ıral Extension Service ● University of Minnesota

FACT SHEET

VETERINARY SCIENCE No. 11–1975

Ketosis of Dairy Cows

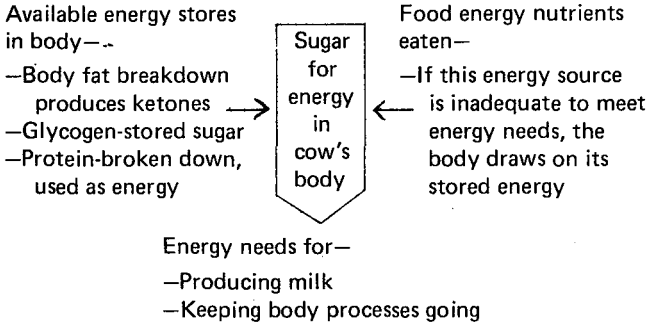
JERRY D. HILGREN

Occurrence and Body Energy Changes

Ketosis, a disease of dairy cattle, occurs within the first 6 to 7 weeks after calving. Most cases occur 2 to 4 weeks after calving.

Ketosis is a condition in which blood sugar becomes lower than normal and body fat is broken down rapidly to support energy needs for milk production and for the production of milk sugar (lactose) going into the cow's milk. The rapid breakdown of body fat associated with low levels of body sugar causes a build-up of fat breakdown products collectively called ketones. Ketones are fatty acids called acetone, aceto-acetic acid, and beta hydroxy butyric acid. The body cannot burn up, or utilize, these ketone bodies because of a lack of blood sugar. This combination of low levels of blood sugar and high levels of ketone bodies causes the cow to get sick and show the signs of ketosis.

Diagram of energy (sugar imbalances in a cow with ketosis)



Types of Ketosis

Primary ketosis is strictly an energy imbalance with high levels of ketones that is not associated with another underlying disease problem.

Secondary ketosis is an energy imbalance with a slight elevation of ketones caused by an underlying disease problem that affects the cow's health as displaced abomasum, hardware disease (traumatic gastritis), uterine infections, and other diseases that affect food intake.

Your veterinarian must examine the cow carefully and decide if she has primary or secondary ketosis and treat her accordingly.

Characteristics of Cows with Primary Ketosis

–It is common in high producing dairy cattle and uncommon in beef cattle.
–It occurs in well conditioned or fat, high producing dairy cattle during the first 6 to 7 weeks after calving during the time of high levels of milk production.
–It occurs primarily during the housing period, usually during winter months. It is rarely seen in pasture cattle.
–It is frequently seen year after year in the same cow or the cow's daughters, so ketosis may be inherited. Ketosis has been diagnosed more frequently during the last 10 to 15 years because treatment works quite well; cows previously salvaged are now treated and saved to produce more progeny with the capability to produce good quantities of milk and a predisposition to develop ketosis.

Signs of Primary Ketosis

The following nervous system signs are observed in some cases:

–biting the manger or drinking cup
–licking on various things
–head tilting, leaning into the stanchion
–excited appearance; appearance of a cow with rabies; may bellow, charge on occasion
–nervous signs occur in about 25 percent of the cases

The digestive tract signs include:

–selective appetite; first quit eating silage, then grain, and later hay
–bowel movements often become scanty, firm, and covered with mucus
–milk production decreases over 2 to 4 days
–cows gaunt up and often appear sleepy
–ketone odor on milk and urine

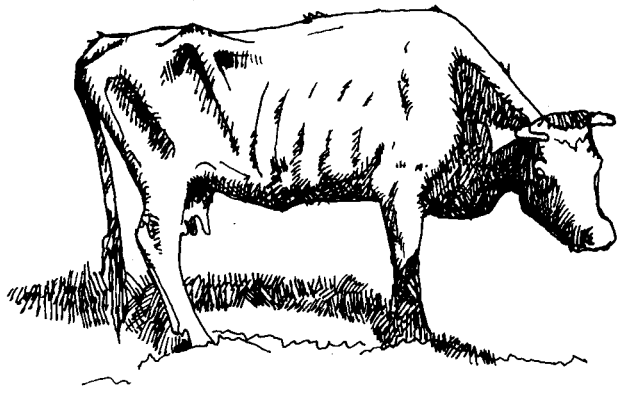
Management factors contributing to the development of ketosis include:

–Feeding dry cows excessively, so they freshen with an excess of body fat. Judge the dry cow's needs based on how young and how thin she is. Do not feed cows so they carry excessive amounts of body fat. Consult with your veterinarian, animal nutritionalist, or county extension agent about dry cow nutrition if questions exist.

—Creating indigestion by increasing the quantity of grain fed too rapidly after calving. Start increasing grain the last 7 to 10 days so the cow is consuming about 10 to 12 lbs. per day when she calves. This acclimates the cow's rumen to digesting grain so that you can increase it gradually after she has a calf with less chances of indigestion developing.
—Don't overfeed protein before or after calving so that a protein type indigestion occurs. Unlimited quantities of quality second or third cutting alfalfa and high protein grain rations frequently cause this problem.
—Some veterinarians feel that cows not allowed daily exercise are more prone to ketosis.
—Sometimes high butyric acid content silage contributes to the development of herd ketosis problems. Feeding corn cut when it is extremely moist may contribute to this problem.

Diagnosis of Ketosis

Diagnosis is based on changes in milk production, typical clinical signs as well as evaluation of the level of ketones in milk or urine. A correct diagnosis is important because treating a secondary ketosis as you would a primary ketosis could result in failure to recover or possibly even death of the cow.



Prevention of Ketosis

—Avoid over fattening cows during the dry period.
—Use judgment in bringing the cow on grain so you don't create an indigestion problem that may cause ketosis, but feed adequate levels of energy to come as close to supporting milk production as possible. Consult an animal nutritionalist or your veterinarian because the total ration must be considered.
—Propylene glycol given in the mouth is beneficial and should be considered if the cow has had ketosis during a previous lactation. It may be expensive to give every cow, however.

Treatment of Ketosis

It is wise to seek veterinary assistance early to help keep milk production losses to a minimum. You may wish to work with your veterinarian on a detection procedure to identify cows developing ketosis at an early stage.

Veterinarians use various methods to raise the blood sugar levels and reduce blood ketone levels. The choice of medications used depends on whether the problem is primary or secondary and any complications that may exist, the duration after calving, fatness of the cow, and probability of relapse after treatment.

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