New IDF standards for milk analysis require new technology

New milk products at the dairies – semisolid and also plant-based – have challenged the traditional FTIR technology. Q-Interline offers two new FT-NIR solutions, enabling a world of new possibilities.

Milk analysis in the lab has historically been done with classic FTIR technology and the associated flow systems, micron size cells, inlet values and homogenizers. This works well for standard products, but the world is moving towards a lot of nonstandard products. Milk is a valuable and popular raw material for fermented products and soft drinks with added starch, sugar, and flavors in forms like chocolate, vanilla and coffee drinks. Together with high fat products these may pose a serious problem for a flow based system with wear, blocking and inability to pump the product.

A huge and increasing amount of milk and whey concentrates are being produced and such products may as well pose problems in a classic FTIR setup.

An increasing amount of soft drinks are nowadays originating from plant based "milks". They contain small fibres and like the milk based products often added with other ingredients making them less optimal for systems based on flow systems.

Last but not least many people have struggled with the analysis of semi-solid products like soups, sauces and products like Mascarpone. Traditionally they have been diluted, but this is not a trivial task for operators and errors may occur.

The IDF organization reacted to these challenges and have together with Q-Interline and other players released two new standards now allowing the use of FT-NIR for liquid and semi-solid dairy products and this helps tremendously as FT-NIR operates with a measurement path of recommended 1 mm (1000 microns) which is almost a guarantee for no blocking. ●

BY ANDERS LARSEN, INNOVATION DIRECTOR, Q-INTERLINE

Milk being sucked into the disposable Pivette

Contact information:
Q-Interline A/S
Phone: +45 4675 7046
Mail: info@q-interline.com
Web: www.q-interline.com

Q interline
Value through insight

The InSight Pro Master cabinet in the back and the operator screen with InSightView software.

InSightPro Milk

at-line analytical performance

In-line milk analysis may be very valuable and highly relevant in the right process control setup but has always been a challenge for a number of the same reasons we saw under at-line and laboratory FTIR based instruments. Applying FTIR inline is very difficult and is again dependent on micrometer mechanics, hard to handle and keep stable in a process environment. Again the new IDF/ISO 23591 has opened for applying the more process friendly mm opportunities in FT-NIR and this has been done by Q-Interline in the in-line solution InSight Pro milk which even received a grant from the EC to finalize the product and start commercialization.

The InSight Pro solution uses the same base analyzer as DairyQuant Go and achieves close to at-line analytical performance and this combined with a result every few seconds gives an overall better data quality compared to pulling a sample every so often. Processes are fare less stable than what we would like them to be and to get the last decimal % dry matter optimized operators need the full insight in real time.

The InSightPro comes with one or two measuring heads place directly in the stream and since the heads are driven through fibre optical cables the InSightPro analyzer can be placed at a convenient location well out of harms way and the measuring heads directly in the stream – accepting high and low temperatures, CIP/SIP.

The new IDF/ISO standards have given the industry two completely new solutions and with them the industry stands to battle the future.

See demo videoes on youtube and read more in depth information on www.qinterline.com

DairyQuant GO

- with the new patented disposable cell system - Pivette®

Q-Interline has taken it all a step further than just replacing a micron cell with a mm cell. Why not eliminate flow cells all together? Armed with this ambition and covered by the new IDF standards the development work started In 2016 and in 2019 the first versions of the DairyQuant GO was released.

The DairyQuant GO is a FT-NIR system using the new patented disposable cell system called Pivette®
0.5 ml product is easily sucked into the measurement cell with a Pipette-like device and the Pivette is being sealed. The disposable cell is inserted, heated to 40° C and subsequently analysed for fat, protein, lactose and total-solids etc. When analysis is done the Pivette is disposed (1 g plast) or recycled.

Pivettes® are available in a blue version handling raw milk, cheese milk, cream, whey and all other "normal" low viscosity products and also a red heavy duty version adapted for high viscosity samples like mascarpone and fermented products.

The analytical performance is comparable to classic FTIR, but the stability is far superior as no cell wear and drift is observed and products can be analysed in any order due to the intrinsic evasion of carry over.

The DairyQuant GO construction further eliminates daily maintenance of filling tanks, emptying the waste bucket, doing zero, heavy cleaning and bias adjustments freeing up time for the instrument responsible personnel.

The DairyQuant GO consisting of the Quant spectrometer and the sealer unit – PC typically placed to the right