**Rumen cannulas vs. wireless bolus sensors for monitoring rumen pH and temperature changes in dairy goats fed control and acidogenic diets in early lactation**

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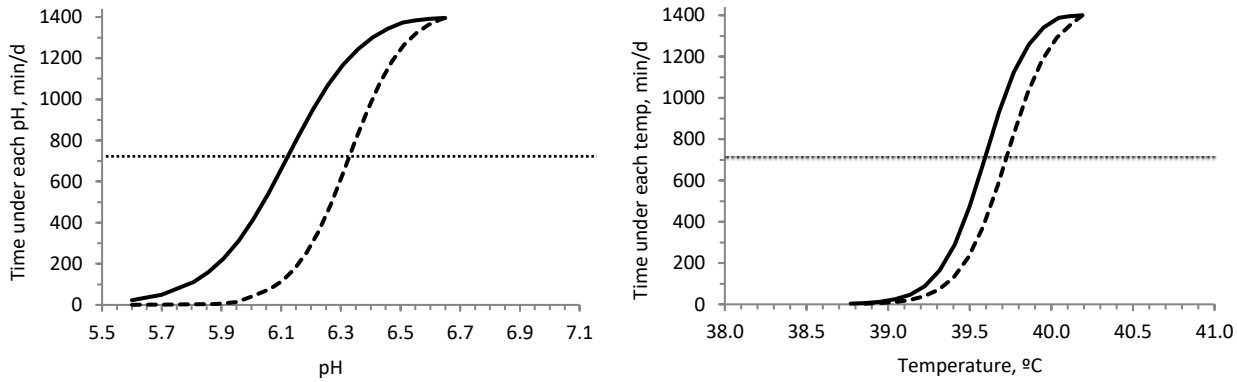
Rumen cannulated dairy goats (4 Alpine and 4 Saanen, 66.4 ± 3.08 kg BW and 93 ± 2.4 DIM), in individual pens with automatic feed and water intake recording, were provided with rumen sensors (27 × 145 mm, 70 g) for pH and temperature and used to investigate the effects of switching from control (CO, 20% concentrate) to acidogenic (AC, 50% concentrate) diets. Diets were offered as TMR and fed ad libitum ×2 daily (a.m. 1/3, p.m. 2/3). Sensors collected data every 15 min for 34 d and diets were switched from CO to AC on d 12 after p.m. milking. Cannulas were used for measuring rumen pH (0, 1, 2, 4 and 6 h after feeding) by pH-meter before (d −4 and −1) and after (d 8 and 14) diet change. Values of pH-meter and sensors correlated (R2 = 0.86; P < 0.001) and were used for recalibration. Obtained pH and temperature values were modeled by logistic regression (Castro-Costa et al. 2015; 2nd DairyCare Conference). Results showed daily variations in rumen traits, with lower rumen pH after p.m. than a.m. feeding. Comparing CO and AC diets before (d −4 and −1) and after change (d 8 and 14), mean rumen pH was greater in CO vs. AC goats (6.32 ± 0.023 vs. 6.12 ± 0.031; P < 0.01). The pH values recorded by sensors fit the logistic model (R2 = 0.97 to 0.99). On average, no pH <5.5 were observed for AC diet, although 2 goats showed values under the threshold. With regard to adaptation to the AC diet, differences among goats, but not between breeds, were observed. Time spent under pH 6.0 and pattern of logistic models allowed classifying goats as sensitive (3/7, 43%) or tolerant (4/7, 57%) to AC diets, showing the consequences of feeding and watering behaviors. Rumen temperature correlated with pH (R2 = 0.66; P < 0.01) although, on average, did not differ by diet (39.7 ± 0.03°C; P > 0.05). In conclusion, wireless sensors and logistic models proved to be useful for monitoring rumen function and to discriminate between sensitive and tolerant goats to rumen acidosis. Recalibration of sensors by using actual pH values is still an issue.

**Figure 1.** Logistic models of rumen pH and temperature daily changes in lactating goats (A = 1,440; *P* < 0.001): pH and temperature of goats fed CO ( ; $y = A/[1+e^{48.0 - 7.84x}]$, $R^2 = 0.98$; and, $y = A/[1+e^{289.8 - 7.32x}]$, $R^2 = 0.98$) or AC ( ; $y = A/[1+e^{68.3 - 10.79x}]$, $R^2 = 0.99$; and, $y = A/[1+e^{281.7 - 7.09x}]$, $R^2 = 0.99$) diets, respectively.

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