

Validation of a Noseband Sensor for Measuring Grazing Behaviour in Veal Calves

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Precision Livestock Farming (PLF) technologies are increasingly used in cattle production, with most applications focusing on adult dairy cows. In contrast, their use and validation in young stock remain limited, despite the importance of monitoring early-life behaviour. The RumiWatch noseband sensor is a well-established tool for detecting grazing and rumination behaviour in adult cattle (Rombach et al., 2018). This study aimed to validate its application in veal calves aged 3 to 6 months under pasture-based conditions. A total of 18 calves from three genotypes (Brown Swiss, Swiss Fleckvieh, Limousin × Brown Swiss) were observed across three pasture-based farms. All animals had a similar supplemental feeding plan and pasture access was ranging from 9 to 12 hours/day per farm and was adapted from day grazing to night grazing in summer. Behavioural data were collected through visual observation using 1-minute scan sampling. Observations took place on three measurement days per farm replicated either twice or three times over the vegetation period. On each measurement day, there were two 2-hour observation intervals: either from 9-11 am and 1-3 pm, or, in the case of night grazing, from 6-8 am and 6-8 pm. Sensor data (n=442 hours) were compared to visual observations across all behavioural categories, showing a high level of agreement, analysed by Bland-Altman statistics, as displayed in Table 1.

Table 1: Statistical agreement metrics between automated and visual observations for grazing, ruminating, and other activities (n=442 hourly summaries).

Metric	Grazing	Ruminating	Other Activities
Concordance Correlation Coefficient	0.93	0.92	0.87
Mean difference and standard deviation (min/h)	1.19 ± 6.29	-1.35 ± 3.49	-0.22 ± 6.75
Upper limit of agreement (min/h)	13.51	5.50	13.02
Lower limit of agreement (min/h)	-11.41	-8.19	-13.45

There was a high agreement, especially for grazing and rumination. Minor discrepancies, mainly due to algorithmic exclusion of short rumination bouts, were noted. The results confirm that the RumiWatch noseband sensor is a valid tool for monitoring grazing behaviour in veal calves on pasture. Its application offers new opportunities for studying and understanding grazing patterns in young cattle under extensive conditions.

References

Rombach, M., Munger, A., Niederhauser, J., Sudekum, K. H., & Schori, F. (2018). Evaluation and validation of an automatic jaw movement recorder (RumiWatch) for ingestive and rumination behaviors of dairy cows during grazing and supplementation. *Journal of Dairy Science*, 101(3), 2463–2475.