

Can You Identify Acidosis Tolerant Cows In Your Herd?

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Subacute ruminal acidosis (SARA) is a prevalent metabolic disorder found in high producing dairy herds. Past studies on steers and sheep indicated that a considerable variation exists in the severity of SARA among animals fed a common diet. The objectives of this study were to evaluate the variation in severity of SARA among lactating dairy cows fed a common high-grain diet, and to determine factors characterizing acidosis tolerant and susceptible animals.

Sixteen ruminally cannulated lactating dairy cows were fed a common high-grain diet consisting of 35% forage ad libitum. Acidosis index, defined as the severity of SARA ($\text{pH} < 5.8$; duration of SARA multiplied by the extent of SARA) divided by dry matter intake (DMI), was determined for individual animals to assess the severity of SARA normalized for a feed consumption level. Although all animals were fed a common diet, minimum pH values ranged from 5.16 to 6.04, and the acidosis index ranged from 0.0 to 10.9 $\text{pH}\cdot\text{min}/\text{kg DMI}$ (0 is no rumen acidosis). Six cows with the lowest acidosis index ($0.04 \pm 0.61 \text{ pH}\cdot\text{min}/\text{kg}$) and four with the highest acidosis index ($7.67 \pm 0.75 \text{ pH}\cdot\text{min}/\text{kg}$) were classified as acidosis tolerant and susceptible animals, respectively. Minimum (5.83 vs. 5.22 ; $P < 0.01$) and mean ruminal pH (6.47 vs. 6.02 ; $P < 0.01$) was higher for tolerant animals compared with susceptible animals, and we observed that susceptible animals sorted against long particles whereas tolerant animals did not. However, acidosis tolerant cows surprisingly had shorter total chewing time per unit of DMI (35.8 vs. $45.1 \text{ min}/\text{kg}$ of DM intake). In addition, although DMI, milk yield, and milk component yields did not differ between the groups, milk urea nitrogen (MUN) concentration was higher for tolerant animals compared with susceptible animals (12.8 vs. $8.6 \text{ mg}/\text{dl}$; $P < 0.05$), which is possibly attributed to less fermentation in the rumen of tolerant cows.

Implications: A substantial variation exists in the severity of SARA among lactating dairy cows fed a common high-grain diet, which demonstrates the challenge in formulating a diet to optimize the productivity of a whole herd. This study indicated the possibility that MUN values, rather than milk fat content, can be used as an easy indicator to identify acidosis tolerant animals on farm.