

Manufacturers' Technical Session

Advanced In Line Milk Analyzer and Its Applications

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The objective of this work is to present the most recent technological, accuracy, and application driven advancements of the Brolis inline tunable laser spectroscopy milk analyzer, commercially known as MilkGenius within the BouMatic ecosystem. Building on results first introduced at the 2023 ICAR conference, this report aims to:

- describe the pathway leading to the analyzer becoming the first inline milk analyzer validated by ICAR;
- summarize the achieved performance improvements, including next generation hardware introduced in 2025;
- demonstrate how the analyzer integrates within different milking system architectures;
- highlight practical applications enabled through BouMatic HerdLine algorithms, ranging from herd level monitoring to automated care of individual animals.

At the 2023 ICAR conference, we presented the first comprehensive infield performance evaluation of our in-line real-time milk composition analyzer utilizing tunable laser spectroscopy, achieving 0.2% RMSEP for fat and 0.1% RMSEP for protein. In 2024, the analyzer became the first ICAR validated inline milk analyzer, completing extensive testing on the BouMatic Gemini robotic milking system with 0.1% RMSEP for both fat and protein. In 2025, a second-generation analyzer was released, offering higher accuracy, improved industrial design, and broader applicability across farm environments. The analyzer can be deployed across multiple milking system types. As a standalone unit, it provides real time fat, protein, and lactose measurements. When integrated with BouMatic HerdLine algorithms, it supports a wide range of herd and cow level applications. Installation specific functionality varies by data availability: discharge line installation offers an economical solution for herd level composition averages, with pen level values possible when milk flow gaps indicate group transitions; partial coverage parlor or rotary setups provide herd and pen averages per day or milking session, along with limited individual cow summaries; full coverage parlors enable complete individual cow tracking with daily weighted averages and long term detection of NEB, milk fat depression (MFD), and acute events; and robotic milking systems provide the most comprehensive data environment, where analyzer measurements are combined with robot derived parameters to generate deeper health insights and enable automated NEB prevention via controlled energy drink dosing and continuous monitoring of individual cows.