

Effects of Grain Induced Subacute Ruminal Acidosis (SARA) On Feeding Behaviour of Lactating Dairy Cows

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Subacute ruminal acidosis (SARA) in dairy cows can occur when their diet contains excessive amounts of concentrate and/or insufficient physical effective fibre. Changes in feeding behaviour have been suggested as a tool for the diagnosis of this disease. To test this, a study was conducted to determine how feeding behaviour of lactating dairy cows is affected by grain induced SARA. The study included 8 lactating dairy cows, 4 of which were rumen cannulated, during two consecutive 6 wk periods. Cows were housed in a tie stall and were fed once daily. Between wk 1 and wk 5 of each period, cows received total mixed ration ad libitum with a forage-to-concentrate ratio (F:C) of 50:50. In both wk 6, SARA was induced by replacing 21% of DM of the diet with pellets containing 50% wheat and 50% barley, resulting in a F:C of 29:71. Feeding behaviour in wk 4 of each period were taken as control. Rumen pH was monitored continuously in rumen cannulated cows. Feeding behaviour was monitored continuously by weighing the feed in the feed troughs using the Growsafe Model 4000/E system (Growsafe Systems Ltd, Airdrie, AB). Induction of SARA reduced the daily average rumen pH from 6.17 to 5.97, and increased the duration of rumen pH below 5.6 from 118 to 279 min/d. These changes in rumen pH show that SARA was successfully induced. Meal criteria were estimated by modeling the three-normal frequency distribution of log-transformed interval lengths averaged 18.8 ± 2.4 min/meal across cows and weeks. Meal criteria and the number of meals per day (8.8 ± 0.9 meals/d) were not affected by SARA. Induction of SARA reduced the meal duration (48.8 vs. 37.7 min/meal) and total eating time (6.7 vs. 5.5 hours/d), and tended to decrease meal size (4.9 vs. 4.0 kg/meal). Eating rate was not affected by SARA and averaged 95.7 g/min across meals. The first meal after feed after delivery was larger than subsequent meals, and contributed to between 41.1 to 54.8% of total daily feed intake. Induction of SARA decreased the duration (154.5 vs. 89.0 min) and the size (21.9 vs. 13.2 kg) of this first meal. However, induction of SARA, did not affect eating rate during the first meal, which averaged 146.0 g/min. A parallel study showed that SARA induced by feeding a diet with a low content of physically effective fibre also reduces the size and duration of the first meal after feed delivery. Our results confirm that grain induced SARA changes feeding behaviour. As grain and alfalfa pellet induced SARA both reduced the size and duration of the first meal after feed delivery, monitoring this meal may offer potential for the diagnosis of SARA.