

#### 48. Continuous recording of pH in the forestomach of dairy cows using two different measurement systems

*Aufzeichnung des pH-Wertes im Vormagen von Milchkühen mit zwei verschiedenen Messsystemen*

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**Question:** Subacute ruminal acidosis (SARA) is one of the most important digestive disorders in high yielding dairy cows fed highly fermentable diets. SARA is insidious and its clinical signs are difficult to detect. Continuous monitoring of the ruminal pH may prove to be a valuable tool for this purpose (1). The aim of the present study was to compare continuously recorded measurements of an indwelling telemetric pH probe placed orally in the reticulum with those obtained from a measurement system placed in the ventral part of the rumen through a cannula.

**Methods:** The experiment was conducted with 6 ruminally cannulated Holstein cows kept in a free-stall barn. The cows were equally distributed into 2 treatment groups based on their previous lactation performance. Cows in treatment CON- were offered a diet consisting of only roughage and cows in treatment CON+ got roughage and were supplemented with a cereal-based and a corn gluten-based concentrate to meet their predicted nutrient requirements. The experiment lasted from 2 wk before the predicted calving date until wk 8 of lactation. During the whole experiment the pH was measured in the reticulum every 10 min with a telemetric pH-Bolus (eBolus, eCow Ltd, Exeter, Devon, UK) which had been applied orally using a balling gun. Furthermore, in wk 2 before the estimated calving date and in wk 2, 4, 6, and 8 of lactation ruminal pH was measured additionally every 30 sec during 48 h with the LRCpH measurement system (DASCOR Inc., Escondido, CA, USA) which was placed in the rumen through the cannula. For the statistical analysis the readings of the LRCpH measurement system were summarised over 10 min. In order to compare the mean pH of both measurement systems a linear mixed model was set up with measurement system, treatment and wk of lactation as fixed effects. The same model was used to determine the effect of treatment and wk of lactation on the pH difference ( $\Delta$ pH) between measurement systems.

**Results:** In general, the pH profiles recorded with the eBolus showed less fluctuations than the profiles recorded with the LRCpH measurement system. The mean pH measured with the eBolus was higher compared to those measured with the LRCpH. The difference was 0.24 pH units ( $P < 0.001$ ). The mean pH was not influenced ( $P > 0.05$ ) by treatment but it decreased continually from 2 wk before calving until wk 4 of lactation ( $P < 0.001$ ) whereupon it remained stable ( $P > 0.05$ ) until wk 8 of lactation. The treatment had no effect ( $P > 0.05$ ) on the  $\Delta$ pH between measurement systems. However, the  $\Delta$ pH was different ( $P < 0.01$ ) in wk 2 compared to wk 4 and to wk 8.

**Conclusion:** The pH profile measured with the eBolus in the reticulum seems to fluctuate less than the pH measured with the LRCpH measurement system in the rumen. Furthermore, the mean pH measured in the reticulum was higher compared to the pH in the rumen. However, due to fluctuation in the  $\Delta$ pH across wk of lactation no fixed correction factor can be provided.

1) GOZHO, G.N., PLAIZIER, J.C., KRAUSE, D.O., KENNEDY, A.D., WITTENBERG, K.M. (2005): *J. Dairy Sci.* 88: 1399-1403

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