteroids.
- Gastric stimulants to increase appetite.
- Supportive therapy.

Failure to respond to treatment within two days indicates that there may be another, underlying problem which should be identified and treated.

Prevention

Ketosis causes financial loss through lost production and treatment. It may be prevented by management strategies that maintain a good appetite and supply adequate feed to meet this appetite during the late dry period and immediately after calving. These strategies include:

- feeding transition rations before calving that reduce the risk of milk fever, retained membranes and dystocia
- feeding ample quantities of high-quality forages and concentrates after calving
- avoiding having cows fat when they are calving.

It is also important to ensure that any health problems (calving difficulties, abomasal displacement, milk fever) are identified and treated as early as possible.

Source: Queensland Department of Agriculture, Fisheries and Forestry; 2009