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CETA won't help

Canada offers only little more access to its milk market



Roland Sossna
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CETA, the little sister of TTIP, might finally be undersigned this autumn. While other sectors of the economy might benefit from the agreement between the Canadians and the Europeans, the advantages for the EU dairy sector will be limited. And in terms of milk exports, there ain't much to gain for Canadian farmers anyway.

The draft for the CETA treaty foresees an import quota of 16,000 tons of EU cheese plus 1,700 tons of industrial cheese (mainly Mozzarella and Cheddar type products) that add up to the existing import quota of 13,472 tons that Europe has been granted so far. This makes a total of 31,072 tons of "decent" plus 1,700 tons of industrial cheeses that may be shipped to Canada duty-free. Although one should never disesteem a market where one can sell products, CETA really isn't the big jump for EU cheese makers. In fact, it doesn't even get close to a modern single cheese plant's output on this side of the Atlantic.

As Canada is more or less self-sufficient in milk, Canada will not be able to export significant amounts of dairy products to the EU. And given the fact, that Canada has sealed its milk market tightly off, milk prices of about 50 Eurocents are more than prohibitive when it comes to export. As market protection has prevented Canadian dairy farmers from being hit by the global milk price, the Canadians are surely keen to keep up their shields at the border. The "generous" triplication of the import quota for European cheeses isn't that generous when one considers that Canada has over 35 million consumers.

In the end, CETA cannot help the milk sectors of both sides. The real benefit surely is elsewhere, thinks Roland Sossna.

A handwritten signature in black ink, appearing to read 'R. Sossna'.



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Whey for babyfood

Hochwald Foods has set a new worldwide benchmark



A total of €90m has been invested into the new whey processing plant of Hochwald Foods (photo: Hochwald)

Hochwald Foods has massively upgraded its activities in Hünfeld, Germany, over the past years. Part of the investment was a new whey processing plant built on a greenfield site for production of demineralised whey concentrate and powder which alone saw a capital expenditure of €90m. IDM was granted a look into the facility.

Close cooperation with Milupa

The plant manufactures only semi-finished products for infant formulas. This is why QC starts at the dairy farm level as Gunter Kaufmann, head of the nearby Hochwald cheese plant, explains. In cooperation with their main customer Danone/Milupa, who runs a babyfood plant in Fulda just a few kilometers away from Hünfeld, Hochwald has not only designed the new plant but also developed a comprehensive QA concept that covers the whole supply chain. Nearness of milk producers, cheese plant and drying facilities allows for processing fresh material and at the same time minimises transport. The semi-finished products reach the customer virtually wall-to-wall.

The QA concept guarantees for instance that the 900 dairy farms that supply Hochwald's Hünfeld facilities cannot use certain detergents. The cheese as well as the whey processing plant had to revamp their water treatment in a way that



Plant managers Gunter Kaufmann (cheesemaking, right) and Olaf Hauschild (whey processing) made sure that Hochwald Foods recruited only highly skilled workers (photo: IDM)

the chlorate level for babyfood production is kept at all times. "The babyfood industry has the highest demands on production standards," says Mr. Kaufmann.

GEA TDS and GEA Niro were awarded with the general contract for the wet and the dry processing parts of the plant as well as GEA was responsible for automation. Only the demineralisation part was installed by Japanese-French specialists Eurodia. The whole building of the new plant took only two years as Hochwald and Danone cooperated intensively providing mutual exchange of know-how. A side effect of this cooperation is that Hochwald may use this know-how in their other plants as well.



A look into the whey processing department in the new Hochwald Foods plant in Hünfeld provides an idea about the highly complex processes that have been installed (photo: Hochwald)



Powder handling according to the strictest hygienic standards (photo: Hochwald)

Whey processing

The new whey processing plant is 700 m apart from the cheese making plant that manufactures Pasta filata and Mozzarella. The sweet whey is separated in the cheese plant before it is fed via a pipeline to the whey processing facilities. The production plans of both plants are highly synchronised so that the whey storage comprises only three tanks for buffering. This makes sure that always fresh whey enters into processing.

Whey comes from the buffer tanks to bactofugation (GEA Westfalia) before it undergoes a 20 – 22 hours demineralisation process in the electrolyse cells supplied by Eurodia. Olaf Hauschild, head of the whey processing plant in Hünfeld: "The Eurodia lines are absolute new technology. After intense validation, they now are running without any problems."

After demineralisation (demin 90) the whey is pasteurised and standardised according to the recipe for the final product.

Then, the demineralised whey is concentrated by several membrane separation processes. These plants were supplied by Tetra Pak Filtration Solutions (DSS). The concentrate either enters a storage tank before (liquid) transport or is being fed onto a high concentration evaporator. The concentrate is being cooled in permanently agitated tanks for 12 to 15 hours so that fine lactose crystals are formed.

After spray drying, the whey powder is kept in 100 m³ silo tanks prior to packaging in big bags. The Derichs company has installed a hygiene sluice for big bags that keeps pallets out of the filling area. For packaging the powder in 25 kg bags, Hochwald also has installed an automated bagging line from PremierTech Chronos.

In case of a breakdown, the whey processing plant is equipped with a second evaporator line that can produce conventional whey powder.

Supply of media

The new whey processing plant produces thermal and electric energy using two co-generation plants supplied by MTU. The operation of these plants is controlled via the steam pressure

in a Bosch steam vessel. Pressurised air is being produced by oil-free screw compressors of Ingersoll Rand. Innovative cooling technology was sourced from Haas GmbH, Anlagenbau, a long-term supplier of Hochwald Foods.

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Skilled workers

The new whey processing plant of Hochwald Foods surely has set a new worldwide standard. It is being operated in a four-shift pattern throughout the year. 60 new jobs have been created. To make sure that workers have the best possible insight into the processes, Hochwald has recruited the bulk of new employees well before the plant went operative.

The basis for the whey processing plant is, however, the cheesemaking operation of Hochwald in Hünfeld that employs a staff of 200 and itself has been modernised with an investment of €25m since 2011 to turn 400m kg of milk into Mozzarella and Pasta filata cheeses.

Technical innovation is by the way one of the characteristics of the Hünfeld operations of Hochwald. Currently, the waste water treatment is being equipped with a patented new process that allows for separating waste water loads for re-use for instance as fertiliser. IDM will report at a later time about this new process.

The Big Bag Revolver by Derichs

German powder handling equipment specialist Derichs has installed a hygienic Big Bag filling station model LFB BR 2000 at the Hochwald plant in Hünfeld. The system is in principle an efficient hygienic sluice that fills the Big Bag on one side in the high care zone which is then passed in a revolving operation through the wall into the packaging and dispatch area. It is only then when the Big Bag is placed onto a pallet. In between the two hygiene zones (white, black) there is a horizontal rolling gate to keep hygienic conditions in the white zone to standards.

Derichs can supply the LFB BR 2000 with a number of options, i.e. a bag inflation, a dust hatch, weighing and an own PLC automation. derichs.de

Original spare parts just one click away Sidel

Sidel, a leading provider of production equipment and services for liquids in PET, announces the launch of “Sidel Services Online” for fast and easy ordering of original spare parts for its equipment and complete lines.

The new user-friendly web interface, available in six languages, provides customers with a personalised overview of their installed base and real time information on parts pricing and availability. It offers one-stop shopping for ordering Sidel original spare parts, together with faster delivery times on offers and orders. The immediate access and 24/7 global assistance it provides can prove critical to line maintenance and continuous performance. Initially available for registered customers in Europe and Central Asia, the service will gradually expand its offer and availability worldwide.

“The proactive and intelligent management of spare parts makes it possible for customers to significantly reduce costs arising from unexpected stoppages and unplanned downtime. Beverage producers can now make this process even easier with ‘Sidel Services Online,’” comments Sidel Spare Parts Director, Martin Lowinski.

The web interface provides customers with a full overview of their installed Sidel equipment, including all relevant technical documentation and detailed e-catalogues, for intuitive navigation, spare parts search and identification. Information about the availability and price of spare parts is accessible online to maximise uptime. Long-term maintenance plans and safety lists will secure critical parts to ensure continuous line productivity. In addition, Sidel’s Parts Administrators are always available to provide support anywhere in the world when customers wish to speak with a qualified company expert.



As an OEM, Sidel naturally knows and understands its customers’ requirements. They look for maximum reliability and durability of their installed lines, improved operator safety, higher long-term production security and increased food-grade safety compliance. This is why the same teams of engineers who design Sidel machinery and equipment, design, test and certify the company’s original spare parts.

Pavel Shevchuk, Sidel’s Executive Vice President of Services, adds: “With Sidel Services Online higher line performance and maximum uptime are just one click away. With fast online ordering of Sidel original spare parts and an intuitive overview of every spare part, it gives easy access to relevant drawings, manuals, and parts lists. This essentially enables our customers to further improve efficiency and, choosing from a variety of delivery options, to optimise their preventive maintenance plans.” The new online ordering web interface is available at www.sidel.com/services-online

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How sustainable is your cheese?

Advances in technology are enabling cheesemakers to get more from their milk



Author: Marjorie Saubusse, Global Marketing Manager for Cheese, DSM Food Specialties



It is a statistic so widely recognized that it scarcely needs any introduction: Nine billion. That's how many people are projected to be alive in 2050, needing access to balanced, healthy diets that allow them to reach their full potential. Dairy products are nutrient-dense, natural and are highly attractive to a wide-range of consumers worldwide in almost any country. So, how can we fulfill this need and deliver more dairy, safely and sustainably, to more people around the world?

With over 100 years' experience in the dairy industry and one of the broadest dairy portfolios of dairy ingredients, we can help to make the cheese making process more sustainable throughout the supply chain. I believe that the choice of ingredients to produce cheese should not be neglected in the context of sustainability. Advances in science and technology are enabling cheesemakers to get more from their milk and deliver quality nutrition to more people around the world.

Choose a smarter coagulant

An example of how to do this is to choose a smarter coagulant. The results of a recent DSM study showed that, compared to other bovine chymosins, a reduction up to 20% in cheese losses during slicing, cutting and shredding could be realized with a specific coagulant. As well, selecting a coagulant with a lower proteolysis means that both manufacturers and consumers enjoy a firmer cheese texture with up to 0.5% minimum increased moisture, therefore resulting in improved yield.

Partner cultures and enzymes

The specific functionalities of cultures and enzymes, as well as the synergies between them, can also help cheesemakers to make the manufacturing processes more sustainable. Another DSM study showed that for Gouda cheese, for example, this synergy resulted in a reduced ripening time from six weeks to just three using the same amount of milk. Less time to mature means reduced stock, energy and maintenance costs.

Adopt a cleaner ripening process

Cheese producers can also review their options in the cheese ripening phase. Instead of applying a coating or cleaning the rind, producers can use a breathable membrane to ripen the cheese. The membrane prevents mold growth, but also prevents the formation of a strong dry rind on the cheese. It therefore reduces cutting losses, requires no removal of the coating, and the whole cheese can be used when it is processed further. DSM has calculated that if all Gouda and Parmesan cheeses produced today this way, we could create the same amount of cheese with up to 3.6 billion fewer liters of milk.

Toward a sustainable future

What has become clear to me in my role at DSM is that sustainability in cheese making isn't just about the environment. It's a complex concept that encompasses productivity, profitability, social sciences and yes, environmental issues. A sustainable dairy industry is one that manages to find the right balance between all these pillars. In my view, cheese coagulants, cultures and ripening solutions have the potential to unlock significant value for the industry, for society, and for consumers around the world.

To find out more about sustainable cheese production, meet DSM at the IDF World Dairy Summit, 16-21 October, and join the seminar 'Get more from your milk'. Visit the DSM booth for the presentation schedule.

BENEO Appoints Christoph Boettger as New Member of the Board

Leading functional ingredients company, BENE0, has appointed Christoph Boettger as new member of the executive board of directors at BENE0 GmbH, effective 1st September. At the same time Hildegard Bauer, who has been a member of the executive board at BENE0 for the past 10 years, has retired from business after 38 successful years within the Südzucker Group.



In his new role, Christoph Boettger is leading all areas of operations including technical affairs, raw material, product safety and quality, as well as the BENE0-Technology Center (BENE0's center of expertise for application technology and customer technical service).



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The DMK cup-fitter

Solution from Bosch Packaging Technology provides innovative packaging design



The cup-fitter portion package for the MILRAM and Oldenburger brands has been described as an exceptional packaging innovation for coffee cream and condensed milk (photo: Bosch)

We've all been made familiar with the drawbacks of the little round milk portion packs at some point during our lives; whether in the canteen, the conference room, or on airplanes. They fall over easily, often straight off the saucer, and have a tendency to squirt in every direction upon opening. It was these flaws that were the driving force behind the DMK GROUP's decision to create and develop an innovative packaging design that has been successfully implemented – in collaboration with Bosch Packaging Technology.

DMK Deutsches Milchkontor GmbH is Germany's largest dairy company, which was founded in 2011 as a result of the merger be-

tween Humana and Nordmilch and now belongs to the DMK GROUP. It is supported by over 8,900 active milk producers and around 7,400 employees. Today, DMK processes 6.8 billion kilogram of milk at 17 dairy locations throughout Germany. Another eight locations manufacture baby food, ice cream and health products, such as nutritional supplements and glucose products. Brands, including MILRAM, Ravensberger, Osterland, Oldenburger, Humana, intact, Leben's, Biolabor, hansal and NORMI, mean that the DMK GROUP is a clear favorite for retailers and consumers in over 100 countries worldwide. In 2014, the company generated a turnover of 5.3 billion euros, making it one of the leading dairy companies in Europe.



It took two years to develop the cup-fitter package (photo: Bosch)

Since the merger, the DMK GROUP has been expanding operations into new markets in order to broaden the sales opportunities for its dairy farmers. While the company has strong trading relations within the EU, the demand for German dairy products is now beginning to reach a wider international market. Here, sales offices in Shanghai and Dubai are paving the way for access into these new key markets. Alongside the high quality DMK brands and trademarked products, its targeted marketing strategy and further product development are continuing to drive the future successes for the company.

New design for greater convenience

The cup-fitter, which the company has developed for the MILRAM and Oldenburger brands has been described as an exceptional packaging innovation for coffee cream and condensed milk. In 2013 it was awarded the "Catering Star" by German caterers. The innovative packaging design is characterized by its teardrop curve shape that fits perfectly against the side of a coffee cup. Furthermore, the new shape ensures spill-free opening and non-drip pouring – perfect for a relaxed cup of tea or coffee.

The single serving principle of classic coffee creamer portions continues to be popular and practical. They decrease wastage by using only individual portions, removing the need to open a larger container. Their extended shelf-life and easy storage are further advantages. Nevertheless, the little pots still cause challenges of their own: "There is a fine balancing act with the individual milk portions. Trying to balance them on the side of a saucer and walk at the same time often ends up with – quite literally – spilled milk. That's down to the round design of the package. It's a universal problem and it was clear to us that there was room for improvement," says Daniela Dehmann, Senior PR Consultant for Consumer Communications at DMK GROUP, explaining the thoughts behind the new design.

Successful collaboration with Bosch

The process from the initial idea through to the actual implementation of the packaging design lasted around two years. A project like this is comes up against a number of unique challenges. "The usual round shape is well-known, but the teardrop design is something new. Not just for consumers, but also for us as manufacturers," reports Sönke Ingwersen, Production Manager at the dairy company since 1980. It was, therefore,



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important that the DMK GROUP had an experienced partner by its side throughout the entirety of the project. With more than three decades of successful collaboration experience, DMK once again selected packaging specialist Bosch Packaging Technology to help turn this ambitious project into reality.

During the implementation of the new packaging design, DMK GROUP also strongly focused on economic aspects: "At this point we had drafted a new design, which we assumed would need more packaging material. It was, however, important for us to not cause greater material consumption – something, which we're proud to say we managed! That means that there are no disadvantages to the new packaging design in regards to sustainability or costs," explains Sönke Ingwersen.

After DMK had approached Bosch with a sketch of the initial design, and strict guidelines regarding material consumption, the machine manufacturer tested the project on its own machines. Finally, the thermoforming machine – TFA 2520 – whose forming tool can be individually adapted to the requirements of the cup-fitter, was selected.

"We selected the TFA 2520 because no corresponding competitor on the market of thermoforming machines was able to match our requirements. It's in this area that Bosch really has a unique selling point. It was a simple choice to work with Bosch due to the many years of good experience that we've had with both their machines and services," summarizes Ingwersen.

Special aseptic technology

The thermoforming machine in use was developed by Bosch to package liquid and viscous products, such as coffee creamers, aseptically in thermoformed cups. The special aseptic technology ensures a long shelf-life for foods without any need for cost-intensive post-sterilization, cooling or the addition of preservatives. Highly precise filling devices, reduced material consumption and low maintenance costs ensure an economic production. In addition, the robust machine construction guarantees a reliable production and a long operating life.

"The quality of the machine was very important to us. If we have a non-sterile cup in every box and receive complaints, it has a very negative effect on our business. Therefore, safety is our first priority," says Ingwersen. "The foil we now use is practically germ-free, thanks to the applied sterilization process. Out of 100,000 product cups, we know that there won't be a single one that isn't sterile."



The thermoforming machine TFA 2520 whose forming tool can be individually adapted to the requirements of packages, was selected to produce the cup-fitter (photo: Bosch)

Rapid implementation and optimal result

The cup-fitter was a complete success! Following the individualized production of the complex machine, which took around one year, the operational start-up was carried out without any complications. Production was able to begin just four weeks after delivery.

The solution from Bosch Packaging Technology has convinced the manufacturer and operators with its innovative technology and excellent service. "The finished product has an innovative shape, which is completely new to the market – a real unique selling point, just as we had imagined it to be. It was important that the shape was correct and that the container corresponded to our exact requirements. And, even after completion of the project, we can continue to rely on the competent care and specialist support from Bosch."

Daniela Dethmann added: "The dispenser is now offered on passenger flights. Even in this testing environment, the new packaging holds up to the pressure. Furthermore, we've had a really good reaction to the new shape. Consumers are satisfied, which means we're satisfied."

Expansion in France

AZO

With an investment of around 2 million euros, AZO is laying the foundations for further expansion of its market position in France and on the European market as a whole. With the French sister company's premises bursting at the seams, it was decided to invest in a new building in Vallet. Apart from offic-

es and storerooms, the building provides two meeting rooms, showrooms, test labs and 1,000 sqm warehouse space.

There are currently 20 permanent employees at AZO EURL; in 2015 sales of around 6.8 million euros were achieved there. azo.com

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Automation System Hellas

Vast experience applied in >350 projects – From small scale to complete turn-key plants

Automation System Hellas has been responsible for design, construction and automation of certain process cells of the new plant of Kri Kri, one of the leading Greek dairy companies. Kri Kri has, as IDM reported in issue 8/2016, built a completely new processing plant after the old one burnt down in late 2013. The project was accomplished in close cooperation with Tetra Pak within only 8 months, whereby Automation System Hellas had only 5 months to finish its tasks. IDM therefore thought readers should definitely have a closer look on Automation System Hellas solutions and services.

Automation System Hellas was established over 20 years ago with the scope to automate plants and processing lines in the food and beverage industries worldwide, with a particular emphasis in Dairy.

Their Production Lines are designed and engineered to meet strict hygiene, safety and quality standards, ensuring the best Return On Investment (ROI) for the clients

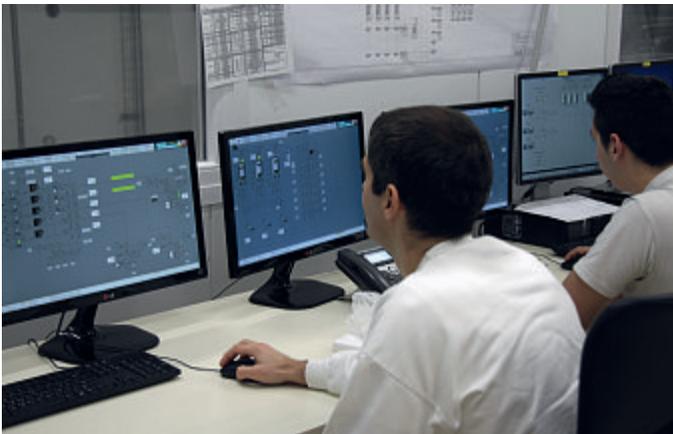
More than 350 successful projects, amongst others in Greece, in the Balkan countries, in Northern Africa as well as in Iraq and Ghana, underline the competence of the company. By offering custom-made production lines and applications, integrating the most trusted and innovative equipment brands worldwide, Automation System Hellas provides flexible solutions to the processing and automation needs of its clients. Cooperation with customers ranges from small projects to turn-key solutions.

Prefabricated units

Apart from the customized solutions for individual plants, the company provides ready tested, automated prefabricated units, with short delivery times and easy installation. These units come with flexible automation software and detailed operator manuals so that even inexperienced operators can easily put them in operation.

Part of the skid-mounted turn-key equipment offered by Automation System Hellas are:

- CENTRASIP, a central unit for automatic CIP, as a compact solution for small and medium size plants.
- CIPLAS, a local unit for automatic CIP, as a ready-to-use solution for medium and large size plants which can be installed either individually or in conjunction with other CIPLAS units.
- GALAXIAS, an automatic milk pasteurization unit for small and medium size plants. It is supplied with different automation levels while it can easily be integrated in any plant.
- THERMAS, an automatic compact heating unit, as a solution for in-line or recirculation milk heating, suitable for all dairies.
- YOGURT/CHEESE HOLDERS, as a solution for yogurt/cheese production plants providing long holding times and sold either separately or in combination with the GALAXIAS.



Typical Central process control



Typical Yogurt fermentation unit



Typical Reception unit with bactofugation



Typical Set Yogurt production with THERMAS

The Kri Kri case

AS Hellas has integrated the best quality components from top suppliers (Alfa Laval, Bardiani, ETA, Festo, GR Inox, Goavec, Grundfos, Inoxpa, Rittal, Siemens, Tassalini and Ytron), into the concept of the new Kri Kri plant in Greece. For the process automation, their customized integrated solution used the most powerful PLC of SIEMENS Simatic series, S7-400.

The fully automated factory was delivered in just 5 months, doubling the capacity of the old one, with vastly improved quality and consistency. Fully automated recipes for maximum standardization were integrated. Smart pre-set CIP programs increase operational efficiency and ease resource management, guaranteeing high cleaning performance and a safe end-product.

DLBA Dairy

In 2015, Automation System Hellas has been awarded a turn-key project by DLBA Dairy in Erbil/Iraq, for the construction of yogurt and Ayran product lines. Pre-fabricated units have been re-assembled and put in operation for the project. Applied know-how used to construct

and put in operation a special-feature mixing, pasteurization and ready to fill set yogurt and Ayran unit, achieving a high quality end product, using initially water and milk powder. Edge automation ensured the combination of high safety and production output. Installed were CENTRASIP, GALAXIAS, YOGAS HOLDER and THERMAS units.

Koukakis Farm

Starting from a small scale, Koukakis Farm has developed into a modern facility which exports its products to demanding European markets. The 5,000 sq.m plant in Kilikis processes 18 million litres of milk a year in a fully automated concept with focus on safety, quality, and better utilization of resources.

Since 2005, AS Automation System Hellas has been designing and manufacturing automated production lines and equipment for Koukakis Farm. The plant is constantly evolving, following the company's growth and with full commitment to ROI. Nowadays, the smart factory ensures complete control of the manufacturing of a full range of pure and high quality products. For more information go to: www.ashellas.com

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Milk standardization for cheese

GEA

The technology used for standardizing milk for cheese production is in common use throughout the industry: generally centrifugal separation for fats and membrane filtration for proteins and other components of the raw milk. However, it is the intelligent use of control systems that have the ability to optimize processes. Here, Jörn Künsebeck (joern.kuensebeck@gea.com) who leads the application development department in the field of liquid dairy at GEA, looks at the benefits.

A primary purpose of standardizing milk for cheese manufacture is to obtain the maximum economic return from the milk. This is achieved by balancing the composition of the milk feed into the cheese making process to match given recipes, while minimizing raw material costs and maintaining the desired cheese quality.

This process, however, is complicated by the natural variation in milk quality: for example from different herds and at different times of the year. The seasonal variation in protein levels – lower in summer and higher in winter – can have a significant influence on the process yield. Also prolonged or even short storage and fluctuations in temperature can affect the proportion of casein and whey proteins in cheese curd.

By standardizing the proportions of protein and fat in the milk feed, cheese producers can reliably produce cheeses with more consistent quality, improve the reliability of the process, increase flexibility so that different recipes can be produced on the same equipment, and achieve maximum efficiency from their plants. What's more, it is possible to add standardization technology to an existing plant to achieve these benefits with the minimum of capital outlay.

Combination of membrane filtration processes

GEA achieves this through a combination of careful control of the membrane filtration pro-



Filtration plant at Tara in Israel installed by GEA (photo: GEA)

cess up stream, intelligent milk storage with different milk fractions stored in separate tanks, and high-level automation control to ensure that the feed components are recombined to create a standardized flow of milk into the process. Working with a standard raw material in this way, with known physical characteristics, means that cheese making equipment can operate at optimum efficiency without the risk that valuable components of milk could be wasted.

The process also generates side streams of product such as casein or whey that can be used for dosing operations or to produce high quality, value-added by-products. This gives the milk used for cheese manufacturing a second life in two ways: casein for cheese; and the native whey protein extracted prior to the cheese mak-

ing process which has many applications such as in infant formula or specialist dietary products.

Using GEA technology in this way removes the need for manufacturers to buy dosing products, such as powdered protein, on the spot market which is expensive. The precise origin of bought-in products can also sometimes be hard to establish leading to 'track and trace' difficulties. The use of GEA standardization technology helps to prevent such problems.

The system can be applied to both batch and continuous processes and allows users to operate cheese making plants more profitably, more accurately, more transparently with the precise track and trace processes demanded by today's legislation and auditing requirements, and with better use of raw materials.

Bent Oestergaard established his own company OCon



Former SPX FLOW Global Director, Bent Oestergaard has established a consultancy company offering his service to the global dairy, food and beverage industry and associated industries like process equipment companies and more.

Bent Oestergaard is well known to the industry and brings with him 35 years of global industry insight and extensive knowledge and experience in technology, innovation, sales, strategy and marketing.

Based in Silkeborg, Denmark OCon ApS (Oestergaard Consulting) offers independent B2B consultancy, including technology and strategic advisory and facilitation processes. The company works closely with its customer's management and specialist's teams to inspire and catalyse value creation to help its customer's business grow faster with higher return. Services to the industry includes:

- Process technology and product innovation advisory
- Strategic business development and market growth plans
- Marketing and communication enhancing market penetration
- Business facilitation from ideation to implementation
- Board member providing engaged and active support.

OCon ApS with Bent Oestergaard has an extensive industry network and might bring in partners as appropriate to strengthen synergies in the consultancy offerings.

Contact: Bent Oestergaard, OCon ApS, Sagasvej 6, 8600 Silkeborg, Denmark, M +45 2162 8491 | bent@ocon.one

MultiSE: Boxing machine of the future ALPMA

At the FachPack show, ALPMA presented its new boxing machine, the MultiSE. Compared with its predecessor, the MultiSE represents a new development with a state-of-the-art servo control system that will allow cheese-making factories to switch flexibly between cheeses of different shapes. The MultiSE reliably boxes round, oval and rectangular cheeses.

The machine helps to keep the time required for format changeover to a minimum: all format parts and parts that require cleaning can be replaced quickly. The new boxing machine operates as a line, which

means that all parts of the machine are readily accessible at all times and are correspondingly easy to clean. alpma.de



(photo: ALPMA)

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all4pack 2016

14 – 17 November, Paris

Against a backdrop of growing integration of the full production chain, the EMBALLAGE and MANUTENTION exhibitions will assert their complementarity in 2016 by becoming “ALL4PACK Paris, a global marketplace for Packaging, Processing, Printing and Handling”. The international event illustrates the inter-relatedness of the sector’s 4 key business lines: Packaging, Processing, Printing and Handling.

An expected 100,000 international professionals (EMEA) will take advantage of the opportunity of this unique show meeting innovations from more than 1,500 exhibitors. To improve international packaging information, All4Pack has launched “The Network”, a worldwide grouping of 11 partner trade shows in the Packaging and Intralogistics industry across 7 countries. all4pack.com

On the following pages, we have compiled some first insights on what will be in store at the show.

GERNEP: OUR LABEL: LABELLING

At All4Pack, labelling machine manufacturer GERNEP presents the latest developments of its rotary labelling machines in modular block building system in accordance with the slogan: OUR LABEL: LABELLING.

Due to the flexibility of the GERNEP-rotary labeling machines to be equipped with different gluing systems and the possibility to design the labelling machine in accordance with different equipment requirements – GERNEP labelers are in duty worldwide.

Outstanding features of the GERNEP-rotary labelling machines are on the one hand, the modular design of the basic machine with the opportunity, to vary different container orientation processes, label control units and bottle plate drives. On the other hand GERNEP-rotary labelling machines provide the flexibility to use different gluing processes like: cold glue labeling from the magazine, hot melt wrap-around labeling from the magazine, hot melt-labeling from the roll and self-adhesive labeling with all its individual advantages in combination on one flexible platform.

To meet all decoration demands in different industries, the rotary labeling machine GERNEP LABETTA is specialized in universal cold glue labeling, GERNEP ROLLINA in affordable hot melt wrap-around labeling out of the magazine and the GERNEP ROLLFED in efficient wrap-around labeling with hot melt from the roll.



GERNEP will highlight the new hightech labeling machine model SOLUTA (photo: GERNEP)

The newly developed GERNEP SOLUTA – in the optimized control and security design – is the consequential answer to match the constantly increasing demand for flexible and diverse container decoration in self adhesive labeling. gernep.com

KHS: Packaging of the Future

KHS will be presenting current highlights in plastic and secondary packaging, along with the latest innovations for PET bottle applications, Nature MultiPack and Direct Print Powered by KHS. Furthermore, visitors will be able to discover a wide range of additional packaging systems.

KHS will showcase digitally printed PET bottles at the booth and provide the opportunity to learn more about how Direct Print Powered by KHS will enable brand owners to launch new bottle decorations within minutes. This disruptive innovation leverages highest possible image variability within future PET bottling lines. Based on specially developed low-migration LED-UV cure inks, Direct Print combines a secure cloud-based artworks manage-



Direct Print Powered by KHS will enable brand owners to launch new bottle decorations within minutes (photo: KHS)



R400 Ultimate, unrivalled sleeve machine cutting and sleeving in a constant movement until the sleeve is placed onto the product!

ment platform, with off-site sample printing for design and approvals. This technology is capable of 12,000/24,000/36,000 bottles/h.

The KHS Innopack Kisters DP display packer provides flexibility for packaging and palletizing while saving materials and resources. It is also available in a block design.

In addition, visitors can find information on innovations such as the KHS InnoPET TriBlock block concept, packaging for the dairy sector and KHS Service. With InnoPET TriBlock, KHS has launched a filling and packaging system for PET bottles to market which incorporates a stretch blow molder, labeler and filler. With consistent neck handling it also enables lightweight PET bottles to be processed. khs.com

PDC Europe: A new reference

PDC Europe introduces the shrink sleeve applicator R400 that has a production speed of up to 24,000 pph. The compact machine operates in a free-flowing modus without reel breakage. The speed for 200 mm (length) shrink sleeves is 450 ppm while it is 600 cpm for small bottles.

The micro perforation patented cutting system easily copes with long cut lengths and/or thin gauge sleeves, for labelling, tamper evidence and bundling.

Its compact footprint, allows the new R400 to fit neatly into most lines. It offers low maintenance, change overs under 15 mn, tools-less, and it is able to use low gauged material. pdceurope.com

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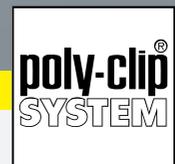


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BrauBeviiale2016

Raw Materials | Technologies | Logistics | Marketing

8 to 10 November, Nuremberg

The Brau Beviiale trade show will again attract not only brewers and fruit juice makers but also representatives from the dairy industry. With 37,000 trade visitors in 2015, BrauBeviiale was the most important international capital goods exhibition for the whole production process chain for beverages and dairy as well.

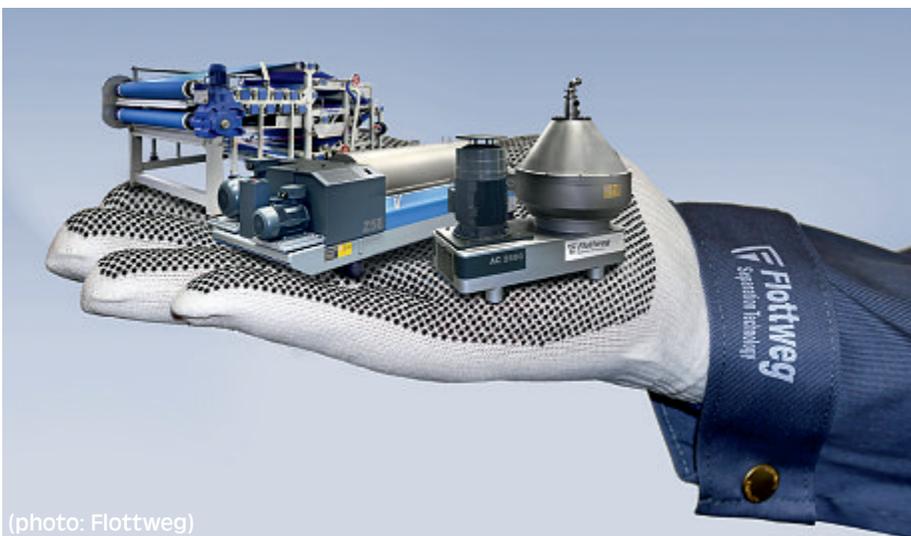
Concentrated know-how, clear structures and focused themes: BrauBeviiale is a compact exhibition. Three days and nine halls give visitors an efficient and comprehensive overview of the current market.

There are virtually more than a hundred of well-established exhibitors that also address the dairy sector, namely Andritz Separation, GEA, KHS, Doehler, TetraPak Processing, Fristam, Sidel, to name but a few.

Learn more at braubeviiale.de

Flottweg: Separation technology solutions from a single source

Flottweg will introduce the brand-new Tricante Z3E at Brau Beviiale 2016. This rounds out Flottweg's product line, offering an attractive centrifuge concept for smaller industrial plants as well. Despite its smaller size, this modular machine boasts all the features and customization options of the company's "big dogs". The Z3E is flexible, maintenance-friendly and powerful. Together with another special feature – the Super Deep Pond – Flottweg's new Z3E will definitely get your attention at Brau Beviiale 2016. flottweg.com



(photo: Flottweg)

JPS: Hygienic HYGHSPIN stainless steel twin screw pumps

When flexibility is needed, the Jung Process Systems' HYGHSPIN twin screw



HYGHSPIN twin screw pumps are manufactured entirely in stainless steel pump in block construction. The pump bodies are securely joined to the drives and therefore create a complete unit that ensures contact-free, perfectly balanced operation (photo: JPS)

pumps provide the perfect solution. As a universal pump, they are capable of gently handling a wide variety of viscosities. For the HYGHSPIN twin screw pumps, high-viscous products are no more difficult to handle than the low-viscosity cleaning fluids used in the CIP and SIP processes. This also means that frequent product changes can be efficiently effected.

Manufactured entirely in stainless steel, these universal pumps fulfil the highest of hygiene standards. The cavity-free design and the location of the shaft seals within the complete CIP cleaning flow are also features of the hygienic design. jung-process-systems.de

KHS: Secondary packaging

Both medium-sized and large plants are increasingly relying on flexible second-



KHS will show a high-capacity glass bottle filler (photo: KHS)

time which already has a taker; Brauerei Schützengarten AG is now to take delivery of the new combination of a KHS packer blocked with a Schubert erecting and closing module. Merging the technologies of both companies brings about an increase in flexibility, quality and efficiency.

NMP Systems GmbH will also be represented in Nuremberg. The KHS subsidiary is responsible for the marketing of the pioneering, innovative Nature MultiPack and Direct Print Powered by KHS plant engineering. khs.com

ary packaging systems. The partnership between KHS and Gerhard Schubert is now generating some particularly indi-

vidual and flexible packaging options. At BrauBeviale both companies will be exhibiting a blocked system for the first

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The focus of ECOLAB's presence at the Brau show will be:

- **Service:** Efficiency relies on Service, Service boosts Efficiency
- **Quality:** Quality calls for Service, Service proofs Quality
- **Efficiency:** Efficiency implies Quality, Quality challenges Efficiency
- **Savings:** Savings require Efficiency; Efficiency generate Savings

In a live demonstration visitors may witness the features of new COP foam cleaners in combination with innovative foam equipment. The built-in Corona Technology makes cleaning processes more efficient. ecolab.com



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Cheese in 3D print

(photo: Printcheese)

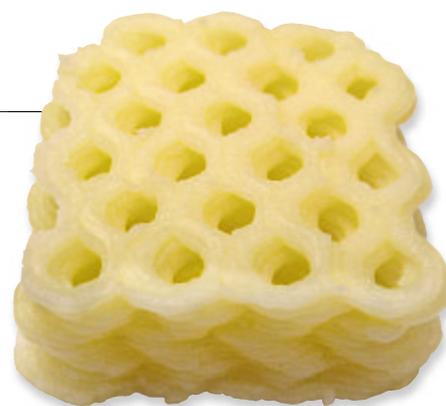
Individualised products: Dutch startup company Printcheese has high expectations

While extrusion has long since established as a production process for processed cheese and is now enjoying ever more attention for producing "real" cheeses as well, the 3D print of cheese is still in a very early stage. But here and there, intensive work is made to bring cheese extrusion into the third dimension. IDM met pioneer Michaela van Leeuwen on her farm in Brummen, The Netherlands.

During her work at the Wageningen University Research Dept. Michaela was introduced to 3D print and decided to try and adapt this technology for food manufacturing. As a dairy farmer's wife, the idea of using cheese as a substrate was quite obvious, says Michaela. A project at two Dutch research institutes then laid the basis for Michaela's startup company Printcheese (printcheese.nl).

"It was my goal from the start to use Gouda as material for 3D print. Meanwhile, I also use goat's cheese as this substrate prints very well",

This complex honey-combe structure was made by a hightech 3D foodprinter (photo: Printcheese)



Michaela told IDM. A prerequisite is that the base product is pasty-like or can be made pasty. This is no problem with processed and goat's cheese but Gouda and other cheese sorts have to be prepared accordingly for print.

Michaela has bought two 3D printers made by PrintRbot customised for food print who actually produce her creations. Heart and star shapes, cylinders and cones non more produce any problem in print just like small cheese wedges which the printers



Shapes like hearts or stars printed from cheese are just the basis for development of more complex 3D objects (photo: Printcheese)

make incl. the wholes. Company logos and similar emblems can also be made; they can be printed live during events in print runs up to 300. Even in Dutch TV Michaela had an appearance.

All this marks only the starting point for Michaela. The largest object that has been made so far by Printcheese measures 4 x 2 cm. In future, industrial food printers will allow to manufacture much larger dimension and the use of more than one extrusion nozzle will allow for producing fillings or multi coloured products.

At the moment, Printcheese experiments with nozzles to exclude adhesion of cheese, another problem that waits to be solved is the entry of air.

The three dimensional shapes for controlling the extrusion head of the 3D printer can be generated by commercial soft-



Michaela van Leeuwen demonstrates regularly the 3D print process for cheese für at events (photo: Pintcheese)

ware which comes with a multitude of pre-set shapes. But generating new shapes takes only a few minutes. At a later stage, Michaela intends to interlink 3D scanners with a PC to generate individual shapes for one-of-a-kind products, such as portraits for instance.

The on-going development work at Printcheese consumes over 40 hours per week which Michaela has to accomplish besides her part time work at Dutch farmers' association LTO where she informs farmers about sustainability. And there are two little daughters to take care of, leaving no time for farm work. The 100 milk cows are taken care of by Michaela's partner Jan Willem Breukink who also has ambitious plans for doubling the herd size after new construction of the farm. Then, the van Leeuwens plan to start their own farmhouse cheese making, and Michaela will of course use that cheese for print.

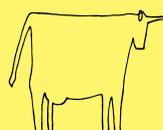
The long-term objective of Printcheese is to manufacture individual delicatessen products made using cheese and other raw material for sale in the conventional retail shops. Michaela speaks of cheese bonbons where each piece has a different shape and is filled or decorated with different ingredients.

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Sterile Filtration from the Point of View of the HACCP Concept

Part 1. Basics



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Last year, it has been found increasingly that auditors deal more and more with the subject of sterile filtration of products and technical gases in audits. This is reason enough to put more focus on the subject. What is the basis of these controls? What is the purpose? How can companies prepare for this?

Food producers must observe special hygiene rules. The producers will be liable if customers suffer any damage from ingestion of their products. This not only applies in case of tort, which is to be controlled by the "fooddefense" measures stipulated in IFS6. Equally, the food entrepreneur bears full responsibility for health-hazardous and/or disgusting conditions of its products – no matter the fault. For example, this is the case if it does not meet its product observation obligations or only does so insufficiently. It is obligated to observe its products and production so that it will recognise unknown dangers as well and ensure remedy.

The consequences of product observation errors can become expensive. A production manager may be personally liable with his private assets if he accepts product defects by, e.g., not using functional filtration. If an audit finds deviations from limits without the corresponding corrective measures being taken, this constitutes gross negligence by omissions.

These risks may be minimised by food manufac-

turers by consistently following the HACCP (Hazard Analysis and Critical Control Point) concept. In this, the subject of sterile filtration of products and technical gases is relevant that has been particularly focused on by auditors in the recent time.

A danger analysis according to the Codex Alimentarius is part of the HACCP concept. Critical control points (CCPs) in the production process must be recognised and potential negative impairments of the consumer removed by suitable

Evaluation	Probability	Probability of discovery	Severity
1	Very low: error is unlikely, the error has not occurred in comparable processes	Control measures prevent errors	Very low: no effect for consumers noticeable
2	Low: process under control, error occurs very rarely/only in theory	Control measures usually lead to the error being discovered	Low: slight feeling of discomfort
3	Medium: error occurs occasionally according to experience	Control measures may discover the error	Medium: doctor required
4	High: error occurs often, process not under control	Control measures rarely discover the error	High: more severe illness/damage to health
5	Very high: error nearly unavoidable	No control measures introduced, control measures will not find the error	Critical: severe health damage to death

Table 1 (Source: Daniela Palm - SGS Fresenius GmbH, HACCP/IFS, 6 November 2012)

steering measures or reducing them to an acceptable scope to mitigate the control point (CP).

The designation of a CCP is always linked to the corresponding steering measures. For this reason, some operations try not to declare too many of them.

However, it is important that a danger analysis according to the Codex Alimentarius is present for this point at all. Those who believe that the filtration control is not a critical control point should be able to explain this decision in a risk analysis according to the Codex. For some auditors, the presence of such a risk analysis is a KO criterion. If a later audit shows that an item was only declared as a CP, while the auditor believes it to be a CCP, this will be a deviation requiring re-work and re-assessment.

In new systems, a risk analysis must be performed in advance already. However, this is a purely theoretical observation that must be verified by controls. If such a new system has not passed the verification by the corresponding filter tests, this does not mean that the same will be true for the future as well. After all, production parameters may change without the production managers being aware of this.

RPZ	Category	Risk level	Measures
>50	A	critical	specific control and monitoring measures – CCP
25-50	B	high	Control measures must be introduced – CCP?
15-25	C	medium	General regular control measures – CP
5-15	D	low	General control measures – CP?
0-5	E	very low	Risk low, usually no further measures required

Table 2 Note: the results marked with "?" can be observed as a "grey zone". (Source: Daniela Palm - SGS Fresenius GmbH, HACCP/IFS, 6 November 2012)

Hazard analysis for sterile filtration regarding the Codex Alimentarius (HACCP)

Possible contamination risks may be chemical (cleaning and auxiliary agents), biological (bacteria, mould, yeasts) or physical in nature (metal abrasion, glass, defective seals and filters). In the process step "sterile filtration", the following risks must be assessed: regarding their causes, the probability of their occurrence, the possibility of discovering them, the potential consequences and the possibilities of countering these.

Based on table 1 and calculation formula, the risk potential figure can be determined.

It must be considered that this can only be an approximate. In particular for microbiological risks, the effects in an insensitive product such as a Cola beverage are rather lower, but must be given much higher relevance in a sensitive product like juice-containing drinks, baby food and healing waters. Therefore, we also speak of a local, i.e. individual hazard analysis. Table 2 helps in risk assessment

See how to use the codex alimentarius for sterile filter applications in Part 2.






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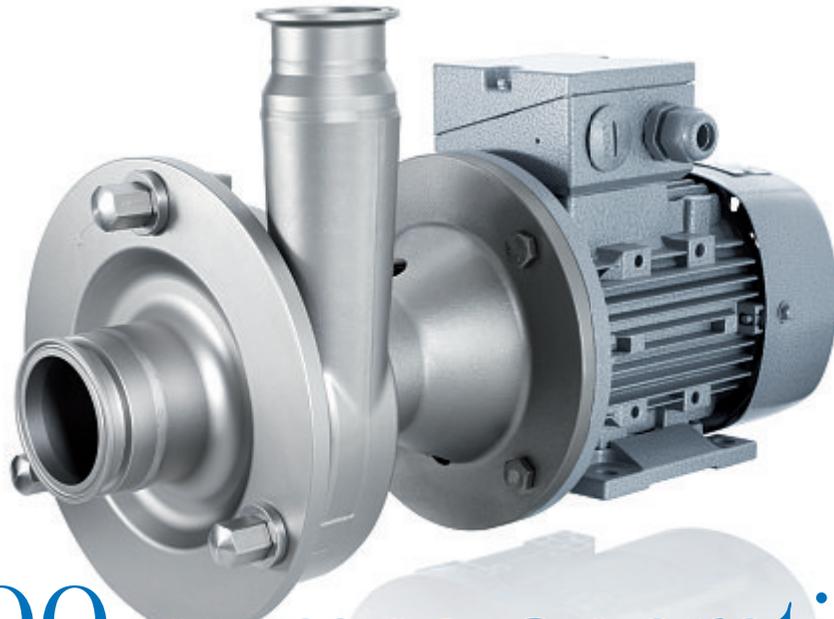
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Figure 1: Centrifugal pumps from the FP line are well suited for evaporators



Over 200 pumps operating

Uelzena and Fristam – Partners from the very beginning



Author: Thomas Kasprick, Sales Engineer, FRISTAM Pumpen KG (GmbH & Co.), Kurt-A.-Körber-Chaussee 55, 21033 Hamburg, Germany; web: fristam.de



Figure 2: Open impellers in conjunction with flow-optimized pumping channels allow for the very gentle product handling even at high volumetric flows

This is the story of years of successful collaboration between Uelzena eG, Uelzen, one of the major independent milk processors for decades in Northern Germany and the Hamburg-based pump manufacturer Fristam, which has produced stainless steel hygienic pumps for the food and beverage industry since 1931. The long-established companies were already working together in the 1950s. At that time, Fristam supplied the first centrifugal pumps to the Uelzen-based company. Today, Uelzena successfully employs well over 200 of Fristam's pumps, particularly for collecting and storing milk, in evaporation and drying plants, as well as for producing butter and butter fat.

Uelzena eG is a well-known manufacturer of dried products for the food and pharmaceutical industry and is among the largest in the industry in Germany with around 600 million

euros in corporate sales. The company's roots lie in the production of milk powder, butter and milk fat products. Uelzena was founded in 1952 to process milk surpluses from regional farms into non-perishable milk powder. Their skills in drying technology have been applied to produce milk-free food products since the middle of the 1970s. This particularly includes spray drying of food ingredients, such as plant dyes, aromas, seasonings, baking aids and vitamins. Since 1983, Uelzena has also manufactured special milk fats for the bakery and confectionery industry using various technologies for fat fractionation, removal of cholesterol, or deodorization and decolorizing.

Reliable components

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nents. Depending on the specific end products of the respective food processing company, hundreds of stainless steel pumps of various types, sizes and designs are being used across the entire production chain. Dr. Peter Fichtl, Managing Director at Uelzena eG, states: "We have developed over 60 years of comprehensive expertise in processing and manufacturing complex milk and food products and are always committed to bring innovative products to the market. For our modern production plants for dried products and milk fats, we need reliable and robust centrifugal and positive displacement pumps. This is where Fristam comes into the game." In the early years of the collaboration, the Hamburg-based pump manufacturer supplied centrifugal pumps in several large packages for milk collection stations to install behind the air separators, for filling and emptying raw milk prestorage tanks as well as collecting milk, storing cream and the first evaporator. These are mostly FP 722 and FP 742 centrifugal pumps. Over the same period the customer also ordered the first FP 732 for the butter melting plant. In the early 1980s, Uelzena expanded its capacities. Fristam supplied a large package of FP 34 and 35 centrifugal pumps for the new evaporation plant. In the 1990s and 2000s, more centrifugal and later positive displacement pumps were added for milk collection, milk cellars, the butter melting facility and butter fat machines. Today, a total of over 200 Fristam pumps are successfully operating at Uelzena.

Modern evaporators

Milk, whey, or other liquids are concentrated and dried for the production of powder. A variety of techniques are available for each processing step. Falling film evaporators are used for concentration. Depending on the respective design and size of the evaporators, a large number of centrifugal pumps are needed, for



Figure 3: FL3 rotary lobe pumps are used at Uelzena for pumping concentrate to the spray tower



Figure 4: The tri-wing helical FL3 rotor

example as feed pumps in the evaporator, circulation pumps within the system and to pump the concentrate from the evaporator to the next processing level. For this purpose, Uelzena uses FP 722, 742, 3522 and 3432 centrifugal pumps which have proven themselves in many evaporation plants for several years. The FP centrifugal pumps distinguish themselves with their open impeller with narrow gaps between the impeller and the cover. Combined with the flow-optimized pumping channel, these ensure minimal secondary flow and very gentle product handling even at high volumetric flows. The pumps can be used universally, they work efficiently and offer exceptional performance. The performance range of the 14 sizes extends to 550 m³/h and a viscosity up to 800 mPas. System pressures up to 25 bar and discharge pressures up to 15 bar pose no problem. Sizes 722, 742, 3522 and 3432 are especially well suited for evaporator plants due to their performance parameters. Of course, the pumps can be cleaned-in-place and sterilized and they correspond to the criteria for hygienic design.

Flexible spray technology

The supply of high quality powder for the industrial production of food products is among the core competencies of Uelzena. The drying of milk and the production of dried milk-free products is carried out in nine spray drying towers with various capacities and with different nozzle types and spraying discs. This flexibility allows for the production of customer and application-tailored powder. The technology applied is especially suitable for the processing of sensible substances, such as protein hydrolysates, vitamins, or even hygroscopic, very salty or odorous substances. "The characteristics of today's food ingredients or milk powder must be defined as precisely as possible,

must be able to be processed well and yet be as natural as possible," explains Dr. Peter Fichtl. Consequently, in 2013, the Uelzener company opted for the FL3 rotary lobe pumps to transport the concentrate to the spray towers. The FL3 pumps can be controlled to operate precisely and accurately as their displacement volume can be accurately metered directly by regulating the pumps motor speed. This is a deciding factor to ensure a consistently good powder quality and the proper operation of the drying plant. In order to ensure a consistently high powder quality, it is imperative to deliver precisely the required quantity of concentrate to the tower. Only then the temperature of the system can be maintained. Due to the special tri-wing helical rotor design the pump works self-priming and thus allows for a problem-free transition from the so called water run to the production of concentrate even at high speeds. Another feature that appealed to the customer is the low wear properties of the FL3 series. Thomas Kasprk, sales engineer at Fristam explains: "Together with Uelzena, we have put the pump through the acid test. Even after over two years it shows no signs of wear and works perfectly well. Based on the positive experiences with our FL3 75 L, four more of these pump models are in use today as concentrate pumps. They transport between 800 and 5000 l/h and handle viscosities of 100 to 250 mPas." Last but not least, the FL3 rotary lobe pumps offer very good cleanability. Due to the simple geometry of the cover and the cavity-free design in accordance with the criteria for hygienic design, the pumps become clean very quickly during CIP. An additional FL pump, an FL3 55 L is currently installed.

Successful collaboration

Uelzena and Fristam have been successfully working together for decades based on quality, trust, reliability and common values rooted in the Hanseatic business tradition. The origins of Fristam over one hundred years ago lie in the production of machines for the dairy industry. Since then, the processing of milk has been a core business activity for the company. Its understanding of complex processes in food production, acquired over decades, and its experience in handling high-quality stainless steel and elastomers puts Fristam in the position to offer pumps which are necessary for the optimal hygiene and safety in the production of foodstuffs. "Important things to consider when selecting a machine supplier include the price-performance ratio of the products, and certainly a high service level and expertise in consulting," says Dr. Peter Fichtl addressing the many years of collaboration with Fristam.

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Fauji Foods and Ecolan teaming up

Debut for the Ecolan Air Aseptic 125 ml package in Pakistan

The new 125 ml Ecolan AirAseptic package had its debut in Pakistan (photo: Ecolan)



Fauji Foods Ltd, Pakistan is the first company worldwide to make use of the brand new Ecolan Air Aseptic 125 ml package. Earlier this year, most of the products in Fauji Foods' liquid dairy portfolio were introduced in a variety of Ecolan packages to the Pakistan market, making Ecolan the company's leading packaging supplier.

Fauji Foods has developed a strategy for expansion a while ago, after having been a producer which had other conventional brand's filling machines and equipment. The company invited all packaging suppliers in the market and finally selected Ecolan based on the added value it could offer. The result was one of the largest ambient milk deals in Pakistan, for Ecolan and worldwide.

The scope of supply of Ecolan was nine aseptic machines and two chilled Machines in combination with the supply of packaging material

125/200/250 ml for Fauji Foods' portfolio of tea creamers and the 125/250 ml packaging material for UHT products. Fauji's range of pasteurized milk is also filled in Ecolan packages.

Challenges

Fauji Foods' Nurple factory was basically a 50 year old plant which needed to be updated. To bring it up to speed and meet the vision of Fauji Foods to be number 1 in the market, required a lot of hard work, the plant infrastructure was ageing and to provide a tailor made solution was the need of the day. Ecolan met these needs and since Pakistan is a price sensitive market, value to money was very important. Ecolan was able to offer product differentiation in the market, efficiency during production and a new lighter approach to doing business.

Perfect fit

"In order for our brands to be number one in the eyes of the consumer, the packages must be convenient as well as easily recognisable on the shelf," says Aamir Khawas, Head of Marketing & Sales at Fauji Foods Ltd. "That's exactly what we get with Ecolan. The new, smaller 125 ml package fits our consumers perfectly, with just the right portion size for everyday consumption. For us, Ecolan's stand-up pouches are the future for liquid dairy products."

"The on the go trend and smaller, single-serve packaging sizes continues to show strong growth globally. With the launch of our new smaller packaging size Ecolan continues to follow current consumer convenience trends," said Anna Annerås, Marketing Director of Ecolan.

Ecolan's new 125 ml package is available in the Ecolan Air Aseptic product range, for ambient distribution, with or without a straw. As with all Ecolan packages, the ease of use when opening, handling and pouring, together with its unique ability to be microwaved, attracts not only the Pakistani consumers, but liquid food producers worldwide.

Fauji Foods

Fauji Foods Ltd is part of the Fauji Group, a business conglomerate set up as a foundation for the benefit of ex-service men. The Fauji Group has considerable interests in a range of industries such as power generation, financial services and fertilizer production. Fauji Foods' dairy portfolio consists of a range of products such as butter, cheese, tea creamers and pasteurized, UHT plain and UHT flavoured milk and juice – with Nurple and Dostea being two of the strong-



Fauji Foods fills its 'Dostea' in Ecolan Air Aseptic packages in sizes of 125, 200 and 250 ml (photo: Ecolan)



Anna Annerås, Marketing Director Ecolean: With the launch of our new smaller packaging size Ecolean continues to follow current consumer convenience trends (photo: Ecolean)



Nurpur liquid milk comes in sizes of 125, 250 and 1000 ml, in Ecolean Air Aseptic 125 ml and 250 ml for ambient distribution and Ecolean Air 1000 ml for chilled distribution. (photo: Ecolean)

est brands. Fauji Foods' portfolio in Ecolean packaging includes the tea creamer brand Dostea in Ecolean Air Aseptic 125 ml, 200 ml and 250 ml for ambient distribution, and the dairy brand Nurpur in Ecolean Air Aseptic 125 ml and 250 ml for ambient distribution and in Ecolean Air 1000 ml for chilled distribution.

Pakistan

Pakistan is the third largest dairy producing country in the world and one of few where more than 90 percent of milk is still distributed unprocessed and unpackaged. Both Fauji Foods Ltd and Ecolean consider this an enormous opportunity for invest-

ment and growth. Ecolean has been present in the Pakistan market for several years, and its activity in the region was strengthened during 2016 with the registration of a fully owned subsidiary company Ecolean Pakistan (Pvt) Ltd in Lahore, Pakistan.

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Complete solutions for automation and plant construction

Bilfinger GreyLogix foodtec

Bilfinger GreyLogix foodtec (BGx FT) has established itself as a solutions provider for automation and plant construction especially for the dairy and food industries. In 2013, BGx FT became an independent entity of the Bilfinger GreyLogix Group and soon saw rapid growth after its acquisition of the company, EB Industrieanlagen AG, one year later. Today, Bilfinger GreyLogix foodtec employs 90 people and generates a turnover of €16m.

"We offer a wide portfolio of services from design and planning through start-up of plant operation including automation. We employ our own assembly teams for stainless steel and electronics. Our customers consist of a number of large and mid-sized dairy processing plants and cheese makers. What differentiate us from our competitors are our innovative solutions for small projects such as the migration of parts and components of processing lines or integration of tanks," explains Martin Engler, who is the Head of Sales at Bilfinger GreyLogix foodtec.

BGx FT, which is still considered a newcomer to the dairy industry, most recently recruited several experts in plant design, construction, and automation after a competitor filed for insolvency. This opportunity has ensured that the young company has significant experience, know-how, and the expertise necessary for good project execution.

Automation

GreyLogix first started in the area of automation based on Siemens systems. Even in 2000, the company was carrying out projects for the food industry. When Bilfinger acquired GreyLogix in 2013, the company was long-



Bilfinger GreyLogix foodtec has equipped, amongst others, the German organic dairy processing plant, Lobetaler Bio-Molkerei (photo: Bilfinger)

since active in automation using all major automation solution providers. Today, the Bilfinger GreyLogix Group employs 665 employees and has a turnover of €70m. Benefiting largely from the international presence of the Bilfinger Group and its capital endowment, Engler views the acquisition as an important step for the company.

Plant Construction

When it comes to plant construction, Bilfinger GreyLogix foodtec (BGx FT) is a process engineering specialist for design, process optimization, and for the entire plant – whether

for process solutions in the wet sections, assembly and piping construction, or commissioning and maintenance – it has a complete portfolio of services. This complements BGx FTs expertise in IT solutions such as MES and PDA systems, ERP systems, security solutions, control technologies, migration and modernization of automation systems, simulation and programming, and so on. All in all, Bilfinger GreyLogix foodtec is a successful provider of end-to-end solutions.

BGx FTs built-in-house control cabinets and IT-based maintenance tool, CAMIX (Computer Aided Maintenance Information Xenter)

nearly round out its range of offered products. BGx FT also provides special solutions for drying plants, comprising of fire-extinguishing systems, fire detectors (DETEX CO-DETEKTION) and drying air cooling systems of the Vertex series which prevent the top zones of drying towers from overheat during production downtime.

As an active member of EHEDG, Bilfinger GreyLogix foodtec ensures compliance with hygienic design standards in the construction of plants. BGx FT also offers fully automated, skid-mounted CIP/SIP and heat exchange modules. Furthermore, while membrane separation plants are planned and designed by Bilfinger GreyLogix foodtec, it cooperates with LTH during project execution.

Project Management

Martin Engler highlights the wide field of additional services his company offers. This includes consultancy, preparation and bundling of documentation, as well as simplified filing and optimized document re-

tention. Those who work with BGx FT can expect professional project management, which has been certified by GPM (German Society for Project Management). BGx FT has learned a lot from numerous projects especially to the benefit of its customers in the US. Today, BGx FT is managing complex projects where other companies – even competitors – are involved.

"Our strength lies in our typical med-sized way of thinking with focus on high customer support and profound knowledge of processes. As GreyLogix is active in many industries, we are able to develop solutions across the board. And we are independent from any machinery and equipment supplier," states Engler.

Bilfinger GreyLogix foodtec currently operates seven offices throughout Germany while another 14 offices of the Bilfinger GreyLogix Group are located in Germany, Austria, Denmark and the Netherlands, which provide the advantage for further expansion of activities.



Martin Engler, Head of Sales at Bilfinger GreyLogix foodtec: What differentiate us from our competitors are our innovative solutions for small projects such as the migration of parts and components of processing lines or integration of tanks (photo: Bilfinger)



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Chasing the gold standard

Putting sugar reduced yoghurt with oligofructose to the taste test



The sugar content of food and beverage products regularly triggers public debate. The main point of concern is the high energy load of processed foods that contain added sugars for taste or technical reasons. “Is this really necessary?” is a frequently asked question, particularly from consumer advocate groups and health-conscious consumers. Sugar- and calorie-reduced products have been available for quite some time; but, they often score badly in meeting consumer expectations regarding taste. Experts at the BENEOTECHNOLOGY Center have conducted trials on fruit yoghurt to investigate the opportunities that the natural dietary fibre oligofructose provides for sugar reduction. We talked to Rudy Wouters, Vice President, BENEOTECHNOLOGY Center, about the results.

IDM: What are the main sugar reduction challenges in a fruit yoghurt?

Rudy Wouters: As with any product reformulation that involves reducing or removing sugar, the main hurdles are retaining the sweetness and body associated with sugar whilst reducing its use. Simply replacing the sweetness is not a big issue. This can be done with high intensity sweeteners. That’s not a complete solution, though, important aspects such as mouthfeel and the final sweetness profile also have to be addressed and correlated with sugar – the gold standard in terms of sweetness. It takes a combination of all these factors to deliver a sweet and full-bodied taste sensation.

IDM: Is there a perfect solution?

When reducing the sugar content of yoghurt, the main hurdles are retaining the sweetness and body associated with sugar whilst reducing its use



Rudy Wouters, Vice President, BENEOTechnology Center

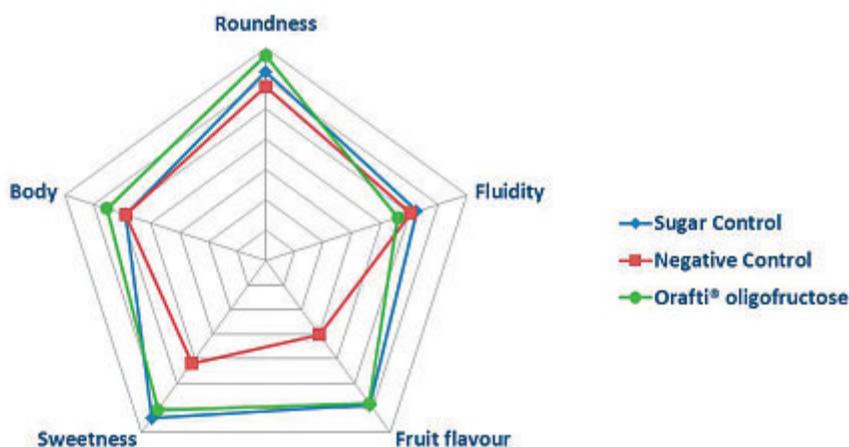


Figure 1: Fruit yoghurt with oligofructose comes very close to the sensorial properties of the original product

Rudy Wouters: I'm convinced that it's possible. At the BENEOTechnology Center in Tienen, Belgium, we conduct trials with sugar-reduced products on a regular basis. It's our goal to imitate the sensorial properties of the original product as exactly as possible. For example, a few weeks ago, we examined how sugar replacement with BENEOT's chicory root fibre (Orafti® Oligofructose) influences the taste profile of a fruit yoghurt. These tests have confirmed that oligofructose contributes to sweetness, mouthfeel,

body and fruit flavour in a similar way to sugar. The test panel was unable to detect any major differences between a fruit yoghurt sweetened with oligofructose and the original product (Figure 1). Following a number of trials, we found that the best sugar-reduced recipe formulation combined sugars, oligofructose and a sweetness enhancer whilst avoiding the use of any intense sweeteners. As a consequence, we reduced the total sugar content by 20% and the amount of added sugars by 35% (Table I).

IDM: How does that affect total calorie content of the fruit yoghurt?

Rudy Wouters: Total calories dropped because we didn't increase the fat content of the product and oligofructose is a fibre with only half the caloric value of sugar. But that's not the only thing that counts; even though most public debate focuses on this one issue, oligofructose also reduces the blood glucose response and adds dietary fibre to a recipe formulation, which supports digestive health. This means that manufacturers achieve several positive effects at the same time.

IDM: What claims are available for manufacturers that partly replace sugar with oligofructose?

Rudy Wouters: Besides claiming sugar- and calorie-reductions, there are a number of other options. First, and this depends on the amount of fibre used, manufacturers can claim the fibre content on pack. Additionally, oligofructose has recently received a 13.5 EU Health Claim that can be used right now. The recent health claim confirms that oligofructose contributes to better blood glucose management as it induces a lower rise in blood glucose response compared with sugar-containing foods/drinks. The corresponding health claim adds significant marketing value to sugar-reduced products.

Technical	Sugar Control	Negative Control	Orafti oligofructose
dry solids	23.5	20.6	23.5
Nutritional/100g			
fat	2.5	2.5	2.5
proteins	3.7	3.7	3.7
Carbohydrates	15.5	12.5	12.1
total sugars	15.1	12.1	11.7
%		-20%	-23%
'added' sugars	10.0	7.0	6.5
%		-30%	-35%
Fibre	0.2	0.2	3.2

Table I: With oligofructose, total sugars can be reduced by more than 20% while preserving the desired taste profile

The top 5 secrets to high-quality chocolate or enriched milks

Best-practice chocolate or enriched milk drinks don't get sedimental or show creaming during their shelf-life – and they owe it all to a group of networks that work closely together



Author: Hanne K. Ludvigsen, Product & Application Manager for Dairy & Ice Cream, Palsgaard A/S, hkl@palsgaard.dk, www.palsgaard.com

Sedimentation was most likely a problem for chocolate milk over 500 years ago, and it's still a problem now – only these days, the problem has reached an industrial scale, and it applies to many more milk drink and particle types than chocolate alone.

Shake before use

Consumer ideas of what constitutes a desirable chocolate or enriched milk drink can differ widely. For example, some expect it to be highly viscous – others prefer a more plain, milk-like viscosity. Sedimentation, too, while considered by the vast majority of manufacturers to be a problem, may even be treasured by some consumers as a core brand attribute, as is the case, for example, for the traditionally glass-bottled Cocio brand of chocolate milk in Scandinavia.

In that same Scandinavian market, however, and in other markets around the globe, sedimentation is an undeniable problem, particularly in cartoned packaging, as consumers often forget to vigorously shake the carton before consumption, resulting in a drinking experience that varies almost with every sip. Further, labels saying “shake well before use” or the more physically demanding “shake vigorously before use” may be perceived negative-



Palsgaard has application centers in Denmark, Singapore, China and Mexico. Here our application specialists are able to perform systematic trials with pasteurised, UHT or sterilised products, making shelf-life studies that cover the entire shelf-life of chocolate or enriched milks (photo: Palsgaard)

ly, perhaps because they call attention to the presence of added substances. But such labels are having to be applied to a growing variety of chocolate and enriched drinks, as we shall see.

From chocolate milk to everything-else-milk

Dairy manufacturers have been quick to jump onto the healthy living bandwagon, develop-

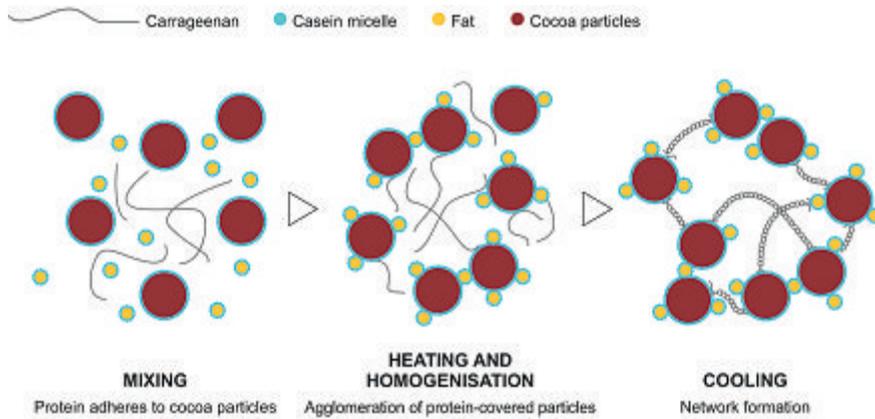


Figure 1. Formation of carrageenan network in chocolate milk (source: Palsgaard)

ing new products with added vitamins, iron, oat fibres, calcium, conjugated linoleic acids (CLA), magnesium and more. The same issue, however, raises its ugly head: adding most things to milk will destabilise the product and endanger both on-the-shelf appeal (for bottled products) and consumer enjoyment (for both bottled and carton products). Even coffee milk, while not widely considered a health-driven product, suffers from the same effect. And a related problem, in long shelf-life products, is the phenomenon known as ‘creaming’.

Sedimental blues

Sedimentation begins the moment the drink has been produced. But, of course, it really starts to work its dark magic once on the shelf. At worst, two distinct layers can appear. In chocolate milks, the bottom one is an (appropriately) dark chocolate colour, while the one just above it has been described as having a “white-livered” appearance by at least one source*.

In assessing the sedimentation aspect of such drinks, sensory evaluations tend to focus upon:

- The amount of sedimentation
- The fineness of the sediment
- The ease or resistance with which it remixes with the milk when shaken

While some particle-containing drink manufacturers have managed to work out how to achieve a consistent and strong suspension, many others, however, have not. For this latter group, there is much to be gained by deploying up-to-date techniques to combat the problem.

Four networks acting in concert

Essentially, any drink containing insoluble particles is prone to sedimentation. Their resistance to sedimentation, if it is to be effective

throughout the shelf-life of the product, first requires manufacturers to consider the choice of milk and particle type.

To reduce the likelihood of sedimentation, state-of-the-art recipes for chocolate drinks based on fresh milk can make the most of four distinct, yet interacting networks that together enable an extremely robust suspension, keeping cocoa particles in their place while ensuring emulsion stability, creaminess and other benefits.

Four of the five networks we’ll discuss in this article are physical effects enabled by:

1. Emulsifiers, which increased flocculation of fat globules to form a three-dimensional network
2. Stabilizers, forming the essential carrageenan network
3. Microcrystalline cellulose (MCC), whose effect on the formation of hydrogen bonds forms yet another network
4. In chocolate milks and other enriched milk drinks that may contain cocoa powder, the tannin component in the powder bonds proteins to add further strength to the drink’s suspension

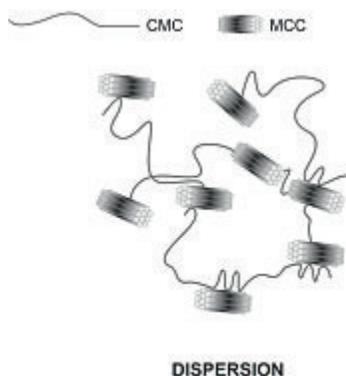


Figure 2. MCC/CMC network (source: Palsgaard)

If all four of these networks are present, as they may be in a sophisticated product, the combined result will hold the cocoa particles – or other particles contained in enriched drinks – tightly in suspension, preventing them from migrating to the bottom of the container. It’s a ‘thixotropic’ network, referring to the fact that if shear is introduced to the suspension, for example by stirring, the network will be broken down, but will tend to revert to its pre-shear state again once the disturbance stops.

Of course, gravity means the network is also subject to subsidence under its own weight, but this is countered by adherence to the inside of the container. And at the same time, the stabilized network improves the drink’s mouth-feel.

Network No. 1: Carrageenan

Extracted from seaweed, carrageenan is by far the most commonly used stabilizer in chocolate milk. In Europe, carrageenans are divided into two distinct groups: Refined carrageenan (E-407); and semi-refined carrageenan (E-407a), both of which can be used in chocolate milk. And it’s a sub-group of these, namely Kappa carrageenan, whose chemical composition has proved useful in chocolate milk because of the way it reacts with milk proteins to form a three-dimensional network.

Essentially, the carrageenan forms a helix with negatively charged sulphate groups turning outwards. This helix interacts with the positively charged casein micelle. When carrageenan is used as a stabilizer, and in order for the network to be formed, the chocolate milk must be cooled to below 25°C before filling, or below 25°C during constant rotation if in-can or in-bottle sterilisation is used. It’s important to store the product at temperatures below 30°C, as the network will start to break down in the heat.

Figure 1 shows how this network is formed in a carrageenan-stabilized chocolate milk.

Dosaging carrageenan is somewhat like walking a tightrope. And it’s a fine line indeed: A dosage that’s just a little too low will quickly produce undesirable levels of sedimentation. Slightly overdo the dosage, on the other hand, and the product is likely to acquire a heavy, gelled body.

So the margin between the two states is narrow. Unless, that is, the stabilizer is accompanied by mono- and diglycerides. This increases the dosage margin, and has the useful effect, due to the creation of a network between fat

globules and whey proteins, of reducing the amount of carrageenan required to form a stable product. But more on that in a moment.

Another factor to be taken into account, of course, in determining the right dosage of carrageenan, is the variation that may occur in the composition of the milk, depending on the season. But there's more still to the dosage decision. It also depends, for example, on:

- The milk's fat content, as more fat requires less stabilizing
- The cocoa content, because more cocoa demands less stabilizer
- The choice of heat treatment (Sterilisation requires less stabilizer than UHT, which in turn requires less than a pasteurised product)

Network 2: The MCC/CMC complex

To consumers, it may seem surprising that refined wood pulp has a contribution to make to keeping milk drink particles in their place. But microcrystalline cellulose (MCC), as it is officially known, or rather a MCC/CMC complex, is often used in combination with carrageenan.

MCC is derived from plant fibres from which the crystalline part of the cellulose is extracted. In a dispersion, MCC forms hydrogen bonds, creating the second of our three-dimensional networks. As an added bonus, MCC-based products can also lend more body and creaminess to the drink.

At temperatures below 80°C, MCC's functional properties are largely unaffected by fluctuations, so cooling and storage temperatures become less critical. That makes MCC-based products a good choice where cooling below 25°C isn't an option – or if the storage is likely to be at more than 30°C, as is often the case in South East Asia or the Middle East, for example.

Figure 2 illustrates the network formation brought about by MCC/CMC, in which particles are suspended.

Because MCC doesn't react with the milk proteins in the same way as carrageenan, the risk of separation due to overdosing is less. That said, overdosing will result in heavy body and high viscosity.

Network No. 3: The effect of carefully selected emulsifiers

The emulsifiers used in enriched milk drinks are typically mono- and diglycerides produced by the reaction of edible vegetable fats or oils when combined with glycerol. The resulting molecule

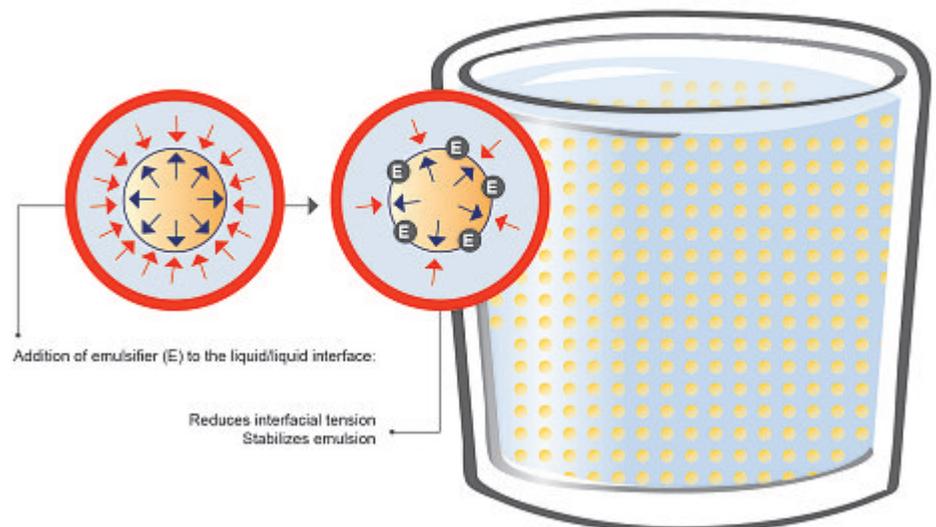


Figure 3: An emulsifier is a molecule with ambiphilic properties (part of the structure is hydrophilic and other moieties are lipophilic). In a multiphase system the emulsifier will adopt a favourable position with respect to energy. The emulsifier reduces surface tension between the phases (source: Palsgaard)

(Figure 3) is composed of a hydrophilic and a lipophilic part, positioned at the interface between fat and protein on the one hand, and water on the other. These molecules are formed during homogenisation and ageing of the product.

The mono and diglycerides form a complex with the whey proteins, making the fat globule membrane more resistant to coalescence, and reducing fat separation in the product at the same time. But that's not all – these emulsifiers lower the net charge of the membrane, creating a three-dimensional network that acts to increase the creaminess of the milk – and the consumer's sensory perception of a thick, luxurious product. Importantly, and perhaps somewhat counter-intuitively, the emulsifiers also guard against creaming in the finished product.

Network No. 4: Cocoa particles

For chocolate milk drinks, the work performed by carrageenan, the MCC/CMC complex and emulsifiers to create a robust suspension is further assisted by the cocoa particles themselves. A typical recipe contains around 1-2% cocoa powder – meaning there's no shortage of particles to distribute and hold in position.

From the moment the milk and cocoa powder are mixed, casein is almost immediately adsorbed to the particles. The strength of this particular network-building effect depends on the degree of alkalisation of the cocoa powder. That's because cocoa powder contains polyhydroxyphenols, which poly-

merise during alkalisation into tannins, known for their protein-binding properties.

In general, the heat stability of chocolate milk is lower than that of milk, however, the closer the pH of the cocoa powder is to the pH of the milk the less impact it has on the suspension's stability. It is important, too, to consider the particle size of the cocoa powder, as the network simply can't support particles that are too heavy. In fact, Palsgaard recommends that less than 0.5% of the particles are larger than 75 micrometers.

Of course, the advantages of this fourth network are lost on enriched milk products that don't contain cocoa powder. Calcium-fortified, non-chocolate milks, for example, which face the task of suspending particles of calcium instead of cocoa, are similarly subject to unattractive settling, but lack the networking effect of their cocoa cousins. Yet the suspension challenge is no less important to address. For example, where sedimentation has occurred, the consumer may lose the fortifying benefits of the drink – and, at worst, ends up with a mouthful of solids and a distinctly chalky taste.

The creation of a durable suspension in this type of milk drink can largely be achieved, for example, by combining a small-particle-size, solid-precipitated calcium source with the networks built by the combination of carrageenan, the MCC/CMC complex and gellan gum, together with the right choice of emulsifier. Gellan gum is a polysaccharide produced by fermentation that creates a gel structure in solutions, keeping the calcium particles in

suspension. The gellan network is formed independently of the proteins in the drink and has only limited influence on viscosity, making it well-suited for a plain milk product.

As with cocoa-based milk products, there is, however, one more network that can make a significant difference, and which can only be created with many years of experience.

The Fifth Network: Global know-how

Working with the four preceding networks isn't something one can expect to get right first time. In fact, it takes in-depth experience and a lengthy track record of varied recipes and testing before it is possible to quickly determine the right balance of ingredients and effects. So, in fact, there's a fifth network that plays an important role in achieving the best results: Palsgaard's own, global knowledge network.

After many years of supplying the dairy industry with emulsifiers and stabilizers, we've managed to build up a significant knowledge bank that supports our customers in arriving at the right recipe, equipment and process parameters in far less time than might otherwise be expected. It's the result of countless trials conducted in well-equipped application labs around the world. In Denmark, Singapore, Mexico and China, for example, application specialists spend days on end to create blends that take key factors such as milk quality, recipe, process conditions and sensory preferences into consideration. The labs are able to perform systematic trials

with pasteurised, UHT or sterilised products, making shelf-life studies that cover the entire shelf-life of chocolate or enriched milks.

Try this

Most often, such trials are conducted together with manufacturers – either in our labs or on the factory floor. In one case, for example, an Asian-based customer was experiencing gelation and sedimentation of the company's calcium milk. That's not unusual, of course, as calcium milks have a greater tendency to gel over time. Even so, the company was experiencing unacceptably short shelf-life – no more than a couple of weeks at best before the product began to show soft lumps, a prior stage to becoming gelatinous. Working together with Palsgaard's dairy team, the recipe and process parameters were reproduced in one of our labs, and a process of experimentation managed to extend the product's shelf-life to as much as six months.

Recommended solutions

So which products does Palsgaard recommend for manufacturers looking to arrive at uniform products with good creaminess and mouth-feel and high storage stability?

Palsgaard ChoMilk 150 is a carrageenan-based product designed to bring uniformity, pleasant creaminess and an appealing mouth-feel to chocolate milk. It's composed of mono- and diglycerides, carrageenan and guar gum – and it's an excellent choice for most chocolate milks.

Palsgaard ChoMilk 150 is an integrated product rather than a dry-blended one, which means spray cooling technology is used to coat the stabilizer with the emulsifier. This brings several advantages:

- Free-flowing properties
- Uniform product without the risk of de-blending during storage and transportation of the emulsifier and stabilizer mixture
- No dust formation
- It can be added to the milk without pre-mixing with sugar

For situations where cooling is a problem, however, a different member of the Palsgaard ChoMilk family is likely to have the best effect. If the local climate, logistics challenges or other factors make it difficult to cool the product below 25°C after production, or if it is to be stored above 30°C, we advise using Palsgaard ChoMilk 173. This specialised product is declared as MCC, mono- and diglycerides, carrageenan and CMC – and it works well in chocolate milk drinks with relatively low protein content (either due to the milk's own protein level or as a result of dilution with water) and even in enriched applications. Able to be used for a wide variety of applications, Palsgaard Chomilk 173 is a dry-mixed product, so the suspension of the product in milk is facilitated by dry-mixing the product with sugar before it is added.

Manufacturers working with high-calcium milk can use Palsgaard Chomilk 173 or Palsgaard RecMilk 131 (declared as gellan gum, mono), as well as diglycerides and locust bean gum, depending on factors such as milk type, calcium particle type and the concentration of particles in the product.

All of the Palsgaard ChoMilk products are capable of delivering a consistently high-quality product without visible creaming or sedimentation, and with appealing consumption characteristics.

References

- [1] <http://www.smithsonianmag.com/smart-news/chocolate-milk-was-invented-jamaica-180949734/?no-ist>
- [2] <http://www.sciencedaily.com/releases/2015/01/150114091001.htm>
- [3] *<https://books.google.dk/books?id=Ud borHX7JdAC&pg=PA120&lpg=PA120&dq=chocolate+milk+sedimentation&source=bl&ots=4peyY9B7Qo&sig=-TL0oHMxZn0pWj9HC90aUcWgyPk&hl=da&sa=X&ved=0CDkQ6AEwa2oVChMI9crEzdaAyAIVxRcsCh0baQCK#v=onepage&q=chocolate%20milk%20sedimentation&f=false>



Carrageenan is extracted from seaweed and is the most commonly used stabilizer in chocolate and enriched milk to prevent sedimentation of particles. It is, however, difficult to dosage as adding too much will cause gelation and too little will cause sedimentation (photo: StinaTano, <https://en.wikipedia.org/wiki/Carrageenan>)



MW Berchtesgadener Land

Lights and shadows of origin labelling

The national origin labelling initiatives in a global context



Author: Alexander Anton, Secretary General, European Dairy Association (EDA), euromilk.org

It all started off with a tweet of the French Minister of Agriculture on 14th March 2016: "Finally, the EU Commission has given its ok for testing the (compulsory) origin labelling for meat and dairy in processed products."



Stéphane Le Fol @StLeFol · 14 mars
Enfin, la Commission a donné l'accord à la France pr expérimenter l'#étiquetage origine des viandes & du lait dans les produits transformés

↳ 238 ❤️ 162 ***

At that time, the French government had not even fully started yet the official procedure of notification required by EU law. What was perceived then by many as a purely political communication exercise in the context of the milk crisis went viral and has turned into a tsunami of national initiatives across the EU to have an obligatory indication of the origin of the milk in processed products like cheese or yogurt.

In the meantime, Greece, Romania, Portugal, Lithuania and Italy have been 'inspired' by the French initiative and notified their own national rules for such mandatory origin labelling.

This summer waltz of compulsory origin labelling notifications in many Member States across the European Union might be the right occasion to bring some thoughts on the value and opportunities of a European and an international origin labelling framework – and on the disastrous consequences such labelling schemes can have.

Hence, the labelling issue might be read both as an information to the consumer which aims to avoid any kind of possible misleading regarding the origin of the foods or as a standard which facilitates the easy and smooth movement of goods within the European and international Markets.

The European harmonised legislation on the food information to consumer gathers the two approaches. On one hand the EU Regulation 1169/2011 excludes the possibility of consumer misleading as pointed out in article 7.1.a) and equally foresees the mandatory indication of origin "where failure to indicate might mislead the consumer"¹.

On this ground, the provisions of the above mentioned EU Regulation² set out the basis for a voluntary origin EU framework, a sort of institutionalisation of food business operators' reputation³ in case they may

want to indicate the origin of a food "to draw consumers' attention to the qualities of their products"⁴.

Secondly, the Food Information to Consumer Regulation recalls the Community Customs Code to determine the country of origin of foods⁵. A definition which refers to an international standard expressed in the WTO⁶ Agreement on Rules of Origin which foresees the determination of country of origin as either the country where the good has been "wholly obtained" or "the country where the last substantial transformation has been carried out"⁷.

Indeed, the international efforts to finally achieve a "common" definition of origin have clearly the purpose to ease the administrative burdens for business operators and to ensure the complete and common understanding of consumers regarding the real country of origin of food products.

From this perspective it would be wise questioning the very logic of the European national origin labelling schemes. The differences among the national texts within the definition of origin and its scope might relate the national technical particulars as measures having an equivalent effect to a quantitative restriction both in a European and WTO perspective. National understanding of the definition and requirements on origin of foods "may divide an affected market into labelled and unlabelled products"⁸ as in France and it would quite probably draw arbitrary distinctions⁹ between domestic and foreign-produced foods. Therefore, national schemes on the country of origin might entail severe consequences on a WTO level as it has been shown by the dispute settlement of last year between Canada and Mexico vs the U.S.¹⁰

Finally, it seems that national technical requirements on the origin of products might result as undermining the international efforts to find a common denominator to the origin issue. A national origin definition triggers a fragmentation of the common legislative framework within the EU Internal Market and

is considered a barrier to trade from an international market perspective. The purpose to avoid any consumer's misleading might be threatened by the introduction of a different legal framework within either the EU Member States and within the WTO Members. Such differences hinder the efforts towards a harmonised European and international food legislation and bring de facto more difficulties in the consumers' perception of the origin labelling of foods.

One thing is sure: the different initiatives in many EU countries definitely put an end to the core principles of the single market for milk and dairy within the European Union. But this 'new European approach' will also have heavy consequences on the international milk markets as soon as this discussion will reach the WTO and Codex Alimentarius level.

¹ Art 26.2.a), Regulation (EU) N. 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers

² Article 26.3, EU Regulation 1169/2011

³ "Food for thought – Revisiting the Rationale of law-based food origin protection" by Sebastian Felix Schwemer page 134-135, EFFL 3/2012

⁴ Recital 30 EU Regulation 1169/2011

⁵ Recital 33 EU Regulation 1169/2011

⁶ World Trade Organisation

⁷ Article 3.b WTO Agreement on Rules of Origin

⁸ "The impact of WTO law on European food Regulation" page 369, By Marco Bronckers and Ravi Soopramanien, EFFL 6/2008.

⁹ "The impact of WTO law on European food Regulation" page 369, By Marco Bronckers and Ravi Soopramanien, EFFL 6/2008.

¹⁰ DISPUTE SETTLEMENT: DISPUTE DS384, United States – Certain Country of Origin Labelling (COOL) Requirements



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Probiotics

Chr. Hansen acquires LGG

Chr. Hansen has acquired the LGG branded probiotic bifidobacteria culture business from Valio for €73m. Alongside Chr. Hansen's own BB-12 strain, the *Lactobacillus rhamnosus* (protected under the trademark LGG) is the best documented probiotic strain in the world. It has been used in food and dietary supplements since 1990 and has a proven beneficial effect on the gastrointestinal and immune system. Cees de Jong, CEO of Chr. Hansen Holding A/S, says: "One of the ambitions in our Nature's No. 1 strategy is to expand our current business within microbial solutions for human health. The LGG® strain and our own probiotic strain BB-12 are the best documented probiotic strains in the world and the acquisition allows us to capture the full potential of the LGG brand across markets for dietary supplements and infant formula offerings, as well as pursuing new opportunities in dairy."



photo: Chr. Hansen

Chr. Hansen has been the largest producer of LGG products for human dietary and infant formula for more than 10 years. Apart from acquiring the full rights to the strain, Chr. Hansen also takes over a number of specialty strains already in production and a bacterial strain collection of around 3,200 strains.

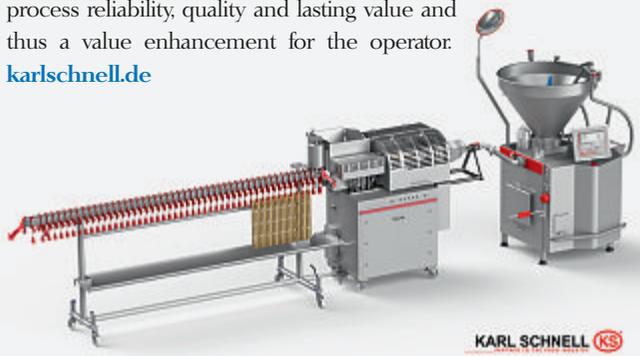
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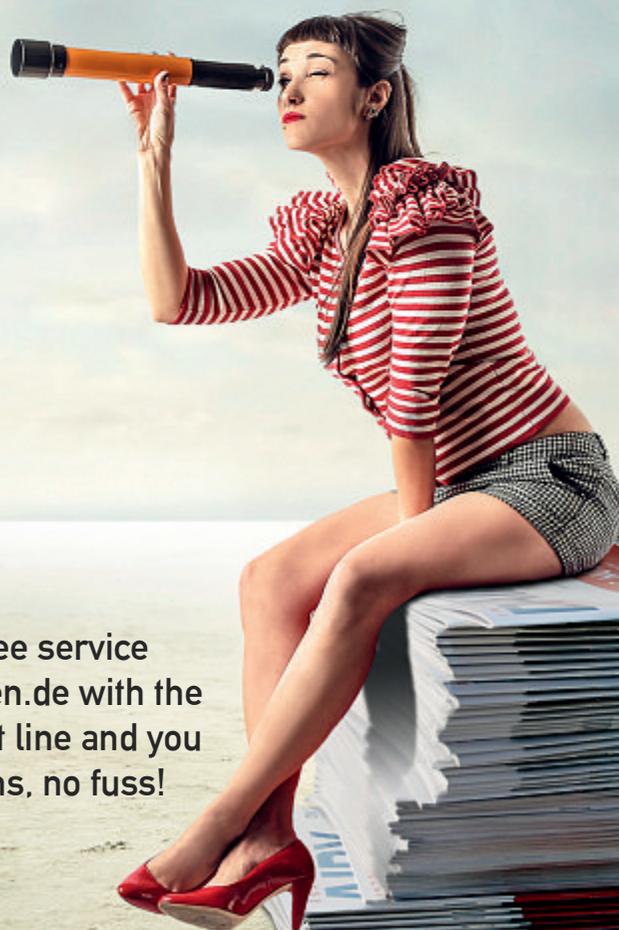
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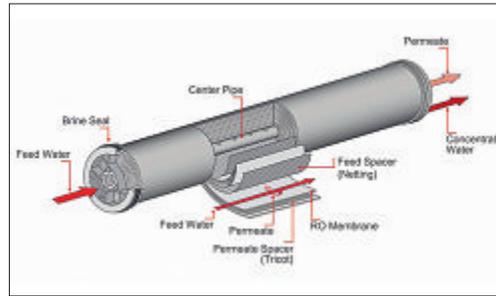


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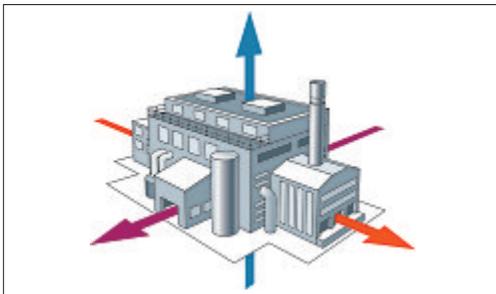


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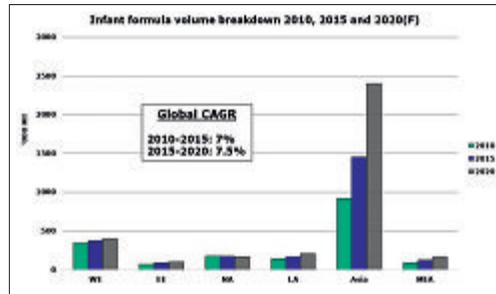
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The global market for infant formula and
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