

Early Lactation Ketosis (hyperketonemia)

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Cause

During early lactation, the energy demands for milk production are greater than the amount of energy cows can consume. Essentially, feed intake, which supplies energy to the cow, cannot keep up with the energy needs of the mammary gland. To compensate for the needed energy, cows mobilize body fat stores, which are reflected in the concentration of NEFA's in the blood. When the mobilized fat overwhelms the metabolic processes in the liver, ketones (i.e. beta-hydroxybutrate or BHBA) accumulate in the blood. These ketones can be detected in blood, urine, or milk.

Identifying Problem Cows

On-farm, subclinical cows can be detected by a cow-side test which measures the concentration of beta-hydroxybutrate (BHBA), one of the ketones, in blood (ie. Abbott Precision Xtra™) or milk between 3 and 14 DIM. Cows are classified as being ketotic when their blood concentration of BHBA is equal to or greater than 1.2 mmol/L. Clinical signs may be seen when the blood concentration is above 3.0 mmol/L. However, clinical signs in cows often are hard to detect. Cows with other metabolic diseases, i.e. subclinical hypocalcemia or milk fever, are more susceptible to multiple fresh cow issues including ketosis.

Why Prevention Is Important

Cows with elevated ketones (BHBA) do have lower performance. Specifically, milk production has been shown to decrease by 3 to 7% with high producing cows possibly being even greater. Ketotic cows are at 3 to 19 times greater risk for a displaced abomasum, and have 3 times greater chance of being culled in the first 30 days after calving. Ketotic cows also are 1.2 to 1.7 times less likely to conceive at the first breeding, but use of synchronization protocols may help decrease this effect.

Preventative Management Practices

Prevention starts in the previous lactation by preventing late lactation cows from becoming over-conditioned. Dry cows should be fed an adequate (0.60 to 0.62 Mcal NEI/lb DM), but not excessive amount of energy. Fresh cows should be managed to optimize dry matter intake where feed is available 20+ hours daily, adequate bunk space per cow (30 inches/fresh cow and 24 inches/early lactation cow), and resting space is provided (1 freestall per cow or 100 sq ft/cow compost bedded pack barns), and fresh water is always available. Heat stress is minimized for both the dry cows and lactating herd. In herds with a high prevalence of ketosis or in cows diagnosed with elevated ketones (tested within 3 to 9 DIM), 300 cc (ml) of propylene glycol can be drenched daily for 5 days in a row. To be effective, propylene glycol must be drenched, not top dressed or included in a TMR, and drenched for all 5 days.