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MARGHERITA

ITALIAN PIZZA CHEESE CULTURES

Sacco System has created “**MARGHERITA**” Italian pizza-cheese cultures, a new range of fast lactic cultures specific to the production of pizza cheese and able to guarantee a product with unique functional characteristics and exceptional taste.

MARGHERITA is made up of two specific products which guarantee excellent acidification speed: **ST Regina-M** and **ST Regina-S**.



Grit your teeth and get on with it!

EU: Principles don't matter any longer



Roland Sossna
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Will the recent ruling by the European Court of Justice stating that compulsory origin labelling of raw materials (milk) used in dairy products is only allowed within narrow limits really make a difference? This is open to question. So let's take a look - one step at a time.

Let us recall: At the end of September, the ECJ ruled that France's decree of 2017 is only compatible with the European Food Labelling Regulation if there is a close link between origin and quality. Three years back, the French had introduced an obligation, with the official approval of the EU Commission, to make labelling milk and dairy products with the country of origin of the milk ingredients compulsory. The French government, in response to angry milk producers, hoped that such a scheme would benefit domestic products. Subsequently, other countries (Italy, Spain, Greece, Portugal, Lithuania, Finland, Romania) felt encouraged to adopt similar labelling rules. Whether and to what extent these schemes have really helped domestic milk suppliers cannot be established or proven.

It is understandable that dairies in these countries, who mainly process just domestic raw material, saw little reason to complain. However, multinational milk processors were concerned from the outset about the partial abolition of the internal market principle. Lactalis, a French company, subsequently went to court and has now been upheld by the ECJ. So far, so good.

The Luxembourg judges' ruling in no way invalidates the regulations in the above-mentioned countries requiring origin marking. Rather, a lawsuit would have to be filed separately in each individual country, or the legislator there would act on its own initiative.

A clear signal from the European Commission is therefore needed to show that it intends to enforce the rules and principles of the Single Market in any case. Unfortunately, however, the Brussels authority is busy with other things, as it has to push through the farm-to-fork strategy by hook or by crook. And it says that by the end of 2022 an extension of the mandatory labelling of the origin of food ingredients is to be introduced. In other words, exactly the opposite of what the EU Single Market provides for in terms of the general marketability of products and the free movement of goods within the EU area.

What we are witnessing is nothing more than a tacit erosion of the basic idea of the Community of States in favour of abstruse regulations, all under the sign of some kind of undefined and completely disordered sustainability dictate. The administrative monster on the Rue de la Loi, in its quest for "climate neutrality", seems prepared to throw even the most sacred principles of the EU fathers overboard.



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Arla Foods Ingredients has launched a new organic functional solution for cooking-stable cheese products (photo: AFI)

Organic solution for cooking-stable cheese

Arla Foods Ingredients

Organic cheese launches are growing at a CAGR of 15.1% in Europe and 73% of European consumers would buy more organic dairy products if they were more widely available. Meanwhile, cooking-stable cheese products – such as grilling cheeses and cheese fries – are increasingly prevalent. They are a perfect protein-rich substitute for meat, and have created new possibilities to cater for the growing number of vegetarian and flexitarian consumers.

Arla Foods Ingredients is now adding an organic line to its Nutrilac range of functional protein solutions, which offer multiple functionalities in dairy, including improved taste, texture, creaminess and stability.

The line includes Nutrilac FO-7922 Organic – a new product for cooking-stable cheese products. Ideal for grilling cheeses, cheese patties for burgers, cheese sticks, cheese nuggets and cheeses for hot pot soup, it can also be used to create recombined dairy products that are just as delicious as those made from fresh milk.

As well as being organic, Nutrilac FO-7922 Organic is heat-stable in processing, allows flexible levels of sodium content and has a pleasant taste. Other advantages include 100% yield.

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GEA's extensive experience in aseptic filling has inspired the design and concept of GEA Whitebloc Aero, conceived to target extended shelf life premium dairy beverages distributed in cold chain. The GEA Whitebloc Aero is versatile, fast and flexible, hence capable of running many small batches and filling a variety of different products on

the same machine. Thanks to a built-in product recovery system, the GEA Whitebloc Aero eliminates product waste during the start-up cycle, at the end of each production run and during changeovers. Filling valves can be equipped with a load cell (weight filling) or flow meter (volumetric filling) for maximum flexibility and accuracy.

Chr. Hansen

Breakthrough in understanding how food cultures with bioprotective effect work



FreshQ food cultures from Chr. Hansen are natural lactic acid bacteria (LAB) specifically selected for their ability to help protect dairy products from spoilage caused by yeasts and molds. Scientific activities related to understanding the underlying mechanisms used by LAB to delay the growth of yeasts and molds have so far focused very much on trying to identify specific antimicrobial compounds produced by LAB^[1,2]. However, no scientific studies have been able to identify compounds that could explain a substantial part of the inhibitory effect seen against yeast and mold spoilage. Therefore, it became apparent that other mechanisms played a major role, but until now the specific mechanism was not elucidated.

Competition for a specific nutrient

Certain lactic acid bacteria are able to delay the growth of spoilage organisms by effectively using the nutrients that the spoilage organisms need to grow. Chr. Hansen scientists Siedler et al (2020)^[3] made a breakthrough discovery showing that in fermented dairy products, competitive exclusion, i.e. competition for a limited nutrient by different organisms, is a major mechanism of fungal growth inhibition by lactobacilli. It was discovered that the depletion of the essential trace element manganese by two Lactobacillus species; *Lb. paracasei* and *Lb. rhamnosus* from FreshQ food cultures was the main mechanism for inhibition of yeast

and mold spoilage in fermented dairy products. A manganese transporter (MntH1), identified by the research team at Chr. Hansen, represents one of the highest expressed gene products for FreshQ food cultures in a fermented dairy product, and facilitates the uptake of manganese from the food matrix, preventing the availability of this essential growth factor for the unwanted contaminants.

In collaboration with North Carolina State University in USA, the scientists at Chr. Hansen proved the mechanism at the genetic level: Deletion of the *mntH1* gene in the tested *Lactobacillus* species resulted in loss of bioactivity, proving this gene and the depletion of manganese as the most important mechanism which can explain the delay in growth of yeasts and molds. The importance of *mntH1* gene activity in *Lactobacillus* was proven in fermented milk, where yeast growth was found only to be inhibited by *Lb. paracasei* having an active manganese transporter. However, addition of excess manganese to the fermented dairy product in the concentration of 0.6 mg/L resulted in restored yeast growth whether or not the manganese transporter was inactivated in *Lb. paracasei* (Fig.1).

The effect of competitive exclusion by manganese depletion on the growth of three different spoilage molds from the family *Penicillium* were additionally shown by the Chr. Hansen scientists Siedler et al 2020^[3]. The sample with the FreshQ food culture showed clear inhibition of the mold growth compared to the reference (Fig.2). Addition

of manganese in increasing concentrations, however, restored mold growth.

Evaluating the bioprotective ability in fermented milk of selected lactobacilli from ten major phylogenetic groups identified a correlation between the presence of the *mntH* gene and bioprotective activity. Thus, manganese scavenging emerges as a common trait within the

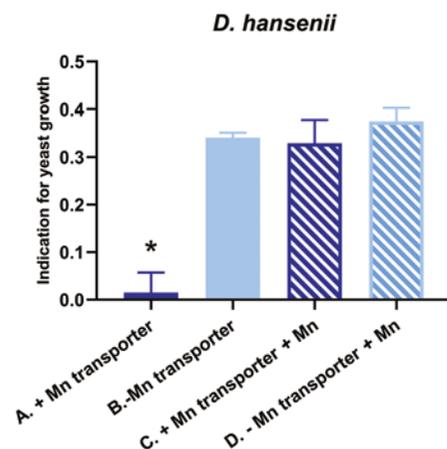


Figure 1: Effect of Mn transporter deletion on yeast growth inhibition (absorbance, 600 nm). Yeast growth in milk fermented by *Lb. paracasei* (A), *Lb. paracasei* with deleted Mn transporter gene (B), *Lb. paracasei* added manganese 0.6 mg/L (C) and *Lb. paracasei* with deleted Mn transporter gene added manganese 0.6 mg/L (D). Growth of *D. hansenii* was measured after 5 days of incubation at 17 °C. Values are presented as means ± standard deviations (n = 2 biological replicates). And bars bearing * are statistically different (p < 0.0001). Adapted from Siedler et al 2020.

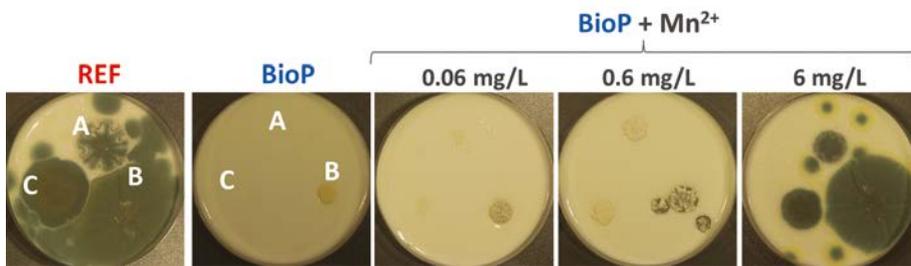


Figure 2: Growth of 3 different *Penicillium* molds, (A) *P. brevicompactum*, (B) *P. crustosum* and (C) *P. solitum* on plates prepared from milk fermented with starter culture alone (REF) or both starter and FreshQ culture with bioprotective effect. Different manganese concentrations were added as indicated. The spoilage molds were added in concentrations of 500 spores/spot. The plates were incubated at 22°C for 8 days. Adapted from Siedler et al 2020.

Lactobacillus genus, but differences in expression levels result in specific strains showing considerably more bioprotective effect than others.

In summary, the ability of LAB such as FreshQ food cultures to deplete manganese has been discovered as a novel and very important competitive exclusion mechanism to delay growth of spoilage contaminants in dairy products. According to Peter Thoeyen, Director in Dairy Bioprotection, Chr. Hansen, the discov-

ery is an important and game-changing chapter in Chr. Hansen's bioprotection history. "For years, FreshQ has helped our customers build their brands, improve quality and reduce food waste while keeping up with market trends for real food with less artificial ingredients. Being able to describe exactly how they do this on a scientific level is helping us in the quest to help our customers with even better solutions for even more food types in the future", he states.

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The new logo will combine the composition and colors of ESI Nutrition with the name and font of the original Laita logo, thus, ensuring continuity and building upon ESI Nutrition's acquired brand recognition. laita.com

FMCG Gurus Column

Foodservice outlets need to capitalize on plant-based diets



Photo: unsplash.com/@micheile

Across the globe, dietary habits are changing as consumers become more health and environmentally-minded. As a result of this, a significant proportion of consumers are looking to abstain from dairy intake completely or moderate consumption. This is because dairy can be associated with bad-for-you ingredients, whilst farming methods are also seen to be detrimental to the environment. The issues of health and sustainability will intensify amongst consumers in a post COVID-19 world, especially as many consumers deem the two issues to be interlinked. As such, it is crucial that the foodservice channel responds to this by innovating and expanding menus around plant-based dairy options. This will be crucial for tempting consumers back in outlets once the virus has passed.

Flexitarians on the rise

In recent years, much attention has been given to the healthiness of dairy products. On one hand, dairy is associated with being high in protein and calcium. However, on the other hand, dairy is also associated with high levels of fat and sugar content. In addition to this, the sustainability credentials of dairy farming is something that has also been called into question in recent years. As a result of this, much attention has been given to consumers moderating their intake of dairy in line with the rising number of people classified as adopting flexitarian dietary plans. For instance, in 2020, an FMCG Gurus

Meat and Plant-based Protein survey found that across the globe found that 24% of consumers said that they follow a flexitarian diet. Meanwhile, a total of 41% of consumers said that they turn to dairy alternative products as a source of protein. The fact that a higher proportion of consumers say this compared to those who follow flexitarian diets, shows that some consumers turn to dairy and dairy alternatives simultaneously.

The two main reasons why consumers are turning to dairy alternatives are for health and sustainability purposes. An FMCG Gurus sustainability survey conducted in Q3 2019 found that in the previous two years, 45% of consumers had made changes to their dietary habits in order to lead a more sustainable lifestyle. Of those who had made the changes, 55% said they associated such eating and drinking habits with being healthier. This highlights how consumers are adopting the notion of Good for Me, Good for the Earth, recognizing that the issues of health and sustainability are interlinked. These two issues are something that consumers are becoming more concerned about in the wake of COVID-19. For instance, 60% of consumers say that they have become more conscious about their health and wellness as a result of the virus, whilst 62% say they will be more attentive to environmental issues. These are key reasons why 23% of consumers say that they plan to eat more plant-based food and drink products as a result of the virus.

Response requested

Like any evolving food and drink trend, it is crucial that the foodservice industry responds to this accordingly. This is something that will be more important than ever in a recessionary environment where consumers are still conscious about mass gatherings and innovation is needed to prompt consumers through the door. An FMCG Gurus Foodservice survey conducted in 2020 found that consumers who follow flexitarian (50%), vegetarian (49%) and vegan (49%) diets are not overly satisfied with the availability of foodservice outlets that cater to these dietary

requirements. Additionally, FMCG Gurus research shows that the appeal of plant-based products in the foodservice sector will appeal to consumers who are not necessarily following such dietary habits.

Indeed, a total of 23% of consumers say that the availability of plant-based food and drink on menus is something that directly influences choice of outlet when visiting the foodservice channel.

Meanwhile, 27% say that outlets can better capture their attention by promoting plant-based food. The appeal of plant-based food and drink in the foodservice channel is again linked to consumers being more concerned than ever before about the issues of health and sustainability. This is a key reason why 66% of consumers say that they would like foodservice outlets to innovate around sustainability initiatives.

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Increasingly, consumers want foodservice outlets that they feel mirror their attitudes and outlook on life, meaning these two areas need to be at the forefront of innovation.

Appeal of plant-based food and drink will grow

Over the next couple of years, the appeal of plant-based food and drink within the foodservice sector will continue to grow. From an industry perspective, this will be driven by increased new developments of products. From a consumer side it will be driven by increased levels of concern about health and sustainability. However, whilst plant-based products have something of a health halo attached to them, it is important to recognize

that barriers can still exist to purchase. For instance, a 2019 survey found that 42% of consumers believe that plant-based food and drink can taste bland and boring. This shows that irrespective of decades of attempts by the industry to convince consumers otherwise, there are still some who feel that healthier food and drink offerings are less likely to taste as good. In addition, 2020 research found that 51% of consumers are concerned that dairy alternatives are more expensive than dairy products – something that could be problematic.

Nevertheless, the appeal of plant-based food and drink products within the foodservice channel will continue to grow, as consumers adjust dietary plans, become more health and sus-

tainably-minded, and what foodservice outlets to demonstrate traits linked to kindness, comparison, and responsibility. As such, it is crucial that the foodservice sector looks to address barriers associated with plant-products and innovate menus to try and get consumers back in through the door.

This article has been compiled based on the following sources:

- ▶ FMCG Gurus – Foodservice survey, Q2 2020
- ▶ FMCG Gurus – Meat and Plant-Based survey, Q2 2020
- ▶ FMCG Gurus – COVID-19 survey, Q1/Q2 2020
- ▶ FMCG Gurus – Sustainability survey, Q3 2019

Efficient conveyor technology

KARL SCHNELL combines hygienic design and maximum stability

KARL SCHNELL adapts their conveyor lines individually. Conveying capacities of up to 50 t/h can be realised. Additional options are often desired, for example belts with weighing systems for raw material standardisation or the transport via metal detectors.

KS only use frictionally engaged belts with roller drive. This means that gradients of 2 to 45 degrees

are possible in the systems. A stable tensile member made of polyester and aramid is advantageous here, as this ensures a long service life and high dimensional stability even with heavy loads.

KS conveyor belts usually have a TPU-coated monolithic belt. TPU is very often used as a coil coating material in food processing, as it can be used without problems

even at very low temperatures, has a very good abrasion resistance and is also resistant to vegetable and animal fats and oils. It is also advantageous for cleaning purposes, as the belts have an absolutely smooth surface. In addition, antimicrobial additives in the belts prevent the growth of harmful microorganisms on the belt surface.

The adhesive properties are also very important, because when transporting very sticky products, it must be ensured that they can be removed from the belt without problems. In addition, the temperature challenges are enormous for the belts; the spectrum ranges from frozen goods at -18 degrees Celsius to processed cheese at 85 degrees.

With these belt types, KS have implemented conveyor lines that transport blocks of cheese weighing 25 kg around 100 m. Or belts for charging raw materials that have a buffer capacity of up to 1,000 kg and then have to transport the product further. [ks.com](https://www.ks.com)



Highly hygienic conveyor belts for universal use in the food sector (photo: KS)

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Sacco System

Lactic cultures for pasta filata and mozzarella



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With over 70 years of experience behind, Sacco (saccosrl.it) has developed a range of lactic cultures for pasta filata cheeses and mozzarella to improve dairy production and create high-quality products, ensuring a simple flow and a reliable and constant production.

Mozzarella is a product that is part of the Italian traditional now it is a true and iconic global gastronomic delight. Furthermore, it is known to everyone for being the main ingredient of another iconic delight namely pizza.

In 1889, when the sovereigns of Italy, King Umberto I and Queen Margherita visited Naples, the best Neapolitan pizza maker, Raffaele Esposito, prepared three pizzas for the royals, including one that honoured the Queen.

Her astonishment was so great and the pizza maker named the pizza after her. From that moment on, pizza became known as Margherita.

From Naples, pizza has conquered the whole world as well as the pizza cheese ferments Sacco System.

MARGHERITA – Cultures to produce mozzarella for pizza

Thanks to study and passion, Sacco System Research&Development has made it possible for the company to develop "MARGHERITA | Italian pizza cheese cultures", a new range of specific lactic acid bacteria for the production of mozzarella for pizza that ensures:

- better fermentation speed
- better stretchability

- fine slicing
- standardisation of production time
- slow post acidification
- excellent browning control.

The line of lactic cultures for pizza cheese "MARGHERITA" is made up of two specific products that guarantee an excellent speed of acidification and are available in freeze-dried and frozen versions (Lyofast and Cryofast): ST Regina – M and ST Regina – S.

From passion and tradition, Sacco System has developed a unique product that brings the quality of Made in Italy to the top worldwide... for a pizza worthy of a Queen.

Download the Sacco System pizza mozzarella cultures at saccosrl.it and/or watch a video on Sacco's Youtube channel.

Simply Cheasly Taking Cheese to New Places

SPX FLOW has released a new video explaining the operation and market potential of its innovative and cost-effective cheese making process, 'Cheasly'.

The Cheasly process is designed to make cheesemaking quicker and simpler and, by using milk or plant-based protein concentrate powder without any whey drainage. This process is designed to give 100% yield for the cheese.

Based around SPX FLOW's advanced Flex-Mix mixer technology, the video shows how the Cheasly processing line is ideal for developing markets. It can be used for milk or plant-based recipes and offers the versatility to produce a wide range of semi-hard, soft, cream and processed cream cheeses such as Quark, fromage frais, pizza cheese and strained yogurt.

The patented Cheasly process is low cost, compact and fully automated, making it ideal for producers to create small quantities of multiple high-quality cheeses to serve local and new markets. Without the reliance on local milk supplies, consistent high quality can



SPX FLOW has developed an innovative and cost-effective cheese making process, named 'Cheasly' (photo: SPX)

be assured along with easy storage of ingredients. To view the video, go to www.spxflow.com.

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Plant-Based Detective

Palsgaard

Theng Theng Sim, Regional Application Manager at Palsgaard Asia-Pacific, can help create your next non-dairy beverage, but she'll need to ask you a few questions first.

Plant-based for centuries

The "plant-based revolution" is getting plenty of attention in Europe and North America, but ingredients such as rice and bean curd have been the basis of Asian meals for centuries. "We've been using plant-based ingredients for many years, so for us it's nothing new. You could say Asia is ahead of the game," says Theng Theng Sim, Palsgaard's Application manager for Asia-Pacific.

What is new in Asian markets, however, is a growing demand for healthy,

convenient plant-based beverages inspired by popular dishes. Increasingly, the question is "How do you take a traditional meal and turn it into a drink?"

Manufacturers pondering this puzzle can encounter a range of technical challenges, which is where Theng Theng comes in. With over 20 years' experience of working with emulsifiers and hydrocolloids, she can help customers (and potential customers) solve problems, improve recipes and launch new ranges.

Non-dairy detectives

Some of the most common problems facing manufacturers of plant-based beverages – separation, sedimentation and gelation, for example – are similar to those encountered with dairy. Reflecting this, many of the solutions in Palsgaard's

range of emulsifiers and stabilisers can be used in both dairy and non-dairy applications.

However, working with plant-based raw materials throws up some unique challenges, one of which is the sheer number of variables involved. "Plant and dairy are very different animals," Theng Theng explains. "Dairy is dairy, but in plant protein you have soy, pea, rice, coconut, walnut, peanut, black bean – it's a very long list. Soy alone can vary depending on country of origin, how it's extracted and whether you're working with a powder or an extract. Because of this, there's not one simple solution for every single plant-based product."

Furthermore, there's a growing trend towards the addition of other ingredients, either for flavour (cocoa powder, for example) or nutritional benefits (such as fortification with calcium). "This makes the situation even more challenging, because you need to suspend all these insoluble particles to create a homogeneous product that looks appealing."

Add to the equation the fact that customers can have very different requirements for their end products – should they be thin or viscous, for example? – and their own manufacturing processes. "Before we can start helping customers, we need the whole picture," Theng Theng says. "We have to understand things like the kind of heat treatment they're using – is it pasteurised? Are they using UHT? What's the mixing process? What's the pH? Different processes will affect stability in different ways, so we need to understand it all before we can recommend a particular product and dosage. We need to



Theng Theng Sim, Regional Application Manager at Palsgaard Asia-Pacific, can help create your next non-dairy beverage, but she'll need to ask you a few questions first (photo: Palsgaard)

ask a lot of questions – sometimes it's like being a detective!"

Customer care in the age of Covid

After considering customers' specific needs, Theng Theng typically recommends a particular product from Palsgaard's extensive range of plant-based emulsifiers and stabilisers and offers it for testing. However, she says the service goes far beyond that: "Usually, if the customer doesn't have a start-up recipe, we'll provide one as a guideline. Others will already have recipes, but need some help with using our product, in which case we can give them detailed advice. We can also help if they have any manufacturing issues, for example with stability. In those situations, it's common to think that the problem is with the stabiliser, but it could be the process parameters, the raw materials or the mixing method. We'll work with the customer to understand where the problem has occurred – and usually it's not with the product!"

Theng Theng prefers a hands-on approach. Until recently, she would proactively offer to meet customers in person, for example attending trials to observe and advise. Sometimes she would invite them to the Palsgaard application lab to run trials together and sample new concepts, which the team often develops after visiting supermar-

kets to get a feel for trending ingredients in different countries.

Of course, Covid-19 has changed the game. "We can't really travel at the moment, so we've been communicating with customers through virtual meetings and webinars. Initially there were some technical difficulties, but practice makes perfect! We've also been sending out samples, so customers can still physically see and taste our concepts. You can talk about recipes all

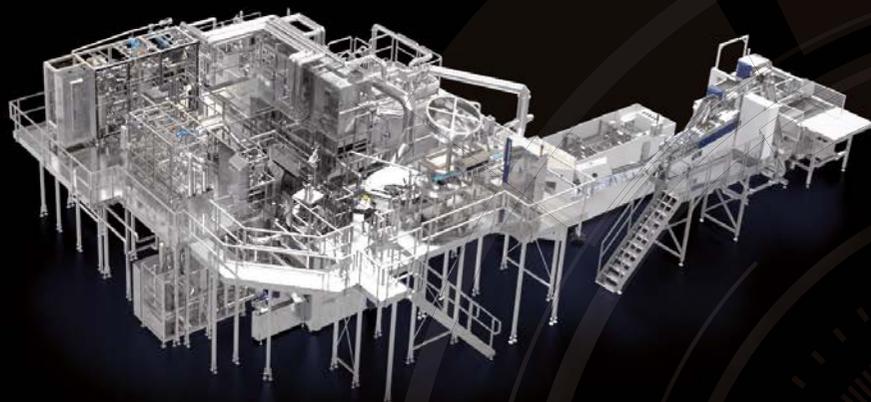
you like, but when you send out physical prototypes, people get to see and taste."

Solving problems, building relationships

The enjoyment Theng Theng gets from problem-solving is clear: "I like it when customers approach us with a challenge, and we need to do a bit of trouble-shooting. At Palsgaard, we enjoy sharing our knowledge and there's huge satisfaction when you're



An unexpected upside of the Covid-19 crisis is that there has been additional time to develop new concepts (photo: Palsgaard)



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able to help solve a problem.” One example of a satisfied customer is the company in the Southeast Asia region that needed to improve stability in a new range of flavoured plant-based milks. “They came to our lab to run trials for a few days, and we worked with them to adjust the recipe on the spot. They’ve now approved the product and it’s due to launch next year, which is very exciting,” Theng Theng says.

Working closely with customers, she often develops strong bonds: “They’re always very appreciative, especially if they’re working in R&D and you help them develop a new product. You start to build relationships with them and sometimes they even become friends.”

So, which does she enjoy more? The problem-solving or the relationships?

She grins: “It’s both! You can’t choose just one of those. In order to solve a problem, you need a lot of communication to get the full picture of a customer’s production process. And it’s easier to talk through a problem when you have a good relationship.”

Bespoke solutions for a plant-based future

An unexpected upside of the Covid-19 crisis is that there has been additional time



There’s a growing trend towards the addition of other ingredients, either for flavour or nutritional benefits (photo: Adobe)

to develop new concepts. So, what can we expect from Theng Theng’s team in the future? “Plant-based beverages are a relatively new area, so many of the projects we’ve been working on with customers are still in the pipeline. Behind the scenes we’ve also been doing a lot of work on improving and developing our products and we’ve been working on a solution for better suspension.”

Theng Theng finds such projects benefit from Palsgaard’s global set-up. “We

have application centres and experts across the world, so I can bounce ideas off my colleagues in Mexico, for example,” she says.

In future, she foresees the development of more bespoke products in response to the need for a wider variety of dairy alternatives. “We’re always listening to customer demands. If there isn’t an existing solution, we’ll try to develop something new for them. It’s an area where we’re keen to move even faster because we’re definitely going to be working a lot more with vegan products in the future.”

Nine new filling lines

SIG preferred partner for two Brazilian dairy companies

SIG has been chosen by Shefa and Líder Alimentos, two major Brazilian dairy companies, as their preferred partner to supply advanced aseptic filling technology and packaging solutions.

A total of nine aseptic filling machines have been installed and are now fully operational at production sites in São Paulo and Paraná. The advanced filling technology from SIG enables both Shefa and Líder Alimentos to offer a wide variety of beverages in aseptic carton packs with different formats and volume sizes. From plain milk and flavoured dairy products to plant-based beverages and nectars, the entire ranges can now be filled in

aseptic SIG carton packs to help meet increasingly differentiated consumer demand. sig.biz



SIG has been chosen by Shefa and Líder Alimentos, two major Brazilian dairy companies, as their preferred partner to supply advanced aseptic filling technology and packaging solutions (photo: SIG)

CSL launches new certified organic products

FLORGANIC Probiotics

More than half of consumers believe that organic products are healthier than products that are not organic. This poses opportunities for innovative producers to expand their offering in a changing market. To support this, CSL Centro Sperimentale Del Latte is launching FLORGANIC Probiotics, a certified organic product range. FLORGANIC Probiotics will support the dairy industry with developing new innovative products that give them a sales and marketing edge over competitors.

FLORGANIC Probiotics offers well-documented lactobacillus strains, such as Synbio blend, *Lactobacillus rhamnosus* CRL1505 and *Lactobacillus rhamnosus* SP 1. saccosystem.com

Sustainably produced ingredients

Palsgaard

Most consumers will pay more for food and beverage products containing sustainably produced ingredients, research by Palsgaard has shown. The emulsifier specialist surveyed over 600 people in four countries.* It found that the COVID-19 pandemic has increased the importance they place on price, but has not detracted from their focus on environmental issues.

Three quarters (75%) of respondents believed food companies have a lot of responsibility for protecting the environment, with 23% believing they have a little. More than nine in ten (92%) said it was important that the ingredients in the products they buy are produced sustainably, with 49% saying it was very important.

Eighty-two per cent said they would be willing to pay more for a food product containing sustainably produced ingredients. Nearly half (46%) would pay over 5% more and 17% would pay over 10% more. Environmental issues were found to be of particular concern to younger consumers. For 18-24 year olds, climate change was the ethical issue food companies should take most seriously.

Sustainability is a key concern for Palsgaard, which in 2018 became the first emulsifier producer to achieve CO₂-neutral production at all its sites. Jakob Thøisen, Palsgaard's CEO, said: "We always believed that carbon neutrality was the right path to take from an ethical point of view. As this research shows, it also makes sound business sense. Consumers,



According to a survey conducted by Palsgaard, consumers are prepared to pay more for foods that are made from sustainable ingredients (photo: Palgraad)

especially younger ones, are increasingly focused on reducing their carbon footprints and will reward food manufacturers who share that commitment."

**Palsgaard surveyed 617 consumers (150 in Mexico, 162 in Singapore, 154 in the UK and 151 in the US) online between the 9th and 15th of June 2020. View the full findings at: <https://bit.ly/31tjRxZ>*



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Know the plant base in your dairy alternative

Successful dairy alternatives are all about the base – and an eye for solving the challenges when producing a brand with the appeal and nutrition that consumers seek

Dairy alternatives hold masses of potential for dairy companies that decide to expand into the plant-based arena. The global market forecast points to profitable growth, and the plant-based diet trend is moving onward and upward as more consumers act on concerns about health, sustainability and animal welfare.

But, no matter how well-established the dairy, a successful plant-based alternative cannot rest on dairy experience alone. If

the high turnaround on supermarket shelves is anything to go by, building a strong plant-based brand is a challenging business that calls for a special approach.

Starting with the base

The fundamental differences between milk and plant-based raw materials are as many as they are varied. Before starting up dairy alternative production, manufacturers need to consider a long list of implications when using a plant base instead of milk. Processability, sensory quality, nutrition, food safety and stability during shelf life will all be top of mind.



Dairy alternatives hold masses of potential for dairy companies that decide to expand (photo: DuPont)



Unlike milk, a plant base tends not to thicken during fermentation (photo: DuPont, Adobe-Stock)

Sonia Huppert, global marketing leader for plant-based health at DuPont Nutrition & Biosciences (dupontnutritionandbiosciences.com), emphasizes the need for a deep understanding of plant raw materials.

“Each plant base behaves in a different way when scaled up to industrial production. Manufacturers have to identify the base that will give their dairy alternative an indulgent and nutritious profile. It may be that a combination of plant bases will give the best result.”

Forecast for global growth

Over the past few years, she has followed the developing dairy alternatives market closely. Growth remains high across regions, notably in Europe and the North and South American markets. In 2020 alone, Euromonitor forecasts global sales growth above 20% in the plant-based alternatives to yogurt and ice cream categories. While the growth forecast for milk alternatives is a more modest 6.4%, the sales volumes are large.

“We are also seeing more demand for a plant-based alternative to cream cheese, which is a particularly versatile option as it can replace cheese, spread and butter and is widely used in cooking,” Huppert says.

In the snacking space, a lot of plant-based innovation is focused on desserts with fruit and other inclusions or fermented beverages fortified with protein and vitamins.

A well-managed process

So how can product developers make a success of it? For DuPont principal application specialist Kirsten Lauridsen, food safety is one of the first considerations. Because plant bases are generally a source of more spore-forming bacteria than milk, processing may need to start with a short, sharp heat treatment to eliminate potential pathogens.

“If you are producing a fermented oat drink, for example, then you need to create the right conditions for adding a live starter culture, which could also contain probiotic strains. UHT treatment removes pathogens before you do that,” she says.

The next sticking point could be the fermentation process itself. While the lactose in milk acts as substrate for dairy fermentation, the carbohydrate composition of plant bases is more complex.

“Carbohydrates vary from plant to plant and can depend on when the plant was harvested. With cereal bases, an enzyme can be used to release glucose for fermentation. Nuts such as almonds are more of a challenge. There may be a need to add sugar to get fermentation started.”

Stable to the end

Unlike milk, a plant base tends not to thicken during fermentation, mainly due to a lower protein content. One solution is to add plant protein isolate derived from pea or soy. Lauridsen explains that this can both provide the desired viscosity and improve the nutritional profile. Use of a stabilizer ingredient – such as pectin or a combination of starch and locust bean

gum – is another possibility for turning a thin and watery product into a creamy experience.

Once products leave the production line, the big test is their stability in storage. While a stabilizer can prevent separation so dairy alternatives keep their homogeneous quality all the way to the consumer, spoilage may still be a problem. Today, manufacturers can turn to specially developed protective cultures.

“For manufacturers that do not yet sell high volumes, an extra five to ten days of shelf life is important for extending the sales window and reducing waste,” Lauridsen says.

Brands that succeed

Once a dairy alternative is ready for market, a big question for dairy companies is how to choose the right positioning. While some major brands have successfully expanded their range with new plant-based options, others are likely to benefit from establishing a separate brand label. A strong focus on health and nutrition is a promising strategy moving forward.

Huppert sums up the opportunities: “More consumers are looking for free-from products, such as lactose-free, probiotics that support digestive health, and proteins rich in essential amino acids – all in a plant-based format with an indulgent taste and texture.”

Manufacturers who crack that code are those who set out by selecting and combining the right plant raw materials. Their products are the dairy alternatives that have the best chance of keeping their place on supermarket shelves for some time to come.



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World dairy situation in focus

IDF launches new report on global dairy markets and trends



Author: Caroline Emond, Director General of the International Dairy Federation



The International Dairy Federation's latest overview of the dairy sector, covering markets worldwide, global trends and preliminary impacts of the COVID-19 pandemic has been released. The latest edition of its flagship publication on global dairy markets, the World Dairy Situation Report 2020, was unveiled at a special online launch event on 27 October. The publication is produced annually by IDF as part of its mission to represent and support the dairy sector globally.

The 2020 edition is the result of close collaboration between dairy experts and key organisations around the globe and within the IDF. It consists of written chapters on production, processing, prices, consumption, and trade, and is expanded with 30 tables that give the reader an overview of global dairy developments. In this year's issue, a full chapter is dedicated to the preliminary impacts of the coronavirus crisis on the global dairy sector in 2020.

Assessing the impact of 2020

Given the depth and breadth of the challenge, the resilience of the dairy chain has been remarkable. Considered as an essential service in most regions of the world, the dairy supply chain is reacting and adapting its practices to face the challenge and continue to produce healthy and nutritious milk and dairy products.

This crisis will no doubt have long term effects on the social and economic fabric of our societies. As is still unknown how long this global pandemic will last, market uncertainty will likely remain for several months.

Given the confinement in many countries, COVID-19 has shifted consumer purchase patterns with less consumptions of dairy products in restaurants and foodservice and increased demand at the retail level. The 2020 milk production growth is expected to return close to the long-term average slightly above 2% after being lower than expected in 2019.

World prices, which suffered a downward shock due to COVID-19, are expected to return to normal levels by 2021. The geopolitical and trade environment also contribute to uncertainty in the dairy sector with ad hoc tariffs being imposed and several bilateral and multilateral trade agreements under negotiation while others are being implemented. Nonetheless, the dairy sector continues to consolidate to achieve greater efficiencies.

In-depth understanding of supply and demand trends

The 243-page report contains detailed information about the international dairy sector, including data tables, graphs, country reports and analyses for more than 50 dairy-producing countries from all five continents. Its statistics will help the reader to better understand and deal with the many challenges and opportunities facing the global dairy market. The report will be of interest for dairy farmers, equipment and service providers, dairy processors, cooperatives, distributors and retailers, experts in dairy marketing, sales, nutrition, ingredient & input firms, food-industry/food service, agricultural schools, universities, governments representatives, consultancy firms and specialized media.

"The World Dairy Situation 2020 is an essential read for decision-makers and dairy sector stakeholders concerned with continuously changing global dairy market conditions. To further meet the needs of our sector, the 2020 edition of the report also features a special chapter dedicated to the preliminary impacts of the Covid-19 pandemic on the dairy sector, including details on how the sector is adapting its practices to continue to produce safe and sustainable milk and dairy products."

The report is available for purchase on IDF website www.fil-idf.org.

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The power of family

Krones group has realized TINE's new dairy plant



Author: Hermann Meyer, Milkron GmbH, phone +49 511 89813-150

Krones' subsidiary Milkron has completed its largest project to date: planning and engineering a new dairy for TINE in Bergen, Norway. The project also integrates expertise from Krones, Evoguard, HST, and Syskron.

The owners of TINE, Norway's biggest producer of dairy products, know each of their cows by name. And it's no wonder: TINE is a cooperative, owned primarily by the farmers who supply the company with raw milk. For the construction of its new dairy in Bergen, TINE has opted to rely on the power of family – purchasing its process technology from the Krones family of companies.

TINE's current structure goes back to the 19th century, when several farmers joined to-

gether to process their raw milk. Over time, the cooperative has grown its membership, which now includes around 10,000 farmers across Norway. "Our aim is to process and distribute our members' milk – and thus ensure sustainable income for local farmers," explains Mårten Haukjem, manager of the dairy plant in Bergen.

Every afternoon, some eight milk tankers roll up with the raw milk collected from local dairy farms. "Logistics are certainly a challenge for us. Norwegian farms tend to be far apart from each other and many are very remote," explains Mårten Haukjem. Jörgen is one such dairy farmer. Although his farm is only about 20 kilometers from TINE's new plant, it takes the milk tanker

a solid 45 minutes to make the trip along curving roads that sometimes narrow to just one lane. Jörgen's 25 dairy cows spend summers at pasture and winters in the barn. His farm represents a typical dairy farm in Norway. Because of the country's topography – a mix of deep fjords and towering mountains – most Norwegian dairy farms are relatively small. The average dairy farmer has 22 hectares and 24 cows.

Market leader in Norway

While TINE's company structure and atmosphere recall a large extended family, the company's numbers are like those of a large corporation. With annual revenue of 2,250 million euros in 2019, TINE is the leading producer of dairy products in Norway. Besides a wide variety of cheeses, the company also produces liquid dairy products.

The new dairy plant in Bergen supplies the entire region with fresh milk, cream, and fruit juices. Although the plant's daily production capacity of 300,000 liters is relatively small, this facility is the most modern of the company's 32 plants. "Our old dairy plant was built in the 1950s and was no longer efficient. Its location within city limits and the existing equipment didn't allow much room for flexibility. We'd long been considering the possibility of building a completely new plant to give us more flexibility in terms of infrastructure and to bring the technology up to the latest state of the art," says Mårten Haukjem. In early 2017, TINE took the plunge and started looking for a partner to make the new dairy a reality.



TINE's new dairy plant in Bergen supplies the entire region with fresh milk, cream, and fruit juices.



“One of the reasons we chose Krones is that they are a large group with a lot of experience ...”Because Krones (Milkron) was one of the few vendors capable of actually delivering the entire process technology, they got the contract.”

- Mårten Haukjem, manager of the TINE dairy plant in Bergen

Milkron, the Krones Group's dairy expert, was among the companies that submitted a bid. Based near Hanover, Germany, Milkron was only a year old at the time, but its people had decades of experience in the

dairy industry to draw from. “This expertise was a deciding factor for us. Milkron knew our industry and had exactly the right connections to build our new dairy,” concludes Mårten Haukjem.

Another major factor in Milkron's favor was the bundled expertise available through the House of Krones. TINE broke the project into three large subprojects – and wanted a suitable partner to serve as general contractor for each one. “To keep the processes as simple and have as few points of contact as possible, we looked for a one-stop shop for each subproject. And because Krones (Milkron) was one of the few vendors capable of actually delivering the entire process technology, they got the contract,” says Mårten Haukjem.

Almost the entire House of Krones was on board

Milkron took care of all planning and execution for the process technology – from milk receiving to processing and storage of the finished products to their transfer to



An Evoguard valve manifold controls the transfer of the milk, cream, and juice to the correct one of five fillers – for cartons, large containers, or bag-in-box containers.

the filler. Milkron continually had experts from Hanover on site in Bergen coordinating the entire construction work – including the subcontractors – and making sure that delivery, assembly, installation, and

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startup of the equipment went like clockwork. “Since neither Milkron nor Krones has an office in Norway, the materials and the entire team had to be ‘imported’. Of course, that required an incredible amount of planning, coordination, and logistics. But they managed it extremely well,” says a satisfied Mårten Haukjem. The project required a considerable amount of material: Milkron installed more than 15 kilometers of stainless steel pipe to carry milk, finished product, water, and heat transfer media between the 54 tanks.

Milkron also brought other Krones subsidiaries on board for equipping the dairy with the necessary process technology.

- HST delivered the homogenizer, which is used to partially homogenize 8,000 liters of fresh milk per hour at a pressure of 200 bar.
- Evoguard supplied almost all of the valves – 1,107 in all. What made this delivery special is that the delivery included twelve valve manifolds of various sizes, which

Evoguard designed and built precisely to TINE’s specifications. That also included AS interface bus communication between the valves and the higher-level controllers. Before delivering the valve manifolds, Evoguard subjected them to a Factory Acceptance Test at its Nittenau plant in collaboration with TINE specialists. Thus, they could ensure and document compliance with the customer’s specifications and proper functioning of the valves before they shipped to Norway.

- For the process control system, TINE wanted an automation solution that was both state-of-the-art and energy-efficient – and they chose Botec F1 from Syskron. The system monitors and controls the entire production process. In addition, TINE’s existing IT environment was fully integrated and interfaces were established to almost all systems. Thus, data on energy and media consumption can be called up and displayed through Botec. In addition, order handling can either be done through

the existing system or directly within Botec (read more on page 25).

- Parent company Krones collaborated with TINE to design a complete energy concept for the new dairy plant, using a three-stage system comprising heat pumps and cooling units. The heart of the system is a hybrid high-temperature heat pump that can generate very high temperatures with a relatively low level of pressure.

Outstanding sustainability concept

“Sustainability is a top priority for TINE. To us, sustainability means efficient, prudent use of raw materials, energy, and water across all stages of production. Our target of no more than 0.5 raw materials waste is ambitious – but we will achieve it,” says Mårten Haukjem. “We also want to operate as energy-efficiently as possible.”

Together with Krones, TINE developed a sophisticated energy concept that addresses consumption across the production processes as well as building services. At the concept’s core lies a heat pump system with two temperature levels – 67 and 95 degrees Celsius – for hot water. The heat pumps use the process heat from the plant’s cooling and compressed air systems. “We have a relatively complex energy network. The heat pumps enable us to use process heat to generate hot water, heat the building, or melt ice and snow,” says Mårten Haukjem.

The plant’s closed-loop systems for water and dry cooling system mean that no fresh water is needed for heating and cooling operations. Four exterior water tanks – each with a capacity of 130,000 liters – serve as a water storage system. Krones coordinated all of the points of contact and supplied the prefabricated utilities on skids. Milkron took care of pipe installation and hook-ups.

The concept has paid off. With it, TINE has reduced energy consumption by 40 percent overall – earning the company recognition by the European Heat Pump Association. Besides the heat pumps, the dairy also has 6,000 square meters of solar panels installed on its roof to generate and store backup power.

Ahead of schedule

This was the first time TINE had entrusted the Krones Group with the en-

From raw milk reception to transfer to the filler

At TINE’s new dairy plant in Bergen, raw milk receiving happens behind gates 49 and 50. The milk tankers begin arriving in the early afternoon. Milk collected from local dairy farms is offloaded on two receiving lanes, pumped from the tractor and trailer ends simultaneously. The milk first flows down into the receiving silo, where it is de-aerated and cooled to two degrees Celsius. It is then pumped upward, into one of the three 100,000-liter raw milk tanks located above the receiving silo.

The milk then enters the hygienic section of the plant. After being heated to 55 degrees Celsius, it travels through a separator, which separates the cream from the milk. The fat content desired for the final product is set, this part of the milk is homogenized, and then mixed back in with the rest of the milk collected. The milk pasteurizer can process up to 25,000 liters per hour. The partial homogenizer handles 6,000 to 8,000 liters per hour. The excess fat is transferred to one of five cream tanks to later be used for producing whipping cream.

The milk itself is heated to 74 degrees Celsius in a heat exchanger, and then immediately chilled again in a regenerative heat exchange process. It is chilled down to two degrees Celsius using ice-water cooling and then transferred to one of five tanks. Besides the 10 tanks for dairy products, the warehouse also holds four tanks for fruit juice production.

An Evoguard valve manifold controls the transfer of the milk, cream, and juice to the correct one of five fillers – for cartons, large containers, or bag-in-box containers. Milkron also installed two CIP systems for cleaning the lines – one for the raw milk and one for pasteurized products. TINE’s specifications required hot-water sterilization at 80 degrees Celsius.

In order to keep waste to a minimum, the milk that is used for flushing the system at the start of the CIP process is heated and made available to farmers to use as animal feed. The mixed phases that arise during startup, flushing, and product changeovers are also collected, concentrated in a reverse osmosis process, and then dosed into the pasteurizer’s buffer tank.



The homogenizer from HST is used to partially homogenize fresh milk

tire range of process technology – and Mårten Haukjem is more than satisfied with the results. “One of the reasons we chose Krones is that they are a large group with a lot of experience. Even the bid they submitted was almost exactly what we had imagined from a technical perspective, and we had many good, valuable conversations during the clarification phase. We always felt good about it and consistently felt that we had made the right choice.”

Besides the technical aspects, the timetable also played an important role. And although Milkron served as the general contractor, coordinating all of the subcontractors, and handling the entire execution of the project, there were still plenty of points of contact. “Timing is always a crucial element on a big project like this. Everyone involved in this project worked together extremely well, during the planning stages and during the critical stages of construction. In the end, we were able to go into production a week earlier than planned,” says Mårten Haukjem. Milkron took care of some final adjustments and then even relocated a juice system from the old dairy to the new one.

TINE now has a highly energy-efficient dairy plant in Bergen with state-of-the-art equipment – but the company isn't resting on its laurels. “We're faced with a challenge: statistics show that consumption of fresh milk is declining. For us, that means that we have to make our production even more efficient, all the while maintaining our high standards of quality,” says Mårten Haukjem. “We never stop striving to become even better.”

TINE puts its trust in Botec F1

When planning its new dairy, TINE opted to fully integrate Botec F1 into its existing IT environment. The custom solution by Syskron is based on three main factors:

1. Automation scope

- Botec F1 to control the entire production process, including
 - milk reception
 - CIP processes
 - all valves fully connected via Asi Bus
 - complete integration of all supply units:
 - water treatment, including ultra-filtration,
 - compressed air supply, cooling system,
 - and heat pumps
- PLC frame with the latest generation of Siemens S7-1500 controls
- Batch handling, including visualization and connection to TINE's MES components

2. Botec features

- Bidirectional tracking and tracing
- Remote maintenance via VPN
- Compatible with Siemens SPS S7-1500 controls and Profinet
- Alarms from Botec F1 are transferred to TINE's SMS system
- Order handling module: production orders can be generated either directly in Botec or in TINE's ERP system and then transferred to Botec
- Language can be switched between Norwegian and English

3. Data interface for TINE's IT systems

- Process status and alarms for “raw materials” are integrated into Botec
- Botec's IFace interface delivers information to TINE's integration platform (Laboratory Information Management System, Business Intelligence System, and Asset Management)
- A data interface connects to TINE's production data acquisition system

The results are impressive: TINE received a state-of-the-art software solution that made day-to-day production operations significantly easier for everyone involved. Highly complex processes can be mapped, controlled, and tracked. Entries are made via an intuitive graphical user interface.

The system also completely integrates all energy supply units, making it even easier for TINE to fulfil its promise of sustainable, energy-efficient production.



For the process control system, TINE chose an automation solution from Syskron: Botec F1 monitors and controls the entire production process.

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Sisterna

Sucrose esters in ice cream

Author: Lia Bax, Product & Salesmanager Food, Sisterna B.V. The Netherlands



© Jason Leung/unsplash.com

Sisterna sucrose esters are emulsifiers with unique and powerful functionalities. Not only are they very effective oil-in-water emulsifiers, they also interact with proteins, and facilitate aeration. These are just of few of the numerous benefits of using Sisterna sucrose esters.

In the area of ice cream there are three different products that we can focus on for sucrose esters; Industrial ice cream, artisanal ice cream and vegan ice. Sisterna sucrose esters in ice cream:

- Excellent clean eating properties
- Improved flavour release
- Reduction of ageing time
- High overrun at low dosages
- Reduction of aeration time
- Homogeneous melting properties
- Cold processing possible in ice cream powder

Industrial ice cream

The requirements for ice cream are very diverse. Consumers require certain eating characteristics or a specific flavour profile. The producer requires quick and easy production. Quality assurance requires a product that can withstand temperature fluctuations. All these requirements are related to the choice of emulsifier, and so a combination of emulsifiers is often used. Emulsifiers improve the distribution of the fat globules and, during aeration/freezing, the destabilisation and agglomeration of fat globules. Furthermore, emulsifiers affect the amount of air incorporated and reduce shrinkage during storage. A finished ice cream depends on the right choice of emulsifiers for its texture, dryness and melting properties.

> Aging time

Sucrose esters reduce ageing time effectively as they can quickly replace the proteins from the fat globules (where cream is used as the fat source). Sucrose ester molecules are smaller than proteins and have stronger surface activity. Reduction of ageing time can save hours in the production process.

> Overrun

Sucrose esters as powerful aerating agents ensure a quick overrun and a stable prod-

uct. Sucrose esters decrease the surface tension between air and water, facilitating aeration.

> **Clean eating profile**

Water soluble sucrose esters have very strong surface activity, ensuring smaller fat globules upon homogenisation of the ice mix and smaller air bubbles upon freezing. It is generally known that smaller fat and air globules result in a smoother, creamier mouth feel. Ice cream with sucrose esters is perceived by the consumer as fresh, creamy, milky and soft, while fat soluble emulsifiers are perceived as more churned and greasy.

Churned fat or so-called "free fat" is needed to create a stable ice cream. Too much churned fat covers the tongue's palate, reducing perception of flavour. More flavours have to be added and even then it is not always possible to taste the total flavour profile. Especially when using delicate expensive flavours, it is worthwhile balancing the free fat with the help of sucrose esters. Sucrose esters create smaller, more stable fat globules compared to traditional emulsifiers. Ice cream produced with sucrose esters will have less free fat and a pure flavour profile.

In order to prove the effect of sucrose esters on the flavour release of ice cream, a sensorial test was performed. A comparison was made between ice

cream based on partly unsaturated mono- and diglycerides 90% (uDMG) and ice cream based on Sisterna SP70.

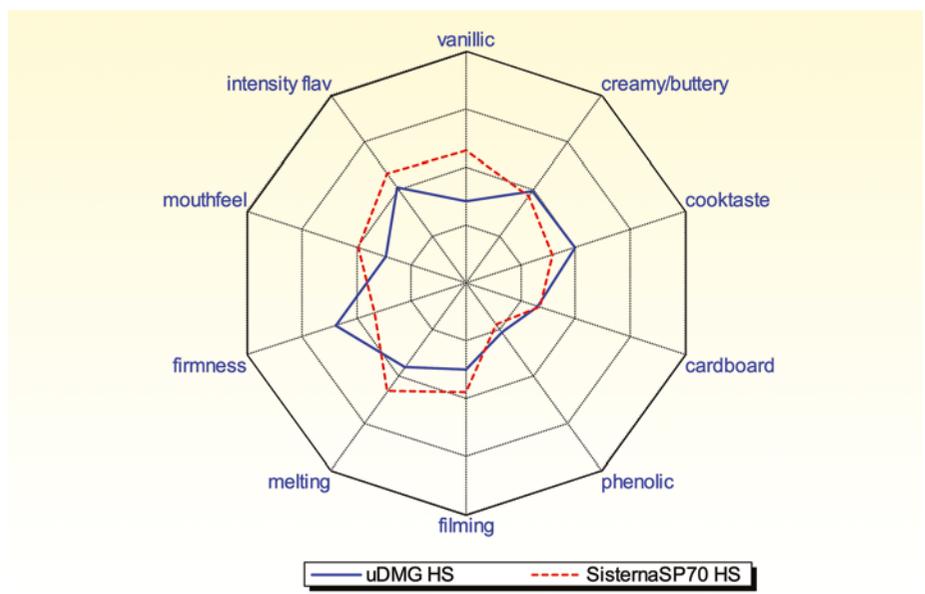
The flavour perception, eating quality and heat-shock stability of (natural) vanilla ice cream was improved by using SP70 as emulsifier. The vanilla flavour, the creamy/buttery sensation, and the phenolic attributes were stronger. The vanilla flavour remained strong even after heat shock. Where the ice cream with uDMG became hard after heat shock, the SP70 sample kept a soft bite. The flip side of this softness is that the ice cream also melted quicker.

Advice

Sisterna SP70 is used as emulsifier in ice creams with varying fat content. The dosage is 0.2-0.3% over the total mix. Sucrose esters combine well with mono- and diglycerides to give the right balance in terms of stability and flavour profile.

Vegan ice

Veganism is becoming increasingly fashionable and vegan food is seen as something in which indulgence, health and/or animal welfare meet. Sisterna developed a vegan ice recipe and found the same benefits from using sucrose esters as were described for milk containing ice cream. The preparation is also comparable with that of dairy ice cream.



Result of sensory tests of ice cream with Sisterna SP70 and uMDG, after heat shock

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Monitoring dairy operations

German dairy uses IP cameras in its plant to monitor the filling line and outside area



(photo: MW Schwaben)

Info at a glance

Milchwerke Schwaben, a leading dairy company in Germany, has equipped its plant in Neu-Ulm with several network cameras to monitor production. In addition to securing the plant entrance and delivery zone for simple access control of entry, employees needed to be notified acoustically as soon as any malfunction occurred in the filling line, the valve manifold or a powder silo.

The solution is based on a combination of high-resolution Axis cameras and speakers that can be operated efficiently and easily using AXIS Camera Station Video Management Software.

Milchwerke Schwaben used the Neu-Ulm-based electrical company Reimer Elektrotechnik as their advisory consultant for the project and chose Axis Communications, innovation leader in the field of network cameras.

Thanks to the AXIS Camera Station video management system, system expansion with additional cameras or speakers can be implemented easily and flexibly at any time.

As one of the leading dairy companies in Germany (as of mid-2020), over 180 employees produce an average of 200 tons of yogurt and dessert specialties, 32 tons of butter, 100 tons of cheese, and 61 tonnes of milk and whey powder per day under the brand name “Weideglück”. Milchwerke Schwaben processes about 426 million kilograms of milk and whey each year. “Weideglück” products are exported to 70 countries around the world.

High quality and security thanks to network cameras

The plant in Ulm looks back on a long tradition. To keep the quality and safety of their sensitive milk products high and to reduce raw material losses and thereby save costs, Milchwerke Schwaben decided to upgrade its video surveillance both inside and outside the production hall.

As a first step, the plant entrance was equipped with new network cameras to enable number plate recognition of the incoming and outgoing trucks, as damage sometimes occurred as the trucks were being maneuvered. The outside area is now monitored by an AXIS P1447-LE and an AXIS P3719-PLE multi-sensor camera. In addition to the simple and inexpensive installation, the latter offers a good overview of the outside area in several directions – doing the

work of four cameras in a single device. In addition to the outside area, the live transmission of images of the filling line was a key point of the installation: Milchwerke wanted immediate acoustic notification as soon as there was any malfunction in the filling line. “We now have 25 cameras in use both inside and out, giving us a full view of the filling line and the intersection leading to the plant entrance,” explains Holger Gebauer, Head of the Electrical Maintenance Workshop at Milchwerke Schwaben.

Malfunction in production immediately triggers an acoustic signal

The interior of the plant is covered by two AXIS P1435-LE and five AXIS M2026-LE MK II Network Cameras that monitor the



The outside area of Milchwerke Schwaben's plant is monitored by an AXIS P1447-LE and an AXIS P3719-PLE multi-sensor camera (photo: MW Schwaben)

pipeline system. A wide-angle camera, the M2026-LE MK II, is used here. Particular caution is required at this stage of production, as the milk powder is pumped from the trucks into the line at high pressure. The connections, solenoid valves and pumps must all be set correctly. Otherwise large amounts of valuable raw materials could be lost in a short amount of time. That is why the cameras of the milk powder line were connected directly to the audio system – a warning signal sounds immediately if a large amount of dust forms. With the help of AXIS Video Motion Detection 4, the camera detects an undesired event or movement, such as the escape of powder, and then triggers the alarm via a network.

"The advantages of the new network cameras became apparent to us immediately in the truest sense of the word. The videos were clear and details were easy to see. The link between acoustic warning and video was also extremely important to us. Thanks to the great network, which has very low latency times in live transmission, we can optimally monitor production, stop it if necessary, and thus save considerable costs," says Gebauer.

Simple system expansions with video management software possible

The successful interaction of all components – encoder, cameras and audio system – was particularly important for Milchwerke. AXIS P7216 Video Encoder is a key component of the installation, converting images from old analog cameras into a digital signal. This way, Milchwerke can gain all the advantages of IP technology, while still using analog cameras.

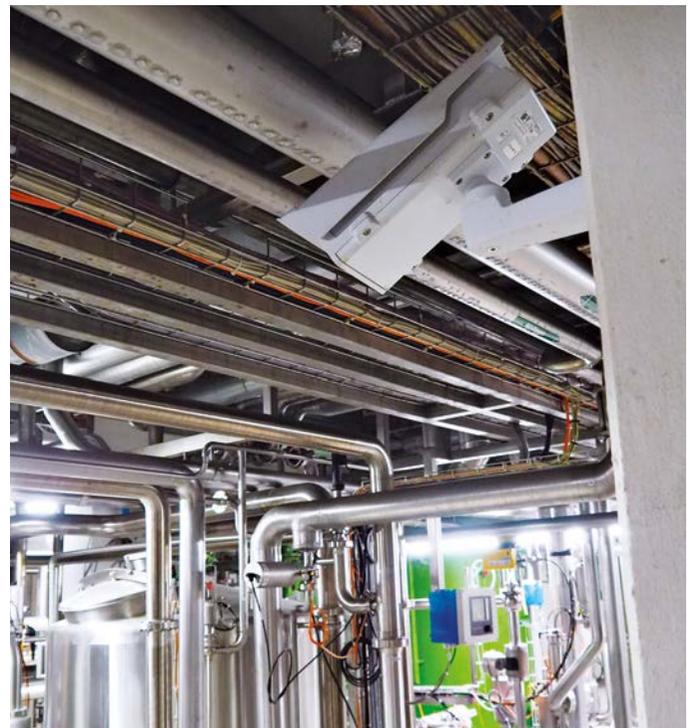
While AXIS Companion was used as video management software at the beginning of the project, the system has now been migrated to the AXIS Camera Station (ACS), which runs on a virtual server at Milchwerken Schwaben (thereby simplifying future system expansions). It is particularly important to Milchwerke to have a flexible, expandable system, as new product creations are constantly in development and the systems and processes must therefore be adapted.

All elements of the production line are linked and managed via the AXIS Camera Station. A 55-inch monitor in the operations room shows images from 16 cameras from the various production areas in real-time. An employee keeps an eye on the monitor, as no video recording takes place indoors for data protection reasons. The high-performance AXIS Camera Station also has an intuitive user interface that allows you to react to incidents in real-time. Depending on requirements, Milchwerke Schwaben can adapt the layout to their daily needs with a live view, site plan, or website display using drag and drop.

Efficiency and optimization of operational processes

Reimer Elektrotechnik was responsible for the selection and implementation of the camera and audio solutions, and also handles support and maintenance of the entire system in Neu Ulm. Two employees are permanently assigned to check the machines and adjust and renew the electrical systems there. "We are on-site so that everything runs smoothly, and the machines don't come to a standstill. We also keep an eye on the efficiency and optimization of operational processes, which is one of the reasons why we chose this modern solution for production monitoring from Axis," adds Marc Klöppel, Master Electrical Engineer at Reimer.

The project in Neu-Ulm began with just a few cameras and a basic system. As the advantages of the new solutions became apparent immediately, cameras, encoders and audio solutions were gradually added. Thanks to the end-to-end security solutions from Axis, these could be seamlessly integrated into the existing systems. Milchwerke Schwaben thus has a future-proof security system that grows along with their requirements.



The interior of the plant is covered by two AXIS P1435-LE and five AXIS M2026-LE MK II Network Cameras that monitor the pipeline system (photo: MW Schwaben)

The environmental impact of products

Sustainable packaging that goes Way Beyond Good

Brands are under increasing pressure to respond to demand for more environmentally-friendly packaging solutions. Aseptic beverage cartons can offer the natural solution (Photo: SIG)

Prominent campaigns on plastic waste and climate change have got more people thinking about the environmental impact of the products they buy. Packaging can play a big part in influencing their attitudes.

74% of Europeans say the media focus on packaging ending up in the sea has influenced them to change their purchasing habits, according to the 2018 European Consumer Packaging Perceptions Survey (ECPPS: <https://www.procarton.com/wp-content/uploads/2018/10/European-Consumer-Packaging-Perceptions-study-October-2018.pdf>). In Spain for example, 81% of consumers say the environmental impact of a product's packaging affects their purchasing decisions. Two thirds have even switched products because of packaging concerns.

Brands are under increasing pressure to respond to demand for more environmentally-friendly forms of packaging. Ace Fung, Marketing Manager Sustainability at SIG, discusses why aseptic beverage cartons can offer the best solution.

Ace Fung: "Recycling packaging is one of the most obvious ways consumers can do their bit for the environment and they expect packaging to be recyclable. Beverage cartons are recyclable after use. They also have the added environmental advantage that they are made mainly from renewable and sustainable paperboard."

The ECPPS found that 52% of all Europeans believe cardboard is the most environmentally friendly packaging. If the same product was

packaged in two different forms, 81% would choose the cartonboard pack over the plastic one.

Independent life-cycle assessments confirm this perception, showing that beverage cartons significantly outperform alternative types of packaging on key environmental impacts, such as fossil resource consumption and climate change. This is thanks to their high proportion of renewable raw materials and their resource-efficient design.

Ace Fung: "Overall, SIG carton packs use between 38% and 77% fewer fossil fuel resources than alternatives such as glass, HDPE or PET bottles, pouches and cans – for a range of products including long-life food, UHT milk and non-carbonated soft drinks. And they have a 28% to 70% lower life-cycle carbon footprint."

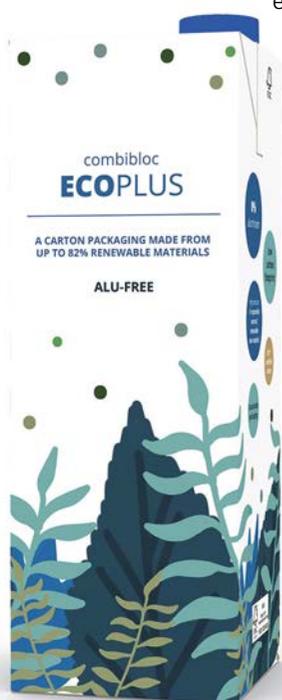
Combatting climate concerns with combibloc EcoPlus

Climate change has become a mainstream topic for consumers, topping the list of environmental concerns cited in a 2019 Ipsos MORI survey. Beverage cartons are helping the food and beverage industry meet demand for lower-carbon packaging – and SIG is innovating to create even lower-carbon solutions.

The combibloc EcoPlus pack for example cuts the carbon footprint of SIG's packs by a further 28% – by using an innovative material composition to eliminate the need for an aluminium foil barrier layer. It's the world's first aluminium-free aseptic carton and it's made of 82% renewable paperboard. Ultra-thin polymer layers act as a barrier to protect the product from flavour loss and external odours, contain the liquid inside and keep moisture out. Sales of combibloc EcoPlus have now surpassed the 1 billion mark.

Polymers linked to 100% plant-based materials with SIGNATURE PACK

SIG built on the pioneering aluminium-free design of combibloc EcoPlus to create the world's first aseptic carton pack linked to 100% plant-based materials. The SIGNATURE PACK 100 solution for the dairy market offers a 58% lower carbon footprint than a standard SIG pack.



The combibloc EcoPlus pack cuts the carbon footprint of SIG's packs by a further 28% – by using an innovative material composition to eliminate the need for an aluminium foil barrier layer. It's the world's first aluminium-free aseptic carton and it's made of 82% renewable paperboard (Photo: SIG)



SIG developed the first fully renewable and recyclable paper straw solution for aseptic carton packs (Photo: SIG)

Ace Fung: “The polymers used in the pack are linked to plant-based materials through an innovative mass balance system that supports the use of renewable feedstock in mainstream polymer production. SIG chose tall oil – a residue extracted from wood in the paper making process – as the plant-based feedstock because it’s a by-product from another industry rather than an agricultural crop requiring land and resources that could be used to produce food.”

Uptake of SIGNATURE PACK 100 is growing for dairy products with well-established brands like CANDIA and Arla across Europe. Major brands, such as Riedel, are also opting for SIGNATURE PACK for juice products. Like SIGNATURE PACK 100, the Full Barrier option uses polymers linked to plant-based materials, but it also includes a very thin aluminium foil barrier layer to protect products like orange juice that are more sensitive to light and oxygen. It has an around 45% lower carbon footprint than a standard SIG carton pack of the same format. SIGNATURE PACK Full Barrier is now offered with ASI-certified aluminium.

SIGNATURE PACK is supporting the transition away from conventional plastics made with fossil fuels without compromising on the quality of barrier protection. The World Packaging Organization recognised this milestone for aseptic packaging by awarding SIGNATURE PACK the prestigious WorldStar Packaging Award in 2019.

Cartons with circular polymers

SIG is also leading the industry by being the first to offer beverage cartons made with recycled polymers produced from post-consumer plastic waste. This means the beverage industry will be able to respond to consumer demand for packaging made with recycled plastics by choosing SIG cartons made with certified circular polymers.

This innovation reinforces SIG’s contribution to the circular economy by making use of low quality, mixed plastic waste that would otherwise be incinerated or sent to landfill. The mixed plastic waste that is collected is treated in a process that enhances the material and transforms it into a high-quality food grade material. Diverting plastic from the waste stream and utilising innovative technologies supports keeping valuable resources in use while reducing the need to rely on virgin fossil materials.



SIGNATURE PACK is the world’s first aseptic carton pack linked to 100% plant-based materials (Photo: SIG)

Alternative to plastic straws

The environmental impact of plastic straws is also a major concern for businesses and consumers around the world. With many governments and cities beginning to ban or phase out plastic straws, the food and beverage industry is under pressure to offer a viable alternative.

To help producers meet these demands and reduce plastic waste, SIG developed the first fully renewable and recyclable paper straw solution for aseptic carton packs. The paper straw is designed to help the beverage industry meet the growing demand for environmentally friendlier packaging, prove their commitment to the environment, and maintain the convenience of small-size, on-the-go packs.

Ace Fung: “We’ve worked closely with manufacturing partners to develop innovative straw solutions that are made of paper and robust enough to pierce the closed straw holes of our cartons. We’ve also redesigned the straw wrapper so it stays attached to the pack and can easily be recycled.”

Going Way Beyond Good

With solutions like SIGNATURE PACK, combibloc EcoPlus and carton packs with circular polymers, SIG is leading the industry on sustainable product innovation and the company has also achieved a host of other industry firsts on its journey Way Beyond Good.

SIG was the first in the industry to enable customers to include the Forest Stewardship Council (FSCTM trademark licence code: FSCTM C020428) label on any of its packs. First to make all its packs with 100% renewable energy. And, most recently, SIG was first to offer packs labelled with the Aluminium Stewardship Initiative (ASI) standard for responsible aluminium.

Ace Fung: “We are partnering with customers to create a more sustainable food system. We are committed to do more, to go Way Beyond Good for people and the planet.”



Ace Fung, Marketing Manager Sustainability at SIG (Photo: SIG)

The right packaging equipment for liquid and viscous food products

Syntegon

From yogurt to baby food, the range of liquid and viscous food products is growing steadily. Dairies and food manufacturers are continuously defending and expanding their market share with fresh ideas. This also poses new challenges for packaging solutions. Consumers expect cups and containers that are produced as sustainably as possible, without compromising product protection or shelf life. At the same time, food manufacturers want a packaging process that is as fast, safe, precise and hygienic as possible. Expert technical support is therefore indispensable to make the right choices.

A variety of questions can arise in the context of new packaging designs. Is the packaging optimally suited to the product, or are there better alternatives? Do the packaging's barrier properties offer sufficient product protection and shelf life? What degree of sterilization does the packaging machine need to deliver, and which sterilization methods are best suited to the task? And lastly: will consumers want to buy the product? "Sustainably developing new products requires close partnerships between food manufacturers, material suppliers, and machinery manufacturers like us," says Korbinian Tomschi, Head of Process Technology at Syntegon Technology in Königsbrunn, formerly Bosch Packaging Technology. Tomschi is also Head of Syntegon's Ampack Technikum, which offers a testing center to help answer these questions.

Dairies and food manufacturers that want to conduct filling trials don't normally have the requisite resources to aseptically fill new products on an experimental scale. Using their own filling and packaging equipment isn't an option, since the throughput rate would be far too high, and interrupting their normal production would be cost-prohibitive. Small testing facilities are the answer, especially when they are operated by machinery manufacturers like Syntegon, with the required expertise and testing centers like the Ampack Technikum. Here, sterilization, dosing precision, and sealing can be tested on a small scale, before taking the step of refitting existing machines or constructing new ones.

Testing under real-life conditions

When it comes to sterilization, testing is essential, particularly for manufacturers and packagers of delicate products like baby food. The sterilization of new cups or packaging materials can be effectively assessed at testing labs like the Ampack Technikum in Königsbrunn. After all, new chillecontainers can only be used in production when and if they meet the hygienic requirements and can be reliably sterilized during the packaging process. The necessary settings are determined at the pilot facility and

subsequently transferred to the customer's own production systems. This yields the optimal decontamination process for the respective product.

Microbiological and chemical tests are one way to answer key questions in packaging design – mechanical and mechatronic tests are another. For example, when a consumer grabs a cup of yogurt from the chiller cabinet, he or she assumes that it actually contains the 150 grams of product that it claims to. And dosing precision is just as important for manufacturers, since product waste harms both their profitability and the environment. Consequently, food manufacturers who plan to purchase or refit filling systems are well advised to experiment with the best settings for dosing their product on a small scale. Especially for complicated filling tasks like layered desserts, test dosing runs like those offered at the Ampack Technikum can be extremely helpful.

In turn, perfect sealing is indispensable for ensuring product hygiene and optimal shelf life. Sealing tests are used to gauge, optimize and validate the sealing performance of new packaging products. New and unconventional sealing solutions are required especially in combination with highly recyclable monomaterials. In this context, representative tests conducted under real conditions will lead to the right decisions in the packaging process.



To ensure that newly designed cups can be reliably sterilized, their forms and/or packaging materials can be evaluated at testing labs like the Ampack Technikum (photo: Syntegon)



As a doctoral candidate at Syntegon's Königsbrunn site, Leonie Kempf is investigating in the sterilization of packaging materials (photo: Syntegon)

For this type of test, the Ampack Technikum offers not only a laboratory, but also test stands and a small, aseptic filling machine that can also be rented. It allows manufacturers to fill small test batches to determine how merchants and consumers respond to their product and its packaging while still in the development phase.

Technological answers to ecological questions

This is most exciting when it comes to testing packaging solutions that do not even exist yet, or adapting packaging for new applications. "For instance, in the future, yogurt cups might have a completely different shape or be made of a different material. Our goal is to use our extensive portfolio and expertise to find technological answers to ecological questions," Tomschi explains. Research into sustainable materials and accompanying test series are intended to find alternatives to conventional plastics, and to improve the recyclability of packaging so as to reduce plastic litter.

High-density polyethylene (HDPE) is frequently used in the food sector. It retains its shape even at high temperatures, and its excellent barrier properties ensure a long shelf life. At the same time, PET offers a popular alternative for packaging material thanks to its recyclability, but is difficult to sterilize using hydrogen peroxide. Effective sterilization and processability can be achieved with the right combination of various machine parameters and material properties.

Basic research remains a vital component

The complex interactions between these parameters are at the heart of Leonie Kempf's doctoral dissertation. As a food technology specialist, she works at Syntegon's Technikum and is the first doctoral candidate to ever work at the Königsbrunn site. She is currently investigating the various parameters that influence the sterilization of packaging, especially those that are relevant for hydrogen peroxide-based sterilization. For this purpose, a testing unit at the Ampack Technikum was completely redesigned and equipped with various monitoring sensors. The unit is ideally suited for research, as it can be quickly and easily refitted to accommodate cups, bottles, large and small containers, and various formats; it can also be used to run sterilization tests for customers' packaging designs. Leonie Kempf's first question is always: how can this bottle or cup be effectively sterilized, while using as few resources as possible? "There is a broad range of influences and effects to bear in mind, depending on the material and package form," she says. The testing unit

Syntegon's Ampack Technikum in Königsbrunn

The future of filling is taking shape in a former warehouse at the Königsbrunn site of Syntegon, formerly Bosch Packaging Technology. The site is home to production halls in which Ampack packaging machines for filling liquid and viscous food products have been manufactured for over 40 years. The 450-square-meter technical center was completely renovated in 2018, at a cost of roughly one million euros, and supplied with cutting-edge equipment. Today the Technikum is a key research and development center for the dairy, food and beverage industries. The microbiological lab is used for assessing packaging and machine sterilization, while the main hall features an aseptic filling machine and various test stands that replicate the functions of large filling facilities. To evaluate customers' new products, not only microbiological and chemical-technical tests are offered, but also research and development services, e.g. to validate specific functions, modules and applications.



The Ampack Technikum features an aseptic filling machine, which can be used to fill small batches for testing purposes (photo: Syntegon)

is also connected to a digital recording system, the results of which she subsequently analyses with the aid of the Fraunhofer Institute for Casting, Composite and Processing Technology (IGCV).

New formats for new products

The future of packaging viscous products will depend on basic research, and on concrete development work. Food manufacturers can benefit from using a highly realistic setting to clarify many of the questions involved in introducing a new product in advance. Does the filling work smoothly? Are sterile conditions maintained? Does the sealing quality meet our expectations? What are the preferred dosing pattern and outcome? Testing a proposed fine-tuning for a large facility on a small scale in advance offers a significant advantage: afterwards, it can be directly and safely carried out at the manufacturer's plant.

"Our goal is to promote a more sustainable and flexible processing and packaging industry. To do so, we need not only our own experts, but also the support of our partners and customers. By collaborating with them, we can develop and implement innovative packaging solutions and more efficient processes. Together, we can assess the entire process, from start to finish," summarizes Korbinian Tomschi.

Production of lactoferrin

The use of Radial Flow Column for large-scale chromatography processes



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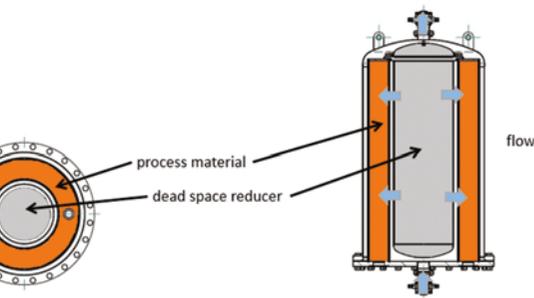
RFC columns for lactoferrin extraction (photo: Handtmann)

Lactoferrin (LF) is found in the milk of all mammals, also in milk and whey derived from cow milk. It is an 80 kDa iron-binding protein and represents about 0.3 % of the total protein content of milk, which equals 60 - 200 mg/l. The thermal stability is 55°C.

Lactoferrin is a very powerful protein: it has antibacterial, antiviral, antifungal, anti-tumor, anti-inflammatory and anti-allergic effects. Isolated from cow's milk, it is therefore a sought-after additive for foods such as functional food or sports nutrition. The use of lactoferrin has exploded in recent years, particularly as a supplement for baby nutrition.

Column chromatography

In chemistry, chromatography refers to all those physico-chemical separation processes in which the separation process is based on the distribution of a substance between a mobile and a stationary phase. Different substances of a sample are retained to different degrees by the stationary phase, while the mobile phase takes over the transport. Chromatographic analysis methods can include the following: classical column chromatography, high-performance liquid chromatography (HPLC) or ion exchange chromatography (IEX) as a special form of HPLC.



Radial throughflow

In ion exchange chromatography, substances can be separated according to their charge. It is based on the formation of heteropolar bonds between the matrix and the mobile phase, whereby the desired charged protein binds. The elution can be done by means of gradients. As soon as the charge binding between eluent and protein is higher than between matrix and protein, the protein migrates into the solution. By detecting the flow at 280 nm, any passing protein can be detected as a peak. In lactoferrin recovery, LF is obtained by ion exchange chromatography.

What is Radial Flow?

The radial flow stands for a continuous flow and high flow rate through the entire adsorber (24/7), a low differential pressure at a high flow rate, the processing of large feed volumes and a good scalability by increasing the separation distance of the corresponding radial flow column.

More advantages of RFC are the following:

- Bidirectional flow
- Ability to sterilize and autoclave the column
- Availability of different screen sizes
- Small footprint
- Low dead space volume
- Minimum ΔP
- Robust design
- Specific packing station for easy packing and unpacking, together with minimizing chromatographic resin losses.

The standard column volume (CV) is 240 and 260 litres respectively at a separation distance of 13,5 cm. In principle, up to 2000 litres of resin volume per column are possible. For milk applications, this will allow processing flow rate of ~15,000 litres per hour.

Axial- vs. Radial Flow Column

While an axial flow column design offers the advantage of a higher flexibility in the separation distance, the radial flow column has much more to offer. Below are the specifications for a radial flow column, which make a radial flow column superior to an axial flow column:

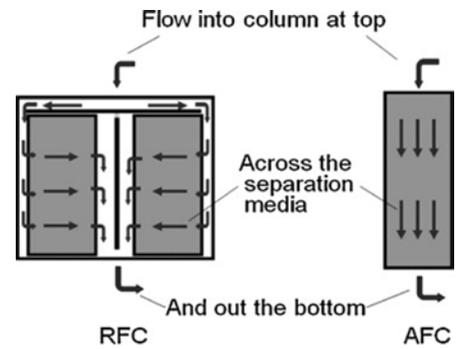
- Reduced pressure drop of 20 - 50 %
- Improved loading efficacy
- Reduced feed handling complexity
- High binding kinetics (dynamic binding capacity)
- High process robustness (larger process tolerance window)
- Higher throughput
- Higher efficiency
- Higher purity.

Is it possible to convert existing Processes from Axial to Radial Flow Columns?

A conversion from an axial to a radial flow column is possible as long as the required separation distance for the efficient separation is max. 13.5 cm, which is in most of the ion-exchange based chromatography processes the case. The change from axial to radial can be justified as described above: radial flow columns have significantly lower pressures than axial columns. This means that the column can be operated at a higher flow rate, resulting in a higher throughput and, in relation to time, a higher turnover.

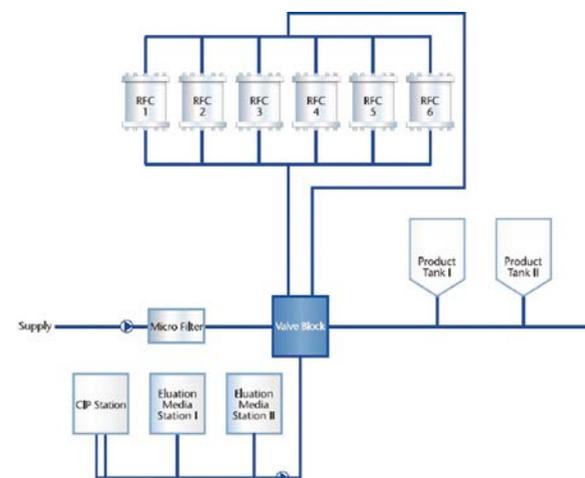
How to extract lactoferrin from milk

For the industrial extraction of the protein lactoferrin from milk and whey, radial flow column based chromatography plants are used. The whole milk is collected at dairy farms and stored in refrigerated conditions until quality test passed and transported to a dairy processing facility. Once the milk arrived to dairy facility, it undergoes cream separation to remove fat and collect skim milk. Then the skim milk goes through a pasteurizer to kill pathogenic bacteria before any further process. For bovine lactoferrin (bLF) extraction, the ideal option is to extract the lactoferrin before the pasteurizer process step. In such cases, skim milk



Example for axial- and radial flow chromatography flow patterns

is pumped through a chromatography column packed with SP Sepharose™ Big Beads Resin (e.g. cross-linked agarose) until the maximum binding capacity of the resin has been reached. The column is then washed with water and low salt buffers, before the bovine lactoferrin is eluted by applying a buffer with high salt solution. Afterwards the resin in the column is regenerated for next purification cycle by a CIP procedure using sodium hydroxid (NaOH). The purified lactoferrin-/salt solution is further processed to remove the salt and concentrate the solution by diafiltration (DF) and ultrafiltration (UF). Subsequently the LF concentrate undergoes a pasteurization step to kill pathogenic bacteria, followed by microfiltration to remove any particulates. LF is further concentrated using a second UF process step and then dried using freeze-drying or spray drying technologies. The powder is formulated and packed to a desired pack size.



Process flow of lactoferrin extraction

Perfect cleaning

Bottle washing machines for Oberweis Dairy

What has only been celebrating a revival in Germany and Europe for a few months, the returnable glass bottle for high-quality milk and glasses for yoghurts, has long been a mega-trend in the USA. The Swiss specialist for bottle washers, PAC Global, has already delivered its second machine to the USA. The customer is "Oberweis Dairy" in North Aurora, Illinois.

Over 90 years Oberweis Dairy

The history of the dairy began in 1927 with Peter Oberweis in Kane County, Illinois, who sold his excellent milk in the area with a horse-drawn cart. Oberweis invested, built a dairy in North Aurora, his son Joe and since 1986 his brother John expanded the busi-

ness in several States with milk, dairy products, ice cream, yogurt and cheese. Since 2007 Joe Oberweis has been managing the company, which now includes a hamburger and pizza chain in addition to numerous "milk and ice cream stores".

For a long time now, the dairy has been relying on returnable glass bottles in various sizes for its milk, especially for premium and organic products. Oberweis uses its cult bottle with half a gallon content (around 1,900 ml) for household deliveries, which are still widespread in the US. This milk, the dairy emphasises, comes without exception from small family farms with 40 to 300 happy cows, is only heated very gently and processed without any additives. The animals grow up absolutely without hormones or medication, the milk

arrives, emphasises the dairy, almost always bottled just 36 hours after milking on the customers' doorstep. "For this enormously high quality of our milk there is only the glass bottle, no plastic or cardboard. Only in glass does the milk stay fresh and cool for a long time, tasting equally good from the first to the last glass," emphasises Marty Rodriguez, Director of Operations and Quality of Oberweis in Chicago.

The specialist for bottle cleaning

Two filling lines for glass bottles run in the main Oberweis plant, one for smaller bottles, the other for half-gallon bottles. For this line, the bottle washing machine was replaced because the company was no longer satisfied with the quality of the old machine. The decision for a new line was made for a "CB 9-1.89-RV-10.6 Mi ng" from Swiss specialist PAC Global. Günther Zimmerman founded this company in 1981 and was the first manufacturer of bottle washing machines which are completely made of stainless steel and strongly insulated hot zones. In the course of 40 years of experience, the systems have been further developed. Today, the machines are energy-efficient and optimised, so that they work in a resource-saving manner and comply with the sustainability principle: Perfect cleaning performance, low energy consumption, decades of service life, compact design and service friendliness.

PAC Global's customers are primarily breweries, but also mineral springs, mineral water plants, wineries and dairies in Europe, Asia and North America. The series machine programme starts at 1,800 bottles per hour and extends to 12,000 bottles per hour, specifically designed for medium-sized companies.



For the front door delivery to households, which is widespread in the USA, Oberweis Dairy uses its half-gallon cult bottle. For owner Joe Oberweis, premium milk can only be filled in glass, so he needs the appropriate cleaning machine (Photo: PAC Global)



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Long pre-soak, thorough cleaning, long hot caustic spray zone

PAC Global supplied a 10.6 metre long and 1.86 metre wide single-end bottle washing machine to Oberweis Dairy in North Aurora, in which 5,000 half gallons can be perfectly cleaned every hour. Before the bottles are immersed in the pre-soak, they are emptied of any residues with absolute reliability. Thanks to the long pre-soak time, the high caustic temperature of 80 °C is already optimally utilised when the bottles are immersed, and the caustic in the immersion soak is regularly circulated. This is followed by an extremely extensive dwell time in the subsequent hot caustic zone with just under 85 °C and 15 internal spray tubes. Seven spray zones with 42 stationary, high-volume low-pressure spray nozzles have an intensive residue removal effect and guarantee the bottles' perfect microbiological condition. Finally, there is slow cooling and several rinsing and spraying with fresh water. Each bottle is in the machine for 17 minutes, passes through five stages of heating and pre-soaking, a long caustic bath and a long hot caustic spraying zone, and after washing, six water spraying zones for cooling. The absolutely clean bottles leave the machine at around 25 °C. At the same time, there are always 1,413 bottles inside the washer. The machine's longitudinal sides have large inspection windows, and all areas are very easily accessible for cleaning.

Low energy and caustic consumption

The very low overall energy consumption of the machine is the result of the combination of long



The "CB 9-1.89-RV-10.6 Mi ng" from Swiss specialist PAC Global, 10.6 metres long and 1.86 metres wide, can perfectly clean 5,000 half-gallon bottles every hour (Photo: PAC Global)

pre-soak, a seven-stage bottle cooling after hot caustic spraying, and fully insulated high-temperature zones. The design of the caustic zones in stainless steel results in a reduction of the radiant heat by almost 50 per cent. The entire machine housing is double-walled in all hot zones (floor, ceiling, side walls, and rear wall) and insulated with 5 cm thick material. The entire machine therefore radiates very little heat. Significant energy savings are also achieved by the five-stage pre-heating of all bottles before immersion in the caustic soak and the use of a small amount of water and caustic (therefore, heat losses are minimal). In addition, there is heat recuperation between caustic II and the pre-warm pre-spray water, compensation of caustic carry-over by automatic re-dosing of caustic II, and optimised liquid guidance including ideal chain guidance, which leads to a reduction of the connected electrical load.

Excellent cleanliness and spare parts available at any time

Marty Rodriguez from Oberweis in Chicago

summarises the reasons for the decision to purchase a new bottle washer at PAC Global: "The straightforward, manageable design, the additional, sophisticated mechanical cleaning through five spray zones, simple and reliable electrics and electronics. Added to this are the uncomplicated, globally available drive units, the full stainless steel machine with its insulation in the hot zones, thus low heat emission and thus low energy consumption. An important reason for the decision in favour of PAC Global was the much better support and possibilities in terms of spare parts and improvements compared to the previous machine. The entire process from purchase to commissioning was not only a business experience, but also a very cooperative one. We bet on the right horse, because above all we have perfect cleaning – even of extremely dirty milk bottles," says Rodriguez.

Many years of perfect cleaning

PAC Global also attaches great importance to the machines' service life of decades, an interplay of compact, completely stainless steel design, 15 mm thick chain guides, extra-strong main conveyor chains, bottle cell carriers and bottle cells made of high-strength steel. All components are easily accessible, the mechanical structure is clearly arranged, the electrical system is future-proof, and the control system is decentralised. The PAC Global principle is: Electronics as much as necessary, but not as much as possible. If a single system fails, it can be easily replaced by a more modern component even after many years. "Each of our machines is completely connected to our factory, we carry out a test run under operating conditions. Only then will we hand over our systems to our customers," emphasises PAC Global owner Günther Zimmermann.



Founded in 1927 by Peter Oberweis in Kane County, Illinois, the company now includes not only numerous "milk and ice cream stores" but also a hamburger and pizza chain. The dairy has long relied on returnable glass bottles in various sizes for its milk, especially for its top and organic products (Photo: PAC Global)

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.

Further information and order:
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THE BOOK HAS 9 CHAPTERS:

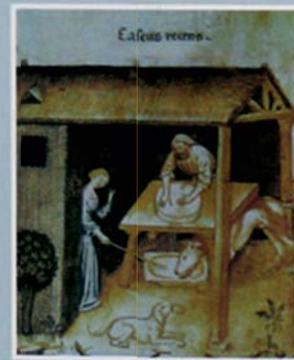
General overview, divided into definition, processing scheme, history, significance of the various groups of cheese concerning nutrition Raw material and additives for the production for various groups of cheese Varieties of the respective groups of cheese as well as their manufacturing processes and 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.

CHEESE TECHNOLOGY

by Josef Kammerlehner, 930 pages, ISBN: 978-3-00-021038-9, €109 plus shipping

Josef Kammerlehner

Cheese Technology



2009

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.

The Future UK-EU Dairy Framework

Time is a scarce commodity in Brexit negotiations



Author: Alexander Anton, EDA Secretary General

The United Kingdom has officially left the European Union on 31st of January 2020 – we tweeted the moment when the European flag was withdrawn from our neighbours' building in Brussels, the UK Permanent Representation that became the UK mission to the EU, where today, the Union Jack is left alone in the wind.

On 31st December 2020, the transition period will end. The political leadership has not taken the current sanitary crisis as a valid reason to extend this transition and hence negotiation period.

On 9th October, we organised a Brexit workshop to take stock of where we stand and to voice once more our dairy concerns and interests in this process with both, the UK and the EU authorities.

Our EDA president Michel Nalet welcomed H.E. Katrina Williams, UK Ambassador to the EU, Peter Giørtz-Carlsen, CEO of Arla Foods Europe, and Ms Brigitte Misonne, Head of Unit

in DG Agri (EU Commission) for a round of high level insights followed by an animated Q&A session with the 120 dairy executives and experts from the UK and the EU27 on the call.

“The high number and high level participation in this call underlines both, the crucial importance of the EU – UK dairy trade for both sides and the huge level of commitment of the lactosphere over the past four years to help the negotiation partners find practical solutions”, stated Michel Nalet when highlighting the joint DairyUK – EDA paper ‘The Future EU – UK Dairy Framework’ that was shared with both chief negotiators already back in January 2018.

Time has become a scarce commodity...

... as any deal reached in the current ‘intensified’ negotiations will have to go through a parliamentary ratification process on both sides of the Channel.

H.E. Katrina Williams, UK Ambassador to the EU, and Brigitte Misonne from DG AGRI, stressed their willingness to reach an agreement benefitting the two parties, and assured they are doing their utmost to achieve this goal.

More specifically, in her intervention, H.E. UK Ambassador Katrina Williams informed the audience that any agreement on the future Free Trade Agreement (FTA) between the EU and the UK will introduce new border controls. Therefore, she advised the EU on the necessity to take this into consideration, making sure to get ready for what will come. The UK govern-



ment plans on transposing all the necessary legislation to go on ensuring that all the food produced in the UK fulfills the highest standards for consumers on a global scale. She stressed that the UK will not compromise on animal welfare nor on sustainability and climate measures. Additionally, in order to recognise the impact of the Covid-19 crisis the UK will phase in the new border control mechanisms in 3 stages until July 2021 to give the industry extra time to adapt.

From the EU's perspective, Brigitte Misonne (EU Commission), explained that the European Commission is working actively to give more clarity on this uncertain future. She stressed out that European businesses need to understand that their work is definitely going to change in the next months: "Changes are going to come, and the EU needs to be ready" - she said. She highlighted that her colleagues in the EU Commission are working ruthlessly to get to an agreement and to facilitate the end of the transition process.

Peter Giørtz-Carlsen, CEO of Arla Foods Europe, delivered a concise state of play of the EU-UK dairy framework, an in depth analysis of the potential impact of an unmanaged end of the transition period.

The negative trading dynamic that Peter Peter Giørtz-Carlsen pictured with "more trade frictions, more costs and more divergence" seem to translate already today into lower EU - UK dairy trade.

He voiced for the UK and EU lactosphere the "key asks" of our industry:

- 1 **Now is the time for both sides to find practical solutions**
(i.e. agree on a FTA without any tariff or quota on dairy)
- 2 **Full recognition of food safety systems and veterinary certifications**
(i.e. avoiding the creation of new non-tariff trade barriers in customs and border requirements)
- 3 **Clarifying the UK's Border Operating Model and providing clear guidelines**
(i.e. on the eligibility and procedure for simpler customs clearance and payment of customs duty)
- 4 **EU and UK to stress-test their border operating models**
(i.e. to ensure they can handle the increased workload and likely disruption)
- 5 **Minimising the additional administration burden**
(incl. ensuring perishable goods like dairy are not held up at the border)
- 6 **New trade deals with rest of the world incl. China**
(i.e. to open new markets for EU dairy and minimise surplus if UK market closes)

A clear picture on the level of preparedness of the logistics sector was delivered by Patrick van Cauwenberghe, Trade Facilitation Director of the Port of Zeebrugge and member of the Brexit Task Force of the European Sea Port Organization.

The speakers' interventions led to a vibrant level of interaction during the Q&A session which is rather unusual in these times of digital meetings.



Katrina Williams
@UKEUDeputy



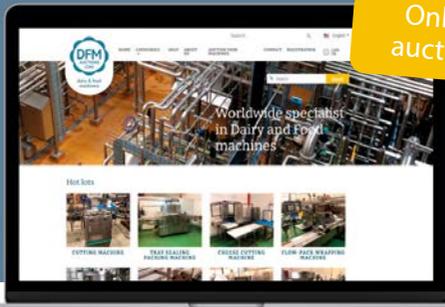
Thank you for inviting me to join the lactosphere for the afternoon. Your views and work are invaluable to us: an excellent event and expert discussion @EDA_Dairy @mnalet

Right after the workshop, we sent out – once again – all our dairy questions to both, the European Commission and the Government of Her Majesty and we continue to push for a pragmatic approach and swift answers for the dairy sector.

EDA President Michel Nalet concluded: "We were honored by Ambassador Williams' commitment and very grateful for the constructive approach: she – and her team – clearly showed that they care about the dairy sector and are active to help us find solutions regarding the technical issues that we will all face at the end of the transition period. The very same is true for Brigitte Misonne and the European Commission. We simply MUST have a smooth transition to keep shelves and fridges stocked with healthy and nutritious milk & dairy products, and to keep balanced markets".



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Cheese technology



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Site Report



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Why now is the time for organic dairy ingredients
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A photograph of two men in business attire (white shirts and ties) sitting at a desk. One man is pointing at a laptop screen while the other looks on. They are both smiling. The background is a bright office window.

IDM has a brand new website!

Have a look at international-dairy.com