

Field Implementation of an Inline Milk Composition analyzer and Cloud Analytics System in Dairy Herds

Andruliene Laima^[1], Vizbaras Dominykas^[1], Baltrenas Augustas^[1], Kripaitis Andrius^[1], Tauras Raidas^[1], Bilinskas Benediktas^[1]

[1] BouMatic HerdLine, UAB

We evaluate the impact of the BouMatic MilkGenius in-line milk analyzer combined with the BouMatic HerdLine cloud analytics platform on management efficiency, labor requirements, recording accuracy, and timely decision-making in modern robotic dairy farms.

An integrated system consisting of the BouMatic MilkGenius in-line milk analyzer and the BouMatic HerdLine cloud platform was implemented on commercial dairy farms in 11 countries across Europe and North America. MilkGenius automatically measured fat, protein, and lactose concentrations at every milking without manual sampling. Measurements were transmitted to a centralized database where longitudinal algorithms analyzed herd, group, and individual cow trends. Milk composition data were interpreted together with complementary information including milk yield, milking frequency, and conductivity. Alerts and recommendations were delivered through web and mobile interfaces accessible to farmers and advisors. Comprehensive monitoring of parameters enabled earlier identification of negative energy balance, milk fat depression, and acute health deviations compared with visual observation. Continuous milk composition monitoring transformed milk recording from periodic measurement into practical decision support.

- Farms reported reduced labor associated with routine cow observation and monitoring for metabolic disorders. In robotic milking installations, detected metabolic risk triggered targeted supplementation and recovery was monitored through subsequent milk measurements.
- Automated sampling reduced missed animals and sampling inconsistencies, improving reliability of herd records and reducing operator-dependent errors.
- Farms identified additional management inefficiencies, including feeding adjustments and discrepancies related to external milk sampling or payment verification.
- Centralized data access through mobile devices allowed herd status to be checked remotely and supported rapid management decisions on site or off farm. The results demonstrate that milk analysis remains a central biological information source in technology-enabled herds and contributes to more efficient and sustainable dairy management.