The new CombiFoss™ 7 DC – Differential Somatic Cell Count and other Advancements in Milk Testing

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Abstract

FOSS has launched the 7th generation of CombiFoss milk analysers in October 2016. The new CombiFoss™ 7 DC seamlessly integrates MilkoScan™ 7 RM and Fossomatic™ 7 DC. The instrument allows to test raw milk for up to 19 parameters, including the brand new Differential Somatic Cell Count (DSCC) parameter, simultaneously in just 6 seconds. The objective of this work is to provide an overview on the key advances of the instrument and an update on the latest developments in terms of working with new parameters for milk testing, particularly DSCC, from around the world.

The MilkoScan™ 7 RM can be used to test for up to 17 different milk component parameters. The latest generation technology includes improvements of the optics and flow systems that result in better statistics, in particular for minor components such as urea and BHB (beta hydroxybutyrate). Apart from that standardisation of spectra is still possible using FTIR equalizer (FTIR – Fourier transform infrared spectroscopy), which is particularly important nowadays where full spectra information is utilised for various purposes.

The Fossomatic™ 7 DC allows to measure 2 parameters, SCC and DSCC, simultaneously at a speed of 600 samples per hour. The key elements of the new milk analyser are a new chemistry, a new incubation unit, and a new measuring module. Besides, the design of the instrument allows easy accessibility of the different modules inside the instrument.

DSCC is a new biomarker for mastitis management. Mastitis remains to be a significant challenge on dairy farms and still causes tremendous economic losses to the dairy industry. DSCC provides more information on the actual inflammatory status of the cow's udder by revealing the percentage of immune cells (i.e. DSCC represents the combined proportion of neutrophils and lymphocytes). Several research projects on the practical application of DSCC in the frame of dairy herd improvement (DHI) testing are currently running around the world.

A first research study, where the DSCC parameter was investigated before, during, and after artificially induced mastitis under controlled conditions was recently completed. The results showed that DSCC values changed significantly during the course of the experiement (i.e. <60%, >90%, and <70% before, during, and after infection, each). Hence, first indications on where to set a threshold for DSCC to distinguish between normal and active (e.g. mastitis) inflammatory response are available.

In conclusion, the new CombiFoss™ 7 DC allows highly accurate, fast, reliable, repeatable, and robust determination of up to 19 parameters from raw milk samples at low cost. DSCC is a new parameter providing more detailed information on the actual inflammatory response of the mammary gland and thus opens up the possibility to develop new tools for mastitis management that can be offered through DHI testing programmes.