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Long-term measurement of rumen pH in dairy cows under practical conditions by an indwelling and wireless data transmitting unit

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Objectives
Subacute rumen acidosis (SARA) is a significant production disease of dairy cattle. The objective of this study was the continuous and long term measurement of the ruminal pH in high yielding dairy cows under practical conditions.

Material and Methods
Therefore, an indwelling system for monitoring ruminal pH and temperature, already described and evaluated by Gasteiner et al. (2009), Veterinary Medicine Austria 96, 188-194, was applied on 4 dairy farms. Data were collected in an internal memory chip and sent via radio transmission to an external receiver. The indwelling system was orally given to 16 dairy cows out of 4 herds. Ruminal pH was measured at intervals of 600 sec over a period of first 80 days of lactation, starting 7 d prior to calving date. Daily mean, minima, maxima and time ruminal pH (min/d) below 6.3; 6.0; 5.8 and 5.5 were calculated. Individual milk yield and milk composition, feeding conditions and ration composition in terms of roughage and concentrate sources were determined and nutrient components were analysed. Statistical analysis was conducted by GLM (Statgraphic Plus 5.1).

Results
Radio transmission of data (twice daily) was functioning without any difficulties. Mean ruminal pH for all cows in all herds was 6.6, ranging from pH 6.7 during dry period to pH 6.1 on day 80 of lactation. A significant decline of ruminal pH was seen immediately after parturition, explainable by an increasing dry matter intake, and a second decline occurred 25 to 30 days postpartum due to the increasing amount of fed concentrates. There was also a significant relationship between roughage composition (ratio grass silage : corn silage ranging from 30:60 to 60:30) and ruminal acid-base status. Ruminal pH continuously decreased from pH 6.8 to pH 6.4 with an increasing percentage of corn silage in the ration.

Conclusions
Results were significantly influenced by the ration composition, by the day of lactation and by the milk yield, and show that the presented method is a very useful and proper tool for both, scientific and practical applications.