Kinetic assessment of the impact of a linseed-rich diet on a milk FT-MIR–based herbage intake indicator

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Using pasture is a sustainable strategy for cattle feeding that provides environmental, economic, and social benefits. Currently, grazing calendars and on-farm controls are the main tools available to the dairy sector to assess the effective use of pasture for milk production; however, these methods are time-consuming and costly. An indicator based on milk Fourier-transform mid-infrared (FT-MIR) spectral analysis could therefore offer advantages in terms of time efficiency, repeatability, and cost-effectiveness. In a previous study, we developed an indicator derived from milk component predictions (e.g. fatty acids, proteins, acidity-related traits) obtained from bulk tank FT-MIR spectra and linked it to the proportion of herbage in the diet, ranging from 0 to 1. In the present study, we further evaluated the potential of this indicator by investigating its annual kinetics across eight farms during 2023–2024 and by presenting preliminary results from this analysis.

A total of 2,445 bulk tank milk analyses were available. Milk was collected every 1 to 3 days and aggregated monthly to match the temporal resolution of grazing calendars. Grazing patterns for each farm were visually assessed and compared with the corresponding calendars.

The proposed indicator showed higher values during grazing periods, with an average increase of 0.17 ± 0.03 (n = 148 aggregated samples). Linseed supplementation did not visually mask the grazing signal but increased the indicator values throughout the supplementation period. When data were available for the same farm, an increase of 0.12 ± 0.01 (n = 31 aggregated samples) was estimated between periods with linseed supplementation without grazing and periods with grazing without linseed. Overall, supplemented diets, particularly linseed-rich feeds, do not appear to mask grazing-related kinetics associated with herbage consumption but rather shift the indicator level during supplementation. The indicator's kinetics therefore appear promising for identifying grazing periods even in the presence of dietary supplementation, although a threshold-based detection approach seems unsuitable due to farm-specific patterns.