



◀ *With a capacity of four million litres per day, the new Fonterra Edendale milk powder plant is the biggest in the world. The dryer can produce a tonne of whole milk powder every two minutes.*

Picture courtesy of Fonterra, New Zealand.

Measure of SUCCESS

How do you produce consistent end products across multiple factories using a constantly varying milk supply? The answer, according to the world's leading dairy exporter Fonterra, is to standardise milk and dairy products in the process. Tristan Hunter, manager of the company's Advanced Process Control team, explains the advantages for any size of operation.

Milk supplies are rarely consistent. Factors such as seasonal variations in milk quality keep producers on their toes as they strive to produce the consistent quality for their customers.

Checking and controlling product composition at key points in the process flow allows it to be standardised according to desired characteristics for a perfect product with optimal yield and quality. In other words, get it right in the process and you'll get it right at the end.

Tristan Hunter has worked with the concept of standardisation at Fonterra for over six years and is clear on two main reasons why it is important to the company. "Firstly, from a processing point of view, we can manage the composition to get a very consistent product with the right characteristics and functionality for our customers," he says. "And secondly, because we have very good control of the product, we see benefits in terms of yield."

By standardising products, Fonterra can also manage their costs well. Even if the sources are changing, it is possible to plan ahead and manage.

While the standardisation concept can

be applied to all aspects of dairy production, milk powder and cheese production are the particular focus areas at Fonterra. And it can lead to substantial benefits. "We can manage our yields with a high degree of certainty and can consistently maintain and deliver a product with the desired composition," he says.

Standardisation with analytical instruments is now such an integrated part of production that it would be difficult to consider life without it. "Loss of instruments would have a massive impact on manufacturing, especially for powders," says Hunter.

Right tool for the job

The standardisation generally occurs early in the process when milk is taken from silos into milk treatment. This creates a standardized milk flow downstream to the cheese vats or the dryers, whatever the process might be. Different analytical solutions are used according to the task in hand and the scale of production.

With 24 processing sites in New Zealand, 10 in Australia and another 50 around the world, Fonterra has the scale

to process some 20 billion litres of milk a year. Large milk powder plants use the FOSS ProceScan™ solution to automatically measure and adjust the composition of incoming milk, for example by adjusting for the amount of cream in milk going into the process. The ProceScan is an infrared-based analytical solution aimed at high production volume operations where it provides a significant return on investment through improved yield, product consistency and reduced cost of manual sampling. Fonterra has more than 30 units installed at the majority of Fonterra powder plants and some cheese plants.

In addition, smaller desktop analysers are used to measure at other check points, for example at the output of the dryer, allowing operators to monitor the drying process for the all-important powder moisture content.

Features of the instruments serve to make standardisation a realistic option. "My personal experience is that they are very reliable and have a high degree of accuracy," says Hunter. The stability of the instruments is also vital. "The days of many bias and slope adjustments are gone

“We can manage our yields with a high degree of certainty”



Standardisation with the help of an analytical solution improves yield and ensures that products consistently match customer expectations.

and the monitoring requirements have dropped,” he says. “Then, of course, we have portability of calibrations which is extremely valuable for our size of operation.”

Often the same instrument can be used to measure a whole range of different products. An example of such versatility is the MilkoScan™ FT 120 analyser. The instrument can handle a high degree of solids which is particularly useful as it is widely used to measure cream.

This versatility aspect is likely to become increasingly important in the future. In addition to the commodity part of the business, Fonterra produces an increasingly diverse range of speciality products with specific compositional characteristics. “This is another area where standardisation is crucial to our ability to deliver the highest quality. It allows us to provide the same level of product consistency as with commodity products and that is highly desirable,” says Hunter.

Standardisation for all

Fonterra has the standardisation technology and capability to meet its growing and changing product mix. All plants have some form of routine measurement in place with the type of instrument dictated by the scale of production. And that scale can be big. A new powder plant with a processing capacity of up to four million

litres per day was opened in September 09 and is the world’s largest milk powder plant to date.

In Tristan Hunter’s view though, the concept of standardisation is valid across the dairy industry for anyone wanting to have confidence in the output of their dairy production. “It ensures that the customer will get a consistent quality product and whatever the scale of operation or whatever the analysis instrument, it means they can run the plant well,” he concludes.

by Richard Mills (rim@foss.dk), FOSS



Fonterra is co-operative owned by 11,000 New Zealand dairy farmers and is the world’s leading exporter of dairy products, responsible for more than a third of international dairy trade.

The Fonterra global supply chain stretches from farms all over New Zealand to customers and consumers in more than 140 countries.

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