

INTERNATIONAL

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May/June 2022

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Editorial:

4 Strategies must be reformulated

Cover Page:

26 On a journey to buttery flavor

FMCG Gurus Column:

40 Natural sweeteners

IDF Column:

42 Nutrition and Health Symposium

Site Report:

16 The first 100% regenerative cheese plant

Markets:

32 New realities for the dairy business

Country Report:

28 Dark times for the dairy industry in Iran

Ingredients:

6 Fine-tuning product properties

10 Plant-based dairy alternatives

Technology/IT:

8 Switchable ring distributor

20 FAM Stumabo

22 Radar for level measurement

35 Heat and cold from one machine

Packaging:

12 Wrap-around packers as central components

EDA Column:

44 European Dairy Trade Policy 2022

Columns:

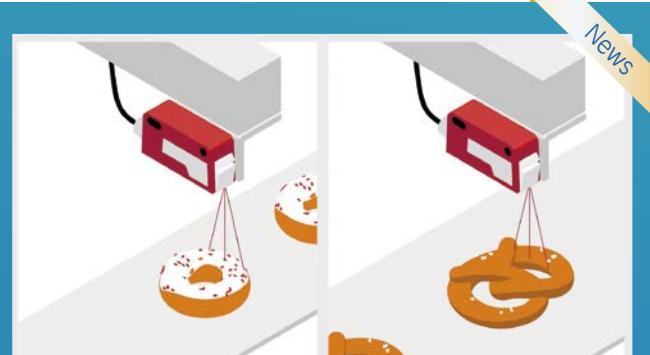
3, 5, 15, 21, 31, 34, 37, 39, 41, 43, 45 News

3, 31 People

46 Supplier directory

47 Imprint

47 Preview IDM July/August 2022



The new IO-Link function modules make device integration easy (fig.: Leuze)

LEUZE**IO-Link function modules**

With their IO-Link function modules, Leuze is introducing a powerful tool: it makes the integration of IO-Link device data into PLC programs significantly easier. Users can simply and quickly transfer the function modules to the control program. Common control systems from manufacturers such as Siemens, Beckhoff and Rockwell Automation are supported. The innovative modular approach makes reading and writing device parameters significantly easier. The function modules can be downloaded free of charge for all IO-Link products from Leuze.

Marie Samuelsson has been appointed CEO of Ecolean following Peter L Nilsson's planned retirement after more than 15 years in the company, in June 2022.

Samuelsson brings several decades of industry and senior leadership experience to her new position. Most recently, she worked as Market Region Manager at ASSA ABLOY, an access solutions supplier. Prior to that she held the position of SVP at Höganäs, a supplier of services and manufacturing applications to the automotive industry. In addition, Marie has worked at Tetra Pak, SonyEricsson and ABB.



From left:
Arne Karlsson,
Marie Samuelsson
and Peter L Nilsson
(photo: Ecolean)

Strategies must be reformulated

The new scenario of scarce raw milk supply



Roland Sossna
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The dairy business as a whole is facing a change. Given that milk is in scarce supply almost all over the world, 'cheap' products are no longer feasible and will not be for the foreseeable future. Articles with traditionally low added value will tend to fall out of the portfolios, all the more so when the corresponding production assets fall out of depreciation. The rapidly rising costs should also create room for more cooperation between dairies, because no one can afford poor capacity utilisation anymore given the milk price level. Dairy processors and cheese manufacturers also have the choice of whether they should supply food retailers or opt to produce ingredients for processors on the world market. Of course, branded companies will not want to give up the market position they have built up over many years, but they too will have to think about whether selling permanently against the price pressures from retailers is really a sensible way of doing business.

Milk may well remain available overall, but only if producers are kept in line. This will probably require new contract models and more transparency and participation in success, even if this puts pressure on margins. In view of the global shortage of grain etc., many farmers (depending on the region) have in fact gained the freedom to realign their production. Securing raw materials is now an absolute top issue of this time, just as important as the question of qualified personnel in the dairies.

Up to now, third-world exports have been the outlet for any surpluses on the raw materials side in the EU and the US. In the long run, however, there will be no more of this in Europe. Tendentially declining or stagnating milk production in the main supply regions for the world market will affect the availability of milk volumes for export. Dutch analyst Erik Eigersma (Strategic Analysis Services) forecasts a world market demand of 88 million tonnes and a raw material availability of only 59 million tonnes for the year 2030, a good 15 million tonnes less than at present. How the gap of 30 million tonnes can be closed is completely open. In fact, the gap could widen further if the Western countries decide in favour of even more climate protection and significantly less production. In any case, the losers in this scenario are the regions that are urgently dependent on milk and food imports.

All in all, dairy managers will have to reformulate their strategies or rethink them altogether. Given the complexity of market parameters and factors influencing the dairy business, not an easy task, Roland Sossna thinks.

Krones' solution "Aseptic dosing station for very small quantities from pouches" received the International Food-Tec Award in silver (photo: Krones)



Krones: International FoodTec Award

In production, media to be metered are usually supplied in special pouches that are individually adapted to the corresponding discharge system. The bags are connected to the dosing equipment via hoses, dosing needles or similar injection systems. Manual interventions are often necessary to connect the injection systems to the dosing device as germ-free as possible or to sterilise the injection needles.

In contrast to systems already on the market, the Krones dosing station does not require any special injection systems, thus enabling the bags to be used and processed safely.

After the entire piping system, including the dosage pump, has been sterilised by saturated steam at over 121 degrees Celsius for more than 20 minutes, the pouches are placed on the work platform and held in place by a light vacuum. In the next step, the dosing area and at the same time the bag surface are sterilised fully automatically with peracetic acid. This prevents recontamination at the puncture site as well as contamination through possible leakages. The peracetic acid residues are safely removed by sterile air and condensate and the bag can be pierced with a mandrel and then emptied. For continuous operation, up to three dosing platforms are available in one machine.

Besides the high level of microbiological safety, the Krones system also offers users other advantages. For instance, it provides a high degree of flexibility, since they are not dependent on manufacturer-specific injection systems when purchasing the packaging form of the medium to be dosed. And the high degree of automation rules out the possibility of operator error.

ANDRITZ

New screen scroll centrifuge

ANDRITZ has developed a new screen scroll centrifuge with innovative features that reduce wear, enable the rapid exchange of parts, and increase maintainability.



The express cartridge design enables the entire rotating assembly to be replaced without dismantling any process piping of the new screen scroll centrifuge (photo: ANDRITZ)

The new ANDRITZ screen scroll centrifuge HX can process bulk chemicals, minerals, agrochemicals, and food, even under difficult feeding conditions. It is designed for improved product quality and maintainability. New features include a Gentle Feeder feeding system, a modular scroll, and a rotating assembly that can be removed and replaced in one piece (express cartridge).

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- ✓ **Dairyzym Acid L**
(acid liquid lactase)
- ✓ **Dairyzym F 100 P**
(acid powder lactase)

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Fine-tuning product properties

Worlée assists with product concepts and applications

As a globally active Hamburg-based raw materials partner and key supplier of natural ingredients and raw materials for well-known national and international customers, (640 employees, >€300 million in sales), Worlée NaturProdukte is also strongly committed to plant-based dairy alternatives. The family-run company brings its broad experience with markets beyond milk and cheese products to the table, enabling it to add new touches to these increasingly popular alternatives. IDM reports.

Martin Kreye, head of the Savoury Branch Management department at Worlée NaturProdukte GmbH states, "We stock a wide range of natural ingredients, so there are no limits to our customers' creativity in product development. We support manufacturers of dairy or dairy alternative products not only with ingredients, but also with consulting, formulation and application development, trend analyses and product concepts, as well as with our superbly equipped technical centre." This food technology centre not only features the specialized equipment and machinery required for development and upscaling, but also includes a show kitchen and meeting rooms where customers can develop and test new concepts in workshops together with Worlée's research and development department.

Implementation of the latest food industry trends naturally plays an important role here. Values, changing times and health are intertwined when it comes to plant-based alternatives. This allows our product development team to work on a consumer segment-specific basis, thus ensuring the acceptability of product innovations looking ahead to the future.

Dry ingredients from around the world

Mai-Britt Sachmann-Jensen, who is responsible for dairy and dairy alternatives at Worlée NaturProdukte, adds, "Using market analyses and market monitoring as our guides, we are constantly developing new formulations and application ideas. Thanks to our



Martin Kreye and Mai-Britt Sachmann-Jensen provide support to dairy and dairy alternative producers in many different ways (photo: Worlée)

global presence and the fact that we serve a wide variety of markets, we can provide customers with a wealth of ideas on how best to differentiate their products in the marketplace. Our dry ingredients can be used individually in applications or in ready-made blends, and we offer a particularly extensive portfolio of organic ingredients, including many that satisfy high social standards. Furthermore, our products are predominantly vegan." At the end of 2021, Worlée's "organic" and "conventional" divisions, which had previously been operated as separate entities, were merged to provide customers with a single consistent contact partner. Sebastian Reifke is responsible for this area within Worlée NaturProdukte.

Worlée was a pioneer in germ reduction for spices and other ingredients. Over the course of time, the original batch process has been supplemented by a continuous process that allows for



the processing of larger product batches. Worlée can also deliver particularly low-germ ingredients that exceed the normal standard.

The company primarily supplies ingredients in dried form, including freeze-, roller-, vacuum- or air-dried products. Customers come from the private label and branded sectors and include, for example, numerous cheese manufacturers and refiners in Germany and abroad. Worlée's ingredients are used directly in products such as curd cheese, spreads, soft cheese, cottage cheese, hard cheese, cheese cubes in oil, smoothies or as toppings. In addition to its broad product range, the supplier offers a sophisticated resource management system for purchasing. Overall, as summarised by Martin Kreye, Worlée's ingredients are the key to fine-tuning various properties of dairy products and dairy alternatives – namely, appearance, taste, texture, and especially nutritional value.



Worlée maintains one of the best-equipped food technology facilities in Germany (photo: Worlée)

Improved CIP

Switchable ring distributor



Author: Joachim Löw, Milkron GmbH

The switchable ring distributor was awarded the Dairy Technology Award by "IDM International Dairy Magazine" as part of the 2021 tender. Meanwhile, the development of the patented function is well advanced. It is worth taking a look at this.

When planning and implementing a CIP plant for a dairy, the cleaning areas that require the largest electric power to convey media are often tanks. In classic storage tanks, the distribution of cleaning agents usually takes place via centrally permanent-installed spray balls or comparable components at the top of the tank interior.

The size of the ball depends mainly on the tank diameter. As a rule, 2 to 2.5bar overpressure is required for distribution inside the tank at this point. Depending on the tank height, a CIP supply pump often has to deliver about 4.5bar.

Volume flows of e.g. 20-30m³/h and more are not uncommon for larger storage tanks, but rather classic. The cleaning effect in the tank is not achieved by mechanical impact when liquids hit, but by the outflowing media including their temperature/concentration.

Problems with the spray ball

If you take a closer look at the function and distribution pattern of a spray ball, doubts arise about the efficiency and quality of this method: The liquid is pressed through narrow holes in almost all directions and, depending on its orientation, sooner or later hits the wall, top or tank bottom. All areas of the tank are hit at the same time, so that the flow is significantly higher in the lower area and significantly lower in the upper area. During phase changes, the "new" liquid is partly thrown directly towards the bottom, while another part goes to the top and mixes with remnants of the "older" liquid when it drains.

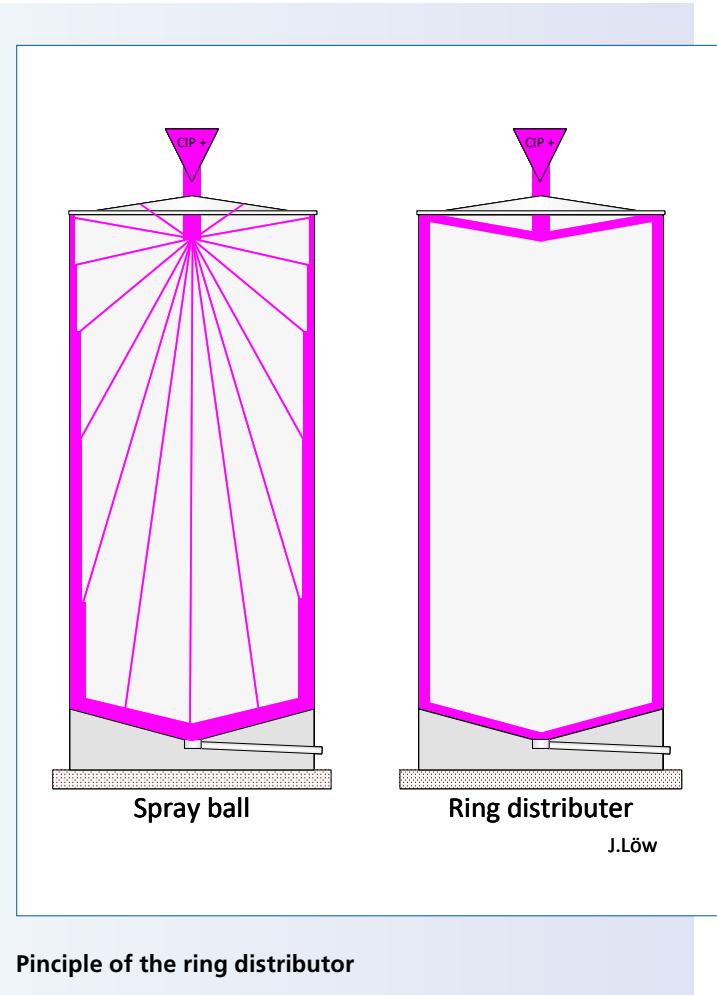
The spray pattern (comparable to a toilet brush) results in a large surface area between the moving liquid and the air volume inside the tank, so that energy is blown "into the air" during temperature changes, which is also clearly noticeable in the ventilation.

Uniform movement, reduced flow

Already earlier the consideration arose that it would be better to let the entire liquid drain from the upper end of the tank wall (in a circular starting) downwards, as the movement of liquid is uniform. This allows the overall volume flow to be reduced. When changing phases (e.g. water to lye), the old medium is "pushed out" more linearly from top to bottom. Mixing is reduced. During temperature changes, significantly less energy is transferred to the air volume; the heat goes more directly to the surfaces to be cleaned.

In order to achieve a uniform, plate-shaped distribution of the liquid in the upper tank, an annular gap is used, which can be realized, for example, by means of a distribution plate. Throwing the liquid from the center to the wall here requires significant less pressure than with a spray nozzle. Thus, even with a larger diameter (in tests e.g. 4.6m) 0.6bar instead of the approx. 2 to 2.5bar when using a spray head are sufficient. This alone can save one third of the electrical power on the flow pump.

Decisive advantages arise if the annular gap can be changed in a defined way during cleaning: The top of the inner tank can be washed at defined intervals. During the phase change, it is possible to increase the throughput of the cleaning and thus to achieve the criteria in the return flow (temperature, concentration) more quickly. By frequently changing the gap size, the flow velocity on the tank wall can be rhythmically changed, which increases the effect of cleaning. In the classic circulation of lye and acid, less volume flow needs to circulate at a narrower gap in order to further reduce of the consumption of electrical energy.



Switching of the annular gap can be achieved with an adapted, classic valve actuator. More effort had to be invested in the design of the distribution plate or the distribution cup and a robust fastening: Different distribution diagrams should be possible without too much narrowing of the gap surface (and the pressure). A basic design should be able to be adapted to as many different tank diameters and flow rates as possible. The component must be removable from the outside without much effort.

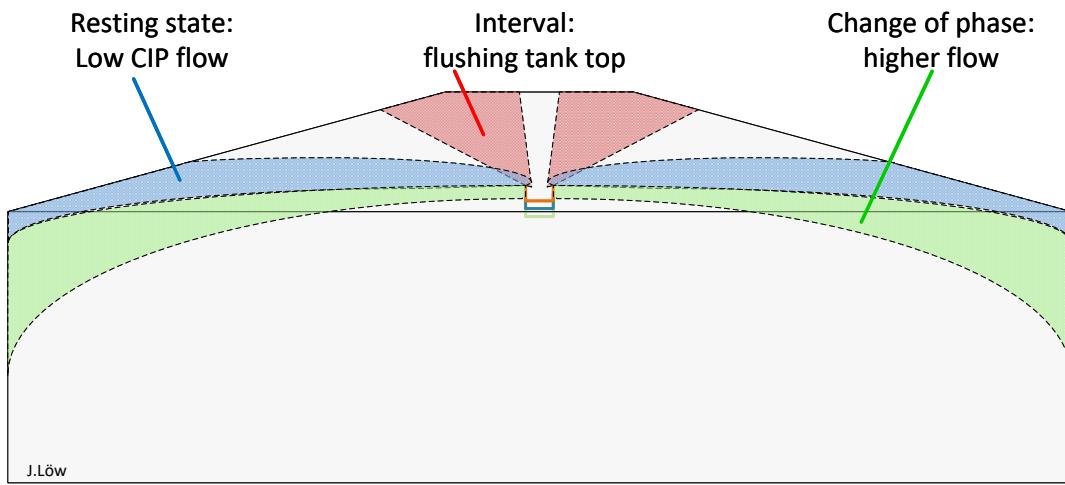
Results of the tests are more than pleasing

We assume that the electrical power requirement of the pumps can be reduced by 35 to 60% even if existing cleaning targets are converted. Smaller mixing phases and shorter cleaning times without reducing the effect are also relevant advantages. For new installations, smaller cable cross-sections and components can often be used, but replacing existing installations also pays off.

Another essential benefit of the ring distributor is that in many companies (e.g. cheese dairies) a defined rinsing of the tank wall with fresh water without relevant dilution of the product when emptying in production is possible. Thus, e.g. in milk and whey tanks, the pre-rinsing can be significantly reduced, often completely cancelled.

The challenges of development and design, the previous tests and the optimizations were supported by the HAW University of Applied Sciences in Hamburg, the Hanover Ahlem University of Applied Sciences and the Evoguard.

example function switchable ring distributor



**Example function
of the switchable
ring distributor**

Plant-based dairy alternatives

Opportunities in markets with high growth rates



Authors: Roland Gianotten, Alexander Krauskopf, Zentis, Germany

Plant-based dairy alternatives show higher growth rates than original dairy products, especially during lockdown periods (but also afterwards). Between October 2020 and September 2021, 338 million kg of these products (spoonable and drinkable) were sold in Germany, with sales value reaching €637 million, an increase of 31% compared to previous moving annual total. Sales of conventional dairy products grew by 1.2% to 1.944 million tonnes during the period and turnover increased by 3.1% to € 4.55 billion.

The highest growth in comparison to individual segments can be witnessed in milk drink alternatives, which reached sales of € 459 million in the above-mentioned period (+ 31.5%). Yoghurt alternatives generated 22% more turnover with € 154.8 million. This implicates corresponding sales volume of 290 million kg (+ 34.2%) for milk drink alternatives and 43.8 million kg (+ 27%) for yoghurt-like products.¹

The primary driver of these developments is increasing demand, but also the broader variety of product assortments and the better availability on the retail shelves and advertising. The latter is also reflected in the promotion share of sales, which is now about 10% and thus half of conventional dairy categories.

Raw materials

Oats as an ingredient base for dairy alternatives now account for almost 50% of all volumes. And in MAT August 2021, oat-based products increased sales by 63m, driven mainly by drinks. Almond

ranks second with €11.3m increase, followed by coconut with €6.1m and soy with €5.5m. Pea as a raw material for plant-based alternatives had a share with a sales increase of € 2.4 million, but with a dynamic upward trend.

Plant-based dairy alternative products reached sales of € 695 million (+6.7%) in seven of the most important markets in Europe between January and July 2021, while conventional dairy products with a volume over €5 billion saw only a small growth of 0.5%. The largest single segment within "plant-based" is alternative drinks with €526 million in sales.¹

Reasons for the growth

What are the drivers for this astonishing development? On the one hand, consumers are reducing their consumption of dairy (10.2 million households in Germany), on the other hand they are increasingly switching to plant-based alternatives (1.7 million households). Almost half of these households are switching their consumption completely to plant-based milk alternatives (819,000 households in Germany). Animal welfare, concerns on sugar levels or additives, climate change and packaging concerns (plastics) are quoted in surveys as the main reasons for the substitution. Younger people tend to give up dairy products by following the motive "I want to become better", while elderly people want to stay active longer. It is no longer just curiosity that makes consumers turn to alternatives; the number of repeat purchases is increasing. Two out of three buyers of yoghurt alternatives stick with them, one third of German households have already bought alternatives,



Plant-based milk alternatives show higher growth rates than conventional dairy products (photo: Zentis)



and overall, spending on these products is higher than on traditional dairy.²

Solutions for alternative products

Zentis is constantly developing product solutions for dairy alternatives, whether for yoghurt, drinks, desserts, spreads, ice cream or even hybrid products. The compounds produced individually for customers are made up of cereals, coconut or nuts as well as fat, and optionally contain stabilisers, proteins, sugar and salt as well as acidity regulators.

Zentis has special experience with hybrid products that synergistically combine both worlds. The motto for this is "Healthy ME & Healthy Planet". Classic cow's milk brings creaminess and calcium to hybrid concepts, while plant-based raw materials such as oats bring positive health and sustainability aspects. Together they form alternative, more environmentally friendly products that can be consumed without sacrificing enjoyment.

Corresponding ready-made mixtures from Zentis allow the largely simple production of hybrid products. These can be specifically tailored to customer-specific concepts and different target groups, such as young families or singles, millennials or DINKS.



Zentis is constantly developing product solutions for dairy alternatives (photo: Zentis)

Based on its core competence, Zentis naturally also advises on fruit, warm flavour or cereal preparations and much more on the subject of milk alternatives. A wide variety of customised possibilities are convincing in terms of flavour synergies, stability, protein or other enrichments.

1 Nielsen
2 GfK

Rapunzel Naturkost expands production capacity

Wrap-around packers as central components

Rapunzel Naturkost, Legau, Germany, is modernising and expanding its nut spread production and filling facilities at its site. The internationally operating organic food producer decided in favour of the same wrap-around packer for both projects. The modernisation has already been successfully completed, commissioning of the new plant will take place later this year. A portrait.

Nothing is more powerful than an idea whose time has come. Even if it sometimes requires a lot of staying power – as was the case with Jennifer Vermeulen and Joseph Wilhelm. Back in 1974 the couple founded a self-sufficiency commune on a farm near Augsburg. "We simply wanted to live a healthier life and share this lifestyle with others," Wilhelm recalls, looking back. In 1975 they went on to open their natural health food store "Rapunzel Naturspeisen" in Augsburg's city centre. To begin with, the young couple's vision and commitment were mostly laughed at, Wilhelm recounts: "We were just the crazy muesli-eaters, the ones with the knitted sweaters and sandals."

From exotic undertaking to organic food protagonist

Once referred to as an exotic undertaking, Rapunzel Naturkost has since developed into an international business with over 400 employees. The company strategy itself has remained the same throughout its forty-five-year history: to produce certified organic, natural and untreated vegetarian foods. The company headquarters and production site has been the former dairy plant in Legau in Unterallgäu since 1985.

There are around 550 Rapunzel brand products. These include sweet and savoury spreads, nuts and dried fruits, muesli varieties, cereals, grains and grain products, rice, oil seeds, legumes, pasta and tomato sauces, antipasti, edible oils and fat, seasoning spices and soups, sweeteners and baking ingredients, sweet and savoury

snacks, chocolate and instant beverage powder as well as wine. Of these, the nut butters in jars make up an essential part of the Rapunzel product range and play a decisive role in the company's success. The most visible evidence of this is a constant increase in the production and filling in Legau. And this is exactly the area for which Rapunzel planned two new projects for 2020 and 2021.

The investment decision was based on the two existing spread filling and packaging lines. There was a growing need for action here, especially in the older nut butter plant 1, recalls Florian Lechner, team leader of Production and machine operator: "Its packing machine was becoming increasingly prone to failure and it was also more and more difficult to acquire spare parts. Besides this, we also wanted to achieve a higher output." The keywords here are output and performance, and in order to meet the growing demand for nut butter a completely new line 3 was also to be built.

The search for a wrap-around packer ended at Fachpack

Managers at Rapunzel therefore embarked on a search for a suitable solution – and they found what they were looking for at the Fachpack trade fair in Nuremberg. Florian Lechner recalls: "A+F presented exactly the machine we had in mind. At the trade fair this was packing similar jars of mustard into trays." Among other things, Rapunzel saw a particularly convincing technical solution in the infeed and liked the fact that the entire system was arranged on one level and everything was easily accessible and cleanable. "We thought this was really good and consequently ordered two identical plants for the modernisation and the construction of the new line," Lechner comments.

The two Rapunzel machines are based on the proven Moduline packaging and cartoning system. The required format parts for product adaptation were individually designed and manufactured for the tasks at Rapunzel. Rapunzel also specified requirements

regarding best possible hygiene and cleanability. The valve terminals for the basic machine, for instance, have therefore been enclosed and the Plexiglas doors designed without gaps.

Conversion during ongoing production and under Covid-19 constraints

The modernisation of line 1 started in November 2020 and the commissioning followed in December already. The given interfaces for the new packaging line were the outlet of the cooling tunnel and the transfer to hand palletising. "The huge challenge was that we had to carry out the conversion during ongoing production. This meant many hands were needed to pack the jars into the trays. And the assembly team had to be very flexible", Lechner explains.

Covid-19 restriction measures such as wearing facemasks, distancing, disinfection and tests complicated matters further. "But everything went smoothly and there were no hitches. After the installation, power was connected to the system and the first jars started running. During the subsequent optimisation process all of the requirements we had set were fully implemented", Lechner adds. A key tool for optimising and securing the plant's performance is, according to Rapunzel, the option of remote maintenance, Lechner goes on to say: "We did experience an operator error once, and I called A+F on a Saturday – we were then able to solve the situation together via remote maintenance."

Additional parts of the order

In addition to the wrap-around packer, the jar transport and a buffer table providing approximately four and a half minutes buffer time for 250 ml jars in the infeed were delivered and installed. "This is the time we have gained for removing any malfunction. However, nothing of the kind has yet occurred", Lechner is pleased to say. A fault in the packaging machine always meant a stop in the upstream processing stage, such as cooling and filling. There was also a follow-up project, Lechner adds: "A+F developed a

The specified output of the wrap-around packer is 7,200 jars per hour.



**From exotic undertaking to organic food protagonist:
Rapunzel currently manufactures and sells approximately
550 brand products (photo: Rapunzel Naturkost)**





Packing of round jars with a volume of 250, 400, 500 and 750 ml in the pack format 2 x 3.



A vacuum checking system specifically developed for Rapunzel, which automatically ejects any jar that is not tightly sealed.

vacuum check system especially for us which they integrated in the infeed. This system is used to eject the jars that lose their vacuum in the cooling tunnel."

The jars to be processed are transported from the buffer table to the packer in a single lane. A distributor system then conducts the jars from one lane to two lanes in the machine infeed. As a next step the jars are put into groups of 2 x 3 jars according to the pack format and moved onto the prefolded carton blank. In this process, a special holding system secures the grouping pattern. The carton blank is then folded around the jars and glued.

Reduced setup time

The packing process is for round jars with volumes of 250, 400, 500 and 750 ml. A specific carton blank is used for each jar type, i.e. there are altogether four carton blanks in use. In the new line the cartons are also to be adapted to the product. "This means a further increase in the variety to be processed. A+F has already tested this successfully", says Lechner. With the new cartoner the actual set-up time is reduced to just about fifteen minutes per format. This makes it possible for Rapunzel to first change over and clean all upstream stations. "In this way, we can start the line up again before bothering about the cartoner. Our employees then have more time for the more complex work", says Lechner, summing up the advantages.

Up to 120 jars per minute

The upgraded line 1 operates with an average output of 50 jars per minute. By comparison: the specified output of the wrap-around packer is 7,200 jars per hour. With a pack format of 2 x 3 jars this amounts to 1,200 cartons per hour or 20 cycles or 120 jars per minute. The question that arises here is: why did Rapunzel invest in a higher output than was actually required? Lechner goes on to explain: "Rapunzel just wanted to have the same machine in both lines. Here the key words are operation and maintenance. And in the new line we are certainly going to need the 120 jars per minute."



Florian Lechner, machine operator and team leader of Production is fully satisfied with the project.

Condition Monitoring

Another identical feature is that both wrap-around packers boast the Condition Monitoring module. Condition Monitoring automatically records comprehensive data from the production, machine and machine environment. This also applies to status messages, warnings and machine malfunctions as well as production data. All of this data is stored on a stand-alone industrial PC, archived and displayed on a dashboard that can be accessed using any up-to-date browser. The system architecture can thus be integrated into a company network without the need for additional hardware. "I have already used this option to specifically analyse the performance of line 1," says Lechner. And with a very positive result for Rapunzel: "When the preliminary processes are all running well we have a significant increase in performance of up to twenty percent. We can therefore now increase the filling capacity because the packaging step no longer limits us as it did before." Does this positive effect translate into an equally positive overall bottom line? Lechner agrees: "We are very satisfied in every respect."

DSM**Sustell receives independent ISO certification**

DSM has achieved International Organisation Standard (ISO) lifecycle assessment assurance by DNV for its intelligent sustainability service Sustell. Many of the largest egg, poultry, pork and dairy integrated producers worldwide currently use Sustell to precisely measure the environmental footprint of their farms. In January 2022, DSM signed a Memorandum of Understanding (MoU) with Charoen Pokphand Foods (Thailand) with an aim to measure and improve the environmental footprint of animal protein production through the use of Sustell.

News

**IMA: Multipack 7000**

On the IMA stand, a Benhil Multipack 7000 was being demonstrated, which went to Wyke Farms after the fair. The machine, which covers the medium output range, forms and packs 200 pieces of butter per minute with an exceptionally high filling accuracy that is 30% better than the competition, according to IMA. The servo-driven machine is characterised by high flexibility and can be changed over to completely new formats in less than 45 min. The new dosing unit can adapt to different product consistencies.

The Fold Wrap 1800 from Benhil enables all-round sealed butter wrapping. The product is hermetically sealed, the packaging is tamper-evident and can still be opened easily. The machine produces up to 140 packs per minute in the 100 to 500 g range.

A paper-based wrapper developed together with Constantia, which is only coated with wax and therefore easily recyclable, was also shown.

IMA Intecma presented thermoformed multipacks based on PP and PET packaging materials, which are recyclable and very easy to separate. Existing machines can be retrofitted for the use of PP and PET films.



Achim Gingter showed the new IMA Benhil Multipack 7000 packing machine for spreadable fats (photo: IDM)

**GEA: LoTo for valves**

GEA has developed special Lockout-Tagout (LoTo) locks for its entire hygienic valve technology range. These mechanical or pneumatic locks help plant operators effectively protect their workforce from hazards in production.

A GEA LoTo unit comprises a shut-off device that fixes the valve in the open or closed position and an optional lock that only authorized individuals can open.

With GEA LoTo, the entire actuator can be locked via a disk lock (photo: GEA)

**DAIRYTECH 2022****Palm-free fat supplementation research**

Internationally renowned Professor of Dairy Science Phil Garnsworthy of the University of Nottingham has worked on a ground-breaking research project, focused on the development of a new approach to feeding ruminants with the potential to transform the industry.

The project compared a new palm-free fat supplement developed by UK nutrition and supplement company UFAC-UK, manufactured from locally sourced vegetable oils together with marine oils, against a palm-oil based control diet.

Initial results point at a potential financial benefit to the entire UK dairy herd in excess of £85m, based on current market prices for the products under trial and liquid milk.

The overwhelmingly positive results from the trial also revealed cows were more efficient when fed on the new fat supplement, increasing milk yields and protein concentrations, with no difference in dry matter intake.

The feed carbon footprint of the new fat supplement, named Enviro-lac, is approximately one third of the footprint of the control palm-based supplement, reducing the feed carbon footprint per kg of milk by 11%. The reduction in carbon footprint could also help to reduce land use change associated with growing palm trees.



From left: Robert Jones, UFAC, Prof. Phil Garnsworthy, University of Nottingham, Mike Chown, UFAC, at the test farm (photo: UFAC)

Mona Dairy

The first 100% regenerative cheese plant



Mona Dairy is a new player in the British and European cheese market. Founded to process milk from five farms with a combined 2,700 cows in Wales, the new cheese dairy in Anglesey is aiming for growth right from the start. The product range initially consists of Cheddar and Gouda. The editorial team spoke to managing director Ronald Akkerman.

Akkerman, who has been setting up and managing cheese dairies in the UK for many years as a technical service provider, was initially only engaged as a consultant when British dairy farmer David Wynne-Finch started to realise his plans two years ago. During the course of the £20 million project, the two then entered into a 50:50 partnership in which Akkerman, in addition to building and setting up the cheese dairy, also took over its management.

No more fossil burning

"Our new Mona Dairy is ambitious in every way," Akkerman explains. "We don't want to go from a standing start with just our

product quality, we also have a really sustainable concept." This concept means that Mona Dairy does not use any fossil fuels, but is 100% regenerative. A biogas plant just 300 m from the dairy supplies the plant with electricity, which in turn relies entirely on heat pumps and CHP. Akkerman: "Via the heat pumps we get two circuits, one with 35 °C and one with 80 °C. That is enough to run the whole operation. For cooling, we don't use ice water either, but the low-temperature circuit from the heat pump."

Akkerman designed the energy part as well as the process technology of the 2,500 m² cheese dairy himself, based on his long experience. The engineering is mainly based on components from Alfa Laval. The cheese vat was sourced from Kalt Maschinenbau, the press from Bosgraaf, while the moulds were supplied by Laude. A Casomatic is to be added in 2023. In principle, Akkerman says, the cheese dairy is a hybrid Gouda line that can also produce dry-filled cheddar. Production is exclusively in 15-kg euro blocks, and all processes are fully automated as far as possible.

Prospects

Initially, 100,000 litres of milk per day will be processed or concentrated from April 2022 onwards, and the milk intake will then increase to 300,000 litres per day by autumn. There will be 40 to 45 employees. In the future, the plant can be expanded to produce up to 35,000 t of cheese.

Mona Dairy plans to sell 50% of its production in the UK, the other half on the European mainland. The company is to decide on the brand name later in the year. Whey utilisation is already secured,

Mona Dairy does not use any fossil energy sources, but works 100% with regenerative energy

as Mona Dairy is located adjacent to the Dutch feed producer Liprovit. This company concentrates whey (60% dry matter) there, which is then processed in Kampen, Holland.

In addition to its energy self-sufficiency, Mona Dairy has another advantage: most of the milk comes from pasture farming, with natural seasonality similar to that in Ireland. All in all, Akkerman and his partners now expect a much better utilisation of the milk.

All processes are interlinked via heat pumps



Mona Dairy has already filed for expansion to increase production from 7,800 tons to 18,000 tons per annum converting 150m litres of milk (photo: Razor PR)



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Horpov[®]l GmbH

Application-specific cleaning concepts



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The speciality of Horpov[®]l GmbH is ensuring flawless dairy products. As an expert in the manufacture of cleaning and disinfecting products for the dairy industry, they focus is on cleaning membrane filtration systems. For the cleaning of membrane filtration plants, the company relies on co-operation with membrane manufacturer Koch Separation Solutions* and various other plant manufacturers.

Good cleaning is result-oriented, cost-effective, reproducible and achieves a stable result. For this reason, Horpov[®]l GmbH has developed application-specific cleaning concepts (hereinafter referred to as Horpov[®]l AR concepts) for its customers. These concepts are used both in general CIP cleaning and in membrane cleaning.

Based on operational conditions, Horpov[®]l AR concepts can include not only an adjustment of temperature, time and concentration levels, but also the revision of the chemical component in terms of ingredients and set-up of the cleaning process. (Figure 1)

The dual-component verification employed by Horpov[®]l and the use of the Horpov[®]l additive system (see technical article on www.horpovel.de/press/), the appropriate cleaning concept can be found and applied specifically to the respective process and the existing conditions. Extensive experience of Horpov[®]l has shown that only an adaptation to the respective process and the specific conditions brings the best cleaning result. Thus, generalised cleaning concepts cannot achieve such a high level of effectiveness.

Horpov[®]l AR - concepts make it possible to work in a resource-saving and reproducible way. Especially in the field of membrane cleaning, the core competence of Horpov[®]l GmbH, the AR - concepts are a successful way of working. In the field of membrane cleaning, this means an intensive examination of the current cleaning procedure by our experienced application engineers with subsequent target definition for the creation of the new cleaning concept.

With a variety of technical devices, it is possible to obtain a meaningful database of the existing system and, on its basis, to develop an appropriate concept adaptation. Since filtration membranes change during their life cycle, this cleaning concept is continuously adapted and optimised by Horpov[®]l application technology.

Selection and design of the right sequence of cleaning steps

For all membrane cleaning, the cleaning must be based on the processed product and the local conditions. This information is used in process analysis to work out which cleaning steps are sensible and necessary. In addition to the sole cleaning effect of a step, the set-up of the membrane and microbiology also must be considered.

Based on experience gained from the Aqua^{ECON}[®] concept developed with ALP-MA/LTH Dresden, a new approach to rinsing optimisation in membrane plants was derived. In conjunction with an advanced chemical-physical process analysis of the cleaning by Horpov[®]l, rinsing phases can thus be significantly shortened to save resources.

In addition to the optimal sequence of steps, significant savings potential must be considered in choosing the exact parameters of circulation and rinsing. By adjusting the circulation steps, reductions in chemical dosing of up to 5% and more are possible. The intermediate rinsing steps adapted to the Horpov[®]l concepts generate reductions of up to 20% and more over conventional rinsing steps.

Enzymatic cleaning steps often are very important for successful cleaning. For enzymatic cleaning to be effective, optimal timing is essential. If the plant is not optimally prepared, it can happen that the enzymes do not act at the intended target locations of the plant. Rather, the most effective time should be determined through process analysis.

As part of process analysis, step times are optimised based on chemical-physical parameters. In addition, energy consumption is reduced by effective parameterisation of the steps. In addition to adaptation of cleaning steps, significant potential results from observing the right cleaning chemistry. In addition to residue analysis in membrane autopsy, processing of technical conditions and requirements should be mentioned.

Depending on the membranes in use and their requirements, it is crucial to consider the accuracy and speed of dosing. If the conditions are right, the implementation of the Horpov[®]l additive system can bring decisive cost advantages. (Figure 2)

Since filtration membranes are subject to a natural ageing process and the processes in the food industry are subject to

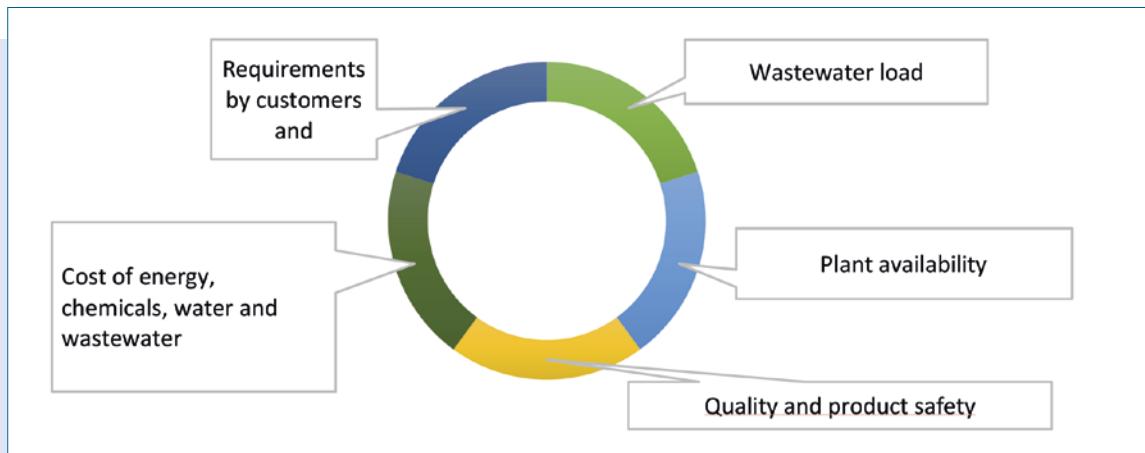


Figure 1:
Requirements to be considered during cleaning

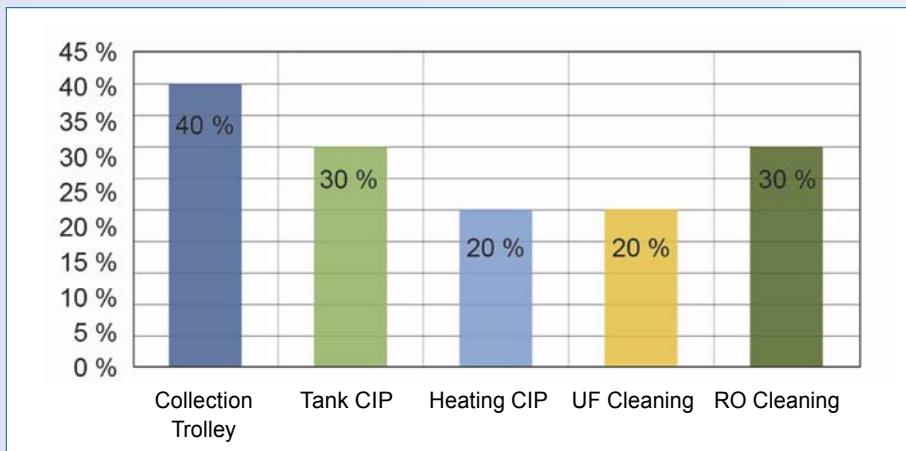


Figure 2:
Possible reduction potential of chemicals when using the Horpovel® additive system of up to 40% compared to full assembly

fluctuations, the most important focus of Horpovel® GmbH is to provide customers with permanent, reliable and close-meshed advice and support with regard to cleaning and the cleaning results achieved, both on site and with online tools such as Horpovel® Live-View and online data loggers.

The Horpovel® service concept, provides regular control and monitoring of cleaning based on recorded chemical-physical parameters and ensures that deviations are detected at an early stage with possible adjustments to the process.

In addition to the biodegradability of the surfactants used, Horpovel® has reduced the use of EDTA to a minimum. This reduction is feasible due to targeted dosing of individual components in conjunction with the Horpovel® additive concept.

The acid cleaning concepts of Horpovel® offer the possibility of phosphoric acid-free cleaning (see technical article on www.horpovel.de/press/) and significantly reduce wastewater pollution by using new KOCHKLEEN™ products.

For both membrane cleaning and general CIP cleaning, the main components of the cleaning chemicals, caustic soda and nitric acid, can be purchased from local chemicals dealers. This simplifies the evaluation of current price structures and cost-effective buying of these components. Horpovel® GmbH sees itself not only as a manufacturer and supplier of cleaning agents and disinfectants, but also as a service provider in the field of cleaning and disinfection. Thereby, an efficient and sustainable use of the available resources is in the focus of the optimization of cleaning processes. In collaboration with our cooperation partners and the use of KOCHKLEEN* – membrane cleaning agents we continuously try to approach this goal.



Please read this article online on our homepage.

*KOCHKLEEN is a registered trademark of Koch Separation Solutions, Inc. in the United States and may be registered in other jurisdictions.

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FAM Stumabo

How to overcome the challenges of cutting cheese

Cheese processors need to consider many criteria when choosing the right solution for their cutting needs. This is where the FAM Stumabo team of application specialists comes into play. Working with customers, they examine the characteristics of specific cheeses, test, identify which elements and cutting methods will deliver the best cutting solution.

Precision cutting

FAM Stumabo designs and supplies cutting solutions for a multitude of food applications. Designers use the knowledge and practical experience to create machines with great value for the user. All blades are manufactured in house and made from the best food grade stainless steel materials.

Reduce (food) waste to a minimum

The Centris line of shredders is powered by the innovative Sure-Shred 16C cutting head. It is designed to meet the demands of today's versatile and higher volume cheese shredding applications. The 16-blade head will double the capacity and provide rapid cutting action that reduces the time the cheese spends inside the cutting head.

The preset slice thickness provides uniform shreds, eliminating slice thickness adjustments. The cutting segments contain continuous grooves keeping the product aligned resulting in reduced number of fines, combs, and waste.

The choice of the right blade will produce very precise and clean cuts which in the end provides product uniformity and reduces waste.

The FAM Flexifam 55 is designed for medium high-capacity dicing and shredding. It produces very clean dices and strip cuts, and its cutting tools are quick and easy to change, reducing downtime.

No compromise on sanitation

FAM Stumabo cutting equipment is built to help streamline processes and produce safe, high-quality food. The FAM Hymaks is a high-capacity cheese dicer guaranteeing uniform dicing and shredding type actions with a minimum of waste.



FAM Centris 400C Hytec is designed for hygienic operation
(photo: FAM Stumabo)



Cut to perfection

Innovating food cutting equipment sits deeply embedded in FAM Stumabo's DNA and is a never-ending process in our company. We always strive to offer our customers better and even more efficient cheese cutting solutions by focusing on continuous improvements and innovations related to cut quality, cut consistency, sanitation, machine reliability, total cost of ownership, operator safety, and user-friendliness.

FAM Stumabo's fully equipped test centres around the world are available to let customers evaluate product quality and appearance. This is just one way to help test or create new products or refine existing ones.

Since its foundation, FAM Stumabo has been growing its business significantly focusing on customer-intimacy, knowing production, and thinking along with customers for the most efficient cutting solutions. Hence FAM Stumabo's firm commitment to cheese processors: 'Together, we cut your cheese (product) to perfection'.



bawaco: Occupational safety

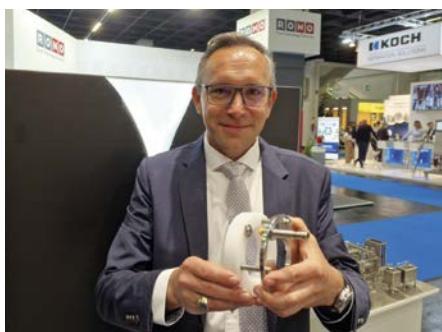
bawaco presented a whole range of detailed solutions that improve safety of work in factories. These include the hose feedback holder, which is used to check flexible connections such as product hoses that have to be connected to a coupling panel for cleaning.

For flexible connections such as emptying containers, receiving hoses or other flexible processes, a hose or coupling must be connected to a cleaning nozzle. In this case, the control system needs to know that the hose is actually connected before a CIP or SIP is started. The bawalIS ensures this by an initiator in the milk pipe connection.

bawaco has developed solutions for safe handling of pipe strains depending on the installation situation and application with protection up to Performance Level D. A possible splash is safely intercepted if the sieve is not completely closed, thus protecting the surrounding area. On the other hand, the bonnet is interrogated with a safe limit switch. In combination with the safe control of drainage and shut-off valves on the sieve, the lines to and from the sieve are safely shut and the sieve is also safely drained before an employee can open the sieve.

The aseptic bawaco sterile bottle holder/sampler is specially designed for lumpy products such as fruit preparations. Installation on the tank or in a pipe is possible. The device is CIP and SIP capable via an adapter.

The bawaco feedback holder INI is used to reliably query the valve position by one or two initiators on Alfa Laval valves (Unique and LKLA-T actuators).



**bawaco Managing Director
Valentin Jörns: Occupational
safety can be achieved with
relatively little effort (photo: IDM)**

IFF HOLDBAC protective cultures

News

Consumers want dairy and dairy alternative products to stay fresh and delicious without having to put up with unfamiliar ingredients on the label. IFF has developed a two new HOLDBAC bioprotective cultures to make that possible.

HOLDBAC protective cultures comprise of specially selected microorganisms that deliver long-lasting freshness up to and beyond 'best before' dates. As natural solutions, they also enable manufacturers to offer a consumer-friendly product label. Another essential benefit is that there is no compromise in the sensory experience.

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Enhanced radar level transmitters help optimize dairy production



Author: Erdem Böcekli, Product Manager Level for Emerson D/A/CH

Erdem Böcekli explains how the latest generation of compact and cost-effective radar transmitters meet the industry's tough level measurement demands and help manufacturers ensure food safety, achieve smooth production processes with reduced product loss, and maximise throughput.

Dairy manufacturers are always seeking ways to increase the efficiency of their production processes, to help maximize profitability and meet consumer demand for an ever more diverse range of products. Automated level measurement solutions have an important role to play in helping them achieve this aim, but there are certain criteria that manufacturers should consider when selecting instrumentation.

Most importantly, the chosen technology must be able to accurately and reliably measure the product level in the storage tanks, mixing tanks and batch tanks commonly utilized in manufacturing facilities. Precise level measurements help to optimize tank utilization, ensure consistent product quality, increase safety by protecting against both overfills and dry-running pumps, reduce product loss through waste, optimize inventory management, and lower production costs.

Level measurement instruments used in dairy production must comply with the industry's strict hygiene and food safety standards, to prevent contamination. They must also be compatible with challenging process conditions such as high temperatures, foam

and turbulence, which can affect measurement accuracy. In addition, devices should be simple to install and integrate into an automation system, to minimize complexity for manufacturers.

Technology options

A broad range of technologies can be used to provide continuous level measurements, including differential pressure transmitters, capacitance probes and ultrasonic transmitters. These technologies are relatively inexpensive but also have certain disadvantages. These can include requiring calibration, which increases complexity; being in contact with the product, thereby creating a food safety risk and the possibility of leakage; and being susceptible to changes in process conditions such as density and temperature affecting their measurement accuracy and reliability.

Non-contacting radar transmitters

For many years, non-contacting radar transmitters have successfully provided level measurements in safety-critical industries such as oil and gas, with high-value materials and challenging process conditions, where their exceptional accuracy and reliability is vital. However, the technology has typically been considered too bulky and costly for use in dairy manufacture.

However, the latest generation of instruments, such as the Rosemount™ 1408H Level Transmitter from Emerson, have been designed specifically for food and beverage applications, and can meet previous industry concerns about the size and cost of such

devices. These latest transmitters provide an accurate, compact and cost-effective continuous level measurement solution that is ideal for the industry's requirements.

The devices are top-mounted, which enables them to minimize the risk of product loss through leakage, while changes in product density, viscosity and temperature do not affect their measurement accuracy. They use frequency modulated continuous wave (FMCW) technology and smart algorithms to maximize measurement accuracy and reliability, even in space-constrained skids and challenging, fast-filling vessels. They do not require calibration, and they have minimal maintenance requirements thanks to their lack of moving parts. Also, because they do not touch the surface of the product being measured, there is no risk of contamination.

Here are some examples of how these innovative new non-contacting radar level transmitters are already providing significant benefits for manufacturers.

Storage tanks

It is important for dairy manufacturers to store products in the right quantities, as this helps ensure that their processes run smoothly, so they can maximize production capability, and reduce production variations, leading to increased product quality and batch consistency. To achieve this, they should install highly accurate and

reliable devices to help maintain precise control of the level in their storage tanks (see figure 1).

Radar transmitters rely on reflected signals, also known as echoes, to perform level measurements. The latest non-contacting devices use fast sweep technology to provide a continuous echo against the product surface. This enables them to collect up to 40 times more information than legacy instruments, which makes their measurements more accurate and reliable.

Increased measurement accuracy is important in avoiding product wastage. This is because inaccurate measurements can sometimes result in storage tanks being falsely identified as empty, and large volumes of product being washed away when cleaning processes begin.

Another important challenge for dairy manufacturers is to maximize tank utilization, so they can keep up with customer demand and increase revenue. The design of the latest non-contacting radar level transmitters enables them to perform accurate measurements to the very top of the tank, where there would previously have been a dead zone. This enhancement optimizes tank utilization and production capacity, helping to increase throughput and profitability.

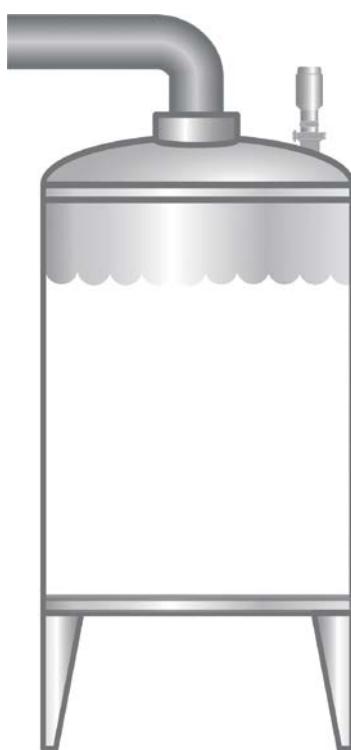


Figure 1:
The latest non-contacting radar transmitters deliver highly accurate and reliable level measurements, helping manufacturers maintain precise control of the product level in storage tanks.

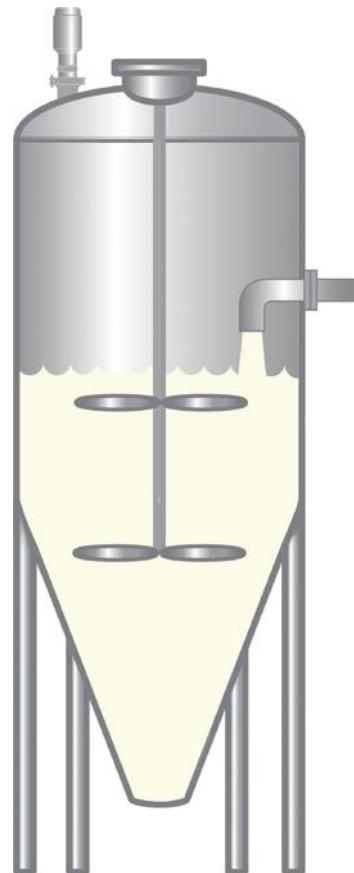


Figure 2:
The exceptional radar beam focusing of the latest non-contacting radar level transmitters enables obstructions in mixing and blending tanks to be avoided.



Figure 3:
The Rosemount 1408H Level Transmitter from Emerson has been designed specifically for food and beverage applications with IO-Link technology.

Mixing and blending tanks

Level measurement devices face a range of challenges when used in mixing and blending applications. These can include turbulence, foam, and obstacles such as agitators in the tank.

Providing an excellent solution to these challenges, the latest non-contacting radar level transmitters use 80 GHz FMCW technology on a single electronic chip with embedded smart algorithms. This enables exceptional radar beam focusing (see figure 2), so that tank obstructions can be avoided and greater measurement accuracy and reliability achieved, even with challenging process conditions such as foam and turbulence.

Reduced size

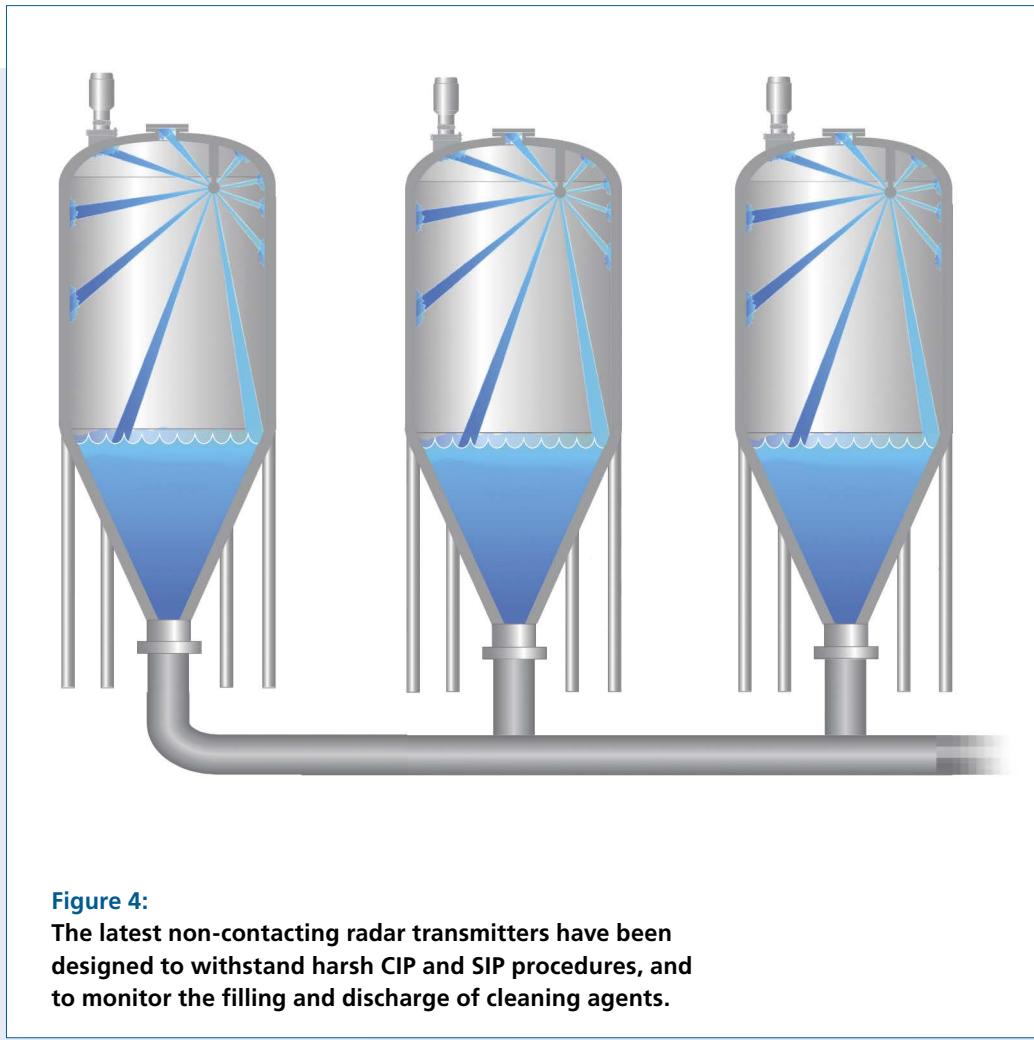
A significant area of improvement in the development of radar devices has been a reduction in footprint. This is vital in dairy production, where there are an abundance of skids with very tight piping arrangements. The traditional view has been that non-contacting radar transmitters are too bulky to use in dairy applications. However, with the latest devices incorporating electronics on a single chip rather than having a separate circuit board, their design has become much more compact and cost-effective, making them an ideal solution for use in space-constrained skids.

An additional challenge presented by tanks with narrow geometry is that they can be fast-filling, which causes quick changes in the product level. However, the use of fast sweep technology enables the latest non-contacting radar transmitters to deliver accurate and reliable level measurements even in these conditions.

Easy integration

Reducing complexity is an important area of focus for dairy manufacturers, and it is therefore vital that the integration of instrumentation with any automation system should be as straightforward as possible. To support this aim, the latest non-contacting radar level transmitters provide conventional 4-20 milliamperes, switch outputs and digital high-speed IO-Link communication (see figure 3).

It is also vital for manufacturers to have measurement devices that are easy to use and maintain. Helping to achieve this, software configuration tools enable the latest non-contacting radar level transmitters to be connected and configured online or offline, with easy-to-use graphic interfaces decreasing commissioning time, digitally recording parameter settings, and optimizing device replacement processes.

**Figure 4:**

The latest non-contacting radar transmitters have been designed to withstand harsh CIP and SIP procedures, and to monitor the filling and discharge of cleaning agents.

Cleaning processes

Dairy manufacturers must take every precaution to reduce the risk of contamination in their processes. Clean-in-place (CIP) and sterilize-in-place (SIP) processes use spray balls and cleaning agents such as water, detergent and chemicals to ensure the cleanliness and sterility of process vessels.

The latest non-contacting radar level transmitters have been designed with robust, easy to clean and food-grade wetted parts, so that their performance is unaffected during these harsh cleaning processes (see figure 4). These devices have a hygienic antenna that is flush with the process connection and insensitive to condensation and build-up, ensuring the removal of process residue during CIP and SIP. In addition, their broad range of hygienic process connections fit most common tank connections and sizes. These devices are also used as part of the CIP and SIP systems, where they help to prevent overfills and dry runs, and monitor the filling and discharge of the cleaning agents.

To further maintain high sanitary standards, many dairy manufacturers wash down the outside of their tanks with foaming chemicals and/or high pressure and high temperature water.

The latest non-contacting radar level transmitters have a polished stainless steel housing with minimal crevices, so that water and any sediments can drain from their body during these washdowns, thereby reducing the risk of bacteria growth. These devices are IP69-rated and have a full range of hygienic approvals, ensuring they meet the food safety standards of any plant.

Conclusion

By combining outstanding accuracy and reliability with a compact, hygienic design and simple connectivity using the IO-Link communication protocol, the latest non-contacting radar level transmitters provide an ideal solution for demanding dairy industry applications. The design enhancements featured in these devices make them easy to implement, and help manufacturers to reduce production variations for increased product quality and batch consistency. Other significant benefits that these devices help to achieve include minimized product loss, and increased food safety, tank utilization and throughput.

Emerson.com/Rosemount1408H.

Embark on a journey to buttery flavor

Chr. Hansen's new ripening solution
for continental cheese



Piquant, buttery, or nutty? Blue, green, or orange? Chr. Hansen invites cheesemakers on an adventure of the senses. Not only can the right ripening solutions take flavor and appearance of cheese in the desired direction – they can even optimize productivity!

Revolutionize buttery flavor in continental cheese types

Revolutionize your path to intense, buttery flavor in young continental cheeses with Chr. Hansen's new ripening solution in the cheese market.



INTENSE NATURAL BUTTERY FLAVOR

Boost buttery flavor 5 to 7-fold, even at 5°C ripening temperature



REDUCE TIME TO MARKET

Accelerate ripening and achieve a powerful buttery flavor in just 2-4 weeks



PRODUCTIVITY AND SUSTAINABILITY

Control eye formation and waste less cheese due to improved sliceability

For consumers of premium and affordable products alike, taste is the most important driver shaping purchasing decisions. Following taste, convenience is also a crucial factor that influences decisions around buying and consuming cheese. For producers of young foil-ripened continental cheese, options for differentiating flavor have been limited. F-DVS CR-Buttery02 is a ripening solution that is uniquely designed to intensify the natural buttery flavor in continental cheese. The flavor development happens at low temperature and within a short time, thereby reducing time to market.

"Buttery flavor in cheese builds on the formation of diacetyl. CR-Buttery02 yields a high diacetyl level after just 2-4 weeks and even at a ripening temperature of 5°C. The diacetyl level remains high throughout ripening, and this is underscored by its intense buttery flavor. Also, when using a citrate-negative starter culture, no eye formation is observed" explains Christian Niebuhr, Head of Application Central Europe at Chr. Hansen.

Due to no eye formation and good sliceability, CR-Buttery02 caters to consumer demands for a convenient sliced format, less waste produced during production, and a subsequently more sustainable product. Consumers have a heightened awareness of sustainability and are actively seeking to support companies who showcase their sustainable efforts. By optimizing production, CR-Buttery02 can help cheese makers cater to the global demand for sustainable consumption and responsibly produced food.

Finding the perfect flavor

The consumer demand for interesting, new taste experiences creates a significant opportunity for cheesemakers to differentiate their products on flavor. For that purpose, Chr. Hansen has developed a comprehensive range of DVS ripening cultures and lipases that enable cheesemakers to customize their cheese whether they wish to expand their portfolio by creating new cheeses with signature flavors, or they wish to renew consumer interest in existing product lines by injecting new life into them.

"To help navigate the flavor landscape, we have developed our digital Taste-IT tool, which we use together with cheesemakers, to understand how tweaks to their recipe, affect taste outcomes. Enabling them to make choices that lead them in the direction they want to go," shares Christian Niebuhr.

Visit us and join the flavor journey:



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A mind-boggling 25% of consumers globally are flexitarians. They are drawn to plant-based options because of their healthful appeal, ecological convictions or the pleasure of trying something new. BENEON helps you develop plant-inspired options that are simply delicious. Sharpen up your recipe with natural ingredients that bring out pure flavours and exciting textures. Create a taste experience consumers will thoroughly enjoy with new and inspiring dairy-free or meat-free recipes. What will be your signature ingredient?

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Dark times for the dairy industry in Iran

Country report



Author: Vladislav Vorotnikov, Moscow, Russia

Iranian dairy companies are caught between a hammer of skyrocketing production costs and an anvil of state price regulation on the domestic food market. Shrinking consumption and problems with export are adding reasons for concerns to local dairy companies.

In the past calendar year, Iran has experienced the strongest rise in prices for dairy products in the past decade. A report from the Ministry of Cooperatives, Labor and Social Welfare published in August of 2021 indicated that the price of butter jumped by 120% during the previous 12 months, while the price of milk climbed by 80%, and the picture was similar on most other dairy products.

The price hike is primarily associated with a change in the farm-gate price of raw milk, Mohammad Reza Bani Tabaa, spokesperson for the Iranian Dairy Industry Association, said. In the middle of 2021, the government approved a raise in farm-gate prices from 4,500 tomans (\$1.06) to 6,600 tomans (\$1.56) per kg. Under these conditions, the prices immediately jumped by nearly 70% across the entire range of dairy products, Tabaa said.

On the other hand, the raw milk rarely reaches dairy companies at the rate approved by the government, Tabaa said, explaining that when the price was 4,500 tomans, the actual deals were concluded at 5,000 tomans (\$1.18) per kg. The state control is nearly absolute when it comes to retail prices, but the authorities turn a blind eye to price differences in the raw milk segment, Tabaa claimed.

The farm-gate price has been raised following an appeal from milk farmers, who have seen the production costs skyrocketing during the past year, amid a sharp rise in price for logistics, electricity, fuel, but above all – animal feed. Mojtaba A'ali, chairman of the

Iranian Farmers Union, estimated that milk production decreased by 50% during the summer months because of drought as well as shortages and high prices for animal feed and other farm necessities.

It is believed that 50% of milk in Iran is produced by independent farmers, who primarily rely on rain-fed pastures, the size of which dwindled due to adverse weather conditions in 2020 and 2021. This factor raised the demand for animal feed, which was already in short supply at the beginning of the last year.

Mansour Pourian, the head of the country's livestock supply council, said that in the second half of 2021, the feedstuff supplies

**Milk consumption in Iran is on the decline for various reasons
(photo: Vorotnikov)**





in Iran became so scarce that farmers started using fruits and vegetables as feedstuff. He added that under the government policy, the available feedstuff is firstly distributed among poultry farmers and only next to dairy cows.

Shrinking markets

In the background of rising retail prices, the Iranian dairy products consumption per capita slumped to 50 kg, the lowest level ever seen, Mohammad Farbod, a member of the board of the Iranian Dairy Industry Association, said. People can no longer afford to consume dairy products in the desired quantities, he admitted.

The falling demand could become a problem for Iranian business as the country already produces more dairy products than it can consume. Farbod said that Iran produces roughly 8 million tonnes of raw milk, of which 10% or 800,000 tonnes is used to manufacture products destined for export. Iran exports milk, cheese, yogurt, buttermilk, cream, kefir, butter, ice cream, industrial milk powder, and whey powder, Farbod said, adding that cheese remains the largest export item, with 100,000 tonnes of foreign sales last year.

"In developed countries, the minimum hourly wage is \$ 10 while in Iran, the minimum hourly wage is about \$ 1, and on the other hand, the price of raw milk in our country is close to the world's average," Farbod said, adding the government officials are always proud to say that Iran is self-sufficient in most dairy products but say little to nothing about the current price situation.

"If the situation continues like this, we will naturally be self-sufficient in everything because people will no longer have only a small ability to buy food products," Farbod said.

Ali Ehsan Zafari, CEO of the Dairy Cooperatives Union, said that the per capita dairy consumption in Iran is yet to hit bottom, and the Iranian government must interfere with production subsidies to improve the market situation. Strong concerns are lingering over the balance between supply and demand on the Iranian dairy market, especially since exports leave a lot to be desired.

"Dairy exports from Iran are decreasing day by day, and we also see that some dairy products are being smuggled [out of the country]," Zafari said.

In this background, some dairy producers voiced fears over a possible surplus of raw milk similar to the one Iran experienced in 2015, when a sharp decline in domestic consumption created a daily oversupply of 2,700 tonnes of milk. Quite a few milk farms went bankrupt and stopped operation in the country, and there are fears the same situation can happen all over again.

A group of Iranian dairy companies called the government to withdraw export duty on milk powder of 16,000 tomans to stimulate dairy exports.

Siavash Salimi, chairman of the board of directors of the Industrial Dry Milk Association, commented: "Currently, we have a production surplus, and producers are selling their products at a loss, so that their production wheel would just keep turning and providing at least some liquidity."

"There are currently 25,000 tonnes of milk powder stored in the warehouse of several producers. There is no doubt that this amount of production will not be absorbed in the domestic market, and we have no choice but to export it," Salimi said.



Lack of feed is a big problem for the Iranian dairy sector (photo: Vorotnikov)

In the first half of the year, Iran exported 37,000 tonnes of milk powder. This figure used to be higher, but the international sanctions stripped the country from most foreign markets. Salimi said that currently, Iran exports most dairy products primarily to the neighboring countries of the Persian Gulf.

The domestic demand for milk powder dropped just like in other dairy market segments. In the previous year, the domestic demand stood at 60,000 tonnes per year, while now it is close to 40,000 tonnes, Salimi said, admitting that in this background, some dairy producers in Iran have to operate at a partial capacity utilization ratio.

Production issues

In addition to a vicious circle of rising costs and shrinking demand, the Iranian dairy industry experiences severe pressure from the US sanctions, which prevent dairy plants from modernizing their production capacities.

Iran faces several impediments in buying foreign equipment. The main hurdle is to pay for foreign equipment amid a US banking sanction that threatens foreign banks with third-party sanctions if they deal with Iran. Before the sanctions, Iranian dairy companies imported equipment from the European Union. Now, the trade is put on halt, and some companies reportedly experience a shortage of spare parts for repair and maintenance of the equipment currently in operation.

"Some equipment is produced now in Iran, while some are imported through gray schemes from some foreign countries. In the past few years, some companies imported equipment from China, but having a choice, most companies would still opt for European stuff," a spokesperson for a dairy processing company commented.

During the past few years, some Iranian dairy companies asked the government to approve equipment imports under a subsidized exchange rate in order to facilitate modernization. However, this has not happened yet.



Most dairy plants in Iran process less than production capacity would allow (photo: Vorotnikov)

Iran currently uses three different exchange rates: the official subsidized rate, the market rate, and a rate controlled by the central bank available to importers and exporters of essential goods. The latter is known as the NIMA rate. The US sanctions introduced in 2018 have substantially reduced Iran's dollar earnings since 2018, forcing the country to dip into its foreign currency reserves, which have dwindled since that time.

In this background, the Iranian dairy industry is reportedly in poor financial health, especially since production costs have been seen rising.

"We are facing an increase in production costs other than raw milk, meaning that since the beginning of the year, salaries went up by 40% and packaging costs by 80%," Tabaa said.

In the past few years, the Iranian government set ambitious goals to boost dairy export to 1 million tons per year and bring the domestic consumption in line with European countries. Now, most market participants are confident that the industry is likely to dive deeper into crisis in 2022 unless the authorities would be able to agree on the terms of the new Nuclear Deal with the US administration and have the sanctions lifted.

The new PET filler platform of KHS offers the highest possible flexibility (photo: KHS)



KHS: Modular PET filler platform

With its new PET filler platform, the KHS Group offers customers a forward-looking solution. Users can optimally adapt the modular system to their needs and reconfigure or expand it as required at any time. They benefit from the greatest possible flexibility with high efficiency.

Block solutions, especially for filling in PET bottles, include the latest stretch blow-moulding technology - with or without fully recyclable barrier protection - as well as high-performance labelers. A central component of the lines are, of course, the fillers. Here, KHS offers innovative solutions for carbonated and non-carbonated beverages as well as for filling all kinds of sensitive products in a capacity range of up to 90,000 bph.

Thanks to the modularity of the filling systems, functions and features can be easily added. The NV filling system is available for contactless filling of water and hot filling of juice at temperatures of up to 95 degrees Celsius.

At the same time, a high degree of automation during format and product changeover enables the greatest possible flexibility. An operator needs no more than a quarter of an hour to change from a 0.5-litre to a 1-litre PET bottle, for example.



Sidel has named Pascal Lefèvre Global VP of its Food, Home and Personal Care business. Lefèvre joined Sidel in 2020. He attended ISG Paris Business School and has more than 20-years of experience working in senior positions within the packaging equipment industry.

People



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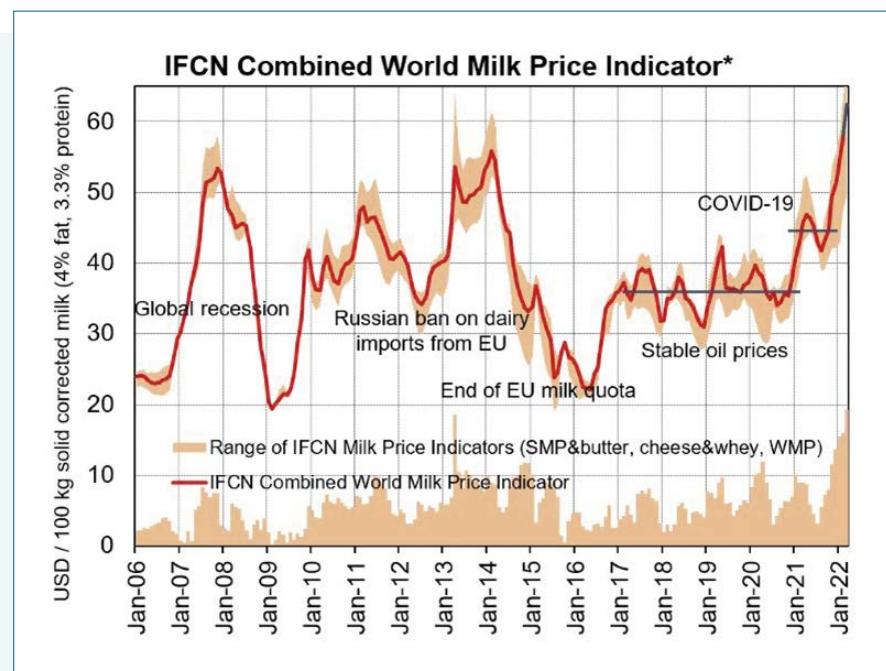


MOULDING SET

New realities for the dairy business

What used to be true could be completely different in the future. For example, in times of high milk prices, milk production reliably increased until too much supply corrected the revenues downwards. This is no longer the case: milk prices are rising from one record to the next, but the supply of raw milk remains tight or is barely growing. It was precisely this scenario that IFCN (Int. Farm Comparison Network) addressed in an online event entitled "Is the dairy industry facing a new reality?" at the beginning of April.

Indeed, milk production has been in crisis mode for years. Keywords for this are Corona, climate and conflicts as well as changing consumer preferences. The war in Ukraine further aggravates the scenario. On the other hand, demand remains

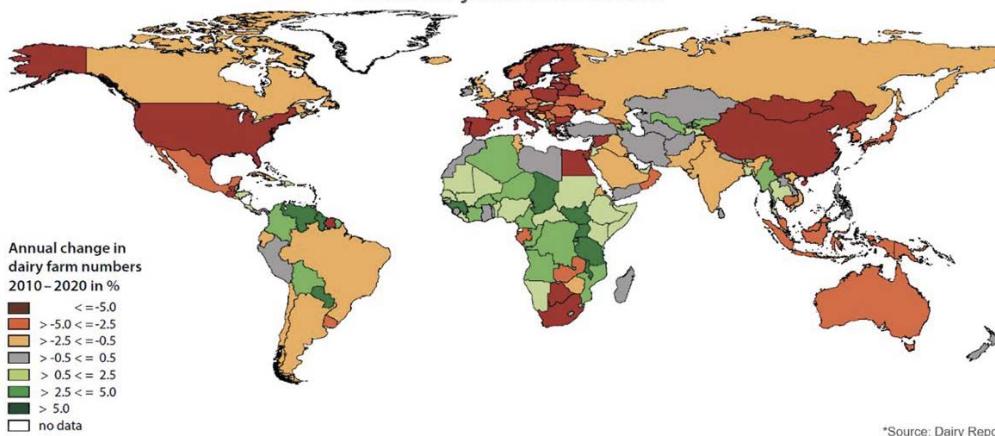


Fewer dairy farms means rivalry between processors and between farm input companies



Overview of the global milk price and factors influencing it
(Fig.: IFCN)

Global dairy farm consolidation



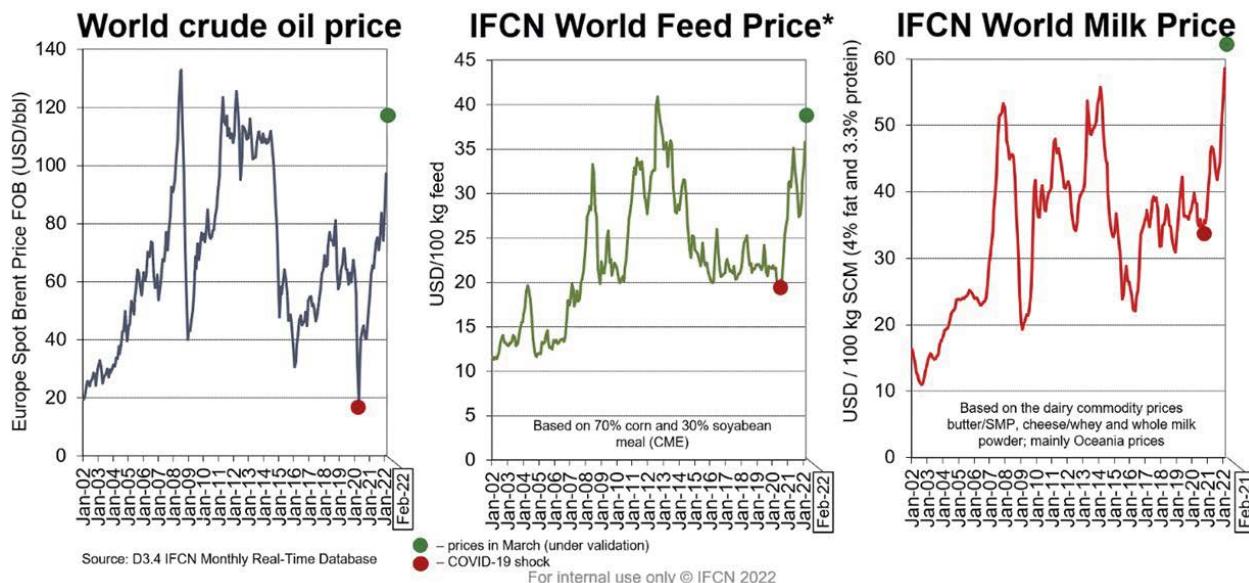
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*Source: Dairy Report 2021

This world map shows where new dairy farms are emerging or existing ones are quitting
(Fig.: IFCN)

The “new” normal in the dairy industry: High & volatile input costs



The development of feed costs and milk prices correlates with that of the oil price (Fig.: IFCN)

unchanged at a high level (1.4% CAGR), despite further increases in product prices. IFCN attributes this to the middle class, which is becoming more and more established worldwide.

Looking at milk production worldwide, 3% of farms produce 63% of the total raw milk. Still 40% of milk is marketed passing by dairies in some form. Without any crisis, milk production is under constant cost pressure, every year 6% of the dairy farms in the EU quit, and according to IFCN, 50% of dairy farms are expected to go out of business by 2030. This, mind you, is without any aggravation of the economic situation through external effects such as the current war in one of the world's largest agricultural countries, which is driving up input costs dramatically. State-imposed climate protection is now one of the main reasons for the demise of farms. It increases costs without raising productivity in the slightest. Climate protection requirements or simply seasonally bad weather lead us to expect that the quantities of milk available to the EU or Oceania will hardly grow any more.

For dairies, this in turn means that their raw material base will come under threat and that competition for raw milk will intensify. In addition, domestic and export business will compete with each other.

IFCN advises to focus on the profitability of the farms and, above all, to get an overview of global developments that influence one's own business. For this purpose, but also to provide better information about market developments, IFCN has developed a new forecasting service that offers, among other things, short-term forecasts for milk prices, commodity prices, milk production (volumes) and profitability of milk production.

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GEA: New-gen valve control tops

The GEA T.VIS M-20 control top marks a new era in process automation using GEA valve technology. The new T.VIS M-20 controls and monitors process and CIP operations. It will be deployable as standard in more than 80 percent of all hygienic applications. To accommodate the rapid rise in plant automation, the T.VIS M-20's top's features include control and connectivity options previously reserved for premium-class control tops. For example, automatic setup greatly simplifies installation and reuse of valves in the process.

To lighten plant operators' workload during commissioning, the valve has an integrated digital intelligence in the shape of a proprietary program code. The Quick-Setup takes care of the entire commissioning process – including self-learning position recognition by the feedback systems. All that operators are required to do is assign the electrical and pneumatic connections. The built-in contact-free path measuring system detects its position with a precision of 50 µm.



Designed for the vast majority of applications in hygienic processes without exceptional connectivity or feedback requirements: GEA T.VIS M-20 control top (photo: GEA)

AmPrima PE and PE PLUS offer fully recyclable packaging for cheese (photo: Amcor)



AMCOR

Fully recyclable cheese packaging

Amcor added cheese to its innovative AmPrima recycle-ready packaging solutions in Europe. The PE recycle-ready portfolio is being expanded for cheese products, to offer brands a more sustainable packaging choice without compromise on performance.

Amcor AmPrima recycle ready solutions provide options for brands who need packaging that still offers the barrier, material stiffness, seal strength, graphics performance and fast run speeds of traditional unrecyclable packaging. New since April 2022 are AmPrima PE PLUS solutions targeting more demanding applications in terms of product protection, packaging convenience and runnability on packaging lines.

AmPrima PE and PE PLUS will be available in a variety of formats including flow wrap for hard cheeses, pouches for grated, and even flow-packs for leak-prone cheeses such as mozzarella. The complex requirements of dairy packaging meant that up until this point, mixed-material plastics have been the standard choice for preserving shelf life, avoiding leaks and offering shoppers convenience. AmPrima will allow to choose a full PE solution with robust product protection, that fits the requirements of most European PE recycling streams.

Packaging formats for cheese are vertical flow wrap, 3-side seal pouch, block flow wrap and stand-up pouches.

GNT

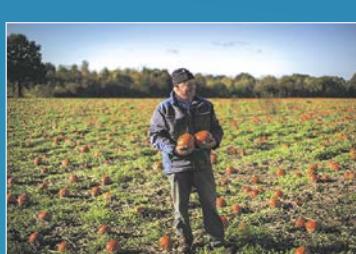
Sustainability roadmap for 2030

EXBERRY Coloring Foods supplier GNT has published a report that sets out its plans to become the leader in its field on sustainability. Each year, GNT produces more than 11,500 metric tons of EXBERRY concentrates from edible fruit, vegetables, and plants – enough to color over 40 billion servings of food and drink.

To ensure the company is fit for the future, it has unveiled a sustainability roadmap for 2030 to optimize its environmental and social impacts across its global operations. The full plans feature in GNT's new 'Sustainability Report 2021,' which also includes detailed information on its performance last year.

GNT's sustainability strategy is built around four key pillars: better products, better operations, better agriculture, and better for people. It features a total of 17 targets for 2030, including cutting the Product Environmental Footprint for EXBERRY product ranges by 25% and reducing the intensity of factories' CO₂-equivalent emissions by at least 50%.

Furthermore, due to GNT's vertical integration, the company will soon be in a position to report on greenhouse gas emissions for 80% of EXBERRY products.



GNT will soon report on greenhouse gas emissions for 80% of EXBERRY products (photo: GNT)

Heat and cold from one machine

Low-CO₂ high-temperature heat pump for sterilising dairy products

Author: Bernd Genath, trade journalist, Düsseldorf, berndgenath@t-online.de

In Trondheim, Norway, the Scandinavian research institute Sintef realised the ideal energy cycle for both a heat pump and operating costs in a dairy. The newly developed propane-butane unit takes as its energy source for hot water production the return flow of the ice water that the plant produces to cool the raw milk with an ammonia chiller. The high-temperature heat pump thus also supports the ice water production with its own evaporator.

Considerable losses

The warm side of the high-temperature heat pump (HTHP) pushes hot water temperatures of up to 115 °C into the food production lines, including the pasteuriser. Despite the temperature swing of more than 100 K, the cascaded structure operates with a COP of up to more than 3.0. The cold required to cool the dairy products to 3 to 4 °C, which already enters the megawatt range in medium-sized dairies, is supplied in the form of ice water by the chillers. The demand for heat for thermal sterilisation, for cleaning the plants and halls and for heating purposes exists at about the same amount as the demand for cooling. The energy consumption is therefore enormous.

If you look around in dairies, however, many of them are not particularly using the energy sources gas, oil and electricity economically. This is often the normal case: An ammonia chiller pushes the ice water to the storage tanks and blows the heat outdoors via a dry cooler, an oil or gas boiler provides 70- or 80-gram washing water for regular cleaning of the tanks and machines, and an electric heater with a COP or efficiency of 0.9 is responsible for the 120 °C process hot water for sterilisation and other purposes. This produces considerable losses. The simultaneous demand for high and low temperature, on the other hand, makes such plants ideal

for a much more efficient system with HTHP, which is, however, still in short supply.

Sintef know-how

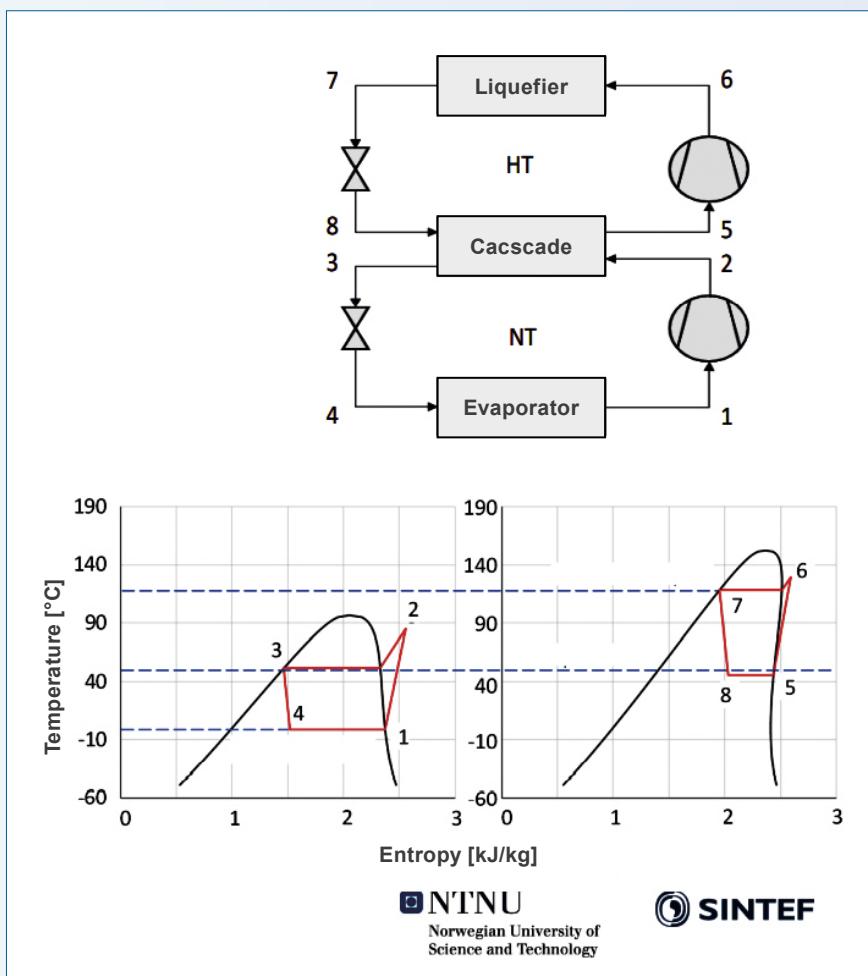
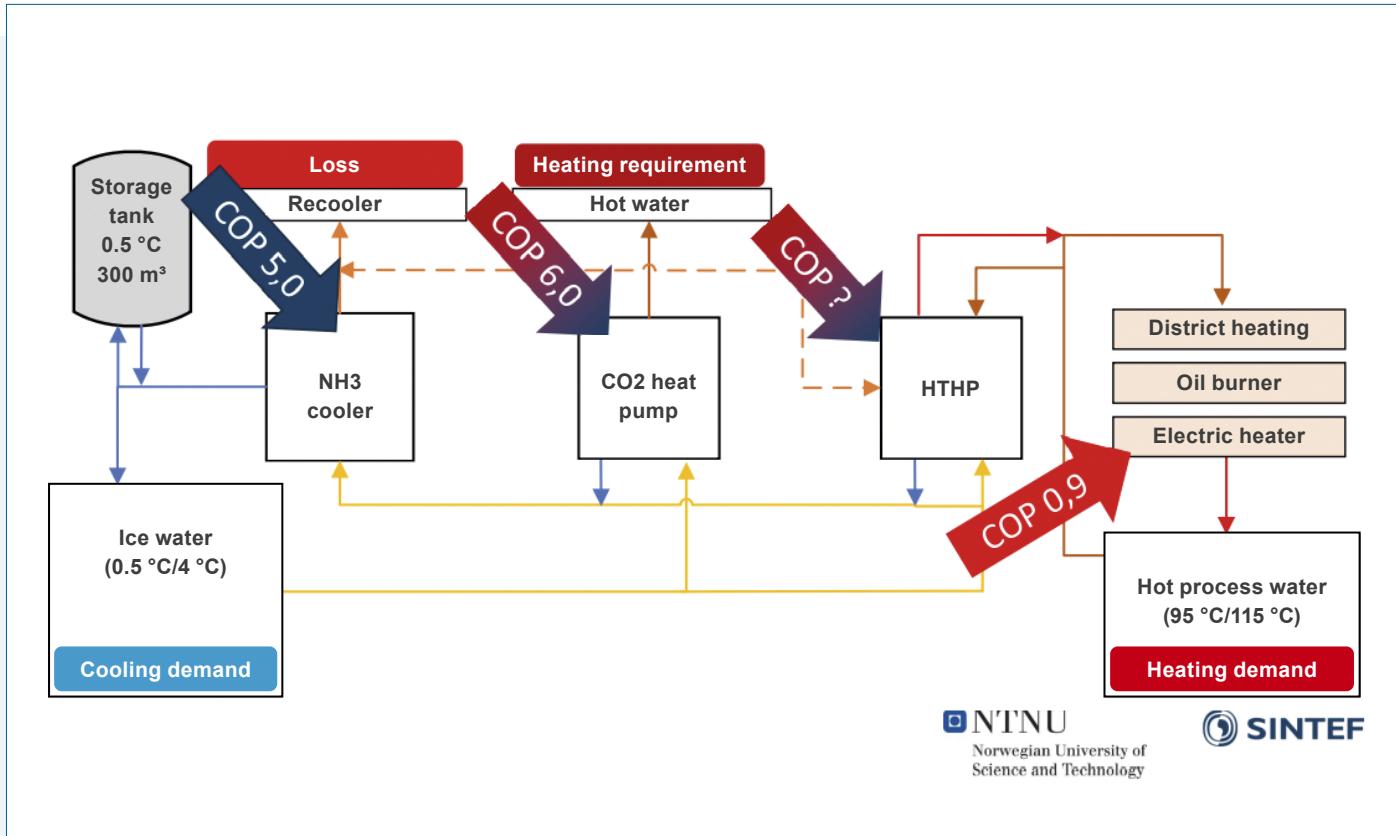
However, since the Paris agreements were signed, the heat pump industry on the one hand and potential customers, i.e. food manufacturers, on the other hand, are now paying more attention to CO₂ savings in the production of food products. As said, HTHP is a natural choice for dairies, as it can support the chiller with its cold side and replace the boiler and electric heating with its hot side.

The first conversions are underway. Christian Schlemminger, project engineer at the Norwegian Sintef Institute, reported on such a retrofit at the German Refrigeration and Air Conditioning Conference last November in Dresden. Sintef is an independent research organisation and the largest of its kind in Scandinavia. There is close cooperation with the Norwegian University of Technology and Natural Sciences in Trondheim NTNU. One of Sintef's focal points is energy research.

Sintef has already completed a number of projects with Tine Norske Meierier BA. The cooperative is owned by its approximately 10,000 supplying farmers. It is considered one of the largest food companies in the country, with cheese as one of its specialities. Schlemminger presented two case studies with Tine. In the first, his institute dealt with the retrofitting of a dairy in Trondheim, which processes about 75 million litres of milk annually. The problem of optimising efficiency here was to take into account the existing equipment. The inventory requires process hot water of 115 °C.

Temperature swing of over 100 K

In the second example, a new Tine building in Bergen, the project



designers were allowed to design the production processes for a maximum temperature of 95 °C from the outset. "This means that a high-temperature heat pump for a temperature swing of 70 to 80 K naturally works with a much higher COP than a HTHP for a temperature swing of 100 K and more," the Sintef scientist elaborated on the differences between old and new buildings in the introduction.

In case study 1, the energy supply consists of an existing ammonia chiller consisting of four machines that cool water from 4 °C down to ice water of 0.5 °C in the cycle. Furthermore, there is a CO₂ heat pump in the dairy for a hot water demand of approximately 75 °C. This HTHP is used to clean the machines and equipment and the rooms with tap water of 10 °C before heating. The third existing heat generator station is made up of a combination of district heating, an oil boiler and an electric heater, which provide the process hot water for food production. This flows to the production line at 115 °C and returns at 95 °C. The case study investigated the possibility of integrating a new type of HTHP into industrial processes of existing dairies based on the retrofit carried out. The study team compared the process and performance parameters as well as the potential savings in terms of primary energy and CO₂ emissions with a conventional reference system.

For use in the typical operating range of 0 °C to 120 °C for ice and hot water production, the natural refrigerants propane (R290) and butane (R600) can be used in a cascade. The advantages of R290 and R600 in cascade are moderate operating pressures, a high achievable temperature range, the availability of standard components and a classic refrigeration installation. Due to the requirements of the EU's F-Gas Regulation and environmental

protection, only natural refrigerants were considered. The regulation governs the industrial use of fluorinated greenhouse gases (F-gases, for example refrigerants) and aims to reduce Europe-wide emissions of these climate-relevant gases by 70 per cent by 2030 compared to 1990. Although Norway is not an EU member, it is part of the European Economic Area (EEA). This means that the Scandinavians, like Iceland and Liechtenstein, have to follow the EU's internal market rules without being able to determine them themselves.

HTHP: The developers opted for an internally cascaded system that connects two circuits in series, namely a low-temperature circuit with propane and a high-temperature circuit with butane as the refrigerant. The low-temperature circuit transfers its heat directly to the butane circuit in the condenser/evaporator. The cascade with a capacity of about 300 kW operates with a combined coefficient of performance of 3.4 plus/minus 0.3. Schlemminger: "Propane boils under atmospheric conditions somewhere at minus 40 °C and butane at 0 °C. The two refrigerants thus complement each other well. The two refrigerants therefore complement each other well. The low-temperature circuit keeps the temperature up to 35 or 40 °C, and the butane then adds another 85 K, i.e. up to over 120 °C. The volume flow of the process hot water is controlled depending on the load."

CO₂ heat pump also cooling

The plant engineers integrated the HTHP into the return line of the ice water generator. The propane-butane heat pump thus uses the waste heat from the dairy products production line, which the return line transports to the chiller. The control system feeds the ice water produced here into a storage tank with a capacity of 300

YEASTUP

Innovative upcycling Sustainable ingredients from brewer's yeast

Yeastup AG, pioneers in the field of sustainable use of spent brewer's yeast, provide nutritional proteins and dietary fibers for the food, beverage and cosmetics industries. Yeastin is a top-quality, highly versatile protein source that is also natural and sustainable. Other products derived from the cell wall of yeast include beta-glucans and mannans, which are marketed under the UpFiber brand. The goal of the founders is to make a real contribution to sustainability and the circular economy: Their vegan proteins and polysaccharides have the smallest possible carbon footprint and require neither arable land nor irrigation.

In collaboration with engineering companies and the University of Life Sciences FHNW based in Switzerland, Yeastup developed a gentle process to extract the ingredients of the cells of spent brewer's yeast and remove off-notes, as well as the natural residues from the brewing process. The result is a protein powder that convinces with highest purity and quality, and, importantly, a neutral taste (photo: Yeastup)

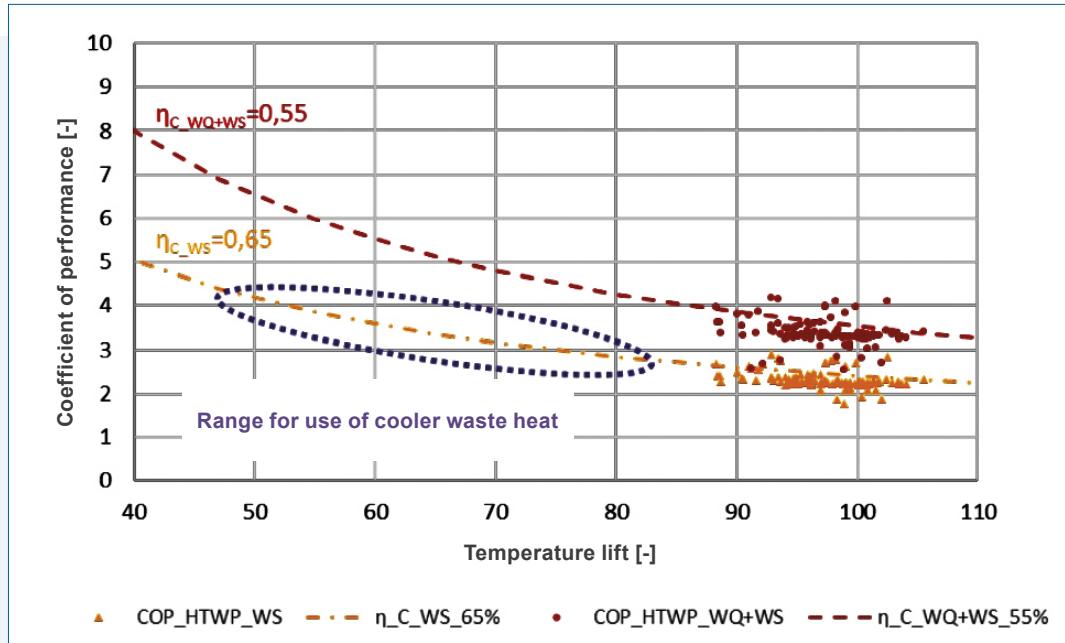
The brand Yeastin comprises vegan proteins obtained by upcycling spent brewer's yeast. Using a newly developed process, the cell walls are gently disrupted to release the nutrients. The result is a high-quality protein with an excellent nutritional profile that is as valuable as that of animal proteins. Thanks to its neutral taste and high solubility, Yeastin can be used in a wide range of applications – predominantly meat and dairy alternatives. Furthermore, its numerous and versatile functionalities mean it

can also act as an emulsifier or foaming agent, and thus replace eggs in vegan formulations, for example.

In addition to the Yeastin proteins and the polysaccharides brand UpFiber, Yeastup offers support with product development and formulation. The company is also aiming to collaborate with food and cosmetics manufacturers on future product development, and is looking to add tailor-made compounds and blends to its portfolio.



News



m³. Not only does the food production line draw cold from this, but the CO₂ heat pump also uses the buffer as a source of energy to heat the cleaning water to 75 °C. In this way, it participates just as much as the new chiller. In this way, it participates in the cold production just like the new HTWP with its cold side. Its thermal output is 160 kW.

Sintef recorded the performance data over a week. The combined COP of propane and butane stages oscillated between 2.6 and 4.1 over the course of a week, with the aforementioned mean value of 3.4. The pure temperature swing approached 108 K during the observation period. For the time being, the refurbishment did without heat recovery from the NH₃ chiller. The reclaimer blows its waste heat into the atmosphere. Sintef calculated the loss. According to this, the coefficient of performance of the HTWP should

The results

"The performance of the new HTHP results in potential savings of 62% in energy consumption and up to 94% in CO₂ emissions compared to a combination of refrigeration-based ice water production and gas- or oil-based hot water production. The study successfully demonstrated that simultaneous provision of process ice water and hot water with a heat pump is technologically possible and that retrofitting into an existing energy system can also be implemented in an economically and ecologically sensible way." (Taken from: Schlemminger/Ahrens: High-temperature heat pumps with natural refrigerants).

Note: The energy and CO₂ savings figures are based on the Norwegian energy mix with a share of 95% renewables, mainly hydropower, in electricity generation.

Regarding the economic efficiency, it should be said that in Norway, due to the lack of a natural gas grid structure, the liquid energy source is just as expensive per 1 kWh as electric power, namely currently about 10 cents/kWh. However, due to the liquid delivery and the long transport routes, the prices differ considerably. Norwegian studies therefore find it difficult to make a transferable economic calculation.



increase by a COP of about 0.5 to an average value of 3.8 to 4. In the analysed period of one week, the process heat demand totalled 117 MWh, the hot water demand 11 MWh and the process cooling demand 77 MWh.

Mainly standard components

Except for the compressor, the machine is based on standard components. The heat pump experts succeeded in convincing the compressor supplier Dorin to convert the 300 kW gross tank compressor to the high temperature of 130 to 140 °C in the factory. Dorin did not have to break any new ground, however. In a preliminary test, the essential modifications had already been worked out on a 20 kW compressor. The client was also SINTEF. Details can be found in a publication by Schlemminger et. al. entitled "Design and experimental results of a high-temperature propane-butane heat pump". It is available on the web. The modifications compared to a standard compressor consist, among other things, of an oil sump heater that keeps the lubricating oil permanently at 60 °C, so that sufficient lubrication is ensured during the periodic starts. Previously, Dorin had to find a suitable lubricant for the high-temperature application in contact with hydrocarbons (propane/butane) without ageing.

Christian Schlemminger's conclusion: "The unit copes well with the requirements. It has already run for more than 2,500 hours and we are confident that it will last another ten years."

www.sintef.no www.dkv.org www.tine.no



GEA: New homogenizers

The GEA Ariete Homogenizer 3160 features up to 1500 bar, with significantly increased flow rate capacity between

200 and 1200 bar. Like all Ariete homogenizers, it can be customized with more than 300 options for easy integration into any sanitary or aseptic process line. The machine will feature state-of-the-art condition monitoring, which is now available for all Ariete homogenizers.

SYNERLINK

Versatech filling machine

Synerlink has launched Versatech, what it calls a future-proof filling solution for the dairy industry. Its modular design enables customers to continually realign this packaging innovation with their evolving business strategy.

"Through conversations with our customers, we discovered a market need for a filling solution that would outlast the standard 20-to-30-year lifecycle," said François Truffier, Synerlink President. "Rather than disposing of this machine when it ceases to support the business, Synerlink's customers can quickly, and inexpensively, reconfigure Versatech to once again work in support of new business initiatives."

Starting with a compact 2.5-by-4-meter frame, Versatech is expandable with standard-increment modules that come in lengths of 440, 880 or 1,320 millimeters. Versatech combines flexibility with a centralized cabling network to offer plug-and-play functionality that allows food and dairy processors to access the latest filling and packaging technologies as they become available.

Versatech includes several other features: a tubular frame shape, removable slats and chainless design were included to simplify maintenance and improve hygiene safety. The enhanced ergonomics of the loading station, and simplified training and troubleshooting via the HMI, address the growing issue of operator turnover.



The new Versatech filling machine can be quickly reconfigured (photo: Synerlink)

The NiSoX homogenization valve distributes particles in the desired size exceptionally evenly. This especially benefits customers who rely on finest emulsions and microemulsions. The valve geometry optimizes energy distribution during homogenization, thereby reducing particle size and significantly improving the homogenization effect.



The GEA Ariete Homogenizer 3160 can be customized with more than 300 options for high performance and reliability in continuous industrial production (photo: GEA)



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The dairy industry needs to reassure consumers about the sensory aspect of natural sweeteners



Consumer Experts, Insight Driven



Across the globe, consumers are being more attentive to ingredient listings, as they question aspects of their life from a health and safety perspective that they previously took for granted. This is something that is having a significant influence on purchasing habits within the dairy sector, with consumers looking to avoid ingredients that they deem detrimental to their health. The war on sugar will intensify over the next couple of years, whilst consumers are conscious of the nutritional profile of artificial sweeteners. This is something that creates opportunities to use natural sweeteners – however, brands need to reassure consumers about the sensory aspect of such ingredients.

The pandemic is something that has significantly influenced the eating and drinking habits of consumers, as more proactive attempts are made to boost levels of wellbeing. Indeed, a total of 73% of people in 2022 said that they are planning to make attempts to eat and drink more healthily whiles a year earlier, 63%

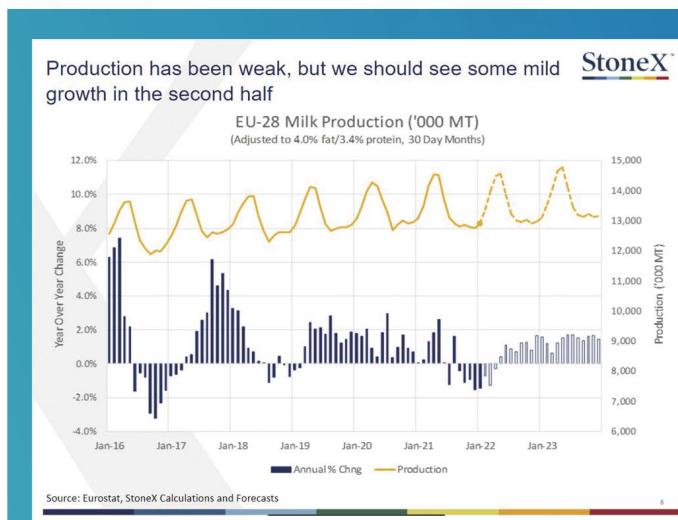
stated that they have been more attentive to the ingredient lists on food and drink products. Irrespective of the level of attention given to the growth of the flexitarian diet, dairy remains a staple part of the dietary habits of many, with 78% stating that they turn to such products to some extent. As such, an increased focus on ingredients is something that is something that will have a significant influence on product choice, especially as consumers look to moderate their intake of dietary evils such as sugar.

When purchasing dairy products, a total of 50% of global consumers state that they regularly check nutritional labeling, highlighting the role that ingredients play in the purchasing decision. When asked what kind of information they look for a total of 60% said that they check the sugar content, whilst 38% stated that they look out for artificial sweetener claims. This highlights two trends. Firstly, sugar remains the number one dietary evil for consumers because of the link between excessive intake and rising

levels of obesity and diabetes. Furthermore, the war on sugar will likely intensify over the next couple of years, as many feel that they have gained weight over the last couple of years because of increased levels of comfort eating and greater levels of inactivity. Secondly, it shows that consumers are concerned about artificial ingredients that they believe are lacking in nutritional value and can potentially be damaging to the wider environment.

Concerns about sugar content and the use of artificial ingredients are something that creates opportunities to promote natural sweeteners within the dairy industry. After all, consumers are becoming more health-conscious and 50% state that natural sweet-

eners are a healthier alternative to sugar. However, only 26% state that they regularly seek out products that contain natural sweeteners, highlighting the attitude/behavior gap that can exist in this area. Indeed, consumers can be conscious of the excessive intake of sugar and artificial ingredients, however, they can be conscious of the taste element of natural sweeteners, something that can be linked to legacy issues relating to the aftertaste of stevia. Irrespective of concerns about health and wellness, consumers are unwilling to compromise on the taste and enjoyment element of products, especially in an era when they turn to food and drink for comfort purposes and to alleviate stress. While consumers may be conscious about the volume of sugar and artificial sweeteners in dairy products, brands need to do more to convince consumers about the sensory aspect of natural sweeteners if such claims are to be more influential on purchasing habits in the dairy industry.



News

1%, logistical problems are preventing the dairy industry from benefiting sufficiently from the high prices in the world market.

A further increase in milk prices is expected in the coming months, but milk producers will not react until the higher product revenues translate into a noticeably higher cash flow for them.

A switch by processors to plant-based raw materials is only possible to a limited extent, because plant-based ingredients are also becoming noticeably more expensive, and there are also ongoing problems with transport capacities.

China is sitting on relatively high stocks, and the government's zero-covid policy is also making sales and imports difficult (lockdowns, closure of ports). From StoneX's perspective, China will remain a difficult market this year, with imports currently 2% below last year.

StoneX sees a turnaround in prices from the summer onwards at best, but it will not be very strong; product and milk prices will probably remain high for the next up to three years.

High prices in the long run? Forecast by StoneX

US financial services provider StoneX gave a forecast for the dairy markets in an online event at the beginning of April. While milk prices in the EU are moving towards ever new records, they are falling in Oceania due to weaker export demand. In the USA milk production is down by

Dairy nutrients support health throughout life

IDF organized its annual Nutrition and Health Symposium, focusing on the role dairy plays across the life stages.



Author: Caroline Emond, Secretary General International Dairy Federation

Over 200 nutrition and health professionals from all over the world virtually attended the event led by 8 experts and 2 moderators from various regions of the world. Good nutrition is key for health and wellbeing throughout life and can help us live our life to the fullest. Dairy products are nutrient-rich and are a source of protein, B vitamins, iodine, calcium, phosphorus, vitamin A, zinc, and potassium – making them an excellent choice for nutritional needs at all ages and stages of life. The unique combination of nutrients and bioactive factors, and how they interact with each other in the dairy matrix, combine to produce the overall effect on health.

Nutrition and health professionals from all over the world listened to international experts discuss the latest research on dairy, nutrition, and health. During the first session, experts presented the role of dairy in maternal diets, for children and teenagers.

One of the main challenges during pregnancy and lactation is the increased demand for micronutrients, such as folate, vitamin B12, iodine and calcium. Dairy products contain these nutrients naturally, helping to nourish both mother and foetus, as explained by Professor Ian Givens from Reading University: "Those who chronically consume suboptimal amounts of calcium may be at risk of excessive bone loss and may need additional calcium to meet both foetal and maternal needs. Milk and dairy foods are often the

primary sources of calcium which are generally of higher bioavailability than from other sources".

Dairy products are an important source of essential amino acids, fatty acids, vitamins, and minerals which can prevent undernutrition and support healthy growth and development during childhood through to adulthood: "However important, the focus on the first 1000 days is insufficient, as intervention is also required in three later phases: middle childhood (5-9 years), when infection and malnutrition constrain growth; adolescent growth spurt (10-14 years) and the adolescent phase of growth, brain maturation and consolidation (15-19 years) if a child is to achieve his full potential as an adult – an important but often overlooked area being the diet", Professor Seema Puri from Delhi University said.

Food-based dietary guidelines are key to provide healthy eating guidance in every life stage. However, only a few countries such as South Africa, Kenya or Nigeria have guidelines tailored to the specific nutritional needs of children. Professor Lisanne Du Plessis, from Stellenbosch University explained: "Barriers to following the guidelines included limited physical and financial access to resources, cultural/family practices, poor social support, and time constraints".

The last speaker of the first session touched on the type of milk that children should drink. Contrary to popular belief, there

are no additional health benefits to consuming reduced-fat dairy for children, as Professor Theresa O'Sullivan concluded in her study: "changing to reduced-fat dairy does not result in improvements to markers of adiposity or cardiometabolic disease risk in healthy children".

The physiological and psychological changes that accompany us throughout adulthood lead to new challenges and needs, and the role of health professionals is to prevent and manage illness that may arise. Therefore, the second session of the Symposium discussed the role of nutrition for the ageing population. Dairy, as part of a protein-rich diet, is essential to prevent Sarcopenia, a condition that reduces muscle mass and strength. Dairy's protein content, especially in the amino acid leucine, is an essential ally in maintaining mobility and independence. "Acute protein intake increases muscle protein synthesis, essential for maintaining muscle protein anabolism and muscle mass. On the contrary, lack of protein intake, especially in breakfast, has been shown to increase the risk of skeletal muscle loss regardless of the age group", Professor Fujita Satoshi from the Ritsumeikan University of Japan affirms.

The nutritional quality of dairy products complements healthy muscles and a healthy skeleton, two areas intrinsically connected. They make up the easiest to use and most cost-effective food group to achieve great effects in fracture prevention and maintenance of mobility. This was well demonstrated by Professor Sandra Iuliano, from the University of Melbourne: "Dairy foods, such as milk, yoghurt and cheese are the major dietary sources of these nutrients [high-quality protein and calcium] so supplementation using these foods may be an effective way to address bone fragil-

ity and fracture risk in our ageing population. Dairy supplementation either in part or as a whole food is associated with attenuation of bone and muscle loss in older adults".

Milk and dairy show signs of supporting brain health. Some bioactive components from milk such as cysteine could contribute to improving brain health in the ageing population. The bioactive milk peptides in dairy products display antioxidant potential, including in the nervous system, which justifies the benefits of including 3 portions of dairy in the diet of those experiencing a decline in cognitive function, such as seen in Multiple Sclerosis. As Professor In-Young Choi expresses, "A recent randomized controlled dietary intervention trial confirms the potential benefit of milk intake to raise brain Glutathione, a major brain antioxidant, in older adults."

Dr Estêvão, a registered dietitian from Portugal, demonstrated how dairy products can be used in clinical settings as an easy, affordable, and reliable source of high-quality and bioavailable protein, calcium, and phosphorus for a population with a very high risk of malnutrition, sarcopenia, and fractures.

As IDF Director General, Caroline Emond, said in her opening remarks, Nutrition and Health is one of IDF's pillars and therefore part of its mission is to stress the vital role of Dairy in nutrition all throughout life's course. This year's edition of IDF's Nutrition and Health Symposium sought to underline both the importance of milk and dairy intake as well as IDF's commitment to promoting its relevance for a healthy life.



GEA: IDEAL Whey Separation concept

The GEA IDEAL Whey Separation concept bases on optimum whey pretreatment by first separating the cheese fines, followed by skimming the cream. State-of-the-art whey centrifuges feature a lower degree of consumption thanks to manual or semi-automatic adjustment of several operating parameters by the operator. IDEAL Whey Separation applies this knowledge of dependencies to a high degree in a mechatronic system for self-optimization of the separation process.

Parameters such as the feed rate of whey are captured by sensors in the periphery of the clarifying separator, which can typically vary in the process and depending on the cheese formulation. Based on this, the bowl speed is adjusted automatically. The size of bowl discharges is automatically adapted to changing process conditions during operation.



IDEAL Whey Separation includes documentation and visualization of productivity-relevant operating parameters in real-time, which also act as the starting point for additional plant optimization projects (image: GEA)

European Dairy Trade Policy 2022



EDA President Giuseppe Ambrosi with USTR Julie Callahan, May 2022

The world has changed since the European Commission had defined the job description of the European Trade Commissioner for 2019 – 2024.

‘Business as usual’, like the functioning of the WTO, the trading partnership with the U.S., China and Africa were then put as a priority as well as the conclusions of the trade negotiations with Australia and New Zealand.

But also: ‘making trade more transparent’ with a commitment to ‘highest level of transparency and communication with the civil society’.

Over the last months, we live in a new geopolitical environment and a new era, also for (dairy) trade:

EU – Ukraine dairy relationship

In a very quick and maybe more symbolic move, the European Union has opened up its Single Market for Ukrainian exports, including dairy: no quotas, no tariffs for Ukrainian dairy. Even if this trade facilitation is – for the time being – restricted to one year, the way forward here seems clear.

And as European Dairy Association, we are in talks with our Ukrainian partners from the Ukrainian Dairy Association Union (SMPU) / Спілка молочних підприємств України (СМПУ) to define our dairy relationship and ways in which we can support the Ukrainian dairy sector – which includes some European / international dairies.

EU FTAs with 'Oceania': tuned again (Australia) / in a final signature mode (New Zealand)

Since the momentum in the FTA negotiations between the EU and Australia has been somehow watered down under the previous Australian political leadership, the new Australian government will for sure make an effort to catch up again.

In the meantime, the New Zealand minister for trade and agriculture, Damien O'Connor and the European Commission have doubled the efforts to get the EU – NZ trade deal done.

We expect New Zealand PM Jacinda Ardern in Brussels end of June 2022 to meet with EU COM President Ursula von der Leyen for a 'signing procedure'.

To be seen if this EU – NZ FTA, that is basically already fully spelled out, will find the approval of the European Parliament and the 27 EU Member States.

A restart of the U.S. – EU dairy connection

We also felt this new era at our EDA Washington DC visit in May 2022, where we encountered at all levels a new interest in our transatlantic relationship – that is right now still under the more or less hidden threat of the Boeing/Airbus case, which is only put on stand-by, but not solved yet.

This new 'openness' translated already in the updated U.S. FDA guidance on how infant formula facilities, especially in European countries applies for exports to the U.S. under new enforcement discretion.

We do hope that this positive transatlantic momentum is a sustainable one. And talking about 'sustainability', there are the "mirror clauses" – or the global application of EU health & environmental standards.

We are waiting for the official EU report on the 'rationale and legal feasibility' of applying EU standards to imported agri-food products, aka 'mirror clauses'.

It goes without saying that all agri-food imports all over the world have to comply with the relevant, mostly Codex Alimentarius based internal standards relating to the final product.

The European Union now intends to impose its requirements on the way products are produced (usually referred to as 'process and production methods (PPMs)'), id est mostly referring to 'sustainability requirements', which are even not yet defined at EU level. This PPMs do often not even have any effect on the physical characteristics of the final product.

While such requirements have already been set and challenged at WTO level (see for instance the ban of certain tuna imports to the U.S.), we consider a multilateral, hence negotiated and ideally science-based approach for the only adequate avenue here.

INGREDION

Functional native starches

Ingredion EMEA launched NOVATION Lumina 8300 and 8600 functional native starches in EMEA. The innovative functional native rice starches were designed specifically to improve colour and flavour release, enabling natural flavours and colours of applications to shine through, even in white products.

Until now, even functional native waxy rice starches contributing the least colour and flavour have struggled to meet strict sensory requirements in white or light-coloured applications with delicate flavours. This limitation has been addressed with the launch of NOVATION Lumina 8300/8600, enabling improved consumer preference and allowing the superior label and functional benefits of rice starch to be accessible to a wider range of products - all while supporting "natural" claims and other clean label messages.



NOVATION Lumina 8300 and 8600 functional native starches improve making of shine-through and white products (photo: Ingredion)

And even if we fully support the EU policy makers in their ambition to be the driving force of the global transformation to sustainable food systems, the 'mirror clauses' strategy that is voiced today in the Brussels political environment is for sure not the most conducive here.

Maybe a good opportunity for the European authorities to show a clear proof point for the claimed EU pro-trade approach, especially in this new geopolitical era, that seems to open up a window of opportunity for rethinking global trade.

News

Cheese cutting machines



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Cost-effective separator cooling

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Doubling down on dairy inspection waste

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Russia: A dairy industry in a perfect storm

Country Report

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

THE BOOK HAS 9 CHAPTERS

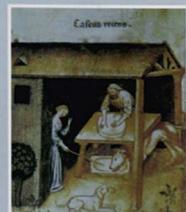
General overview, divided into definition, processing scheme, history, significance of the various groups of cheese concerning nutrition Raw material and additives for the production for various groups of cheese Varieties of the respective groups of cheese as well as their manufacturing processes and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

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Josef Kammerlehner

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