

Diagnosis of Subacute Ruminal Acidosis (SARA) using a Diabetes Kit

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The current diagnosis of subacute ruminal acidosis (SARA) relies on the measurement of the pH of rumen fluid samples, which are difficult to collect. Several studies have reported that SARA increases blood glucose. Hence, the monitoring of blood glucose using a diabetes monitoring kits may be useful for the diagnosis of SARA on-farm. However, SARA caused by feeding a high grain diets and SARA caused by feeding a diet with insufficient coarse fibre can have different effects on blood glucose, which may impact the accuracy of blood glucose measurement for the diagnosis of this disease. A study was conducted with dairy cows with rumen cannula in which these two forms of SARA were induced. Experimental periods were 4 weeks long. In the fourth week of each period, cows either received a control diet with 70% of forage (DM basis), or a high grain diet that induced grain pellet-induced SARA (GPI_SARA) (67% concentrate DM basis 37% wheat-barley pellets), or a diet that contained alfalfa pellets and very little coarse fibre that induced SARA (API_SARA) (45% of concentrate 32% of alfalfa pellets). Cows were fed once daily at 9 am. During the fourth week of all periods, rumen pH was monitored continuously in all cows. Whole blood was sampled immediately before feed delivery and at 6 h after feed delivery. Blood glucose was measured in these samples using the Optium Xceed™ Diabetes Monitoring System. The average daily rumen pH was 6.30, 5.99, and 5.98, for control, API_SARA, and GPI_SARA, respectively. The duration the rumen pH below 5.6 was 56.4, 225.2 and 298.7 min/d for control, API_SARA, and GPI_SARA, respectively. This shows that both forms of SARA resulted in similar depressions of rumen pH. Blood glucose was higher during the grain-pellet induced SARA than during the control period (4.47 vs. 4.25 mmol/L), but blood glucose did not differ between the alfalfa-pellet induced SARA and control.

Implications. The Optium Xceed™ Diabetes Monitoring System can detect differences in blood glucose caused by grain-induced SARA, and can contribute to the diagnosis of this form of SARA on-farm.