

# Eye on innovation

**O**ur Cow Molly, a producer and processor specialising in cow to customer in 12 hours and Arla Foods Stourton Dairy were both visitor highlights at the recent SDT annual spring conference on the first day. Both visits were thoroughly enjoyed and resulted in wide ranging discussions at the conference dinner that night.

## Growing business with technology

The keynote presentation was given by SDT president Soeren Vonsild, who began by noting that manual operations are subject to error, while automated operations are subject to far fewer errors. However, when they do happen they are persistent, which is an interesting conundrum. He went on to explain how technological developments are driven by labour costs and how these affect the entire life of the product, from process to market and brand. Fewer than two per cent of innovation projects actually influence financial return, while 90 per cent of time is spent on these, with much innovation being focussed on product rather than processes. The barriers to technological innovation for both large and small businesses were highlighted and it seems large businesses are rooted in product innovation, whereas small businesses have difficulty funding development.

## Developments

Professor Martin Howarth of Sheffield Hallam University discussed the impact of compositional changes in milk. He described a collaborative project at the

**The theme of innovations in dairy technology and engineering were highlighted at the Society of Dairy Technology's annual spring conference at Sheffield Hallam University 25-26 April. Dr Liz Whitley reports**

university, which is using instrumentation technology throughout production in order to analyse products and then using further technology to optimise the product. The projects currently being worked upon include milk powders and cheeses for cooking. They are producing very interesting results, he noted.

## New technologies

Fresh from bringing in 80 new cows from Ireland for the Kingshay Farm near Shepton Mallet, Duncan Forbes gave a fascinating overview of the new farm that has been built using a variety of modern technologies available to milk producers. The cows have access to grass from the state of the art building that includes innovative building design and the use of robotic milking systems. The collars that are key to robotics have a much wider use, including being able to track where the cows are, their health and ultimately their progesterone levels, leading to careful monitoring of when cows are ready for artificial insemination.

## Non-thermal processes

A wide range of non-thermal processes are available to the food technologist, and Dr Nivedita Datta of University College Cork discussed possible applications to the dairy industry. The processes include membrane filtration methods, centrifuga-

tion, CO<sub>2</sub> processing, high pressure processing and millisecond technologies, along with further technologies under investigation including high pressure homogenisation, pulsed field processing and continuous ultra-violet light. All these have to meet a range of criteria including maintaining the fresh taste of milk, reduction of vegetative cells, spoilage and spore forming organisms and elimination of pathogens. It was noted that most non-thermal processes are only able to achieve all of these when used in conjunction with thermal processes, however.

## Advanced microbial profiling

Dr Greg Jones of Campden BRI asked for help from the cheese industry with a fascinating new identification tool that is being shown to differentiate between genuine products (eg, those with PGI or PDO status) and those claiming to be genuine, but in fact are not. The technology involves population studies using a DNA profiling technique and enables comparison of microbial populations to identify profiles unique to each product. Dr Jones would like to talk to companies who can send samples of cheeses, both genuine PGI/PDO and counterfeit samples.

## Skills

Day two of the conference started with Louise Codling of the National Skills Academy for Food and Drink describing the impact of the Eden Foundation Degree on the industry and the changes that have taken place. The apprenticeship framework has made a difference to how these courses are funded and it was heartening to hear that more than 60 trainee dairy engineers are participating in the apprenticeship this year. Furthermore, Codling explained that apprenticeships are now available at all levels including up to levels seven and eight, which



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Dr Nivedita Datta of University College Cork discussed applications of non-thermal processes to the dairy industry

are traditionally post-graduate level. It is hoped that this will help to fill the void in new entries to the industry, which is a problem that most share.

## The best use

Dr Mike Lewis started by saying that milk falls into two broad categories: those that are good at coagulating and those that are not. This concept has led to research seeking to identify how milk might be analysed prior to the decision to process it. This picked up the thread of analysis that was touched on in earlier papers and is an interesting challenge on the automation of the industry.

## Pre-treatment of cheese milks

In another presentation that reflected the variable nature of milk, Professor Tim Guinee of Teagasc FRI discussed the influence of milk composition on the composition, yield and quality of cheese. Guinee noted that this influence is emphasised in systems that work on time rather than physical or environmental parameters, which goes back to the need for training and education.

Mitigation of these influences is achieved by milk standardisation (casein to fat ratio), which may be achieved by membrane filtration methods along with the use of standard operating procedures based on objective criteria.

## OneStep process

Keith Goodby of Tetra Pak Processing provided an insight into the cost advantages of the OneStep process for UHT processing, which removes some of the traditional pre-treatment stages along with the SpotOn standardisation system. He noted that the cost of investing in new

technologies could quickly be reclaimed as they can reduce operational costs and therefore significant savings are possible.

At the opposite end of the scale, Bob van de Meerendonk of engineering group NIRAS talked about down-scaling as opposed to upscaling. What this means, he said, is applying the same technologies but on a smaller scale so that the small dairy can achieve the same benefits as a large dairy. An interesting thought that he enlarged upon was that a large company, instead of building a large dairy with a very large milk field, could build several much smaller localised dairies using the same technology and be managed centrally. Normally we associate small with traditional, but he explained that this doesn't have to be the case.

## Smallholders in East Africa

Brian Dugdill started his dairy career in the same way as many do, but quickly stepped outside of the traditional box to work on international projects. His inspirational presentation showed how some comparatively simple technologies could transform the lives of not just individuals but whole communities in remote

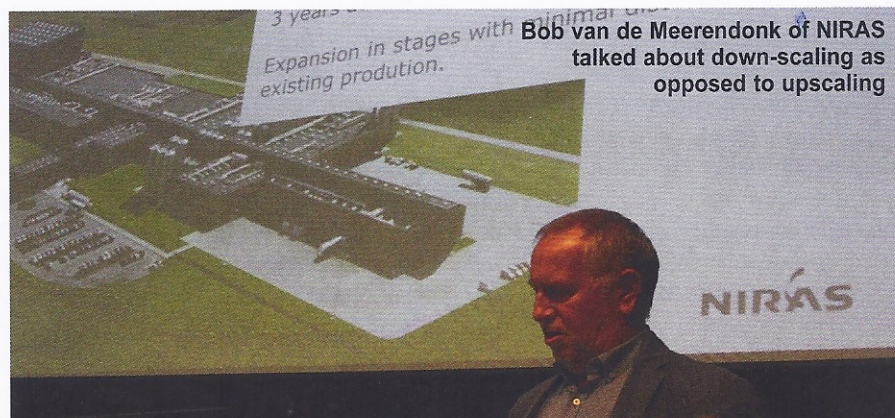
parts of the world. In East Africa, simple solar solutions are bringing electricity to farmers so that they can now chill their milk. One may think it's simple, but when the farmers were previously only able to send morning milk for processing, it can be seen how this can impact on their livelihood. There are other benefits from these solutions including enabling mobile phones to be used as there is electricity for charging, and the cooling units can be used to cool other products.

## CIP advances

Kim Yoemans of Diversey examined how cleaning in place systems can be improved by monitoring efficiency and linking that to the duration of the CIP process. The CIPTEC process utilises technology to monitor the effectiveness of CIP continually, sending results to a central data collection point. These data can then be used to adjust the duration of the process to reduce the time spent on cleaning, while maintaining effectiveness.

The final presentation of the conference addressed the treatment of wastewater and with dairy effluent typically being ten times more polluting than crude sewage, this is an area for savings. Nigel Stevens, a consultant in this area, gave an insight into the problems and showed that something as simple as location in the UK could have a profound effect on cost. Primary, secondary and tertiary treatments of wastewater were reviewed and the presentation concluded with discussion of the benefits and concerns of membrane bioreactor technology and anaerobic digestion processes.

The presentations are available to members of the SDT on its website. The next event will be on 23 July in Nantwich, prior to the International Cheese Awards. Please visit [www.sdt.org](http://www.sdt.org). **DI**



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