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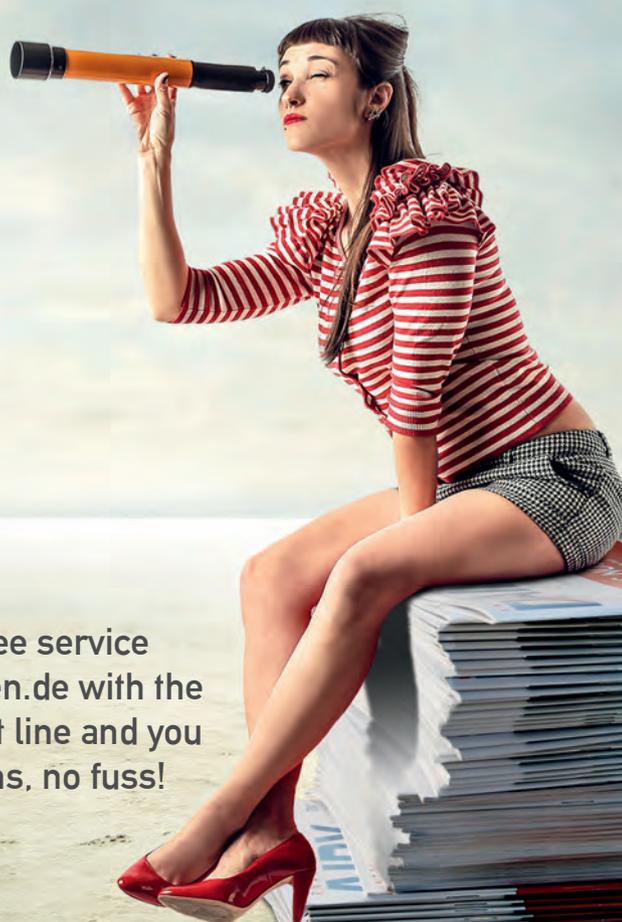
CHR HANSEN

Improving food & health

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Exaggerated slogans all over

The ominous „25 percent organics“ chatter



Roland Sossna
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The European Union has set ambitious goals to increase the market share of organic foods to 25 percent by 2030. This is basically as fine as it sounds well in the ears not only of “green” consumers but of almost everyone. But the EU has simply forgotten to present the Master Plan of how to get to a 25 percent market share.

The ominous European Green Deal of which the Farm to Fork Strategy is an essential part has not taken the full picture into account. One could say that this is quite typical for the EU and its institutions who are simply unable to develop sound strategies. But the Green Deal is just too important to be installed without public discussion and assessment of its consequences as it is more than likely to fundamentally change the life of people. Of course, its all about politics. Big slogans and messages are always needed to transport political messages. Yet, we need well developed strategies and economic assessment if we really want to get to a carbon neutral continent by 2050 and still have a market economy. Social or environmental trade-offs must be studied before and it must be clear that measures taken really will lead to the desired effects.

Getting back to organic foods, the ominous 25% slogan might just stay what it is, a mere motto. It needs money in the hands of consumers to buy the necessarily more expensive organic products. And it needs a common agreement that it is really worth buying organic foods. There’s even more: it needs a kind of guarantee for growers and producers of organic foods that they will be able to sell their produce in the end. Otherwise, not too many will convert from conventional to organic farming or to processing and marketing of such raw material. Brussels and Member States must develop a reasonable plan for how the 450+ million consumer block EU can be lead to eat more organic foods. But as always there’s little to hear from the EU other than issuing exaggerated announcements, thinks Roland Sossna.

Berglandmilch TWO ULTRACLEAN FILLER MACHINES INSTALLED

Berglandmilch, the biggest Austrian milk processor and distributor with 9 locations, has invested in GRUNWALD filling machines with ultraclean technology and UV packing material sterilisation, setting another benchmark in terms of sustainability, protection of the employees and a high degree of environmental sustainability.

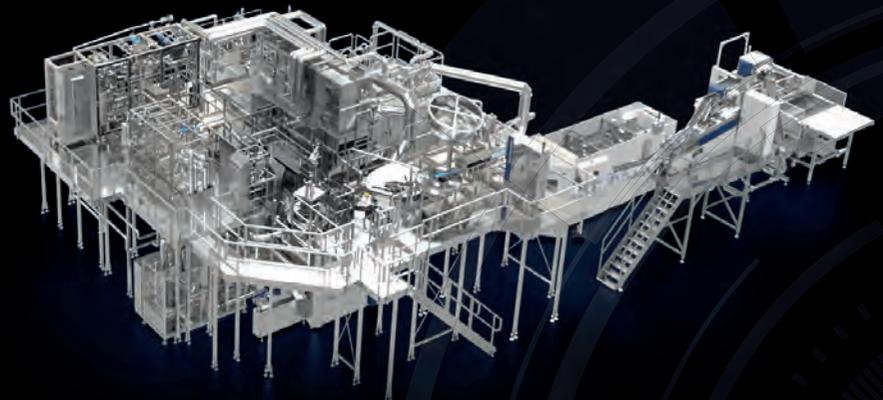
The 8-lane GRUNWALD linear machine with ultraclean design with appropriately certified double UV sterilisation fills the products of Berglandmilch at a sterilisation rate of at least LOG4 (ultraclean). The use of this UV technology also marks a move from the use of peroxide to sterilise the packing materials towards a modern hygiene concept. This is an important factor for the filling and production of the high-quality bio products of Berglandmilch.

Shortly after this linear cup filling machine had been commissioned they placed another order with GRUNWALD for a rotary-type bucket filling machine in ultra-clean design. The production speed of the new bucket filler was one of the decisive criteria for the order placement.

The model GRUNWALD-ROTARY XXL was convincing by its extended design as a 1-lane or 2-lane compact and flexible rotary-type bucket filling machine for a high production output. Another crucial factor was that this GRUNWALD bucket filling machine also uses the special UV technology and achieves at least sterilisation rates of log4 – and this also with 10 kg buckets.

Berglandmilch thus joins the group of well-known companies which successfully use the forward-looking GRUNWALD UV technology in the field of the packing material sterilisation.

UVC disinfection in the new GRUNWALD-ROTARY XXL filler that Berglandmilch has installed at the Aschbach plant (photo: Grunwald)



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Asia's largest milk powder plant AmulFed uses efficient GEA technologies

India's largest dairy cooperative, Amul, started producing milk products for people in the Gujarat state, and beyond, in the 1950s. Heralded as the pioneer of India's 'white revolution', Amul has been instrumental in making India one of the world's largest producer of milk and milk products. GEA being a global technology leader and long-term partner of Amul was the obvious choice to plan and build Asia's largest milk powder plant at its AmulFed site in Gandhinagar. Thus, the focus at the new AmulFed site in Gandhinagar was set on sustainable production with innovative and future-proof GEA technologies. The plant was completed in record time so that it could be commissioned in time for this year's flush season, the peak milk production season in India.

The scale of the powder plant, which covers 26,000 m², and is eight stories in height, was unprecedented in the Indian dairy sector. The automated GEA facility can produce 150 metric tonnes per day (TPD) of skimmed milk powder and 120 TPD of dairy whitener. The plant sits on the same site as Amul's existing 60 TPD and 100 TPD powder plants, which were also supplied by GEA, in 1994 and 2004, respectively. "The three plants together mean that AmulFed is now the largest single-site skimmed milk powder facility with capacity of 310 TPD in Asia," explains Rajesh Golani, Head of Sales Support and Offer Management, GEA India.



The MSD Spray Dryer is equipped with a dual feed system to allow 24/7 operation and features a GEA developed DDD Air Disperser with adjustable nozzles for precisely defined agglomeration and better bulk density control of the milk powders. The system features GEA's smart SPRAYEYE visual camera system, which gives operators a better oversight and ultimate control of the atomization and agglomeration process (image: GEA)

Working in partnership

Amul approached GEA in 2015 to help them in conceptualizing the AmulFed project and to generate plans for the prospective plant. GEA has equipped some of the

world's biggest milk powder processing plants, and the AmulFed stakeholders were able to see these firsthand. "GEA & AmulFed project teams visited New Zealand to see the latest and large milk powder plants,





India's largest skim milk powder and milk whitener plant is located in Gandhinagar. It is operated by Amul and extends over 26,000 m² and eight floors. (image: GEA)

to evaluate the technology, production processes, building concepts and plant engineering," Golani notes.

"In addition, we had series of interactions with the project managers at AmulFed on selection of suitable technology, superior features with respect to energy efficiency, productivity, sustainability, plant and product safety, eco-friendliness, hygiene, zoning concepts and product quality, so that everybody was able to evaluate every aspect, and efficacy of the new plant at par with global standards," Golani, says. Amul evaluated bids from multiple competing suppliers, and in 2016 GEA won the tender. GEA was responsible for the complete turnkey project, end-to-end, from milk processing to powder packing and including auxiliary systems, electricals, utilities, piping and automation.

Production 24/7 and completion in record time

Hygienic design principles and advanced, integrated processing solutions ensure sustainable and future-proof milk powder processing at the AmulFed plant. Built to operate 24/7, the 150 TPD processing and packaging line can handle the highest volumes of milk arriving from dairy farmers throughout the region during the 'flush' season, when milk production is at its maximum. The highest capacity and quality manufacturing at AmulFed means that milk at peak loads is processed and converted

into valued-added products, including skimmed milk powder, dairy whitener, and whole milk powder.

The AmulFed project had to be completed in record time, and within the very tight timescale. Stakeholders from Amul and specialist GEA teams from key technology centers around the world worked closely together to align multiple workforces, complete the civil works, plant construction, installation and configuration, including utilities and ducting, to match existing space and layout.

"The biggest achievement is that we could complete this whole project within 20 months. Our flush had started and we needed capacity and we are thankful to GEA that they completed this project on time," explains Dr. Rupinder Singh Sodhi, Managing Director, Gujarat Cooperative Milk Marketing Federation, Amul.

The process step-by-step

The end-to-end solution includes GEA's energy efficient separators with integrated direct drive, bacteria removing clarifiers, high pressure homogenizers and hygienic valves for the liquid milk processing as well as the largest GEA MVR evaporators delivered to India to date. These evaporators require typically 30% less space than conventional systems, and help to cut energy use and costs, and reduce CO₂ emissions. Three sets of reverse osmosis polisher units treat condensate from the evaporation plant and re-

use the water, which makes AmulFed nearly a zero-water plant. "Impressively, one hundred percent of evaporated water is condensed and reused in the dairy plant," comments Dr. Singh Sodhi.

After evaporation, the milk concentrate is transferred via small buffer tanks to the spray dryers. The supplied multistage GEA MSD Spray Dryer is the largest Spray Dryer at the AmulFed plant. The MSD Spray Dryer is equipped with a dual feed system to allow 24/7 operation and features a GEA developed DDD Air Disperser with adjustable nozzles for precisely defined agglomeration and better bulk density control of the milk powders. Drying in the MSD spray drying plant is carried out in three stages, resulting into higher energy efficiency. After the first stage of drying the milk product is transferred to the integrated fluid bed at the bottom of the drying chamber for the second stage of drying, and then to the VIBRO-FLUIDIZER for the last stage of drying and cooling. The resulting powder is then sifted through GEA's high sanitary vibratory sifter. The MSD spray dryer plant is equipped with hygienic air insulation panels that can be removed periodically to allow for inspection of any fine cracks in the chamber wall. The chamber door with inflatable gasket ensures zero leakage during CIP. The system features GEA's smart SPRAYEYE visual camera system, which gives operators a better oversight and ultimately control of the atomization and agglomeration pro-



The resulting powder is sifted through GEA's high sanitary vibratory sifter. (image: GEA)

cess, to help maximize reliable processing of the highest quality powders. As Dr. Sodhi opined, the powders produced from this plant have excellent instant properties.

Minimized emissions

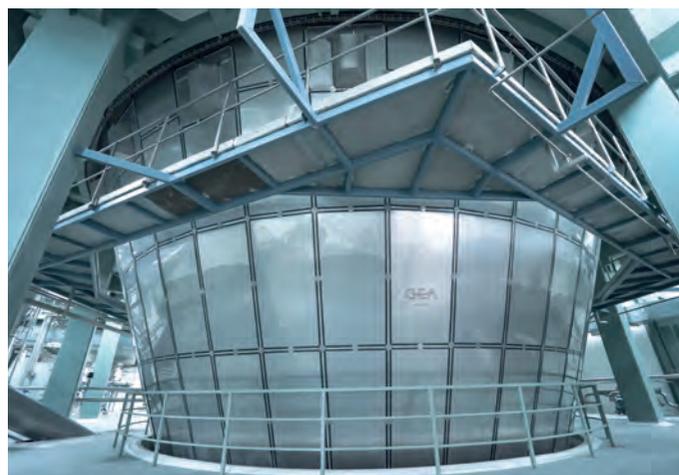
The exhaust air from the dryer passes through four cyclones to GEA's largest available SAN-ICIP bag filter, and the fines discharged from the bag filter are then returned to the drying chamber, saving product and enabling nearly zero emissions.

The dried skimmed milk powder is transferred from the MSD system via GEA's pressure dense phase pneumatic conveying system to various storage silos, from where it can then be transported to the packing machines through a vacuum dense phase conveying system. The conveying system is designed to minimize product breakdown and to retain agglomeration, and so instant powder properties are also retained. AmulFed also operates a fully automated, high speed 25 kg bag filling line, supplied by GEA,

which features total bag control, and an enclosed filling area. The system eliminates the need for an operator to handle unfilled bags, which minimizes contamination risk and helps to ensure complete safety. The plant in addition operates retail and jar filling lines, so can be flexible to match changing market and consumer demands.

Advanced safety features

Importantly, the AmulFed facility has been configured with advanced safety features.



The MSD spray dryer plant is equipped with hygienic air insulation panels that can be removed periodically to allow for inspection of any fine cracks in the chamber wall. (image: GEA)



The fully automated, high speed 25 kg bag filling line, supplied by GEA, features total bag control and an enclosed filling area. (image: GEA)



At GASTI Verpackungsmaschinen GmbH, part of the IMA DAIRY & FOOD Group, **Berthold Burgmeier**, took on the role of Managing Director of the business on 1st April 2021.



BENEO, manufacturer of functional ingredients, has appointed **Stefanie De Roover** as Sales

Director EMEA. In her new role, De Roover will lead the company's sales in Europe, the Middle East and Africa from BENEO's site in Tienen, Belgium.

"The plant is equipped with an advanced level of safety, including a CO detection system, explosion suppression system as well as nozzle camera to monitor the atomizer cloud," notes Golani. Systems for monitoring and regulating the entire plant operation, help to ensure top quality production, optimize the use of resources, minimize waste, product loss and emissions, and reduce down time and unnecessary stoppages.

AmulFed plant delivers the highest quality products

"We looked at the competency of GEA to provide us with a fully automatic plant. Our aim was to look for the best technology that could deliver a very good quality product, very good efficiency, environmentally friendly, and also deliver a high level of productivity," explains Anilkumar Bayati, General Manager, AmulFed Dairy.

"It's a completely integrated setup right from our milk processing to our packaging. The products manufactured are of global standard and the products produced by the plant fetch the best price in the globe, because of the quality of the milk and the technology that we have adopted. This has really helped us in achieving our target."

As Golani sums up, "Amul is a powerful brand – a market leader always striving to set up new benchmarks in Indian dairy whether it is in terms of technology, production scales and new dairy products. So are we at GEA always at the forefront of innovative dairy technologies, engineering skills and project management techniques and our cohesive GEA teams zealously building plants that are large, complex and challenging. It was therefore natural for both GEA and Amul to forge together a continuing partnership to build this momentous plant, setting up new paradigm for the Indian dairy sector."

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Innovation for increased safety of production

CONDETTA SECOA

Cocoa is the world's most popular taste in flavoured milk drinks and their plant-based alternatives. However, heat-resistant spores can survive in the manufacturing process and cause major product damage in the final product. With CONDETTA SECOA cocoa, CONDETTA has achieved a breakthrough for low-germ products, offering increased product safety and quality. "CONDETTA SECOA is a real product innovation," highlights Dr. Wolfgang Weber, Managing Director of the independent ifp (Institut für Produktqualität GmbH), CONDETTA's newly developed cocoa powder.

"This powder mixture has an unprecedented level of quality." What excites him so much about the concept is the solution to a recurring problem in the cocoa processing industry: the sensitive raw material cocoa is a natural product that is not free of microorganisms such as certain *Bacillus* species. These in turn form spores that can survive the industrial production process – with the unpleasant consequence that the quality level of the end products decreases and spoilage processes can occur. To prevent this, food companies have so far used, among other things, the energy-intensive process of preheating to allow

spores to germinate and transform them into their vegetative and thus thermosensitive form. Now, after two years of development, the CONDETTA has achieved a milestone to overcome the problem.

More robust and safer

CONDETTA has developed proven low-germ cocoa powder. The powder mixture CONDETTA SECOA offers the opportunity to question the energy intensive preheating. Dairies and the export business are exposed to fewer risks: the produced milk drinks are more robust against fluctuating ambient temperatures during transport. This is all the



CONDETTA
SECOA
Coat

Applications:
Confectionery
Coating

CONDETTA Head of Product Development and Quality Assurance Karsten Stieg and his colleague Carina Knipper during the sensorial and instrumental evaluation of the cocoa powder quality. (photo: Condetta)

more attractive for export-oriented companies. The team led by Karsten Stieg, Head of Product Development and Quality Assurance, has brought CONDETTA SECOA to market maturity: "We want to offer a higher level of vertical manufacture and react even more flexibly to market trends," says Stieg. That's why he is putting more of the department's resources into research and development to optimise the product and its quality as part of the development process, with the "strategic goal of generating more added value for the customer."

As a result, almost sterile products have been created in the portfolio around CONDETTA's high-quality cocoa powders, which comply in every respect with the European Directive 2000/36/EC on cocoa and chocolate products. Following testing by comprehensive qualification and validation processes, there are three new products in the range: CONDETTA SECOA Coat for the confectionery and coating industry, CONDETTA SECOA Sweet for the ice cream, baking, instant and preparation industry and CONDETTA SECOA Drink for the dairy industry. CONDETTA SECOA achieves the desired colour values and germ contents through an adapted production process.

Convincing results

The ifp in Berlin has analysed various standard qualities of cocoa powders in comparison with the new CONDETTA SECOA. The result: although low microbiological contamination (<300 CFU/g) was detected in various standard qualities, a significant increase and thus high germ counts of mesophilic and thermophilic spore formers were achieved in enrichments. In addition, growth of spore-forming organisms such as *Bacillus subtilis* and *Bacillus circulans* was again detected. Currently, spores are only insufficiently specified, and experts also argue about the effects of different strains and their effects on the end product.

Qualified evidence of the achieved spore reduction:

Sample name	Mesophilic total germ count, aerobic	Thermophilic total germ count, aerobic	Spores aerobic spore formers, mesophilic	Spores aerobic spore formers, thermophilic	thermoresistant spores, aerobic spore former, mesophilic	thermoresistant spores, aerobic spore former, thermophilic	aerobic mesophilic growth	aerobic thermophilic growth
			10min 80°C	10min 80°C	30min 100°C	30min 100°C	3 days, 30 ± 1°C	3 days, 55 ± 1°C
	[CFU/g]	[CFU/g]	[CFU/g]	[CFU/g]	[CFU/g]	[CFU/g]	(per 10g)	(per 10g)
Cocoa standard quality								
Immediate prepared samples	1,0 x 10 ²	< 10	1,8 x 10 ²	< 10	< 10	< 10	-	-
2 h room temperature	1,5 x 10 ²	< 10	3,9 x 10 ²	< 10	< 10	< 10	-	-
24 h at 30°C	-	-	1,9 x 10 ⁵	6,0 x 10 ²	< 10	< 10	not detectable	not detectable
48 h at 30°C	-	-	5,3 x 10 ⁶	3,0 x 10 ⁴	< 10	< 10	detectable	detectable
7 d at 30°C	-	-	3,0 x 10 ⁶	3,0 x 10 ⁴	< 10	< 10	detectable	detectable

CONDETTA SECOA Coat								
Immediate prepared samples	< 10	< 10	< 10	< 10	< 10	< 10	-	-
2 h room temperature	< 10	< 10	< 10	< 10	< 10	< 10	-	-
24 h at 30°C	-	-	< 10	< 10	< 10	< 10	not detectable	not detectable
48 h at 30°C	-	-	< 10	< 10	< 10	< 10	not detectable	not detectable
7 d at 30°C	-	-	< 10	< 10	< 10	< 10	not detectable	not detectable

Source: Extract from ifp test reports dated 29th May 2020 and 10th July 2020
CONDETTA goes to a quality level with CONDETTA SECOA Coat where spore growth is not detectable.

In contrast, CONDETTA SECOA showed extremely low initial germ counts of <10 CFU/g in the studies. Even after 24 to 48 hours of incubation under ideal conditions, no growth of spore formers or heat-resistant spore formers was detected in a large number of enrichments. Accredited methods for germ and spore count, dilution, heat treatment, microbial counting and identification (MALDI Biotyper) were applied and additional enrichment approaches were performed to detect the growth capacity of existing spores. For the industry-renowned food chemist Dr. Wolfgang Weber, this is a "gamechanger" because CONDETTA has achieved a significant reduction in thermo-resistant spores. CONDETTA thus meets the spirit of the times. The international market research company Innova Market Insights emphasises that new launches of milk-based drinks containing cocoa and their plant-based alternatives are

enjoying great popularity worldwide. Cocoa, for example, has an index-related growth of approx. 7% in the period from 2015 to 2020. CONDETTA thus offers the right product in the No. 1 taste.

Individual customer service

The taste profile, described in internal sensory tests as chocolatey and rounded, makes Managing Director Jan Herbert very proud and convinces him of the new development CONDETTA SECOA to better manage an immanent risk in the future: "We want to contribute to consumer protection, brand trust and image with a high level of product safety for our customers." No matter where the low-germ powder mixture is used, CONDETTA does not only supply a valuable raw material, but also accompanies the customer with individual solutions – as a partner at eye level.



Applications:
Ice cream
Bakery
Preparations
Instant



Applications:
Dairy

CONDETTA

Dairy products, baked goods, sweet desserts or ice cream: CONDETTA base mixes are found in numerous food products. The subsidiary of confectionery manufacturer August Storck KG, headquartered in Halle (Westphalia, Germany), produces powdered components that provide taste, colour, sweetening and consistency. Customers from the food industry in over 50 countries trust in the know-how gained from over 70 years of experience in the cocoa-processing food industry. CONDETTA distributes many thousands of tonnes of compounds every year and is also certified for the manufacture of products in organic, halal, kosher and VLOG quality. condetta.com

Climate neutrality and animal welfare

Gropper sets a new standard

Gropper, an owner-managed German dairy, has made a name for itself by producing the first climate-neutral fresh milk in the country. This product also bears the animal welfare label of the German Animal Welfare Association, guaranteeing an especially high standard of animal welfare. IDM asked Wolfgang Hoff, Managing Director – Export/Marketing/Sales how the idea became reality.

IDM: Does “climate-neutral” refer to the entire product, from milk production to processing to retail? Or only to one aspect?

Hoff: Our climate neutrality approach for milk is product-related and is based on the calculated CO₂ footprint (product carbon footprint) along the life cycle of the milk, up to the customer's central warehouse.

IDM: CO₂ emissions are inevitable in the value chain. How do you deal with these, and how high are they in Gropper's case?

Hoff: To begin with, our credo in this context is: calculate, avoid, reduce and compensate for unavoidable emissions. We try hard to avoid emissions wherever possible. One of the actions implemented by Gropper in order to compensate for unavoidable CO₂ emissions is to support regional climate-protection projects, among other things. Over the years, we have managed to greatly reduce CO₂ emissions through various measures and thus make a con-



(photo: Gropper)

siderable contribution to climate protection. Our rieser URWASSER mineral water brand and parts of our liquid milk business are already climate neutral.

IDM: Was the packaging chosen specifically to reduce the CO₂ footprint?

Hoff: With our PET bottle, we see ourselves as industry pioneers. It is made of 50 percent PET. With rieser URWASSER, it is already 100 percent – so no more new plastic is discharged into the biosphere. In the meantime, we have been able to switch many of our products to a new

PET bottle: instead of 26 grammes, the new bottle weighs only 23 grammes and is currently the lightest of its kind on the market. This saves 500 tonnes of plastic per year. The Gropper dairy also welcomes the deposit for PET bottles for juice and milk (as planned by the German government). In addition, we have replaced the lid of some coffee drinks with a new type of drink lid plate. This means a plastic saving of one third.

In addition, the Gropper dairy was honoured with the German Packaging Award in 2020. The award-winning new material is a recyclable sleeve packaging. It enables



Wolfgang Hoff, Managing Director – Export/Marketing/Sales at Gropper: animal welfare and climate neutrality offer opportunities for differentiation in the refrigerated food sector

the sleeve to be separated from the PET bottle. This allows the materials to be separated according to their material flows and the main component of the packaging to be returned to the cycle.

IDM: How exactly do the offsets work? Do your customers and the company share the costs?

Hoff: Compensation for CO₂ emissions (for fresh milk) is currently based on climate protection projects by Climate Partner. Our goal is to recoup the additional costs incurred

through the market and at the same time to exploit all potential savings by avoiding and minimising emissions.

IDM: Offsetting can only ever cover individual parts of production, or does Gropper want to offset all its emissions? Is it possible that, because thousands and thousands of companies are already offsetting, the available areas for reforestation etc. would quickly become scarce?

Hoff: Our ambitious long-term goal is to achieve climate neutrality both for our products and at all our locations. Reforestation is only one of many options. We are currently supporting the humus build-up for domestic agriculture as well as projects in other countries.



Gropper Dairy

Gropper, an owner-managed dairy which was established in Germany in 1929, generates sales of 680 million euros based on a milk intake of 355 million kg, of which 80 million kg is organic milk. The number of employees stands at 880. The dairy runs two plants for milk processing: one at the headquarters in Bissingen and another plant in Moers (joint venture with Dr. Oetker). In addition, there is a fruit juice plant in Stockach, located directly in the area of Lake Constance.



Emulsifier manufacturer Palsgaard has named **Michael Skriver** as Chief Commercial Officer (CCO) effective 1st May 2021, reporting to CEO Jakob Thøisen. Skriver joined Palsgaard after a distinguished international career, most recently as CCO of AAK Asia. He will be responsible for the further development of the company's Sales, Application, Marketing and Product Management functions.



Gropper recently launched entirely new liquid milk varieties which combine climate neutrality and animal welfare



The EDA elected **Giuseppe Ambrosi** as its new president. With a wide experience in the European dairy sector, Ambrosi's focus will aim to promote and reinforce the image and reputation of milk and dairy. As CEO of Ambrosi Spa, market leader in premium specialty Italian cheese, and long-standing chairperson of the Italian EDA Member ASSOLATTE, Ambrosi has a deep insight into the European dairy world.

With the European Commission rolling out its five years' work program with full steam, Giuseppe Ambrosi's focus will be highly based on promoting and reinforcing

the image and reputation of milk & dairy. "Delicious, nutritious and healthy – this is dairy!"

News from Chr. Bock & Sohn

Highly flexible moulding/packaging line,
new machine series



Chr. Bock Sales Manager Gerd Ketterer:
The new, modern control system makes
work easier for the machine operator
with its design based on pictograms
(photo: Chr. Bock)



Chr. Bock Sales Manager Heiko Berndt:
Automation of machines can some-
times get too much (photo: Chr. Bock)

Chr. Bock & Sohn, a long-established supplier of moulding and packaging lines for food fats from Norderstedt, Germany, reports growing sales of its machines to butter manufacturers. Numerous suppliers to the baking industry are turning to recombined butter, as it offers technological advantages in further processing.

For Uelzena, a completely new machine has been developed that can form and package textured butter in sheets and blocks. The BFW 15 (the designation stands for Bock Flexible Wrapper for a product weight of up to 15 kg) has already been sold to other butterfat producers since the pilot project at Uelzena. Its output is up to 8 t/h. The BFW 15 achieves its flexibility through the consistent use of servo drives. Packages from 2 to 15 kg can be produced. Virtually all products that come from a scrape heat exchanger can be processed. "The development of the BFW15 is based on a patent that we took over from Gerstenberg & Agger in 2007," explains sales manager Gerd Ketterer. "We were able to keep the machine very small in terms of floor space; this benefits the production plants just as much as the modern control system, which makes work much easier for the plant operator with its contemporary design based on pictograms.

3000 series

There is also news from Chr. Bock & Sohn regarding the further machine programme. This year, a complete relaunch is taking place, which finds its expression in the 3000 series. Included in the revision are the block packaging machines DKS and SAB as well as the plate packaging machine BPM. These are equipped with new features, such as Siemens S7 1500 control or more sensors in the dosing system, so that temperature and flow rate can be precisely determined and critical conditions detected. In addition, the machines can regulate their own speed, with the rework rate as an additional parameter. Like the BFW 15, the new 3000 series features the new HMI. Externally, the 3000 series also differs from its predecessors by the particularly solid constructed frames and the so-called "Mood Line", an LED band that runs around the top of the machine and visualises the operating status.

However, the classic design with cam discs is retained. "It is possible to automate machines too much," says Sales Manager Heiko Berndt. "This always requires appropriately qualified personnel on the part of the user, and servo technology is not so durable that it will last the average service life of our machines of 30 to 40 years."

According to Ketterer, the market for butter blocks in the 2 to 10 kg range is becoming increasingly interesting, espe-



Chr. Bock has launched the new 3000 machine series (photo: Chr. Bock)

cially for smaller dairies. Here, Chr. Bock & Sohn offers complete lines including cartoners and palletisers, which eliminates the well-known interface problems. Overhauled machines are also available, although "overhauled" is not the right word, as the lines are virtually

completely rebuilt with 60% of the parts replaced and modern controls installed. Chr. Bock & Sohn builds about 20 new machines or lines per year, with a standard delivery time of nine months. The production is characterised by a particularly high own parts manufacturing,

which directly benefits the quality and the working accuracy of the machines (a weight variation of $\pm 0.1\%$ is guaranteed during filling). Special configurations and set-ups of the machines are always feasible for Chr. Bock & Sohn, Berndt assures.



The new BFW 15 can produce plates and blocks (photo: Chr. Bock)

Product innovation by Chr. Hansen



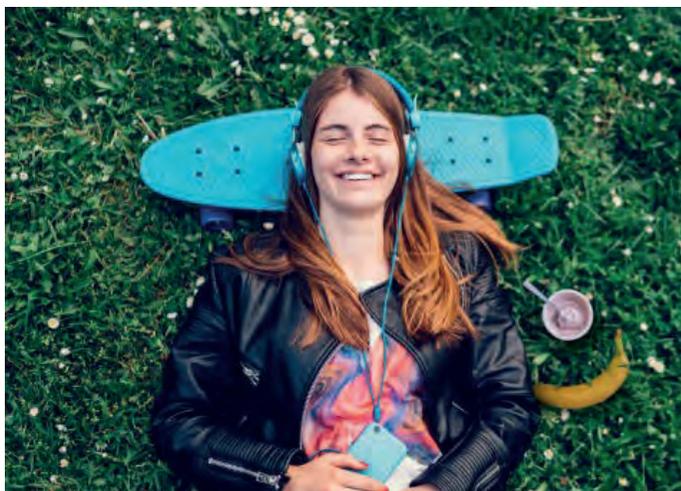
Next generation of FreshQ cultures

According to Chr. Hansen, the new range of FreshQ bioprotection cultures is a game changer in terms of low impact on post acidification, which allows a wider segment of dairy producers, retailers and consumers to benefit even more from the fermentation technology. Now, the company is launching the next generation of FreshQ cultures, specifically developed to unlock the benefits of bioprotection for producers who may experience challenged cold chains, long fermentation, and in-process holding times. The special food cultures can be applied to a broad range of fermented dairy products, such as yogurt, white cheese and tvorog.

This new generation of FreshQ enables the dairy industry to level up by offering producers the following benefits:

- Less post-acidification impact at accelerated temperatures during distribution, or in circumstances involving long holding times or slow cooling
- Improved sensory fit compared to other food cultures with bioprotective effects.

Peter Thoeyen, Chr. Hansen's director of Bioprotection, "For customers looking to trim food waste and produce the best possible products under challenging production and distribution circumstances, this new launch is a game changer. Our new generation of FreshQ cultures has been selected to enable resilient, consistent outcomes without undesirable impacts on taste and texture – resulting in optimized shelf life, improved sustainability throughout the value chain, and superior freshness that our customers and their consumers can count on."



VEGA Culture Kit

Chr. Hansen's VEGA Culture Kit was specifically developed for fermented plant bases. It is comprised of customizable starter cultures, probiotics and bioprotective strains for dairy-free alternatives to yogurt. The kit enables plant-based innovators to create customized and differentiated features for their products in taste, texture, health and sustainability. The VEGA Culture Kit offers producers the following benefits: enhanced taste and texture, probiotic support, boosted sustainability credentials.

As dairy-free alternatives to yogurt, "vegurts", gain traction worldwide, competition continues to grow among producers striving to offer consumers tasty, healthy and sustainable products. With today's launch of the VEGA Culture Kit designed for optimal results across the full scope of plant bases, Chr. Hansen aims to enhance its support of plant-based innovation.

The VEGA Culture Kit offers producers the following benefits:

- Enhanced taste and texture: VEGA offers an exciting new innovation; a choice of starter cultures that can differentially drive flavor and texture in plant-based yogurts. This allows producers to optimize for specific product characteristics by selecting the cultures that yield the results they are after.
- Probiotic support: VEGA nu-trish blends of cultures enable consumers to enjoy the benefits of the world's most-researched probiotics, including Chr. Hansen's Bifidobacterium, BB-12 and Lactobacillus rhamnosus, LGG. These cultures have been designed specifically for use in plant bases to ensure convenient delivery of the correct serving and stability of probiotics, all while delivering robust performance and clean flavor.
- Boosted sustainability credentials: VEGA FreshQ culture solution supports a longer shelf life with superior freshness and fewer quality issues through the action of fermentation.

Probiotics may improve sleep and stress of rotation shift workers

Intake of specific probiotic strains suggests a favorable impact on anticipatory stress and sleep quality for rotation shift workers. Chr. Hansen, in collaboration with Griffith University, recently

Chr. Hansen uses traditional fermentation principles to help improve quality and shelf life and reduce waste (photo: Chr. Hansen)



Chr. Hansen has developed a special solution for “vegurts” (photo: Chr. Hansen)

completed a study on the impact of stress, sleep, and the immune response. The aim of this study was to investigate the benefits of two independent probiotic strains, *Lactobacillus acidophilus*, DDS-1 and *Bifidobacterium*, UABla-12, on the immune system of individuals working rotating shifts. The findings of the new study provide initial support for the use of these probiotic strains to im-

part the effects of stress associated with working a rotating shift. While the study points to the potential of probiotics to impact the change across markers of stress and the immune system in rotating shift workers, the findings may be applicable to a large, otherwise healthy population dealing with inconsistent sleep – be that new parents, students facing exams, people in stress-filled situations, etc.

Flexible hygienic wall bracket solution

Vikan

Vikan offers a new cleaning-tool storage solution – the Hi-Flex Wall Bracket System. Conceived as a wall bracket plus separately available grip and hook modules, the durably constructed system is easy to install and provides flexible storage of up to five tools. Hygienic design and availability in 12 colours help to ensure hygienic storage wherever cleaning tools and other utensils are used in a facility.



New hygienic wall bracket for cleaning tools (photo: Vikan)

The four products in the system are:

- The Hygienic Hi-Flex Wall Bracket System, which stores up to five products via attachable hooks and grip bands
- The Single Hook module for storing individual products with hanging holes
- The Grip Band module, which stores almost any product with a handle
- The Double Hook module for storing two products with hanging holes.

Finland’s most sustainable brand

Valio

Valio has been chosen, for the eighth time in the row, as the most sustainable brand in Finland. European organisation Sustainable Brand Index carries out annual consumer opinion surveys on brand sustainability in Finland and rest of Europe. The survey shows that Finns value Valio’s local production, healthy products, animal welfare, and environmental issues most of all.

What’s core to Valio’s sustainability work is its ambitious goal to reset milk production’s carbon footprint to zero by 2035. The emergency of the pandemic has not influenced the progress of Valio’s sustainability work.



Reduced quality risks and increased reliability

TORAY Reverse Osmosis (RO)



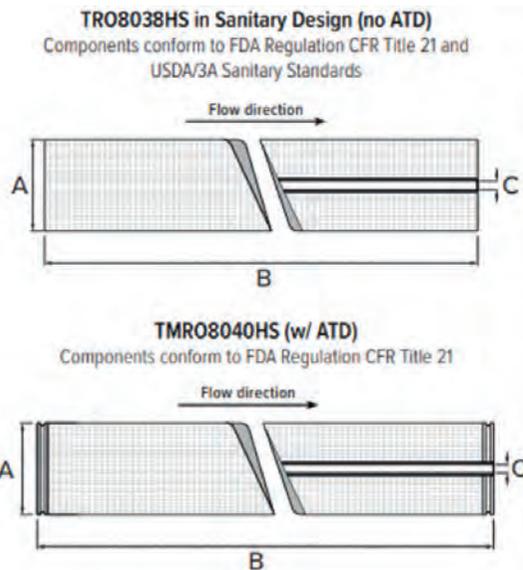
Author: Uwe Schwarz, TORAY MEMBRANE EUROPE AG, Grabenackerstrasse 8b, Münchenstein 1 CH-4142, phone +41-61-415-8710, email: info.tmeu.mb@mail.toray



RO plant, hot water sanitizable (Source: MMS AG, Urdorf, Switzerland)

Reverse osmosis membranes from TORAY remove not only particulate substances but also the majority of all dissolved substances from aqueous solutions of all types. The RO elements of the type TORAY TMRO-HS or TRO-HS leave nothing to be desired in the field of TS/TDS retention, even at low working pressures. In addition,

the elements can be sanitised up to 85°C. In the RO permeate, all bacteria are reliably and continuously reduced. In practice, this allows a permanent improvement in process safety, facilitates compliance with internal limit values and opens up additional ways to meet increased customer demands.



Specifications for TMRO8040HS & TRO8038HS

NaCl rejection %	Permeate flow rate GPD (m ³ /d)	Feed spacer thickness in. (mm)	Active area ft ² (m ²)
99.5%	9,000 (34.1)	0.028 (0.71)	400 (37.2)

Standard dimensions in. (mm)

Size	A Diameter	B Length	C Permeate tube ID
8040	7.9 (201)	40 (1,016)	1.125 (28.6)
8038	7.9 (201)	38 (965)	1.125 (28.6)

Test Conditions

Feed water pressure psi (bar)	150 (10.3)
Feed water temperature °F (°C)	77 (25)
Feed water concentration mg/l as NaCl	2,000
Recovery rate %	15
Feed water pH	7

Possible applications

Water treatment: Undesirable substances that damage product quality, such as nitrate or chlorate, etc., are removed from process water. Lactose can be concentrated and recovered from the NF permeate produced during whey processing. The permeate, which is extremely low in salt and bacteria, has a wide range of applications in the operational production environment.

Special features of sanitisation with hot water

Hot water sanitisation reduces existing germs and causes slight compaction of the membrane. This initial compaction is also referred to as conditioning and ends after the third sanitisation cycle when the final, stabilised separation and flow performance is achieved. For time-critical applications that only allow the shortest possible interruptions in operation – for example, membrane replacement in a production environment that is still running – it is also possible to purchase pre-conditioned membranes ex works.

Practical case study

For the treatment of NF permeate from whey processing, TORAY RO membranes were compared with other membrane products. For this purpose, exclusively new membrane modules of all participating suppliers were operated and evaluated under comparable conditions.

The membrane TORAY TRO 8038 HS showed best results in hydraulic performance (flux) and separation performance (retention). The COD in the permeate was 82% lower than the competitor's product, which means a lower residual load in the permeate and a significantly higher yield (in this case of lactose).

The operational advantage of hot water sanitisation has even receded somewhat into the background in view of such a performance advantage.

Hot water sanitizable and other membrane modules for process applications are produced at Toray's California manufacturing facility, certified to ISO 9001:2015 and 14001:2015 to ensure product and service quality compliance

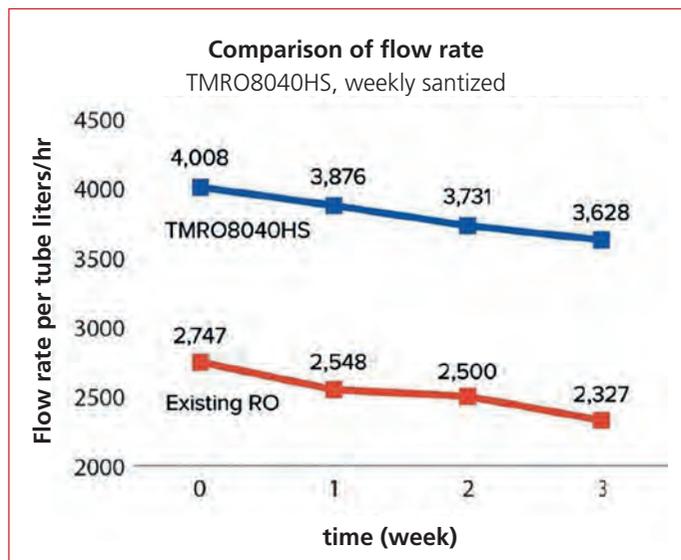


Fig 2: Comparison of flow rate

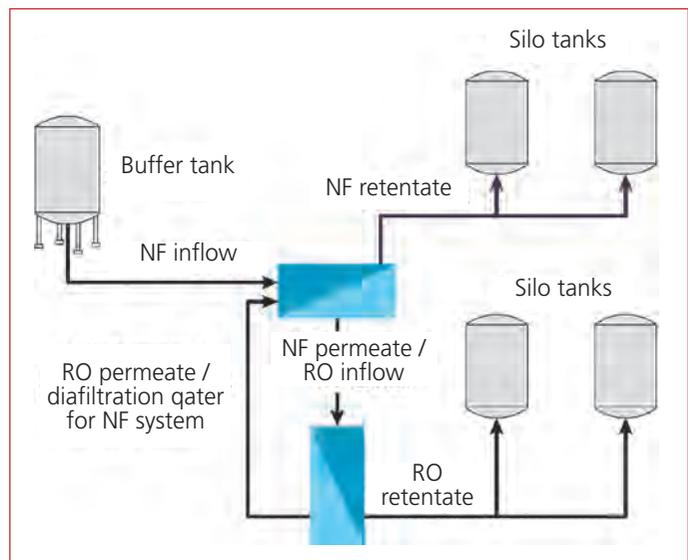


Fig 3: NF and RO process

Unlocking shelf-stable yoghurt's potential

Palsgaard

Palsgaard has developed a clean-label stabiliser blend to help manufacturers create thermised yoghurts with a clean mouthfeel, a creamy consistency and excellent stability. Theng Theng Sim, Regional Application Manager at Palsgaard Asia-Pacific, explains.

The thermised yoghurt market is still in its early stages and there are plenty of reasons to expect significant growth in the years ahead. As it can be stored at ambient temperatures, chilled transportation is not required to maintain its quality and texture. It also offers a longer shelf-life than chilled yoghurts but, unlike UHT products, it is heated only at standard pasteurisation temperatures.

"Thermised yoghurt is now well established in China but it's yet to really take off elsewhere," Theng Theng Sim, Regional Application Manager at Palsgaard Asia-Pacific, says. "We see a lot of potential, especially in countries with cold-chain distribution challenges. Maybe some manufacturers have thought about shelf-stable yoghurt but haven't been able to develop the right product."

Contending with challenges

Achieving the right mouthfeel and texture is an important part of the challenge of developing a thermised yoghurt product that will appeal to consumers.

"Preferences vary from country to country when it comes to texture, but most want something smooth and glossy with a clean

mouthfeel," she adds. "The main quality issue, though, is always syneresis."

Syneresis, or serum separation, refers to a shrinkage of the gel as a result of the instability of the gel network, with the structure

of the yoghurt becoming so tight that the water is squeezed out.

"It's very tricky," she says. "If you use the wrong type of stabiliser or the dosage is too high, the water squeezes out because the structure becomes too tight. If you don't use a stabiliser, you can't bind the water so it will squeeze out from the curd."

Thermised yoghurt also needs to undergo heat treatment and, as a result of the low pH levels, that process can denature the milk protein and cause the product to become curdled or grainy.

Another issue for manufacturers has been developing shelf-stable yoghurts with clean labels, with the commonly used stabilisers requiring E numbers.

A new solution

Palsgaard may be best known for its emulsifiers, but the company also has extensive knowledge of stabilisers. Having identified the potential in the thermised yoghurt market, the company set about developing a solution that would address all these challenges.

The result is Palsgaard® AcidMilk 310, a plant-based, Halal-certified stabiliser made from just two ingredients.

"Our Palsgaard AcidMilk series includes some gelatine-based options and some that are starch-based," Theng Theng says. "For Palsgaard AcidMilk 310, we are using a combination of vegetable fibre and starch. In general, the function of starch is to thicken, gel and hold water in the yoghurt. With the wrong choice of starch or the wrong dosage, the yoghurt will become



A Brookfield viscometer mounted on Helipath drive motor is being used to measure the yoghurt viscosity. The viscosity measurement will allow us to know if the yoghurt is runny or thick and enable us to adjust accordingly to the targeted texture.



Designed for use with either fresh or recombined milk, Palsgaard AcidMilk 310 is suitable for stirred and drinkable yoghurts.

very starchy and sticky. It may also result in grainy yoghurt. The vegetable fibre helps to develop some viscosity and also provides a very clean mouthfeel, but for the starch we had to be very careful."

Palsgaard had experimented with various stabiliser blends for shelf-stable yoghurt,

including options with more ingredients. However, the company found that the combination of vegetable fibre and starch produced the best results, achieving a clean mouthfeel, creamy consistency, smooth and glossy texture, and excellent stability after heat treatment.

"We tried other options, but we started to see serum separation and we got a grainy texture," she adds. "Thermised yoghurt presents a new level of challenging technical issues. We really didn't know whether using vegetable fibre and starch would work, but you never know until you try it. We went through the heat process and wow! It was a nice surprise for us – just two ingredients and no E numbers."

Palsgaard AcidMilk 310, which is blended in Palsgaard's CO₂-neutral factories, also comes at an affordable price. "People think clean label means a very expensive product," Theng Theng says. "Actually, Palsgaard AcidMilk 310 is not a Rolls-Royce price. It's very cost-effective. Consumers in many countries are looking for clean-label products and you don't really see that now for thermised yoghurt, so this is something that got us very excited."

All photos: Palsgaard



Theng Theng Sim, Regional Application Manager, Palsgaard Asia-Pacific

Suitable for scoopable and drinkable yoghurts

Designed for use with either fresh or recombined milk, Palsgaard AcidMilk 310 is suitable for stirred and drinkable yoghurts.

To provide inspiration to customers looking to explore the immune health trend, Palsgaard recently unveiled an acai beetroot drinking yoghurt concept using Palsgaard AcidMilk 310,

which gives it a smooth and creamy texture and a mouthfeel similar to milkshake.

“As well as helping customers develop new products or perfect existing products, we often create prototype recipes in our six application centres to help spark ideas,” she says. “For this concept, we wanted ingredients that are very nutritious and can help to boost the immune system but that would also blend well with the base. Beetroot and acai berry blend really well and the yoghurt tastes great.”

Palsgaard AcidMilk 310 also prevents whey separation during distribution and storage as well as providing excellent water-binding properties.

“Drinkable yoghurt is very different to stirred yoghurts,” she says. “The only common issue we see is the serum separation. With drinkable yoghurt, there is more water present so it’s important to minimise sedimentation.”

Helping producers make the switch to shelf-stable

Regardless of whether manufacturers are looking to produce stirred or drinkable thermised yoghurts, Palsgaard’s experts will work closely with them to ensure they can implement Palsgaard AcidMilk 310 effectively and get the results they want.

“A lot of producers would like to do shelf-stable yoghurt, but they don’t have the ability to do it yet,” Theng Theng says. “We are going to share this technology with customers in several countries and teach them how to produce it. They don’t need to invest in any new equipment for thermised yoghurt because it’s only a pasteurisation temperature. We just have to share our expertise.”

The company is now sending out prototype samples to demonstrate Palsgaard AcidMilk 310’s potential. Without the need for cold-chain distribution and an expected product shelf-life of up to six months, the process has been unusually convenient.

“With normal yoghurt, it’s very difficult to courier because it needs to be kept chilled,” Theng Theng says. “For thermised yoghurt, you don’t have to worry about the storage conditions. That’s very beneficial for manufacturers and we think there is definite potential for expansion in the market. We have had customers interested in thermised products in the past but we didn’t have a solution at the time. Now we do – and it’s really clean label, too.”



Shelf-stable thermised yoghurt made with clean label stabiliser Palsgaard AcidMilk 310 can be produced on standard equipment

Palsgaard AcidMilk 310

Made from starch and vegetable fibre, Palsgaard AcidMilk 310 is developed for use in thermised yoghurt and other fermented milk products. It provides the following advantages:

- Protects the proteins against heat denaturation at low pH values
- Imparts a creamy consistency
- Provides smoothness and glossiness
- Prevents syneresis/whey separation during distribution and storage

Production process for thermised yoghurt

1. Add milk powder, sugar and Palsgaard AcidMilk 310 to water. Mix well
2. Heat to 65-70 °C for complete dissolution
3. Homogenise at 250 (200/50) bar
4. Pasteurise at 90 °C for five minutes
5. Cool to 43 °C, add culture and mix well
6. Ferment at 43 °C until pH 4.20
7. Pasteurise the yoghurt at 75 °C for four seconds
8. Cool to below 25 °C and fill aseptically



Particularly suited for the production of UHT dairy products and desserts as well as milk-based drinks, vegan beverages, and fruit juices: the new HLI series high-pressure homogenizers from HST (photo: HST)

HLI high-pressure homogenizers from HST

Reducing operating costs and improving environmental performance

HST Maschinenbau, which has been part of the Krones Group since 2014, has added the HLI homogeniser series to complement the proven HL range. These new 55 to 90-kW systems can process up to 13,000 liters per hour at 200 bar. The systems in the new series each consist of a three-piston high-pressure pump with a homogenizer valve at the outlet.

The “I” in HLI stands for “integrated” and underscores the design changes implemented in the new series. A compactly dimensioned drive design eliminates the need for additional units or coolants, which makes for a substantial reduction in operating costs for media and electrical power during production.

The homogenizer valve on the HLI series can be perfectly matched to the required physical stability of UHT dairy products, vegan beverages, desserts, and fruit drinks. As a result, shelf lives of up to twelve months can be achieved without compromising the product’s flavor.



Rethinking eating patterns.

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The traditional three meals a day have evolved to fluid meal moments. Get on board with the eating challenges in the new normal and offer the right bite for each break. Help consumers to get the most out of their day with Palatinose™, providing full carbohydrate energy coupled with a more balanced blood sugar level. Focus on inner wellbeing with Orafiti® Inulin and Oligofructose, naturally sourced prebiotic fibres that improve digestive health. From your lab to their lunchbox, aim for functional products that are sensorially and nutritionally appealing to today’s consumers.

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Lactoprot performs pioneering work

RO permeate from acid casein production becomes raw material

A DyVaR plant from Dutch company SALTECH concentrates the RO permeate to 50% dry matter. It was delivered completely pre-assembled in three sea containers (photo: Lactoprot)



With the development of a plant that concentrates the salts produced in the production of acid casein and makes them usable, Lactoprot has achieved a real pioneering achievement at its Leezen (Germany) plant.

The company is currently the world's first producer of acid casein that can return this problematic cargo to the natural cycle as a basis for fertiliser. IDM was allowed to visit the plant on site.

Steffen Rode, managing partner of Lactoprot, reports about increasing difficulties in the past to dispose of the RO permeate from acid casein production. Fewer and fewer wastewater treatment plants can cope with the variably high COD and salt load in the permeate, so that the production residue had to be transported over ever longer distances. A specific enquiry about possible solutions at a trade fair then brought Lactoprot into contact with the Dutch company SALTECH, which specialises in seawater and industrial water desalination. In a pilot plant at SALTECH's Sneek factory, it was then validated that the permeate from Leezen could be processed with the "DyVaR" technology; in tests, an extraordinarily high concentration factor of 1:12 was achieved. The concentrate has approx. 50% dry matter, it contains mainly monovalent ions such as Cl, Na, K, but also P, Mg and Ca. The low pH value of 3.7 prevents crystallisation, the concentrate remains liquid and stable for months.

Evaporation, but different

Under these conditions, Lactoprot decided to commission SALTECH with the delivery of a permeate concentration. However, the project could only be realised after a delay, because the municipality had great difficulty with the building permit, despite the project's pronounced sustainability character, and then the lockdown made things even more difficult. About six months ago, however, the plant started operation. Since then, it has initially been running twice a week; after the optimisation phase,



View into the inner workings of the DyVaR process
 (photo: mi, Lactoprot)

it is planned to operate four days a week. The operation is fully automatic, a worker with special knowledge in wastewater management takes over the monitoring. All data is fed directly into the plant's overall control system. The DyVaR-60 plant was delivered completely pre-assembled in three sea containers, which only had to be placed on top of each other and connected to the periphery.

The RO permeate is concentrated according to the familiar principle of evaporation, but the plant design is completely different from what is known in the dairy industry as a vacuum evaporator. The single-stage concentration takes place in a battery of relatively small cyclones, which are evenly charged with the permeate (5% dry matter). In order to be able to process the highly aggressive permeate at all, the DyVaR plant is made of GRP.

The inflow is designed for a maximum of 86 m³ per day, the permeate passes through the cyclone system several times until a concentration level of 50 – 55% is reached. Approximately ten percent of the feed is discharged as concentrate, the majority of the rest is vapour, which is compressed in series by three compressors. The vapour condensate is first treated in an aerobic bioreactor and then filtered in an RO equipped with a ceramic membrane and is then used in the evaporative coolers and as boiler feed water. The concentrate is stacked and later transported in a silo truck to the fertiliser manufacturer. Energetically, the DyVaR plant requires relatively little input, as a consistent heat exchange is carried out. Process control in the highly acidic range also offers advantages in cleaning, because fouling can be largely prevented by suitable flow rates.



26-05-2021
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16-06-2021

Upcoming auction

**Closing complete Dutch cheese plant -
June 2021**







Various lines - machines - tanks - components




dfm-auctions.com

Lactoprot

Lactoprot operates highly specialised plants in Kaltenkirchen and Leezen and a mixed plant in Lübeck, Germany. The largest production facility is Leezen, a dairy plant north of Hamburg dating back to 1878, in which € 50 million have been invested since the takeover in 2003.

The Leezen plant produces acid casein, WPC 80, lactose and roll dryer powder. It processes 200 million kg of milk and 5,000 t (dry matter) of whey concentrate.

Sister companies are Dairyfood in Riedlingen (biolactose, WPC, factory drying), Novoprot in Wiesmühl (roll dried caseinates, starch drying, lactose-free milk powder, factory drying as well as fermentatively produced production aids for the bread and meat industry and oat drinks) and Nutriprot in Lübeck (sports nutrition).

In Kaltenkirchen, Lactoprot has one of the most modern pilot plant facilities in Germany. The heart of the facility, in which €1 million has been invested, is a UHT heater with plate and tube heat exchangers as well as direct steam injection and steam infusion, which operates on a semi-industrial scale and was built by Asepto. Here, Lactoprot develops applications



(photo: Lactoprot)

of its dairy ingredient, starch and hydrocolloid-based solutions for the dairy, ice cream, delicatessen and general food industries.



Look at the variable aseptic heater in Lactoprot's technical centre, which also has the necessary laboratory capacities (photos: Lactoprot)



Lactoprot has invested a total of €2.5 million in the new RO permeate treatment. Compared to the previous solution of sending it to wastewater treatment plants, there is relatively little saving in operating costs, but the company has got rid of the major concern of how to deal with the salt load in the long term. Lactoprot's solution is groundbreaking for all acid casein producers worldwide, as well as for all companies that demineralise whey.

Plant manager Norbert Luft (left) and Stefan Rode, managing partner, have turned permeate from Lactoprot's acid casein production in the Leezen plant into a sustainable raw material stream (photo: IDM)

Highly flexible production line

Danone



The new production line can supply chilled and ambient dairy as well as plant-based products (photo: Danone)

Danone commissions its first flexible production line at the Ochsenfurt plant in Germany. It can be used to produce chilled and non-chilled products (pudding, yoghurt) and plant-based products. The line is designed for different packaging formats and materials (rPET, paper).

The new production line will enable a more flexible and customer-oriented production that takes into account the ever faster changing consumer needs. It will also be possible to manufacture smaller production quantities, for example to test an innovation in the market.

The new line should also make it possible to differentiate between mixed and non-mixed cartons, different sizes or e-commerce oriented packaging relatively late in the manufacturing process. Labels are printed digitally on site.

An amount close to double-digit millions has been invested.

Bringing benefits of protein to juice drinks

Arla Foods Ingredients

Consumers are increasingly seeking beverages that combine health benefits with great taste and refreshment. At the same time, many are turning away from standard juice drinks because of their perceived high sugar content. This is helping drive demand for fortified and functional beverages, the global market for which is forecast to grow to USD 125 billion by 2025, at a CAGR of 5.1%. High-protein and source of protein claims are also growing in the category, with an 8.6% increase between 2015 and 2020.

Lacprodan ISO.Clear is a whey protein isolate developed by AFI for the fortification of functional beverages without cloudiness, graininess or off-taste. It has a protein content of 90%, offers high heat stability and is clear in solution making it suitable for pasteurized or UHT processed juice drinks. To showcase its potential, Arla Foods Ingredients has launched a new protein-enriched juice drink concept.



Lacprodan ISO. Clear is a new whey protein isolate developed by AFI as an ingredient for juice drinks (photo: Arla Foods Ingredients)

Improved water treatment system

Axium Process

Stringent discharge rules for trade effluents are fuelling enquiries into the benefits of the latest wastewater processing technology, says Axium Process. The filtration specialist has seen a rise in demand for customised membrane systems as environmental responsibility, operational costs, and discharge limitations put increasing pressure on companies to find improved solutions for trade effluents.

Derek Davies, Business Development Director at Axium Process, said "A growing number of industrial companies need to balance their discharge consent against increased levels of production and spikes in output linked to manufacturing processes. Failure to do so can result in hefty fines, snap inspections, and reputational damage. Even similar industries have very different filtration requirements, so the ideal solution is a purpose-designed treatment process for each application." Advances in effluent processing techniques mean that cross-



The market shows a rise in demand for customised membrane systems (photo: Axium Process)

flow membrane filtration can filter raw effluent and recover high quality water. It allows highly customised solutions to be developed that can meet ambitious sustainability goals.

Accurate raw materials accounting

Meierei Barmstedt eliminates measurement discrepancies caused by gas entrainment with the Promass Q Coriolis flowmeter from Endress+Hauser



Authors:

(left): Manuel Martini, Product Manager Ultrasonic/Teqwave, Endress+Hauser Flow

(right): Florian Kraftschik, Marcom Manager Media Relations, Endress+Hauser Germany

For many food manufacturers, raw materials accounting is a highly important and frequently discussed topic. The idea behind this thought is to measure the exact amount of delivered raw materials, such as milk, oil or alcohol, and then precisely allocate how much is used in each of the individual production steps. The goal is to provide as much as transparency as possible when it comes to the raw materials used in each and every product – such as cheese and butter at a dairy operation – and to be able to create full cost accounting. The Promass Q Coriolis-based flowmeter from Endress+Hauser offers food manufacturers a one-of-a-kind opportunity to optimize their raw materials accounting with innovative technology.

Erroneous volume and mass flow measurements

Volume and mass flow are two commonplace terms whose meanings can lead to very stark differences in materials accounting. In contrast to volume, mass flow exhibits a constant behavior when subjected to changing influences such as pressure and temperature. That's why the accounting sys-



Four Promass Q instruments operate side-by-side at the raw milk delivery terminal.

tems rely on units of mass in many cases. Many companies nevertheless use volume measurements, which can lead to unwanted differences in the raw materials accounts settlement. But even mass flow measurements have potential sources of errors that users have to take into account. In the field, one of the primary causes of measurement discrepancies relates to undetected air or gas entrainment in fluids, which distorts the measurement value and leads to differences

in the raw materials accounts settlement. To prevent this from occurring, Meierei Barmstedt relies on the Promass Q, a Coriolis-based flowmeter that detects gas entrainment and lowers the measurement error ratio to nearly zero.

Gas entrainment distorts values at the delivery point

The dairy's tank trucks make daily runs from farm to farm to retrieve the milk. Be-



Meierei Barmstedt processes raw milk and skimmed milk into cheese, butter, milk and milk concentrates at its plant in Barmstedt, Germany.

cause the trucks are not full at the start of the run, the tank still contains a considerable amount of air. As the truck navigates curves, accelerates and performs braking maneuvers, the milk constantly swishes around in the tank and mixes with the air. This effect has an enormous disadvantage for dairy operators.

If volume flow is used as the measurement unit when the milk is retrieved from the farm, it leads to an exaggerated measurement, which in turn exaggerates the amount of raw milk delivered to the dairy. This is because the air has significantly increased the volume. In practice, an increase of 10 percent, or even 20 percent in extreme cases, is not uncommon. This so-called “milk overrun” has a negative impact on the finances. Assuming the air is purged during the production process, the dairy operator ends up posting a loss when settling the raw materials accounts. This also makes it difficult to create accurate full cost pricing.

With this in mind, instead of volume flow, many dairy companies use mass flow to measure the amount of milk that is delivered and processed during production. Coriolis systems, such as the Promass family of instruments from Endress+Hauser, have

proven their worth in such applications for years now. Unfortunately, unwanted accounting differences can still occur even when Coriolis-based flowmeters are employed. As with volume flow, one of the reasons for this effect is air entrainment, which influences mass flow measurements as well. Although the effect is considerably lower, it still exists and can lead to deviations. When processing large quantities of raw milk like Meierei Barmstedt, small percentage errors add up to significant sums at the end of the year.

Multifrequency technology for reducing measurement discrepancies

To eliminate discrepancies in the mass flow measurements, Meierei Barmstedt relies on the newest member of the Endress+Hauser Promass family – the Promass Q, an instrument that features the patented multifrequency technology. The Promass Q was designed to eliminate measurement errors induced by gas entrainment down to a level of nearly zero. The unique patented feature of the sensor is that the Coriolis tube oscillates within two superimposed resonance frequencies instead of just one, a major

advantage over the conventional Coriolis measurement principle. Measurement errors caused by entrained gas can be virtually eliminated. In simple terms, this has to do with a physical effect in which the relationships between the two stimulated resonance frequencies equate to the relationship of the measurement errors induced by entrained gas in fluids. The oscillation of the two superimposed resonance frequencies means that both relationships – resonance frequency and error – are known. The instrument uses this information to determine the value at which this error ratio, which is tied to the entrained gas, is almost zero. It then adjusts the oscillation frequency accordingly.

Elimination of the measurement error caused by heavy gas entrainment has a considerable impact on the incoming supply of the raw milk. Compared to the processes available to date, the Promass Q allows food manufacturers to measure the quantity of incoming raw milk more accurately than with currently-available Coriolis mass flowmeters and as a result, significantly optimize the internal raw materials settlement even further. Accounts settlement with the dairy farmers is more accurate as well.



The multifrequency technology compensates for errors that result from homogeneous entrained gas.

Determining overrun levels

The Promass Q multifrequency technology not only makes it possible to eliminate mass flow measurement discrepancies with fluids. It can also precisely measure the overrun in other products where various gases are infused, such as cream cheese or ice cream. In this case manufacturers strive to create an especially light and fluffy consistency, such as in cream cheese.

In environments where experience served as the basis for entrained gas values and the amount of gas was adjusted after drawing samples – after all, raw milk is subject to certain fluctuations – overrun can now be measured with a high degree of accuracy. This in turn helps reduce fluctuations in the quality of the end product.

The Promass Q has repeatedly demonstrated its suitability for measuring over-

run. Users were able to monitor and regulate the entrained gas levels in the process by means of density measurements, thus preventing off-spec batches or fluctuations in product quality.

Digital communications interfaces and internal self-test function

Beyond the sensor with its multifrequency technology, the electronics is what makes it easy to integrate the Promass Q into existing systems. In combination with the new Proline 300/500 transmitter variant, the sensor is capable of forwarding the signals via a wide range of digital communications technologies such as Profinet, which also helps support the digitalization strategies for the production processes. In addition, the Heartbeat internal testing function offers a key way to simplify quality management. Companies that operate according to ISO 9001, IFS or other certification standards are frequently required to calibrate and/or verify critical measurement points. And this is precisely where the internal, TÜV-certified verification function comes into play. This feature determines the status of the instrument, with a likelihood of 94 percent, and delivers a clear indication of whether the device is still measuring within specifications



Raw milk quantities are measured in units of mass.

or is experiencing problems. Users thus enjoy an even better way to document the traceability of individual batches while reducing the amount of red tape at the same time.

Promass Q – jack-of-all-trades

The Meierei Barmstedt example illustrates that by deploying the Promass Q, demanding food manufacturing processes can be even more reliable and cost-efficient. Manufacturers are also in a better position to address challenges such as accurate accounts settlement or full cost pricing. The Promass Q is a multivariable measurement instrument that supplies users not only common values such as mass flow, density or temperature, but also quality-relevant parameters such as overrun or brix value. The Promass Q is a genuine jack-of-all-trades designed to help food manufacturers with their daily challenges. All images: © Endress+Hauser



Gas entrainment levels are highest directly after delivery, the point at which the Promass Q eliminates the measurement discrepancy.



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What's next in dairy?

How brands can develop healthier products that support optimal immune function



Nicolas Touillon, Business Director Fresh Dairy, DSM Food Specialties

Traditional dairy products remain consumer favorites, and recent DSM research – which surveyed 5,000 consumers across 10 countries to explore current and emerging food trends – shows that consumption of dairy-based varieties is still on the rise.¹ The survey also highlighted that improving nutritional intake was a key motivator behind this increase, with consumers showing a preference for dairy foods with added vitamins and minerals.² It is clear that people are increasingly prioritizing their health and wellbeing, and are making healthier purchasing choices that align with this trend – but how can dairy brands play their part in helping to support these needs?

Driving innovation in dairy

The first step to meeting the sophisticated expectations of today's discerning consumers is understanding exactly what they are looking for from their dairy products, and what 'health' and 'wellbeing' means to them. DSM's research identified, for instance, that 40% of respondents will seek to buy more lactose-free products in the coming years.³ This comes as lactose-free varieties continue to appeal to not only individuals with an impaired ability to digest lactose, but also health-conscious consumers, thanks to their perceived health benefits.⁴

Interest in functional food and drink has also seen a surge in popularity, with fortified dairy products that offer enhanced nutritional



The link between good nutrition and optimal immune function is increasingly highlighted by scientific evidence (photo: DSM)

value increasingly entering the mainstream. Unsurprisingly, products enriched with essential, immunity-boosting nutri-

ents like probiotics, vitamins and minerals⁵ are particularly sought after in today's climate. This trend was highlighted in DSM's recent Consumer Immunity Panel (September 2020), which found that 45.4% and 37.5% of people – primarily younger consumers – are committed to eating yogurt and milk products with added micronutrients, respectively⁶, a clear increase from the DSM data obtained in 2018⁷. The 2020 study also shows that 36% of respondents associate probiotics with supporting immune health. Indeed, food options that support the immune system are increasingly at the forefront of the public agenda, and dairy producers have an exciting opportunity to differentiate their offering and tap into this need by delivering nutrient-rich dairy goods with the immune health benefits consumers are looking for.

What role does nutrition play in immune health?

The link between good nutrition and optimal immune function is increasingly highlighted by scientific evidence. Nutritional immune support has, historically, centered around vitamin C supplementation⁸, but vitamins A, B6, B12, D and E, as well as nutrients such as folate, zinc, iron, selenium, magnesium, copper, and omega-3 fatty acids, have since all been shown to play a part in supporting a healthy immune system.⁹ Vitamin A, for instance, helps to strengthen the functioning



Immunity and dairy (photo: DSM)

of the epithelial lining, which is considered the body's first and frontline defense against infections, while vitamin D may support respiratory health. In addition, some probiotic strains have been shown to promote the production of natural antibodies, while others can even inhibit the growth of harmful gut bacteria. *Lactobacillus casei* L26 has, for example, been the subject of multiple scientific studies that indicate that this probiotic strain may contribute to a healthy immune system.^{10, 11, 12, 13, 14}

The key to success

From lactose-free solutions to dairy varieties fortified with nutrients like vitamins, min-

erals and probiotics, the industry is under rising pressure to develop innovative, on-trend products that support immune health. While it can be a complex task for producers to monitor ever-changing consumer trends and formulate goods that meet expectations, while also doing so economically, the right expert partner can ensure a smooth process and quick route to market. With in-depth insight into consumer trends and decades of experience in nutrition and food science, DSM is well-positioned to help brands develop premium lactose-free and fortified fermented dairy goods that appeal to today's discerning consumers. For example, these capabilities, together with DSM's

broad portfolio of solutions, have been leveraged to create a next-generation lactose-free fermented yogurt drink prototype, called #StayStrong. Developed with Maxilact LGi lactase, Delvo Fresh FV-122 yogurt culture and Delvo Pro L26 *Lactobacillus casei* probiotic strain, and fortified with DSM's Quali-A, Quali-D and Quali-E vitamins – it has strong potential to support consumer health and immunity. And it is innovations like these that accelerate progress towards DSM's wider mission: enabling better food for everyone.

For more information go to [dsm.com/food-specialties](https://www.dsm.com/food-specialties).

Sources:

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The Russian dairy industry is at a major pivot

Price limits and tagging

Author: Vladislav Vorotnikov, Moscow

The tagging project in the Russian dairy market could turn out to be worse for the dairy industry than the pandemic, the international sanctions, and the Russian consumers' lowering purchasing power altogether, market participants believe. However, expanding export supplies raise hopes for a brighter future. In 2020, Russia was one of the few dairy markets, where the Covid-19 pandemic has not hampered the demand, despite

the original gloomy forecasts. For instance, Russian cheese production increased by 4.6% to 565,000 tons and butter – by 3.5% to 279,000 tons compared to the previous year. In the milk and fermented milk segment, production dynamic remained flat, as overall production stayed at 8.2 million tons, Russian state statistical service Rosstat estimated.

"The pandemic and sanctions have had a substantial impact on the Russian dairy industry," said Constantine Synetsky, chair-



Product tagging against counterfeit could cost the Russian dairy industry a lot of money



Russia will significantly increase its dairy exports in 2021

man of the Southern dairy union. "The sanctions, however, gave the industry an impetus for further development," he added.

The pandemic prompted Russian dairy companies to adjust their business. Before the pandemic, when most people worked in their offices, customers opted for expensive dairy products in small packages for a quick one-time meal, according to Synetsky.

In 2020, the demand in this segment dwindled, while the demand for dairy products in family package size increased tremendously. This trend was associated with decreasing purchasing power and that an unprecedented share of office workers started working remotely.

"It is quite clear that the consumer margin on products in the family package is noticeably lower than that of high-margin goods in individual package," Synetsky said, adding that Russian dairy companies lost some part of the profit as a result.

However, the market conditions were way better than forecast in the initial period of the pandemic. The Russian government authorized all food companies in the country to continue business as usual, even during the complete lockdown in March-May of 2020, and not a single dairy company in the country reported that the pandemic disrupted its operations.

An opinion poll conducted by the Russian information service MilkNews showed that for most companies, 2020 sales were more or less in line with their pre-coronavirus expectations.

"The sales have not dropped, but they have neither substantially grown," commented Svetlana Abramova, production director of the Talisky dairy plant, adding that the company managed to improve sales by expanding the supply list of retail partners.



The Russian dairy sector is in fear that 2021 could be worse than the previous year



The pandemic has changed the demand for dairy products

"The sale of our dairy products has decreased under government contracts. Kindergartens remained closed during the period of lockdown, and our sales in this area stopped. At the same time, demand in the retail segment was up, as people preferred to stay at home and consume more dairy products", said Anastasia Bazyleva, chairman of the sales department of the South Sakhalin collective farm.

Quite a few companies reported that the market demand even exceeded their expectations. For example, the Semicarakorsky cheese factory increased sales by 23%. According to Elena Fomina, deputy general director of the factory, millions of Russians were not allowed to travel, which greatly supported domestic demand.

Soaring costs, mounting concerns

On January 18, the Russian government initiated a mass vaccination against the coronavirus with its Sputnik V vaccine, which is projected to constrain the pace of the epidemic already in the next few months and return life back to normal.

However, the Russian dairy producers are confident that for them, 2021 would be worse than the previous year. The main concern is associated with the compulsory label-

ing, or tagging reform ordered by the government to fight counterfeit in the food market.

The Russian union of dairy producers Soyuzmoloko estimated that the tagging will put an additional financial burden on the Russian dairy industry, around Rub61 billion (\$900 million). For comparison, the Russian dairy industry's entire revenue amounted to Rub35 billion (\$500 million) in 2019.

The tagging reform was originally slated for 2020 but postponed for mid-2021 due to the pandemic. On January 20, 2021, The Russian Ministry of Industry and Trade initiated labeling with QR codes of milk and cream with a shelf life above 28 days, as well as ice cream.

Starting July 1, 2021, the labeling is proposed to extend to milk and cream with a shelf life of less than 28 days, cheese, butter, milk pastes, cottage cheese, and soft drinks with milk fat, and from October 1, 2021 – buttermilk, yogurt, kefir, condensed milk, and other products. For farms that independently sell their own dairy products, it is proposed to delay mandatory tagging until October 1, 2022.

"During the past several years, there was a lot of back-and-forth with the tagging reform. Now, the authorities are concerned that the project could spur the

prices on the dairy market, so there are no guarantees that this timeline is final," commented a source in the Russian dairy industry who wished not to be named. "The project makes no sense to the industry since counterfeit has already been defeated – there is no need in additional control measures, especially so expensive ones," he added.

Domestic food prices indeed seem to be a matter of concern for the Russian government. In the last days of 2020, following the order from Russian President Vladimir Putin, the Russian Parliament adopted a law changing Russian trade rules to allow the government to establish price limits on basic foodstuffs when prices have risen by 10% in one month. Previous law allowed for such interventions only after a 30% monthly rise.

In the previous few months, the price for some categories of dairy products has been seen steadily increasing, which was primarily associated with the skyrocketing grain, and consequently, feed prices.

It is yet to be seen how the upcoming tagging could change the price situation on the market. According to Soyuzmoloko, the prices are set to rise by nearly 10%, since companies would simply have no choice but to place the additional financial burden upon their customers, at least partly.

The Russian perspective technologies development center – the government agency authorized to supervise the tagging project – estimated that the overall cost of the reform for the Russian dairy industry is much lower than the industry's estimations, at around Rub4 billion (\$60 million), so the production costs should not dramatically rise.

The International Consumer Unions Confederation supported the government assessment, claiming that the dairy industry's production costs would be limited to only 1% due to the tagging project.

Expanding international trade

In 2020, the Russian dairy product import was the highest since the introduction of the food embargo. The country imported 316,000 tons of cheese, 14% up compared to the previous year, and 442,000 tons of milk, cream, and fermented products, by 16% higher than in 2019, the Russian Federal Customs Service estimated.

Growing supplies from Belarus was the main factor driving the Russian dairy import. Belarus accounted for 87.3% of all imports in 2020, according to Soyuzmoloko. However, closed borders contributed to a sharp rise in domestic demand for premium dairy products, and so for products from far abroad too.

According to Maxim Polyakov, general director of Russian cheese distributor Foodland, cheese import was on the rise because wealthy Russians stayed home or moved to the Russian resorts during the holiday season instead of visiting European countries.

A research conducted by the Russian newspaper Kommersant showed that suppliers from other countries took advantage of the growing demand for premium dairy products on the Russian market in 2020.

One of Russian largest food retailers, X5 Retail Group,

reported that its product range was expanded by dairy products from Argentina and Switzerland. Another Russian retail company, Vkusville, increased cheese import by 37% compared to the previous year, purchasing more cheese in Switzerland, Argentina, Uruguay, and Serbia.

Azbuka Vkusa increased its dairy import by 25%, primarily at the expense of Switzerland cheese, the company reported. Some market participants also noticed growing dairy products import from New Zealand.

The sharp rise in dairy import concerns Russian dairy producers, and could enhance competition on the market, said Artem Belov, chairman of Soyuzmoloko.

However, not only import but also export is growing. In 2020, dairy exports increased by 25%, and in 2021 a further growth of around 20% is anticipated, he said. The biggest sales markets are Kazakhstan, Belarus, Mongolia, and Abkhazia. However, there are some big export contracts in the pipeline. The Russian agricultural holding Rusagro is mulling plans to begin exporting milk powder to China, while Comos Group has recently sent the first shipment of milk to the U.S.

In 2020, Comos Group increased its dairy export 10 times. Russian dairy companies are taking advantage of the Ruble's weakening exchange rate. This factor is promising to make local dairy companies more competitive in the international arena this year.

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Making naturally safe cheeses is now easier than ever

Dairy Safe™ cultures provide excellent protection against defects like late blowing while ensuring optimal flavor development





Consumers expect the food products they purchase and consume to be healthy and clean label, and meet sustainability and ethical considerations. This is as relevant to cheese as any other food. Cheesemakers therefore strive to make natural and clean label cheeses which are free from additives and preservatives and even contain reduced salt levels. However, at the same time they want to avoid cheese defects without compromising on quality, taste and shelf life of the cheeses.

Dairy Safe™ cultures give assured bioprotection against late blowing and spoilage. For decades, manufacturers have relied on Dairy Safe™ to protect their cheese without the use of preservatives like nitrate or lysozyme – while delivering award-winning flavor.

Our cultures are chosen from a nisin-producing species of *Lactococcus lactis*. They are ideal for inhibiting growth of Gram-positive bacteria like *Clostridium tyrobutyricum*, thus preventing butyric acid fermentation.

By protecting your cheese against late blowing defects, Dairy Safe™ not only saves you the time and expense of producing a defective product; it also unlocks new revenue potential – by enabling you to upgrade your cheese whey to infant-nutrition quality. Dairy Safe™ cultures are easy to use. They are suitable for all types of milk (cow, goat, sheep) and can be used in a rotation system with several phage alternatives. By providing natural protection against late blowing, they reduce financial losses due to disapproved product.



DSM Food Specialties

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Innovation and the power of nature

CP Kelco

CP Kelco launched a new multimedia resource spotlighting its capabilities in action. Filled with value-creating ideas and nature-powered innovation, “Innovation... Powered by Nature” aims to help manufacturers in the food segments understand market trends and navigate a changing industry landscape through problem-solving and collaboration.

CP Kelco also looks at what’s next – what manufacturers need to have their eye on to pivot for the future: enhanced focus on health and wellness, new processes and technologies, sustainable sourcing and production, and of course, new functional ingredients and applications.



CP Kelco’s new resource is focused on helping companies remain competitive in today’s innovation-driven business landscape (photo: CP Kelco)

Interleaving film – no more MULTIVAC

With its innovative spray system, MULTIVAC Sustainable Liquid Interleaving, MULTIVAC is introducing a sustainable solution for packaging thinly sliced or highly sticky products. This means that there is no requirement for the conventional interleaving film between the slices of these Products. The new system can be integrated into existing slicer lines.



A spray system can save interleavers in cheese slicing (photo: MULTIVAC)

Precision nozzles on the spray system atomise a liquid interleaving medium, which is both odourless and tasteless and can be tailored to the particular properties, e.g. fat content, of the sliced product.

Multipurpose filler for bottles and cans

Kosme Barifill Canto

For the first time, the Krones Group presents a multipurpose filler that handles glass bottles, PET containers, and cans – the Barifill Canto. The Italian subsidiary Kosme is responsible for its development, construction, and installation. Kosme wanted to be able to offer smaller manufacturers the greatest possible flexibility in container choice without requiring them to invest in three different filling machines. The Barifill Canto fills beer, CSDs, sparkling water, and sparkling wines in a variety of can types and sizes, and also handles PET containers or glass bottles.



Krones has developed the first multi-filler Barifill (photo: Krones)

Innovation partner

AFI

Arla Foods Ingredients is product innovation partner in a new four-year project to turn papaya fruit into a nutritious and affordable snack for low-income consumers in Ethiopia. Led by the Global Alliance for Improved Nutrition (GAIN), the project brings together multiple public-private partners. Their ultimate objective is to build a fruit processing value chain that will help reduce malnutrition, create jobs and cut post-harvest papaya loss.

The application team at Arla Foods Ingredients has already developed the first prototype recipes for a dried fruit protein bar based on papaya pulp and containing milk and whey-based ingredients.



Arla Foods Ingredients helps to turn papaya fruit into a nutritious and affordable snack for low-income consumers in Ethiopia (photo: AFI)



Nurica lactase produces gut-health promoting GOS (photo: IFF)

Ground-breaking lactase released

IFF

IFF announced has launched a lactase enzyme called Danisco Nurica in China, offering a new way for dairy producers to create a premium product to fulfil consumer health needs while increasing profitability.

Nurica enables manufacturers to naturally produce dietary fibers in the form of GalactoOligoSaccharides (GOS) in situ by transforming lactose in dairy products. GOS have been shown to increase populations of health-promoting species of gut bacteria, and as such has potential in prebiotic innovations and improving gut health. In application trials, the Nurica lactase has shown no detectable impact on the acidification process, taste or texture.

Economical recipes ensure worldwide food supply

Hydrosol

For toppings for hot dogs, pasta or convenience products, Hydrosol offers a stabilising system for making spreadable cheese analogues for squeeze tubes. The system gives a creamy mouth-feel even with just 20% cheese content, and the products can be eaten hot or cold. For example, they can be heated to about 40 °C before eating, and adhere to warm pasta very well. Due to their high viscosity, the products can be filled and marketed in various kinds of tubes and squeeze packages.

From milk drinks and vegetable-based cream for whipping or cooking, to breakfast cream, to yogurt products for spoon eating or drinking, the Stabisol and Stabimuls series of functional systems offer a wide spectrum of possibilities for cost-reduced recipes. Another special feature is that in combination with protein mixes from the Stabiprot series, manufacturers can also make premium products to satisfy the consumer demand for protein-rich puddings.



Lower-cost recipes are needed to ensure sufficient food supplies at affordable prices (photo: Hydrosol)

Rising energy costs?

Decreased membrane flux?

What's in my membrane?

PERFORMANCE OPTIMIZATION PROGRAM (POP) for membrane filtration

A unique non-destructive procedure to assess organic, inorganic and biofilm fouling.

Realco is bringing a completely new approach to optimize the performance of membrane installations in the food and beverage industry. Its unique technology results in a significant increase in production rates, extension of membrane life, water and energy savings, and reduction of production costs whilst using sustainable products.

Fouling, a critical issue in performance

One of the most critical issues affecting the performance of membrane processing systems is membrane fouling. It is the result of the accumulation of substances (organic, inorganic, or a combination of both) on the membrane surface and/or within the membrane pores, which leads to deterioration of membrane performance. The specific membrane cleaner required depends on the type of fouling that the membrane has been exposed to. But it is a real challenge to determine the types of fouling and the corresponding types of cleaning products to use.

Membrane fouling is a serious problem in all pressure-driven membrane separation processes that reduces water flux and production performance, as well as membrane life cycle.

Fouling control strategy

Realco has developed a PERFORMANCE OPTIMIZATION PROGRAM to determine the type of fouling and the most appropriate cleaner to use. This will enable membrane systems to be cleaned effectively to recover water flux, maximise production performance and extend membrane life.



Using this unique program, our expert team will first define the optimal rinsing time in the cleaning procedure to avoid water waste. A deeply cleaned membrane will

take more time to get fouled. The technician will be able to save water by either:

- reducing cleaning frequency: 1 cleaning per week can be saved (15%)
- reducing cleaning steps
- reducing rinsing time

The team will then apply the FOULING ANALYSIS KIT, a patented method that provides a precise diagnosis of membrane fouling. Thanks to its unique and specific enzyme-based solutions, the diagnosis is a precise determination of the organic or inorganic fouling on the membrane. The presence of a potential biofilm contamination will also be evaluated in a specific phase. This allows us to recommend the right enzymatic cleaning products and processes to be applied. Realco offers to its clients 3 range of enzymatic products with a portfolio of more than 15 products suitable to each industry.

1. ENZY+ CLASSIC: all-in-one enzymatic solutions that are high performance, simple to use and cost-effective, suitable for a less problematic installation in terms of fouling.
2. ENZY+ SILVER: all-in-one solutions of multiple enzymes, developed



for more complex installations, with a higher risk of fouling (feed stream more likely to cause fouling and high volumetric concentration factor (VCF)).

3. ENZY+GOLD: concentrated solutions of multiple enzymes for very complex installations which have very frequent losses in yield (feed stream causes high fouling and very high VCF).

The Realco enzymatic products will also bring the following benefits:

- Cleaning at a lower temperature, from 35 °C to maximum 45 °C.
- Cleaning less aggressively than with conventional products (pH 9 vs. pH 11,5), ensuring a longer lifetime of the membranes.
- Removing or significantly reducing the use of chlorine
- Improve microbiological levels
- Prevent biofilm contaminations

Once implemented, these tailor-made products and cleaning procedures can recover in full the initial membrane flux and increase the production rate up to 30%.

By targeting accurately, the fouling present in the equipment with a tailor-made cleaning process, the POP approach offers an increase in productivity, decrease in costs in terms of water, energy, and membranes by replacing conventional chemical products with sustainable solutions.

www.realco.be

Business case

Type of production: dairy

Membrane type: RO

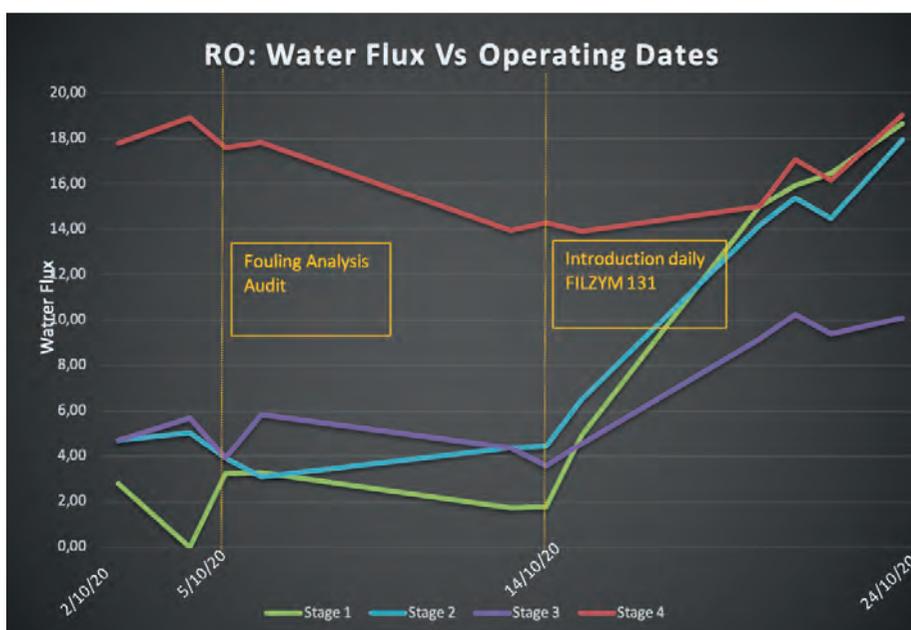
Year: 2020

Description: The 14-months old membrane filters were ready to be changed as they were completely fouled. They were cleaned with a non-Realco enzymatic cleaner based on protease.

Problem identified: The Performance

Optimization Program has allowed us to identify biofilm and fat fouling in the membrane installations.

Solution: The customer starts using a Realco enzymatic product only 10 days after the diagnosis. Due to a major recovery in water flux and production performance which was sustained, the order of new membranes was then cancelled.



ISI – Innovative Steam Injection

Raw milk character is preserved

With the concept of ultra-high temperature treated fresh milk, Dutch milk and food research institute NIZO food research was ahead of its time. The idea at that time was based on the knowledge that milk only needed to be heated to high temperatures only for a very short time to inactivate harmful germs and their spores, but also heat-resistant enzymes. The result is a milk that largely retains a character similar to raw milk, but has a long shelf life.

Extremely gentle, but effective

Although the ISI (Innovative Steam Injection) concept is similar to UHT treatment, it takes place in a completely different temperature-time window, explains Prof. Peter de Jong, Principal Scientist at NIZO. Roughly described, milk is heated up to 60°C and then brought to 160°C in less than a second, before it is cooled back down to 60°C in just 0.3 seconds. Such rapid temperature changes can only be achieved by means of steam injection followed immediately by expansion cooling. The steam used is extremely superheated at a pressure of 18 bar to ensure high heat transfer. The process is so gentle that 70% of the whey proteins retain their native form, according to de Jong.

The starting point for the process development was a computer model with which NIZO was able to determine the temperature-time regime in advance on the basis of the expected chemical and biological effects. Of course, extrapolation had to be carried out because the individual inactivation kinetics were not always available in full. However, the heating system constructed on the basis of NIZO calculations and expert expectations worked better than the theoretical predictions, according to de Jong.

"Despite its advantages, the ISI process was not able to establish itself at the time," de Jong sums up. "The time was simply not yet ripe for a longer shelf life of 60 days for fresh milk. In addition, the process costs are around one cent per kilogram of milk, whereas conventional pasteurisation only costs around 0.3 cent." Compared to high-pressure pasteurisation, however, ISI appears to be absolutely superior, both in terms of cost and homogeneity of heating. "ISI is a reliable, fast and effective process that heats the product homogeneously through," de Jong notes.



Prof. Peter de Jong, Principal Scientist at NIZO: the ISI process heats milk to high temperature at very short time (photo: NIZO)

Functionality is maintained

New findings on positive effects of raw milk consumption on human health, such as signs of a strengthening of the immune system or reduction of allergies, which researchers in Utrecht, Austria and the USA are working on, are currently bringing ISI procedure back to the fore. Scientists in Utrecht have discovered that β -lactoglobulin has corresponding bioactive properties in its native structure. NIZO is also involved in such a research project together with international dairies, which is currently in the definition phase. Bioactivity of proteins is increased and process performance of evaporators is increased due to less fouling with milk preheated by ISI (as a result of lower viscosity). With the focus on temperature effects, approaches are to be developed to produce milk powder with even better suitability for use in infant food. But ISI is also of interest on a smaller scale, namely in the processing of goat's milk or a milk treatment directly on the farm.



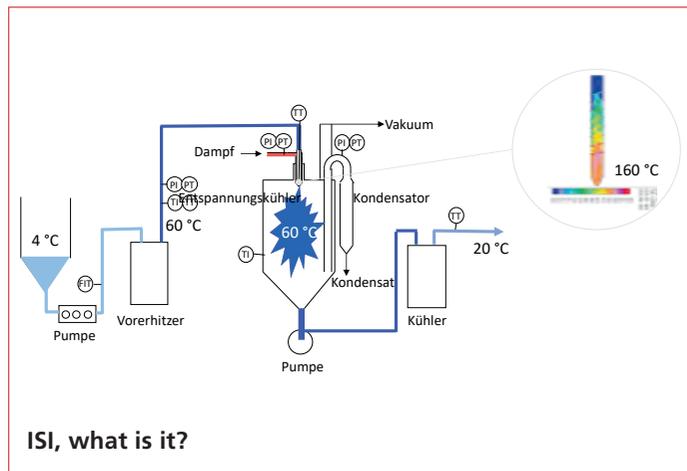
The Dutch NIZO food research operates the best equipped and largest pilot plant for milk process technology in Europe (photo: NIZO)



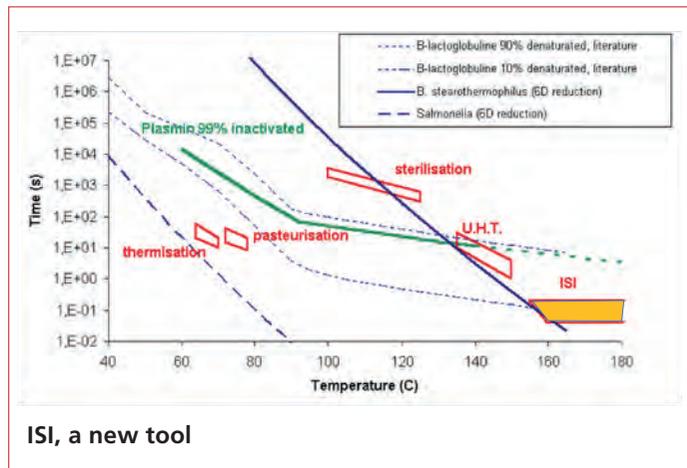
ISI – the Innovative Steam Injection technology

The ISI heater has been developed by NIZO food research based on experience in dairy product research. The idea is originating from advanced computer model simulations generating an optimal temperature-time relationship of the process. This relationship was transformed to a process concept and equipment design. The technology, based on steam injection, enables very fast heating at very high temperatures. The sophisticated design of the steam injection zone makes it possible to achieve a residence time of less than 0.1 second at 140 - 200°C. The heating is directly followed by flash cooling in a vacuum vessel.

ISI works in a new and unique operating region, achieving a better inactivation of heat-resistant spores than the usual UHT technology, while the product degradation is reduced to a minimum.



ISI, what is it?



ISI, a new tool

Nutrition symposium confirms important role of dairy in diets

IDF Symposium to review the latest science on the contribution of dairy in diets gathered several hundred nutrition and health professionals from around the world.



Author: Caroline Emond, Director General, International Dairy Federation (IDF)

On the 11 and 12 May, the IDF Nutrition Symposium 2021, an entirely virtual event, convened nutritionists, dietitians, health regulators, policy makers, scientists, and other health professionals with an interest in nutrition and health to discuss the important role of dairy foods in healthy sustainable diets, the impact of diet and nutrition on non-communicable diseases, and the effect of nutrition and diets on the microbiome and immune system.

The event included the welcome contributions from experts at the Food and Agriculture Organisation of the UN (FAO) and World Health Organisation (WHO): Dr Franco Branca, Director for Nutrition for Health and Development at WHO, who gave an insightful introduction on the impact of diet and nutrition on non-communicable diseases, and Dr Nancy Aburto of FAO, who gave a detailed presentation on the important role of animal-source foods such as dairy in a sustainable diet.

Recognising dairy's integral place in dietary guidelines

Dairy foods are an integral part of evidence based dietary guidelines around the world, yet they are often under scrutiny or criticised for their role in the diet, and in health and disease. It is therefore important to build and share knowledge around dairy, nutrition and health messaging which supports the role of dairy in food based dietary guidelines.

"The high level of interest in the IDF Nutrition Symposium demonstrates the value for health professionals to access nutrition dairy science. As the world grapples with the challenges of feeding a rapidly increasing global population, a principal concern related to food production and consumption is producing adequate amounts of nutrient dense foods such as dairy to nourish the world sustainably, accessible to all, and without compromising global health. A sustainable diet would be incomplete without dairy! Dairy is the highest quality protein and highest bioavailability", said IDF Director General, Caroline Emond.

Including dairy in diets is important in meeting the challenge of delivering on Sustainable Development Goal 2: Zero Hunger. Studies have shown that dairy plays an important role in providing enough protein and nutrients to feed the world. The Symposium provided the opportunity to build a deep, mechanistic knowledge of the health properties dairy and leverage this understanding into nutrition and management.

Some key takeaways from the discussions:

- Dairy as a vital nutrient source: Not all protein is equal, and milk is the best natural source of calcium, highest protein quality and has the best overall digestibility.
- Dairy for bone health: The importance of bioavailable nutrients from foods particularly dairy foods for sustained bone health. Consumption of dairy in childhood makes an important contribution to bone health later in life.
- Dairy and body weight: There is little evidence to support the concern for limiting dairy products consumption on the grounds that they may promote obesity. Especially in childhood and adolescence where most of studies conclude to an inverse or null association between dairy intake and obesity.
- Nutrition and antiviral immunity: A healthy diet and good nutrition play a significant role in building a strong and healthy immune system. The immune system is very sophisticated, and a lot of lifestyle factors influence the immune response. Among the multiple nutrients that may be involved, recent convincing evidence supports special roles for Vitamin D and Zinc in particular.
- Dairy and inflammation: Dairy and inflammation: Based on scientific evidence, there are no pro-inflammatory effects of dairy consumption, and many anti-inflammatory effects are reported. Fermented dairy products may have beneficial impact on inflammatory markers, with no explanatory mechanism very well identified at this stage.
- Sustainable diets: to assess the environmental impact of food, it is important to consider the nutritional aspects, in terms of nutrient density/protein quality.

For further information about IDF and upcoming dairy events, please contact communications@fil-idf.org or visit www.fil-idf.org

The Global Market for Sports Nutrition and Dairy/Plant Proteins 2021-2025

3A Business Consulting

A new report from 3A Business Consulting, named The Global Market for Sports Nutrition and Dairy/Plant Proteins 2021-2025, shows that the market for Sports Nutrition will continue its value and volume growth as pandemic related rules are lifted. The global sports nutrition market is estimated to USD 21.9 bn. in 2020 and expected to amount around USD 31.2 bn. in 2025 corresponding to an impressive CAGR of 7.4%. Protein powder represents the biggest value category followed by protein/energy bars.

Report headlines are: global sports nutrition market data and trends, market profile for all key markets, key players and distribution channels, ingredient volume usage and major company users, ingredient applications and product launches, consumer segments and trends, covid-19 trends.

The report can be purchased for EUR 3,800; for more information, contact: Tage Affertsholt - 3A Business Consulting; Tel: +45 70 21 00 98, E-mail: ta@3abc.dk, Web: www.3abc.dk



Sports Nutrition Book

Global Market for Sports Nutrition and Dairy/Plant Proteins 2021-2025

Published June 2021



Three questions to Giuseppe Ambrosi, the new president of the European Dairy Association

The future of Europe's agriculture is being decided under the current Common Agricultural Policy (CAP) negotiations. But what is the CAP all about and why it matters to the EU dairy sector?



Giuseppe Ambrosi, the new president of the European Dairy Association

Giuseppe Ambrosi: The common Agricultural Policy (CAP) of the European Union is one of the pillars of the whole EU policy since 1962, representing one third of the total EU budget for each year and acting as the unifying policy between agriculture and society, between farmers and EU citizens.

In July 2018 and elaborated by the -then- Commissioner for Agriculture Phil Hogan, the European Commission proposed a package of three regulations with the aim of reshaping and modernising the CAP given the new context. Concretely, the EU has become more open to global markets and has made new commitments at international level, for example on climate change mitigation.

Since November 2020, the European Parliament, the EU Council, and the European Commission entered into the so-called trilogue negotiations phase. Although discussions were supposed to end last month, an agreement could not be reached and negotiations are expected to finalize by the end of June.

For us in the dairy industry, the Common Market Organization (CMO) is the most important part of the CAP. It is in principle the basis for the support measures for agricultural markets. Of course, the markets for dairy products are vibrant, but also subject to international price volatility. The existing regulatory framework with its market management tools, like the public intervention of SMP, has proven its efficiency in the past and also recently.

However, there are today some sticking points in the CMO negotiations that could affect dairy. On the one hand, we have grave concerns when it comes to the proposed changes to some articles of the regulation regarding measures against market disturbances. The system proposed by the European

Parliament would impose levies on producers in certain situations and this is hence a clear contradiction to the market orientation of successive CAP reforms since 2003. Returning to old practices and the necessary administrative processes at all levels would be detrimental to the interest of producers and processors.

On the other hand, the evolution of the CMO policy towards greater market orientation should be at a pace that gives dairy farmers and processors sufficient time to adapt without unnecessary disruption. That is why the safety net in case of extreme market situations through public intervention will be kept. As I said, recent experience has proven that intervention can be effective in a period of extreme downward price movements.

Another field of 'work in progress' is enhanced market transparency. Evidence shows that price transparency can be a double-edged sword and excessive price transparency can restrict competition and harm the interest of primary producers. Some proposed changes of the CMO bear exactly this risk. Transparency in the dairy sector is already secured through various other measures, including new initiatives in the field of market transparency and price reporting.

We have consistently echoed our message of simplification and policy coherence. As a major contributor to the EU's economy, the EU dairy industry has always been and will continue being a constructive partner in the design of legislative proposals and we really trust in the negotiators in the European Parliament, the EU Council and at European Commission level to come finally to an agreement in June. Not only the dairy sector needs a stable and previsible political framework.

The European Commission's Farm to Fork Strategy, part of the European Green Deal, was published a year ago. Is Europe on the right track here?

Giuseppe Ambrosi: As the European Commission's flagship policy, the European Green Deal aims at overcoming the current climate and environmental challenges by developing a roadmap that will make the European economy sustainable, resource-efficient, and competitive in the global arena, with the target of reaching zero net emissions of greenhouse gases by 2050.

At the heart of the European Green Deal we find the so-called Farm to Fork Strategy, launched one year ago with the idea of transforming the EU food system to make it more sustainable by altering the whole value chain, from EU food production to distribution and consumption.

The European lactosphere did not wait for the European Commission to come up with its Farm to Fork Strategy. Building a more sustainable future is and has always been part

of our business strategies, but we have to keep the balance between the three sustainability pillars and guarantee the highest dairy quality while keeping the affordability aspect in mind.

Resource-efficient dairy processes, the use of manure as an effective and environmentally friendly alternative to mineral fertilisers, the continuous reduction of our climate impact or the prevention of food loss and food waste are part of our daily work.

However, we also know that actions have consequences, so it is always good – if not crucial – to analyse all possible outcomes beforehand when planning a strategy to make sure that its building blocks will not fall from the base. This is what we are demanding from the European Commission: to publish a so-called impact assessment of its Farm to Fork strategy for EU agriculture and dairy.

So far, we have only seen an impact study from the (former) U.S. administration. Now that it has been one year since this strategy was launched, together with more than 30 EU-based organizations from the EU agri-food sector, EDA has urged the European Commission to publish a comprehensive impact assessment of the Farm to Fork strategy. This strategy has the clear objective of transforming the entire EU food system and its value chains, so there really must be a process of cross-checking the different targets while considering the voice of all the stakeholders affected, from farmers to food processors. This is a pre-requirement for the success of this strategy.

'Uniting dairy excellence & ambition' is the new motto line of EDA. How ambitious can the EU dairy sector be with regards to the future?

Giuseppe Ambrosi: Our new leitmotiv, 'uniting dairy excellence & ambition', sums up what EDA has been standing for already in the past, but will focus on even more in the future: uniting the different dairy processors across the EU and the quality excellence of their dairy products while representing the ambition of a sector with a promising (and sustainable) future ahead.

I am fully confident that despite of the challenges, the EU dairy sector will remain a pillar of EU's economy, a thriving sector within our EU agri-food industry and the best ambassador of Europe's culinary landmarks, delivering delicious and nutritious dairy excellence, essential for all stages of life.

By combining iconic dairy tradition and nutritional avant-garde, the EU dairy industry connects the past and the future, the rural and the urban worlds, and fosters the common understanding needed to move to the next level. In addition, we know how to evolve in order to meet today's climate demands by lowering our impact on climate and environment without risking our dairy quality. With all this in mind, we have enough reasons to be greatly ambitious.

That is why and how we are 'uniting dairy excellence & ambition'!

Cheese cutting machines



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Reconditioned dairy equipment



dairy & food equipment

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The business IT solution for your entire enterprise

High-performance coatings for food contact applications

Ionbond

Increasing wear resistance and component longevity is an important way to increase competitiveness and drive down costs. IHI Ionbond newly offers a variety of high-performance coatings, which have proven themselves in the tool, industrial components and automotive industries, for the food processing industry. The coatings have US FDA Food Contact (TOR) approvals, which was established after strict tests of biocompatibility, migration, wear and dissolution in various environment.



Coatings for food processing: anti-wear, anti-sticking in dry and low-lubrication conditions (photo: IHI Ionbond)

How MULTIVAC is battling against climate change

Let the film start!

Slicing and portioning food without waste, developing packs made of recyclable materials, actively supporting sustainability initiatives and collaboration: In a new short film, MULTIVAC explains how the company is engaging in the battle against climate change – as the only specialist packaging business, which has managed to be in the list of "50 Sustainability & Climate Leaders". The film can now be seen on the website <https://uk.multivac.com/en/multivac/>



The battle against waste in food processing is one of the pillars of MULTIVAC's sustainability strategy (photo: MULTIVAC)

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COMPANY
PROFILES 2021

INTERNATIONAL
DAIRY
magazine

International Dairy Magazine

COMPANY PROFILES 2021

Dear Readers,

herewith, we are presenting the COMPANY PROFILES 2021, a special supplement designed to provide you with some extra portion of professional information.

COMPANY PROFILES 2021 is intended to provide you with an overview of established companies in the supplying industry and problem solvers for specific cases in your company's everyday business. On the following pages, these companies present themselves briefly and inform about their services and products.

Our WHO - WHAT - WHERE for the dairy industry, cheese makers not to forget, offers in short form key information about well-established and reliable suppliers and has been established as a reference work for many years. We recommend that you keep the COMPANY PROFILES separately at hand. As it is easy to handle, you can quickly get in touch with the suppliers listed here, if necessary. The COMPANY PROFILES is included as a booklet. This means that the COMPANY PROFILE can be removed and can be archived separately as a reference source directory.

Best Regards

Roland Sossna
Editor

June 2021

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PHOTOS COVER PAGE:

Milkron GmbH, Grunwald GmbH

BITZER ACPs: more than 40 years of experience in a single unit

When it comes to producing dairy products and refrigerating foods, manufacturers around the world put their trust in BITZER quality. BITZER, the refrigeration and air conditioning specialist, developed its Ammonia Compressor Packs (ACPs) especially for them, as they increasingly rely on ammonia-based cooling in their production. Due to its high energy efficiency and outstanding thermodynamic qualities, ammonia is the ideal refrigerant for large systems in the food industry.

The first choice in the dairy industry

For more than 40 years, BITZER has offered suitable components for ammonia and, thanks to its ACPs, also has larger cooling capacities in its range. BITZER ACPs contain compressors, motors, oil separators and oil circuits, as well as optional frequency inverters, control units and economisers.

Developed with the aim of minimising life cycle costs for the operator, the ACPs boast outstanding efficiency in the part load range,



BITZER Ammonia Compressor Packs (ACPs) are among the preferred systems for process cooling in the dairy industry

which in turn makes it possible to keep energy costs as low as possible. Series-produced BITZER ACPs are delivered fully assembled and require minimal commissioning support. They also minimise unplanned downtime and maintenance costs thanks to their multiple compressor units and fail-safe systems.

BITZER ACPs for large-scale industrial applications are used at companies around the world, including a cheese manufacturer in Austria, a Scandinavian dairy cooperative and an Indian milk-processing facility. They were also named Refrigeration Product of the Year in 2019 by ACR News, one of the UK's leading refrigeration and air conditioning magazines.



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CP Kelco

CP Kelco is a nature-based ingredient solutions company with approximately 90 years of experience working with food and beverage manufacturers in more than 100 countries worldwide. From neutral pH and acidic dairy beverages to cheeses, yogurts, fruit prep, dairy desserts and your dairy alternative product development, we unlock nature-powered success by applying ingredient innovation and problem-solving to develop customized solutions for your formulations.

Ingredients to Help Solve Dairy & Plant-Based Dairy Alternative Challenges

The world's leading dairy brands rely upon our portfolio of nature-based ingredients for viscosity modification, thickening, suspension, stabilization and gelation, with ingredient grades to support your Halal, vegetarian, Non-GMO and other clean label project goals. If you want to hear more, we'd love to talk about it.

NUTRAVA™ Citrus Fiber – This next-generation ingredient supports dietary fiber intake and is sourced from an abundant raw material supply of citrus peels. Suitable for a broad range of dairy products.

GENU® Pectin – Easily recognizable by consumers, it protects and stabilizes protein, minimizes sediment and serum separation. Can also be added before fermentation of drinkable yogurts. Grades available to simplify organic-compliant yogurt fruit preparation.

KELCOGEL® Gellan Gum – A multifunctional ingredient for dairy and dairy alternative beverages, it provides suspension of insoluble protein,



calcium, minerals and cocoa while contributing minimal mouthfeel and a smooth pour.

GENU® Carrageenan – Helps create rich and indulgent textures. Interacts with milk casein to stabilize protein, provide uniform suspension of cocoa and minimize fat creaming in chocolate milk. Suitable for use in HTST and batch pasteurization processes.

SIMPLESSE® Microparticulated Whey Protein Concentrate – Provides a creamy mouthfeel and supports a whey protein label claim without adding chalkiness. Heat and pH stable, it's easy to use.

See how we can help you unlock nature-powered success: www.cpkelco.com.



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Chr. Hansen GmbH

Improving food and health

Building on 145 years of research in microbial science, we use nature's own resources to commercialize innovations from farm to fork, for the benefit of animals, plants and humans – and today more than 1 billion people consume one of our ingredients every day. Our technological platform has game-changing potential and is more relevant today than ever before. We use this unique position to drive a sustainable food and health revolution, together with our partners and customers.

Chr. Hansen was founded in 1874 by a young, ambitious pharmacist in the capital of Denmark, Copenhagen. His name was Christian

Ditlev Ammentorp Hansen, and he was about to make a fundamental impact on the history of science and innovation in the food industry.

Based on Christian D.A. Hansen's legacy and our desire to explore the unknown, Chr. Hansen has continued to develop natural and microbial solutions for future generations and has grown to become a pioneer and market leader within our core business areas: Food Cultures & Enzymes and Health & Nutrition. With our innovation as the backbone we have made it our mission to improve food and health by working with nature's resources to develop sustainable solutions for the food, nutritional, pharmaceutical and agricultural industries.



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Production takes place at state-of-the-art facilities on four continents, which all share ambitious goals to continuously improve our performance on environment, climate and occupational health and safety.

Chr. Hansen Germany - Technology center in Pohlheim and Nienburg

Chr. Hansen has been active in Germany for more than 90 years, an important market for the company. Pohlheim is our global center of excellence for meat cultures, bioprotection as well as cultures for non-alcoholic beer and fermented beverages. Since the site has become part of Chr. Hansen in 1991, it has been extended continuously with the latest significant expansion including new logistic (2018) and QC facilities (2020). More than 100 passionate employees work in innovation, production, logistics and support functions by dedicated teamwork along the value chain, to secure first class supply of our customers worldwide and day by day.

In September 1997 Chr. Hansen acquired fermentation facilities for the production of enzymes in Nienburg/Weser. Since then, chymosin, an enzyme for cheese production, has been produced in a modern biotechnological fermentation process. Chr. Hansen sells this enzyme to the cheese industry worldwide, from Nienburg via a branch network of the group. The research department, which was set up on site, in the meantime worked on continuous further development of the production process and the environmental friendliness of processes. The course is set: Chr. Hansen focuses on novel agricultural solutions, reduction of food waste as well as improved health care. The factory, which by then also comprised a distribution and service center, today employees 142 staff.

Pioneering science

Backed by more than 145 years of innovation and our curiosity to pioneer, we constantly strive to anticipate global trends. We put this into action at our major research facilities in Denmark and 19 application and development center worldwide where we work closely with our customers to bring new exciting products to the market. We have a broad and relevant culture collection with access to close to 40,000 microbial strains. This allows for extensive screening and selection of the best available combinations of strains. We have the know-how to solve customer needs and help them deliver unique, safe and high-quality products.

Sustainability in focus

Chr. Hansen has been supplying natural ingredients to the food industry for more than 145 years. Understanding of and respect for nature's scarce resources have always been an integral part of our DNA, and we published our first sustainability commitment as early as 1949. Today, sustainability remains at the core of our overall strategy. In fact more than 80% of our revenue directly supports UN's Sustainable Development Goals. In 2019, our efforts within sustainability were acknowledged when Chr. Hansen was ranked as the world's most sustainable company by Corporate Knights. In 2020, Chr. Hansen confirmed its top position by being appointed as no. 2 in the global ranking by Corporate Knights. However, the journey is far from over.

For more information: www.chr-hansen.com

Chr. Hansen in a nutshell:

- leading global biotechnology company
- key business: Development and manufacturing of enzymes, food cultures and probiotic bacterial strains for food, pharma and agricultural industry
- listed in C20-Index at NASDAQ OMX Copenhagen
- global turnover: 1,189 billion Euro in fiscal year 2019/20
- more than 3,600 employees in more than 30 countries worldwide
- more than 30 subsidiaries worldwide
- research facilities in Denmark and USA
- development centers in Denmark, USA, France and Germany
- application centers in more than 20 countries
- modern production facilities on three continents
- awarded on the world's most sustainable company in January 2019
- ranking to the second most sustainable company in the world 2020



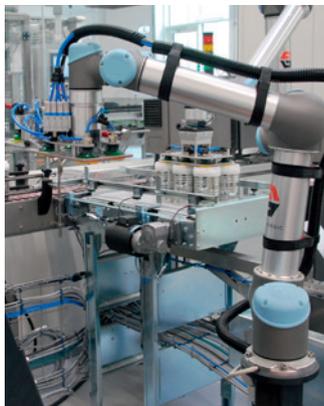
FIPROS

Your outsourcing partner for blending and packing of milk-based powders

Benefiting from almost 30 years of experience in contract manufacturing of food and food ingredients, the Danish company FIPROS Nutrition ApS offers a brand new, state of the art processing site for the blending and packing of dairy powder products, including conventional and organic stage 1 to 3 infant-, toddler- family- and other nutritional milk- based powders..

State-of-the-art technology and a sustainable production process

FIPROS Nutrition is a daughter company of FIPROS A/S, a contract manufacturing partner for high quality food processing solutions, and offers its customers from all over the world the newest equipment, a digitalized production system, maximum food safety, and an outstanding hygiene concept.



Its modern, sustainable production concept uses gravity as a means of material transportation, thereby considerably decreasing the use of energy and securing an effective, gentle, and resource-saving production flow.

Maximum flexibility for large- and small-scale productions

The production set-up is designed for maximum flexibility with regards to niche products and production volumes, with a Minimum Order Quantity of two tons. This makes it possible to service customers with large-scale productions as well as medium and small sized producers, who are looking to expand into new markets or launch new products.

A hundred percent confidentiality

FIPROS Nutrition, together with its mother company FIPROS A/S, has about 100 employees at its company headquarters on the island of Funen in Denmark and more than 150 customers worldwide. FIPROS does not market any own products or engage in product development, thus guaranteeing a hundred percent confidentiality regarding recipes and product features.



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foodfab

Forward-Looking Process Planning from foodfab

"We understand the special challenges of food production. Our designs always focus on optimizing the processes that take place in the building – in other words, we plan from inside out," says Michael Trautwein, Managing Director of the ATP consulting subsidiary **foodfab**. The process planning specialist with offices in Innsbruck and Munich has been advising the food industry's major players for over 30 years and has long been the market leader in the sector in Central Europe.

As part of the network of ATP architects engineers, which, with over 900 employees, is Europe's leading integrated design company, **foodfab** develops sustainable, future-fit building concepts. In a period of constantly changing consumer behavior and growing global challenges, the consultancy is notable for its many years of experience and its extensive knowledge of efficient production processes, structures, and layouts.

foodfab reacted rapidly to the European Green Deal, which was unveiled by the EU in 2019 and envisages a 55 % reduction in CO₂ emissions by 2030 and CO₂ neutrality by 2050, by offering individual climate protection masterplans. "Together with ATP

sustain, the ATP Group's specialist design company in the field of sustainable design, we drew up a roadmap for CO₂ reduction that addresses not only the actual core process of a building, but also all the key parameters of the site and its surroundings," says Trautwein.

Each **foodfab** masterplan is based on detailed analyses and simulations. With the help of the digital design method Building Information Modeling (BIM) it can check the efficiency of material flows and production logistics at an early stage, reduce the consumption of resources and costs across the entire building lifecycle, and deliver precise information that allows clients to take well-informed decisions. "Digital integrated design enables us to find the best overall solution for a smart and commercially successful building. And, in the process, we use a modular, expandable building method – which permits flexible and crisis-proof production," emphasizes Michael Trautwein.

foodfab's satisfied clients include well-known dairy companies such as Milei and Uelzena in Germany and EkoNiva in Russia.



Integrally designed with BIM by foodfab/ATP: EkoNiva – Dairy Facility in Masljanino (RUS). Visualization: ATP

foodfab GMBH

Planning and consultancy for the food industry

- Masterplanning
- Factory planning
- Production technology planning
- Material flow planning
- Process technology consultancy
- Machinery layout planning

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The next ultraclean (UC) machine generation: fully-automatic cup filling and closing machine GRUNWALD-FOODLINER 20.000UC in 10-lane design with integrated tray packer for dairy products

Maximum hygiene level without using peroxide

Respecting the environment, more ecology in food production, wider range of natural products, avoiding chemical additives – the consumers' list of requirements is extensive and could be extended. Moreover trade has demanded extremely long shelf lives for their products – and also for highly sensitive products of the dairy and food industry – for a long time.

Such long shelf lives can only be achieved if the products are filled at a guaranteed high hygiene level and if procedures are used which reliably sterilise the packing materials (cup, bucket, lid and film) during the filling process.

GRUNWALD design engineers have been aware of these requirements for a long time as the development of dosing and filling technology has always been of great significance. Therefore a reliably high product safety and the adherence to statutory hygiene regulations are one of the most important issues at GRUNWALD for the development of new machines.

Ultraclean technology for higher demands

Four years ago GRUNWALD set new standards with regard to hygiene with the certified and peroxide-free sterilisation procedure developed. This ultraclean concept meets all



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1- to 2-lane GRUNWALD-ROTARY XXL; fully-automatic bucket filling and closing machine in ultraclean design for 1, 5 and 10 litre buckets

requirements for observing maximum hygiene levels in the production of dairies and the food industry. Up-to-date machine technology guarantees a reliably higher product safety and combines maximum possible flexibility with maximum performance and reduction of running costs on the basis of maximum hygiene standards at the same time.

The biggest advantage of this guaranteed reliable, certified and peroxide-free sterilisation system is not using any chemicals which means it is free of peroxide. Therefore it respects all the health of the machine operators to a large extent and does not have any impacts on the environment. In addition the issue with the overdosing of chemicals has been solved!

The pulsed light high-performance UV(C) sterilisation was tested by several independent German institutes and they also confirmed its effectiveness. They certified that this UV(C) sterilisation was an ultra-modern and efficient alternative sterilisation procedure which presents no health hazards and which gives reliable service without using peroxide and guarantees maximum sterilisation rates.

Ultraclean sterilisation for cups and buckets

The pulsed light high-performance UV(C) sterilisation rate for cup filling machines was well tried and tested over the past few years. In the meantime it has been further developed by us and now it can also be used on rotary-type and inline bucket fillers for handling buckets up to 20 litres. A sterilisation rate of at least LOG4 is guaranteed for buckets from 1 to 10 litres. In addition this procedure can be generally applied for all standard cups and lids used by the food industry.

The central point of the hygiene concept developed by GRUNWALD is the guaranteed reliable sterilisation system of pulsed light high-performance UV(C) sterilisation. It variably guarantees a sterilisation rate of at least LOG4 for cups, buckets and lids. With this procedure the packing materials are sterilised with pulsed UV(C) radiators and not with H₂O₂.

The next GRUNWALD-ultraclean (UC) machine generation

Meanwhile the development engineers have implemented the next stage of the GRUNWALD ultraclean (UC) concept: GRUNWALD-FOODLINER 20.000 UC. The 10-lane inline cup filler – an intelligent filling and packing machine

- in ultraclean (UC) design with peroxide-free hygiene concept
- maximum hygiene standard and at the same time maximum speed (sterilisation rate ≥ LOG 4 at 40 cycles/min.)
- fully-automatic tunnel cleaning
- highest possible flexibility
- up-to-date, fully integrated industry 4.0 solution guarantees maximum process reliability in order to entirely avoid production downtimes.

GRUNWALD GMBH

GRUNWALD GMBH – a family-owned German mechanical engineering company, located in Wangen im Allgäu with more than 190 employees and reliable partner for dosing, filling and packing.

GRUNWALD GMBH is leading supplier of format flexible cup and bucket filling machines for filling various products in prefabricated packaging materials (cups, buckets, trays, similar containers, jars). Since 2019 all GRUNWALD machines are peroxide-free.





Sema

Machines and systems from the professionals

sema Systemtechnik GmbH has been a leading international manufacturer of machines and systems for packaging technology and the semi-finished products industry for more than 35 years. sema produces and markets technologies for packaging, transporting, palletising, case erecting and packing primarily packaged products, mainly for the food industry, with a focus on the dairy industry, delicatessen manufacturers and the beverage industry.

The medium-sized company is owner-managed and serves customers in Germany and Europe from its base in North Rhine-Westphalia. Customers include industry leaders as well as medium-sized companies from the dairy sector.

sema Systemtechnik started manufacturing secondary packaging systems ten years ago. In the meantime, more than 300 machines are in efficient use. Within just a few years, sema Systemtechnik has been able to establish an important market position as a supplier to the dairy industry. The specialisation

sema
systemtechnik



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ranges from case erectors and set packers to wrap-around cartoners and sleeve wrappers. A relatively new concept allows dairies to place products in crates both individually and with a carton sleeve. First, perforated trays are produced, from which the cups are transferred to a sleeve wrapper and then placed back into the trays.

Competence from the individual machine to the complete final packaging line.

The specialist for secondary packaging in the food industry offers not only single machines but also a fully automated complete programme.

Integrated components offer customers from the dairy and beverage industries fully automated packaging lines.

In addition to the appropriate machines, sema's scope of services also includes providing customers with competent advice and support in the optimal layout planning of their line and the correct design of their packaging.

In the short term, the focus is on current development trends such as shorter changeover times, the removal of complexity from the machines, partially automated changeover and preventive maintenance. Here, sema Systemtechnik continues to focus on high flexibility. Innovative and economical solutions are created through a lean and flexible organisation as well as in-house design and production.

sema products are successful - through experience, innovation and creativity! And if it should go beyond the standard, sema offers the right special solution. Flexibility and speed in organisation and a service that is there when you need it make first-class machines into outstanding products.

Some highlights in brief:

The compact one for cups and buckets.

The newly developed case erector 1300 s shines with its compact design and high cycle rate.

- Highest performance in operation and short set-up times for other tray formats.
- Reliable mechanical gripper for different formats and precise placement of the trays.
- Perfect positioning of the cups or buckets in the auger, precise unfolding of the trays.

The flexible one for various carton formats.

The Top-Loader 2100 s BFS/flex, also newly developed, is suitable for many different formats.

- Packs up to 14,400 cups per hour and can be changed over to another format in no time.
- Row gripper with mechanical actuation or by vacuum.
- Versatile - 200 g / 500 g rectangular and 500 g round cups each with or without or without inverted lid.

Separial lidding of crates or trays.

With the lid applicator 3800 s/flex, sema offers for the first time the possibility to close loaded crates or trays with a lid.

- Can be used flexibly with all standard tray sizes.
- Designed for trays of 6, 10, 12 and 20.
- Covers the loaded crate with a 2-sided U-lid as well as a 4-sided lid. Lid can be glued to the tray for optimum security.
- The lid optimises the protection of the products and enables picking by machine.

sema case erector 1300 s with top loader sema top loader 2100 s BFS/flex sema lid applicator 3800 s/flex

TREIF Maschinenbau GmbH

Cutting and grating of cheese with the specialist

Largest spectrum of food cutting technology

The focus of TREIF has been the cutting of food for more than 70 years. The successful company bundles the largest spectrum of food cutting technology.

With around 500 employees worldwide, innovative machines, equipment and systems are being developed and produced exclusively for the cutting of food. Planned and implemented are efficient, customer-oriented solutions for handcraft, supermarkets and industry including automated line solutions for cutting products such as cheese, meat, sausage, bread and baked goods. The company has four business units for this purpose: Dicing, portion cutting, slicing, i.e. cutting of cheese, sausage, ham, etc. into thin slices, and bread cutting as well.

In addition to the high quality-standards in view of cutting precision and the convincing yield-results, TREIF attaches great importance to hygiene conditions. This means that the machines are also fully adapted to the special features of cheese cutting in terms of hygiene (open design, easy cleaning, technologies to prevent contamination). The best example is the CASAN industrial dicer with its standard hygiene cylinder.

The CASAN works highly precisely even when very small cubes or flakes are produced. With its high-performance grating mode, it is very suitable for the pizza production and the convenience sector.



TREIF is also the appropriate contact for the weight-accurate portioning of cheese or cutting into thin slices, right up to the production of levelled packages including the use of robot technology. In the customer centre, that was opened in 2016, interested parties, customers and partners can experience all the machines and have cutting tests carried out with their own products - also virtually.

The TREIF machines, including the knives, the "centrepiece" of the machine, are 100% manufactured in Germany. The company has an international sales and service network.

In October 2020, TREIF was acquired by the Icelandic machine manufacturer Marel. The product portfolios and the geographical presences of the two companies complement each other perfectly to offer even more value to existing and future customers.



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TREPKO

The TREPKO Group is one of the world's leading suppliers of packaging solutions for the food industry. The TREPKO's activity concentrates on two innovation types: process innovation and product innovation. All solutions meet the most stringent quality and hygiene requirements and their performance combined with flexibility offers individual and optimized solutions designed specifically for the customers' needs.

- professional care of TREPKO specialist
- own workshop
- training
- service
- spare parts
- conference & exhibition
- FAT



- Filling & Closing Machines (aseptic in-line, rotary, carousel)
- Bottle Filling Machines
- Filling & Coagulation Plants (for U.F. white cheese)
- Dosing Systems
- Bag in Box Lines
- Brick Forming & Wrapping Machines
- Bulk Filling, Forming & Wrapping Lines
- Forming, Filling & Sealing Machine Solution
- End of Line Solutions
- Full after-sale service (technical support, spare parts)



TREPKO A/S

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WEHRLE

Reliable Treatment for Dairy Effluents

Wastewaters from the dairy industry are as diverse as the range of products itself. It is advantageous to treat those effluents with a process combination particularly designed for the respective effluent type and treatment objective.

A good plant constructor thus offers a wide range of treatment solutions to find the most economical solution for the different treatment challenges.

Since 1982, WEHRLE sets benchmarks as pioneer and technology leader for the treatment of very difficult and complex wastewaters. The wide range of available process technologies allows intelligent process combinations to fulfil the requirements and expectations of the client in the best possible way. Not only the technical solution but also the best possible cost-effectiveness of the plant is thus a priority to us.

WEHRLE consults, plans and builds plants and also offers corresponding services such as piloting, efficiency optimisation and retrofit of existing plants.

Especially for applications in the industry also factors beyond the used technology are important: a reliable performance in case of possible variations of wastewater volume and loads in the industry (e.g. caused by seasonal production or changes of product lines) and by all climate conditions, as well as a modular design for future upgrades of the production and easiest operation, to enable a simple outsourcing of the plant operation. The stable high effluent quality of WEHRLE plants allows an easy, optional upgrading, e.g. to use the treated water for reuse and to save costs for process water, heat energy and possible softening.

The treatment of production wastewater from ice cream production containing calcium using the anaerobic high-performance BIODIGAT®-SB reactor saves costs by avoiding surplus sludge.



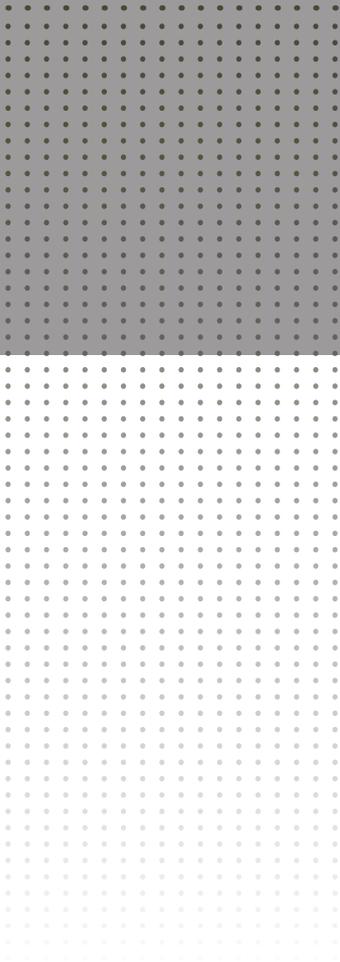
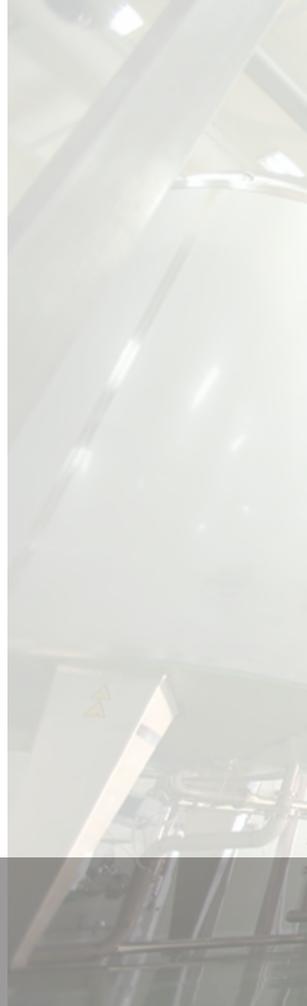
Aerobic Treatment of Dairy Wastewater by a Practical Containerized Plant



WEHRLE Umwelt GmbH

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Learn from the expert!

The CHEESE TECHNOLOGY book has been a German a long-standing, widely appreciated benchmark and is now available in English. The book comprises all fields of cheese technology in an exemplary extent and depth. Much of the latest literature has been reviewed and insights thereof integrated in this book.

**THE BOOK
HAS 9 CHAPTERS**

Further information and order:
www.cheese-technology.com

General overview, divided into definition, processing scheme, history, significance of the various groups of cheese concerning nutrition Raw material and additives for the production for various groups of cheese Varieties of the respective groups of cheese as well as their manufacturing processes and evaluation (quality, shelf life, etc.) Packaging of the various cheese groups Influences on quality, checking and quality assurance Description of defects and notes for improving quality issues.

This book addresses above all cheese makers but also trainees as well as students, graduates of food technology and scientists. For special instructors, this book is a solid base for courses or lectures. It is an extremely valuable help as reference book for dairy specialists and the cheese industry as well as for technical advisers and suppliers. CHEESE TECHNOLOGY makes an invaluable contribution to the preservation and documentation of accumulated know-how of cheese technology across decades.

