



Review: One of Important Metabolic Disorder is Sara Correlation between Milk Fat Depression



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Abstract

Rumen acidosis is a digestive disorder that occurs when ruminants consume carbohydrate-based feeds that can be fermented easily. Under normal conditions, the pH value of the rumen is between 5.5 and 7.0, while the critical value for acidosis is 5.8. Acidosis categorized in different forms is known as acute and subacute (SARA) or more frequently clinical and subclinical acidosis. Acute acidosis occurs when the pH value of the rumen falls below 5.0, SARA, which occurs on a flock basis and results in severe economic losses, occurs when the pH value is between 5.0 and 5.5. Many studies have shown that the cause and the consequences of the decrease in pH value lead to acidosis. The accumulation of volatile fatty acids (VFA), which is abolished by the degradation of carbohydrates, decreases the pH value of the rumen accumulation and decreases the pH value, thus reducing the feed consumption.

Keywords: Acidosis; Ruminant; SCFA; pH value; Fatty acids; Carbohydrates; Acidosis; Feed stuffs; Bovine disease; Acetic acid; Butyric acid; Propionic acid; Endotoxins; Lypolysis; Insulin; Diagnosing; Grains

Ruminal Acidosis

Ruminal acidosis is a bovine disease that affects ruminants that are fed with high-grain diets. Easily fermentable carbohydrates inclusion creates short-chain fatty acids (SCFA) within a short time after consumption, which can cause a reduction in ruminal pH [1]. It can be present in different forms, is known as acute and subacute or more frequently clinical and subclinical acidosis. Factors affecting of acidosis are not only high grain diets, but also type of ration meaning of the ratio of forage and concentrate, the source of grains, processing methods of feed stuffs, moisture of feed, feeding system, feeding with different diets without adaptation period and sometimes mycotoxins and unsaturated fatty acids.

According to results of some studies the prevalence of SARA in dairy herds is a range between 11% and 26% [2,3], although on account of no clinical signals, this prevalence might be even higher.

Signals of SARA

Since SARA has a non-clinical symptom, the points to note that is important for farmers and nutritionists are summarized below.

Due to the SCFA accumulation, the ruminal pH drops. This parameter also crucial for acidosis however the essential point

is not only reduction of pH but also the number of hours of reduction, because the fluctuations that occur during the day due to feeding ration are ordinary. Because of the high production of SCFA resulted in lower ruminal motility that can be caused dry matter intake reduction, since the bacterial endotoxins release and the osmolarity of rumen increase as well [4].

The SARA also alters the faeces particle size that may be enlarged around 1-2cm or including undigestible grains and consistency that can be described as bright yellow with foamy appearing and a sweet sour smell [5]. Additionally, SARA can be caused the depression of milk fat due to the high grain-poor forage diets because of the acetic acid comes from forages.

Milk Fat Depression

In ruminants, milk fat is produced by de novo synthesis with acetic acid and B-hydroxybutyric acid. Lower forage: concentrate ratio in diets reduces the concentration of acetic acid and therefore the amount of milk fat. On the other hand, Higher concentrate diets increase the propionic acid concentration which has anticetogenic effect that decrease the usage of B-hydroxy butyric acid. Additionally while propionic acid increase, Vitamin B₁₂ production levels decrease. This leads to a reduce in milk fat synthesis from acetic acid in udder. The last correlation between SARA and the milk fat depression is that high concentrate and

limited forage increase relative glucose and then insulin activity which causes a decrease in plasmaliglycerides due to lipolysis [6].

Conclusion

Taken together, it is possible to prevent the negative effects of SARA which causes significant economic loss especially milk fat depression, through managements and feeding strategies. Firstly, farmers and nutritionists should be a good observer by monitoring the cows and take precautions in the correct way. Because the signals of SARA is crucial for diagnosing this metabolic disorder.

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