

Leveraging Mid-Infrared Milk Spectroscopy to Increase the Sustainability of Dairy Farms

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Sustainable dairy farming is based on three pillars: economic, social, and environmental. It aims to produce milk profitably while ensuring the well-being of workers and animals, and minimizing environmental impact. Increasing sustainability requires mastering multiple factors, which are sometimes antagonistic and difficult to quantify. This includes measuring, analyzing, and integrating extensive data. The use of mid-infrared spectrometry to analyze monthly individual milk samples during milk recording, or daily bulk samples for milk payment, is investigated. Several new models to predict sustainability-related parameters are explored. The creation of standardized spectral databases allows for longitudinal studies and comparisons of different farming systems, feeding regimes, regions, etc. Afterwards, the integration of these MIR measurements into life cycle assessments will be assessed to enable the evaluation and monitoring of the carbon footprint, ammonia emissions, and energy consumption of dairy farms.

Keywords: Sustainability, Mid-Infrared spectroscopy, milk recording, milk payment.