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Good news for the industry

The EU export business is set grow significantly

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According to the recent OECD/FAO Agricultural Outlook, the share of commodities in EU dairy exports will grow from 24% in 2016 to 28% in 2026. Total EU dairy exports are to increase by 37% in that period. Cheese exports alone will be up by 26% to almost one million tons and SMP exports will grow by 60% to 910,000 tons – making Europe the dominant supplier of these two categories to the world market.

This looks like good news to the industry. Owners, managers and farmers can be assured that their investment in processing capacities over the past few years was justified and an overall good decision. Of course, the past investment may not be enough to be able to utilise increasing milk production to make SMP or cheese in sufficient quantity just to match the Outlook's estimate. In the period between 2016 and 2026, OECD/FAO think it to be likely that the EU milk pool will grow by 8% to almost 176 million tons which is about 13 million tons more than processors have available today.

However, there are some political trends towards reducing export possibilities especially of the EU dairy and cheese industry. Even conservative politicians, not just the Greens and the socialists, say that dairy exports counteract initiatives in developing countries to build an own milk production by flooding local markets with cheap/subsidised products. In the run-up to the Federal elections in Germany, long-time Chancellor Merkel stressed that one would have to take a close look in future as to where German dairy products end up as the might be possibly impeding local development.

So, the myth that farm produce in areas, where conditions for agriculture and milk production are favourable by chance, disturb worldwide farming has reached top level decision makers. It is quite sad by the way that this kind of politicians is babbling away things that are just wrong. Take India as example: OECD/FAO estimate a 50% growth of milk production there to about 228 million tons until 2026. On the other hand, Africa's milk production, due to the climate, will never be able to meet the ever growing demand. If EU products could not reach this market any more one day, malnutrition especially of toddlers and children would be the effect.

Given worldwide growth of population, to be a dairy farmer or a worker in the dairy industry is one of the most sustainable professions around, despite all the political drivel, thinks Roland Sossna

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Fonterra's Heerenveen plant has a peak processing capacity of 2.7 million litres of whey per day (photo: Rockwell Automation)

New dairy ingredients plant for Fonterra

Integrated automation, motor control and process control solution

Fonterra Co-operative Group Limited is a multinational dairy co-operative, owned by around 10,500 New Zealand farmers. The company is responsible for approximately 30% of the world's dairy exports and with revenues in excess of NZ$19.87 billion, it is New Zealand's largest company and accounts for 25% of the country's total exports.

With a network of offices, productions sites and technical centres across the globe, it employs some 16,000 people in New Zealand and around the world; collecting 22 billion litres of milk annually in order to make dairy products available to millions of consumers in 140 countries.

The Heerenveen plant

The company has commissioned a new dairy ingredients plant in Heerenveen (IDM has published a site report in issue no. 11-12, 2015), in the north of The Netherlands, which is used to produce three variants of lactose powder and a range of protein products. This includes whey protein concentrate, whey protein isolate and a lipid-rich whey protein concentrate as well as several specialty functional whey protein concentrate powders for use in high-value paediatric, maternal, and sports nutrition products.

Officially opened in July 2015, the new plant is built on a 25 hectare site and has been developed in partnership with leading Dutch cheese manufacturer DOC Kaas – where the Fonterra plant processes the whey originating from the other plant's cheese making process. The plant is Fonterra's first wholly owned and operated ingredients plant in Europe. Peak production will see the plant process up to 2.7 million litres of whey per day, with annual pro-

duction figures of around 25,000 tonnes of lactose and 5,000 tonnes of protein products.

Motor Control based around Allen-Bradley products

For the automation and control of the plant, Fonterra had a wide choice of suppliers and system integrators from which to source primary equipment. In New Zealand it uses Allen-Bradley programmable automation controllers (PACs) and SCADA solutions from Rockwell Automation, with motors and motor-control technology from other suppliers. At the Heerenveen development, Fonterra did initially investigate using the same combination of suppliers. However, with an incredibly powerful integration and Connected Enterprise solution proposed by Rockwell Automation and Beenen B.V., a Rockwell Automation Recognised System Integrator, Fonterra opted for a complete wall-to-wall solution of automation, process and motor control based around Allen-Bradley products.

Recognized System Integrators make the commitment to deliver the highest technical solution and customer service, leading with Rockwell Automation technologies. These integrators have a mutually supportive relationship with the Rockwell Automation sales and/or distributors they work with.

Using this approach Fonterra was able to deploy a completely integrated control solution from a single supplier that also offered effective communication from the shop floor to the top floor. Production data can be captured, collated, and analysed in order to improve processes and Fonterra can share vital manufacturing information with a wide variety of disciplines both inside and outside of the factory.

Fonterra was able to deploy a completely integrated control solution from a single supplier that also offered effective communication from the shop floor to the top floor (photo: Rockwell Automation)

Challenge

The primary challenge for the new site was the relatively short timescales in which the plant had to be up and running – the first orders were received in February 2014 and the plant needed to be up and running by the end of 2014. Beenen, with support from Rockwell Automation, was instrumental in addressing this challenge in its commitment to meet the 12 month timescale, compared to an industry average of 18 to 24 months.

In addition to the timescale challenge, Fonterra has its own standards for motor control and faceplates – with interfaces to devices from other providers and competitors. During the project, they were converted to the Rockwell Automation standards by using our process library.

Solution

The complete integrated solution chosen by Fonterra, comprised multiple elements of the Rockwell Automation product offering, many of which are part of the company's cutting-edge Connected Enterprise offering.

By using EtherNet/IP as the primary communication protocol, Fonterra has given itself the opportunity to move easily into The Connected Enterprise, an approach manufacturers are adopting to leverage the use of connected machines, supply chains and customers. Manufacturers are able to establish manufacturing processes that are data/information rich, supported, secure and future ready for market demands.

Ultimately, a Connected Enterprise approach for manufacturers will create a more competitive, innovative enterprise that can deliver insights to improve productivity, sustainability and economic performance through faster time to market, lower total cost of ownership, improved asset utilisation and enterprise risk management. Other benefits of access to real-time, contextualised information, include minimised downtime, improved technology and process optimisation, greater workforce efficiency and smarter expenditure. Because EtherNet/IP is based on standard, unmodified Ethernet, it means that there is very little that needs to be done for these connections to be established; and full security solutions are also available for user control and to prevent unwarranted access.

From a product perspective, Fonterra has deployed multiple Allen-Bradley ControlLogix programmable automation controllers (PACs), working in conjunction with Allen-Bradley CENTERLINE 2500 motor control centres (MCC), complete with Allen-Bradley E300 Electronic Overload Relays and more than 250 Allen-Bradley PowerFlex variable-speed drives, some with dual-Ethernet capabilities. Arranged in 42 cabinet columns, the MCC installation is 50 m in length. As well as providing intelligent centralised motor control, the CENTERLINE MCCs also offer advanced energy management capabilities and integration into the Rockwell Automation Integrated Architecture – delivering true plug-and-play capabilities.

According to Alex van Dalen, the General Manager from Beenen BV: "Beenen worked very hard to win this project and was initially bidding against two other local system integrators. We go for quality and the best solution, therefore Beenen employed Rockwell Automation to design and develop the MCC solution, while Beenen undertook the remainder of the electrical and automation work based around other Allen-Bradley solutions. We built up a real team ethic with Rockwell Automation and the positive effects of this cooperation was evident in the dealings with Fonterra and, of course, the success of the project."

Arranged in 42 cabinet columns, the MCC installation is 50 m in length (photo: Rockwell Automation)

FactoryTalk View

The software installation is just as impressive: FactoryTalk View offers overall visibility into the processes and interface with the ERP and process-control systems; FactoryTalk Historian is used for collection; and FactoryTalk VantagePoint is used for information, visualisation and dissemination. By making data freely available in an easy-to-read format, when you need it, in the specific format required for each job role; operators and managers are able to make much more informed decisions, much quicker and with greater positive effects on the line optimisation. FactoryTalk AssetCentre gives Fonterra the ability to centrally secure, manage, version control, track and report automation-related asset information across its entire facility. AssetCentre also provides automatic scheduled backups of controllers thus supporting "disaster recovery". Rockwell Software CPG Suite delivers value-based applications that can help Fonterra achieve operational excellence, increase supply chain effectiveness, adhere to regulatory compliance guidelines and meet sustainability goals.

Completing the installation is a number of value-added service offerings, which include a parts-management contract providing critical spare parts, a TechConnect upport contract and in-depth training for the Fonterra operatives.

Results

According to Alex van Dalen: "The Fonterra team was particularly enthusiastic about the benefits of Premier Integration in relation to the motor control offering from Rockwell Automation. They found the diagnostic software very useful to 'see' into the contactor from the MCC and also in the frequently controllers. The Connected Enterprise approach will also allow them to leverage their manufacturing data far more effectively and then share it with all those that need to see both historic and real-time information."

Hans Berghorst, Operations Director at Fonterra, explains: "Rockwell Automation is the Fonterra standard in the Netherlands and by deploying a complete Rockwell Automation solution, we only have one supplier instead of two, which also offers benefits in terms of maintenance and spares. We also selected our suppliers based on total cost of ownership (TCO). Rockwell Automation came out well; we not only looked at the CAPEX, but also at the life costs over 10 years and determined that the Rockwell Automation approach developed by Beenen was the best solution. Our engineers are also enjoying the benefits of the integrated approach. The MCC IntelliCENTER solution allows them to do restarts from the HMI in the control room; they don't have to go to the MCC."

Discussing the creation of the new faceplates, Berghorst adds: "It's a mixture of Fonterra, Beenen and Rockwell Automation engineering. Our plan was always to have a standardised solution and we do have our own in-house libraries that we use as standard within Fonterra, which are all the same worldwide. But of course now that the motor drives are from Rockwell Automation, we jointly developed new faceplates, based on Fonterra's engineering standards.

"We knew from the start that we wanted to use Allen-Bradley PACs and control solutions. We do a lot of joint development with Rockwell Automation back in New Zealand, so it is easy to copy and paste routines and programmes. In addition, we have specialists in our process control department in New Zealand who know and understand Rockwell Automation solutions very well. Also, from a support point of view, it's always better when you have a standardised solution."

Discussing the five year service contract, Berghorst continues: "I think within Rockwell Automation there are some very knowledgeable advisors, who know the systems inside out. We also saw very good co-operation from Beenen who undertook most of the direct interactions with Rockwell Automation.

"It is the first time we have built a new facility in Europe," Berghorst concludes, "so it is difficult to compare the performance characteristics compared to other sites and other technology, however, so far we are very satisfied with the performance."

Choosing the right filter
Axium Process

Filtration specialists Axium Process manufacture stainless steel filters that are customised to suit specific site or process requirements for applications ranging from pump and instrument protection to critical applications where filter failure or collapse is not an option.

Working closely with their customers, Axium Process' engineers are able to help select the right filter from a comprehensive range of stainless steel wedge wire and sintered mesh designs that are tailored to suit a given application, flow rate and pressure. Axium's filters are successfully used in a broad range of applications and the wedge wire design is excellent for products where smoothness and consistency are essential such as creams, emulsions, yoghurts, soft cheese and paints. All filter types are very easy and simple to maintain and do not require tools to dismantle.

Available as 90°, in-line and straight thru designs, filters are fabricated in both standard and compact options with either 4" or 6" housings. All filters can be fully customised as jacketed, duplex, triplex or multiplex options and supplied with a stainless steel support frame when required. **axiumprocess.com**

Delivering filtration levels between 5 micron up to 6,000 micron as standard, Axium's robust and versatile Pure-Screen and Fine-Screen filter ranges are in daily use throughout the dairy industry (photo: Axium Process)

Hohenloher Molkerei continues to invest

Introduction of GMO-free milk requires adjustments in operation

The Hohenloher dairy has significantly expanded its logistics capacities in recent years – the new storage tracts can be seen on the right hand side (photo: Hohenloher Molkerei)

The new warehouse is equipped with the particularly robust "Magnesia" floor (photo: Hohenloher Molkerei)

The Hohenloher dairy in Schwäbisch Hall, Germany, continued to invest heavily last year despite the milk price crisis. € 7.5 million was put up for a variety of projects. IDM was on site.

Separation of milk sorts

The reason for almost all investments was that Hohenloher dairy had almost completely switched to GMO-free milk last year and is therefore particularly dependent on a clean separation of the milk sorts.

In order to be able to cope with the separation process physically, two new raw milk tanks of 150,000 liters and three new product tanks of 200,000 liters each were installed. Supplier was Tankbau Ullmann from Kempten. This company has also set up a new 30,000-liter cream tank, which provides the basis for the dairy to produce non-GMO cream and cream products.

The milk acceptance facilities were also expanded, and instead of two has now four tracks, which feed a total of nine silo tanks. The collection truck drivers are equipped with an RFID chip, which makes access to the milk acceptance lines possible at all, and allows to guide the vehicles to the right acceptance lines. With this fully automatic system, fail-offs are excluded. The total discharge capacity is 65 m³/h per station, leaving significant space for future higher raw material input.

A fully automatic milk intake by Tetra Pak Processing was installed. This company has also supplied the new valve nodes for raw and finished milk. The system is so flexible that four milk lines can be run in parallel, and at the same time milk from up to four tanks can be drawn off on two heating or filter lines. In addition, it is possible to clean while the tanks are being filled or emptied. Up to four CIP operations can be performed simultaneously.

The new valve knots in the milk intake and/or for the milk storage facility make production even more flexible (photos: Hohenloher Molkerei)

Tetra Pak PlantMaster

At the heart of the entire automation of dairy processing as well as filling and packaging processes at the Hohenloher dairy has been the Tetra Pak PlantMaster automation and MES system since 2016. This system was implemented more largely as in any other German dairy. The milk is provided with a so-called Work ID from the farm, an ID it keeps until the end, i.e. after packing. This means that the code on the packaging allows for tracing not only to the origin of the milk, but also to the ingredients and packaging material and, of course, to all process and quality data. Tetra Pak Processing has created a special connection for the transfer of laboratory equipment to the LIMS Qualifax used by the Hohenloher dairy for many years. The infusion plant for ESL dairy production, which was newly acquired in 2016 by GEA (15,000 l/h), was also linked to Tetra Pak PlantMaster. This was done through one of the 40 virtual servers that the dairy has set up. The eleven Tetra Pak filling lines and all heaters, peripherals, etc., which are used by the Hohenloher dairy, and the existing ERP by Regnum are also integrated.

Tetra Pak PlantMaster offers a comfortable operation as the Hohenloher dairy

The new GEA infusion plant for ESL milk production was connected to the automation system Tetra Pak PlantMaster (photo: Hohenloher Molkerei)

has installed the module CIP Flex. This means that it is possible to individually parameterize cleaning processes without IT specialists or service technicians in order to be able to set up a CIP sequence suitable for process requirements. All possible evaluations can be called up at the touch of a button, they can be visualized on masks pre-installed or customized. This not only provides all documentation required for certifications, but also approaches for optimizing process flows.

In order to be more flexible in the filling of ESL milk and, above all, to ensure its ability to deliver, the Hohenloher dairy has installed a new Tetra Pak filling line for 1-l edge packs with one-stop opening (7,000 units/h).

Energy Optimization

On the energy side, a further optimization with the installation of an ice water silo from Tankki took place in 2016 at Hohenloher Molkerei. This was supplied by the Haas company. It holds 191 m³ of ice water, which is formed via NH_3 over a pipeline of 1.104 m length in the silo. The storage capacity is almost 7,000 MWh at 40 mm ice thickness. The cold store is completed by an NH_3 refrigeration system, which was also supplied by Haas. With its new and existing ice water silo, Hohenloher Molkerei has sufficient capacity to be able to shift the refrigeration production to night-time operation. Even when the unit is running at full load, the refrigeration system can run for six hours without regeneration, or it can intercept peak power. Besides, a new cooling room for fresh produce was built by Stadler.

Logistics

Last year, the Hohenloher Molkerei expanded its storage area by approx. 3,000 m² with the renovation of a neighbouring building and an unused production hall (85 x 35 m), which means that there are storage facilities for another 10,000 pallets. The connection to the production is provided by forklift trucks, while another warehouse is equipped with conveyor systems from SEMA. SEMA has also installed a new palletizing and pallet security center. With the new storage capacities, the Hohenloher dairy will build on the future. If on normal days 45 trucks are loaded with finished goods, there were 70 trains on Foundation Day 2016. Further growth in production can now be handled without problems on the storage side.

(photo: Hohenloher Molkerei)

New refrigeration center for the Hohenloher dairy

The Hohenloher dairy has further upgraded its refrigeration supply. One tank of Tankki was installed. The cooling capacity in pre-cooling mode is approx. 2,300 kW. The storage capacity of the two Tankki ice storage silos is approximately 11,500 kWh.

Specifications

Refrigerant	R717 (ammonia)
Refrigerant charge quantity	approx. 10.500 kg
Cooling capacity	approx. 2,300 kW
Storage capacity	approx. 11,500 kWh
Evaporation temperature	modulating -1 ° C to -7 ° C
Condensation temperature	+ 30 ° C
Manufacturer	Tankki OY
6 piston compressors	

The changeover to the new refrigeration center took place in the ongoing dairy operation. Planning, design and implementation of the ammonia refrigeration system as well as complete ice water supply by Haas Anlagenbau GmbH.

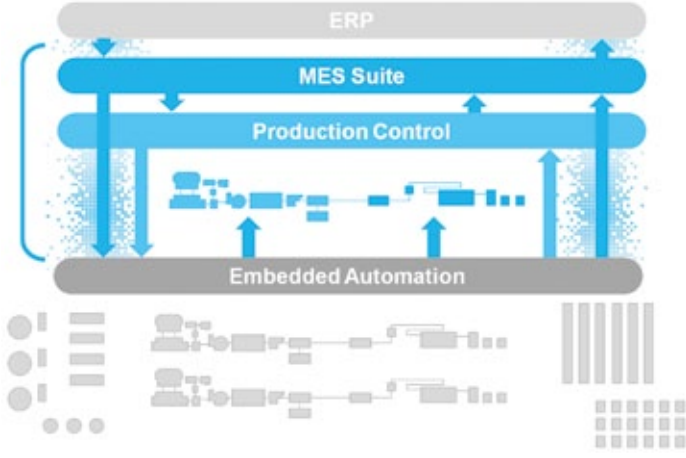
Tetra Pak PlantMaster

Tetra Pak PlantMaster is, according to the supplier, the only automation solution available on the market that is based on comprehensive know-how in the field of food processing; it covers the entire food production plant – from raw material acceptance to finished products, independent of the plant manufacturer and can integrate several production sites.

Comprehensive control over the processes maximizes the value added by:

- a flexible, scalable and tailor-made plant automation and information solution, which maps everything from a single plant part through a complete line to the entire production plant
- an open MES software solution that seamlessly integrates any plant or data source and stores data in understandable information, for example, in reports or dashboards
- an overarching data management system, modular and retrofitable, which simplifies the manufacturer-independent integration of process systems with the ERP system and other data sources.

The solution is tailor-made for every company – with unlimited possibilities to supplement new functions for future requirements.



(Fig.: Tetra Pak)

Systems Magnetic separator based on EHEDG guidelines

Goudsmit Magnetic

The Hydrohansu-type rotating cleanflow magnet recently introduced by Goudsmit Magnetic Systems was developed in collaboration with producers of top-tier food products. The driving force was the need for removal of very fine iron (Fe), AISI 304 and 316L particles in the dairy industry, for products such as baby food, yet it is also suitable for use in lactose industry. Rotating magnets prevent the accumulation of fatty powders on the magnetic bars and guarantee a high level of separation. The new magnet system is hygienically designed in accordance with the EHEDG guidelines and can be cleaned semi-automatically.

The single-piece, hydroformed housing is made entirely of grade 316 stainless steel and therefore as no dead ends, sharp corners or welded seams, which prevents bacterial growth. The complete system has a high quality surface finish (Ra ≤ 0.6 µm). The magnet rotor has pneumatically operated magnet bars, is mounted in the door and rotates on a bearing. To prevent product from entering the space between the rotor and the housing, it is fitted with a removable labyrinth air lock. **goudsmit.eu**

The Hydrohansu-type rotating cleanflow magnet recently introduced by Goudsmit Magnetic Systems was developed for removal of very fine iron (Fe), AISI 304 and 316L particles in the dairy industry (photo: Goudsmit Magnetic Systems)

The Daireuse Process

Biological treatment of evaporator condensates (Cow Water) in combination with membrane technologies

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Within the industry in general the dairies belong to the largest consumers of potable water, therefore the saving of water and water reuse approaches are of specific applicability for these factories. This paper describes an innovative process for upgrading of evaporator condensate from concentration of milk or whey to potable water quality*, known as the "Daireuse" process.

Veolia implemented such a Daireuse process in a large dairy in Belgium:

This dairy upgrades up to 1,500 m³/d of evaporator condensate from concentration of milk to potable water quality for replacement of drinking water in various applications in the dairy including CIP cycles and final rinses. The dissolved organic components of the condensates for example are minimized by a combination of biological and membrane processes to a TOC value of 0.2 mg/l only. The reverse osmosis process itself cannot nearly achieve such a low TOC value.

(photo: Veolia)

Water used for cleaning of production plants in German dairies is subject to the German Drinking Water Regulation (Trinkwasserverordnung 2001[1]). The local health authorities however may permit exceptions (changes in composition) for food processing companies if they are convinced that the quality of the water used does not negatively affect the healthiness of the final product.

The quality of the treated water from the Belgian dairy has been analyzed and assessed by the IWW (Rheinisch-Westfälisches Institut für Wasser). The IWW concluded[2] that the RO permeate is of a quality which does not raise any concern that the usage of this water could adversely affect the quality of the final food product. The process and operation is appropriate and sustainably save. The permissibility of a deviation according to §18 German drinking water regulation is therefore confirmed without any restrictions.

Treatment of Evaporator Condensate in a large Dairy in Belgium

1 BACKGROUND INFO

This dairy produces various milk products including powders. In 2012 they had to extend their processing capacity. However the availability of additional drinking water was limited.

** except from the contents of minerals (pH and solubility for calcite) all other limits of the German drinking water regulation are safely met.*

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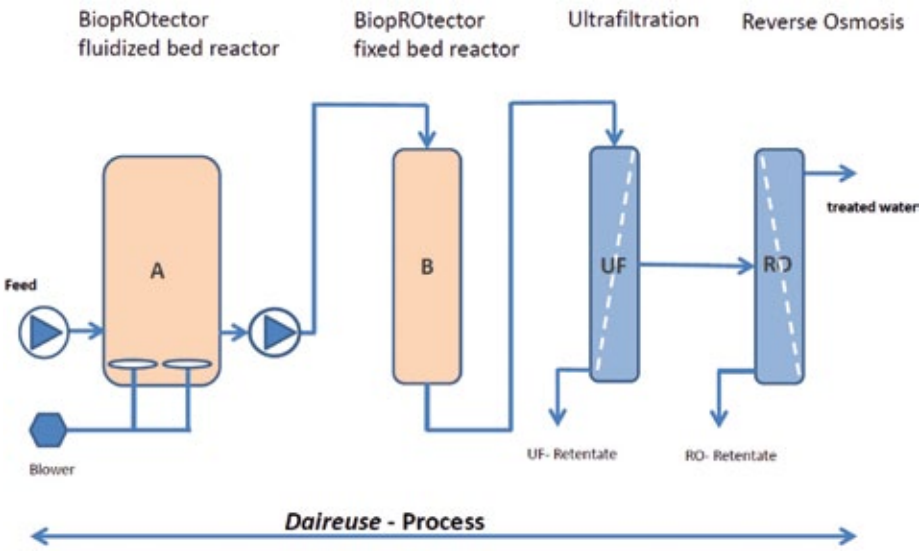


Figure 1: Process combination of the Daireuse process.

Therefore they had to start new ways of water management.

Condensates from evaporation of milk and whey contain low molar mass organic molecules, traces of lactic acid, alcohols, acetoines, non-protein-nitrogen etc. Those components enhance microbiological growth (often associated with slimy by-products), create odors and cannot be removed completely just by a reverse osmosis process. These very small organic molecules are biodegraded by the innovative BiopROtector technology (carrier-based biological process) and converted to other components which then are separated easily by downstream membrane systems.

This allows a high water quality to be achieved with a very low content of TOC, comparable to drinking water also regarding the low potential for microbiological growth. In the present case the treated water is blended with drinking water, standardized and fed into the common dairy network for potable water.

2 PROCESS OVERVIEW

For upgrading of the condensates the Daireuse process has been applied, consisting of the following main process steps:

- BiopROtector: biological fluidized bed reactor and fixed bed reactor
- Ultrafiltration (UF)
- Reverse Osmosis (RO)

2.1 BIOPROTECTOR

The BiopROtector not only prevents biofouling in downstream membrane units but in combination with UF and RO it is also a key technology for producing high quality process water from evaporator condensates which is contaminated with dissolved organic molecules.

The BiopROtector for this application is designed as a two-step process (see figure 1)

- Fluidized bed BiopROtector (A), to remove the bulk of nutrients (>75%) present in the feed water
- Fixed bed BiopROtector (B), a polishing step for further removal of remaining nutrients and reducing the biological activity of the feed water

In case of low contaminated water at typically COD (=RBOC**) levels < 10 mg/l and NH_4-N < 1 mg/l, the fixed bed BiopROtector (B) is applied directly without pretreatment (A). It is able to reduce the concentrations COD and NH_4-N to levels where growth of a biofilm is minimized, thus producing high quality process water

Backwash of the fixed bed BiopROtector is done typically once per month to get rid of surplus biomass and to keep the BiopROtector vital. The backwash procedure takes approx. 15-20 minutes.

In case of high contaminated water (this is the case here) the amount of oxygen in the water is insufficient to oxidize the COD and ammonia in the fixed bed BiopROtector. For those situations a two stage BiopROtector is designed, a fluidized bed with coarse bubble aeration (A) followed by a fixed bed unit (B).

With high amounts of nutrients in the condensate the bulk of the COD and ammonia is oxidized in the fluidized BiopROtector. The carriers are kept constantly in suspension by coarse bubble aeration.

ULTRAFILTRATION

The BiopROtector converts very small organic molecules into gases and microorganisms which can be separated easily with ultrafiltration technology. UF membranes separate quantitatively components with particle sizes > 0.05 µm. High quality hollow fibre UF membrane modules with certification for drinking water production are used.

In order to control membrane fouling a regular (typically daily) chemical enhanced backwash (CEB) cycle with low concentrations of chemicals is performed.

In addition to the CEB mentioned above, a recovery clean is applied from time to time (typically every 6 – 8 weeks) to fully recover the permeability of the membranes.

2.2 REVERSE OSMOSIS

For double security and for elimination of dissolved, non-biodegradable components a reverse osmosis unit is finally installed.

The RO permeate is similar to DI water (conductivity << 50 µS/cm). Usually it is stabilized by addition of small amounts (0.3 mg/l) of chlorine dioxide and – depending on the application – blended with other water sources and standardized prior to reuse.

The RO concentrate (approx. 15 – 20% of the feed flow to RO) is still of high quality (COD lower than in RO Polisher permeate) and is typically utilized as process water for less critical applications (e.g. water for cooling towers).

The RO unit includes a cleaning-in place (CIP-) system for regular rinsing or service cleaning of the unit.

3 ECONOMICS

The Daireuse process is a combination of standardized units which are also used in other drinking water applications. To achieve a long service life pipework and tanks are made from corrosion resistant, high quality plastics. That's why the equipment can be offered quite cost-efficiently. Also the operation costs for Daireuse systems are relatively low:

- Chemical cleanings are required only occasionally and are mainly performed by using cheap basic chemicals (e.g. NaOH, H_2SO_4). Costs for cleaning chemicals are therefore quite low
- Due to the low cleaning frequency a long membrane lifetime is achieved. The membranes used for UF and RO are drinking water membranes which are manufactured in large quantities. Membrane replacement costs are therefore relatively low.

*** Readily Biodegradable Organic Carbon: the fraction of organic components, in most cases present as volatile fatty acids, like acetic acid and propionic acid, alcohols, acetoins, amino acids etc.*

- Energy costs are low as well, achieved by applying high-efficient drinking water pumps and system configurations.
- High level of automation and operator-friendly process control unit minimize the requirements for operator attendance, keeping the costs for man-power low. At the same time the quality of the treated water is documented gapless by efficient monitoring.

4 WATER QUALITY

The quality of the treated water in the Belgian dairy was analyzed and assessed by IWW Mühlheim with regard to use as process water for CIP units in German dairies.

In Germany, such waters are generally subject to the drinking water regulation (Trinkwasser-Verordnung). If a dairy intends to use other waters than "drinking water" it requires an exemption from the competent health authority. Such an exemption may be granted based on §18 TrinkwV, if they are convinced that the quality of the water used does not negatively affect the healthiness of the final product. The IWW summarized their assessment as follows:

The Daireuse process is a combination of standardized units which are used also in other drinking water applications (photo: Veolia)

- The colony count (directly after RO, before disinfection) was slightly above the limit defined in the drinking water regulation. The RO permeate however is finally disinfected by addition of 0.3 ppm chlorine dioxide. Therefore there is no doubt that in the final application there is no measurable colony count anymore.
- The RO permeate is particle-free and low in TOC (0.21 mg/l). It is therefore very easy to disinfect.
- The pH and the solubility for calcite were below the limits. Both values however were typical for demineralized water and have no negative effect on the applications intended.
- All other parameters (107 parameters analyzed) were within the limits of the drinking water regulation
- The permissibility of a deviation according to §18 German drinking water regulation is therefore confirmed without any restrictions"

5 LITERATURE

[1] *Anonymus: Bekanntmachung der Neufassung der Trinkwasserverordnung vom 02. August 2013. Bundesgesetzblatt, Teil I, 2013, ausgegeben zu Bonn am 07.08.2013 (46): S. 2977-3004*

[2] *IWW Prüfbericht „Untersuchung und Bewertung von aufbereitetem Brüdenkondensat für Lebensmittelzwecke in deutschen Molkereien gemäß Trinkwasserverordnung, Juli 2015*

Fi Europe Innovation Awards

Entry now open

The world's leading food and beverage ingredients show rewards companies for outstanding innovations, whilst the Start-up Innovation Challenge offers a platform for cutting-edge newcomers to the industry. Non-exhibitors are welcome to enter selected categories.

"Thought Leadership", the guiding concept for this year's Food ingredients Europe, is echoed in the 2017 Fi Europe Innovation Awards. With ten newly created categories spanning all industry sectors, the Awards recognise and reward the ability to demonstrate and stimulate innovation. Especially for young start-ups, FiE offers an exclusive platform: After last year's inaugural success, the second Start-up Innovation Challenge invites companies to share a pioneering project with a broader audience. Closing date for entries is 22 September for the Innovation Awards and 23 October for the Start-up Innovation Challenge. **figlobal.com**

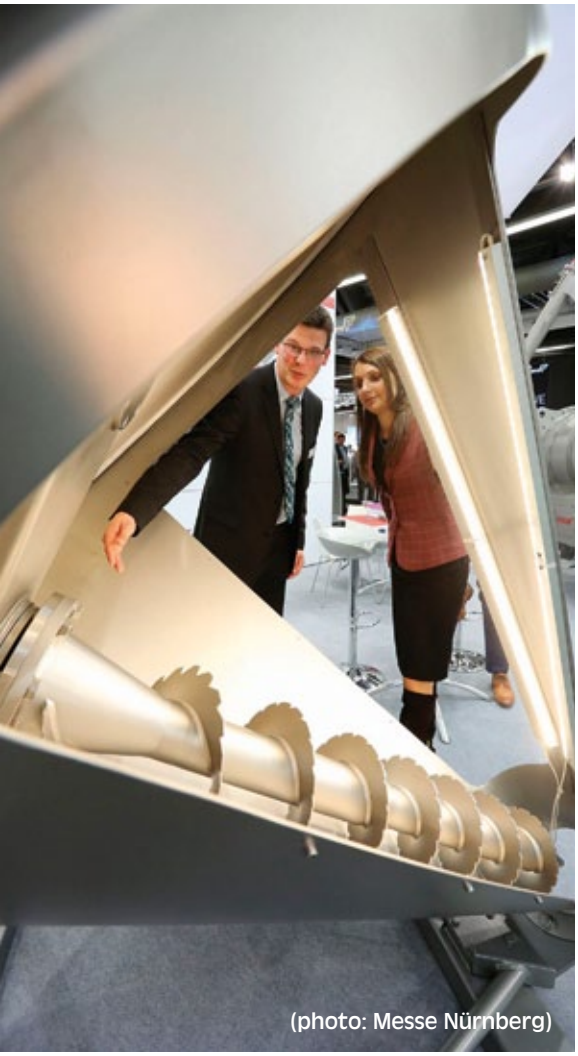
Food ingredients Europe Innovation Awards 17

POWTECH 2017

26 – 28 September, Nuremberg, Germany

POWTECH, the world leading trade fair for the processing, analysis and handling of powder and bulk solids, will take place in Nuremberg from 26 to 28 September 2017. With around 900 exhibitors, POWTECH is the undisputed number one platform worldwide for innovative powder, granule and bulk solids technologies. It showcases the current state of the art in mechanical processing technology and analysis, and offers a unique overview to numerous industries, from pharmaceuticals, chemicals and foodstuffs to glass, ceramic, building as well as environmental and recycling technologies. Production managers, engineers and bulk solids experts come to POWTECH to experience pioneering innovations for size reduction, screening, mixing, conveying, dosing or granulating and supporting technologies.

For milk processors active in drying or blending, POWTECH should be definitely worth a visit. powtech.com



(photo: Messe Nürnberg)

GEA: Inspiring powder solutions

GEA will showcase its scope of expertise, wide range of technologies and solid and liquid processing solutions like technically advanced process components, including BUCK containment valves, VESTA tank bottom valves, and tank cleaning systems as well as the new pump range of Hilge CONTRA and HYGIA.

GEA's liquid jet solids pumps and jet mixers for the admixture of powder into liquid are also exhibited. GEA will further highlight the SRS vibration sifter, designed for applications that require high standards of hygiene and sanitary processing.

And, completing the line-up, the compact and versatile MOBILE MINOR MM-100 spray dryer, equipped with the new cyclone CEE (Cyclone Extra Efficiency) for highly efficient powder separation, will also be exhibited. GEA has developed the CEE based on extensive computational fluid dynamics modelling of a well-known yet complex unit operation.

The compact and versatile MOBILE MINOR MM-100 spray dryer is now equipped with the new highly efficient cyclone CEE (photo: GEA)

Improved cyclone performance and the resulting higher separation efficiency increases yield, reduces emission and has the potential to reduce the complexity of the spray drying plant by minimizing the number of powder separation unit operations. gea.com

A continuous cleaning Cleanflow magnet filters iron and stainless steel contaminants as small as 10 microns out of powders, like sugar and therefore prevents production downtime and damage claims (photo: Goudsmit Magnetics)

Goudsmit Magnetics: Magnet for a continuous process

Goudsmit Magnetics will show a recently developed magnetic system: the continuous cleaning Cleanflow magnet. It removes both iron and stainless steel from powders and bulk goods and achieves capacities of up to 200 tonnes/hour. The system is suitable for installation in ATEX zone 20/22 and can be cleaned without stopping the product flow. It can be installed directly below the sieve or even just before the loading/packing point.

The Cleanflow magnet is easy to integrate into existing production processes. The company reports of increasing demand for magnets that filter both fine – from 10 micron – and coarse iron particles from product flows. goudsmitmagnets.com

Kaeser: Industry 4.0 for all

Why buy incomplete single devices when it's possible to enjoy a fully networked complete station that provides full access to vital operating data from anywhere: Industry 4.0 has arrived in the blower segment, bringing maximum energy efficiency, availability and sophisticated data analysis.

The Sigma Air Manager 4.0 master controller, which previously revolutionised the rotary screw compressor segment, is now also available for blowers. The SAM 4.0 is the key technology for benefiting from Industry 4.0 services and forms the heart of Kaeser blower stations. This central controller acts intelligently to control the individual machines for optimal efficiency and adjusts their flow rate perfectly to the overall flow rate demand profile. The SAM 4.0 analyses operating data in a matter of seconds, simulates alternative management scenarios and selects the most efficient option. The bottom line: users benefit from previously unimaginable energy efficiency.

Of course, these powerful capabilities can only be harnessed when the components of a station deliver consistently efficient performance – which is precisely what users can expect from the DBS, EBS and FBS screw blower series from Kaeser. Their superior efficiency outshines both the competition as well as predecessor models. Compared to conventional rotary blowers, the new Kaeser screw blowers are up to 35% more efficient, whilst also offering significant double-digit energy advantages over many commonly available screw and turbo blowers on the market.

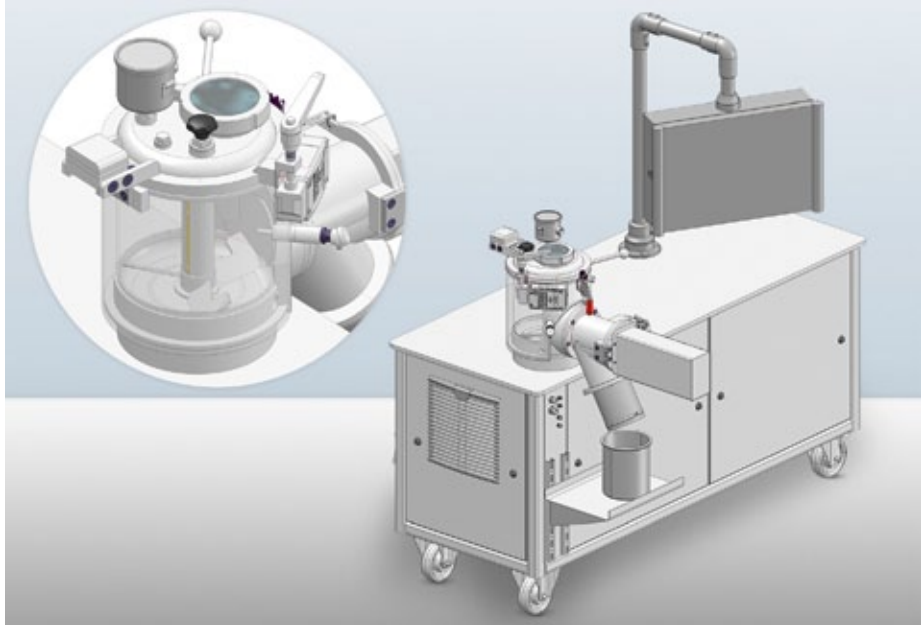
When it comes to compressors, Kaeser offers a wide range of perfectly tailored solutions for efficient and reliable compressed air production and supply. These highly efficient compressors range from the compact Aircenter, for more modest needs, to larger frequency-controlled models such as the ASD – which, thanks to a newly developed reluctance motor, delivers especially cost-effective performance – through to the CSG with its integrated i.HOC rotation dryer – the perfect solution for applications requiring large volumes of premium quality, oil-free compressed air. kaeser.com

Kaeser's dry compression rotary screw compressor with the new integrated i.HOC rotation dryer delivers compressed air with pressure dew points down to minus 30 degrees Celsius whilst saving both energy and space (photo: Kaeser)

MTI: New laboratory mixer

MTI Mischtechnik presents an all-new line of laboratory mixers developed for the food sector. The design corresponds to these industries' very exacting hygiene requirements; the systems can nevertheless be flexibly adapted to the special needs of diverse applications. The model shownwas configured at the request of an industry leader who will use it for recipe development in dairy processing. A further highlight is MTI's UT 250 vertical universal mixer having a working volume of 205 liters; this unit, too, is built to a very high standard. In addition, MTI presents the latest capacity expansion of its R&D Center that will provide further flexibility gains in developing customer-specific machine configurations and in implementing pilot production runs.

The MTI laboratory mixer can be used for homogenising different recipe ingredients or as a friction mixer for carrying out thermal processes. The energy input is adjustable over a wide range via the machine's rotational speed and hence, the peripheral velocity of the mixing tool. Moreover, the mixture can be tempered by water via the mixer's double jacket. mti-mixer.de



At Powtech 2017, MTI Mischtechnik premiers its newly developed line of laboratory mixers for the foodstuffs and pharmaceutical industries. The version presented at the trade fair is tailormade for dairy processing needs on behalf of an industry leader (photo: MTI Mischtechnik)

MILEI's new high-tech plant

Derichs realised the bulk material lines and a mixing line

Authors: Dipl.-Ing. Marc Derix, Head of Sales, Martin Röger, M.Sc., Marketing & Controlling, Derichs GmbH Process Engineering, Daimlerstrasse 25 - 29, 52531 Übach-Palenberg, derichs.de

For almost 40 years, MILEI has been concentrating on the enrichment and fractionation of valuable whey and milk ingredients. In order to expand the production capacity and to modernise the production process, it was decided to build a new production.

A new 15,600 m² state-of-the-art production facility was built, which allows milk processing to be increased from 20 million kg per year to 150 to 200 million kg of milk per year. The result is a production process in which high-quality products are manufactured with best possible energy efficiency. The combination of the process steps is unique worldwide. MILEI demonstrates its innovative power in international competition in the production of powdery and functional high-protein derivatives from milk and whey.

After a long and intensive planning phase, under the direction of the engineering firm KSI as general planner for the whole new production facility, Milei decided in 2014 to have the entire bulk material plants, from the outlets of the four drying plants to the filling plants and an additional mixing line planned and realised by the company Derichs.

Product feed via bag discharge station and Big Bag discharge (photo: Derichs)

Product variety

The extensive portfolio of MILEI ranges from lactose powder, permeate powder via demineralised whey powder to whey and milk protein powder with up to 80% protein as well as various dry-blended products.

System requirements

A sensitive area, such as the production of high-quality food ingredients, for example used in baby food production, places great demands on plant manufacturers. A dust-free system that meets the highest hygiene requirements (EHEDG, GMP, IFS) is just as self-evident as compliance with the Atex regulations and statutory provisions for batch tracking.

These requirements were fully met by Derichs during the planning and realisation of the plant.

From the conception to the construction, the in-house production of many components to PLC programming and visualisation, Derichs was able to contribute its full experience in the field of plant construction in the food industry – especially in the dairy industry. Through close coordination with the project management of MILEI, a faultless and up-to-date standard production plant could be built.

Plant concept

The entire plant was conceived as two separate and independent parts: (1) a plant for permeate and lactose powder;

New bagging process at MILEI (photo: Derichs)

The main stream powder conveying was solved using pressure vessels (photo: Derichs)

A total of 13 powder silos was installed at MILEI (photo: Derichs)

and (2) a plant for high protein derivatives from milk and whey.

Conveyor systems

Both systems have several product-specific pneumatic conveying systems as well as a large number of silos.

The conveying systems were specially designed for the properties and requirements of the finished products. As a result, the protein derivatives are conveyed as gently as possible by means of "dense phase" conveying systems with transmitting vessels. The lactose and permeate powders are promoted by specially developed systems in such a way that a reliable conveying is ensured without the usual glazing in the pipelines.

For all systems, complex filters and air conditioning stations have been used to ensure the required product quality.

Silo

A total of 13 silos with a storage capacity of 150 m³ each with Atex-compliant equipment were installed. All silos are inside the building and are equipped with exact weighing systems that measure the silo content with an accuracy of up to 50 kg. This allows for a very accurate record of the inventories and tower services.

Special delivery systems optimised for lactose and permeate powder ensure a safe product output even for longer product storage. Additional ventilation systems for the silo headroom, using filtered and dried air, ensure hygienic storage of the products.

Mixing line

To prepare various functional dry mixes, a mixing line was installed with a Derichs batch mixer type MBZ. Due to its large motorised cleaning doors, the mixer can be cleaned optimally and quickly. The two-shaft paddle mixer makes it possible to produce homogeneous mixtures quickly and in a product-friendly manner. The product feed and dosing is made from silos, big bags and sacks.

Loose loading in silo vehicles

The end products are loaded into silo vehicles via a hygienic, pneumatic loose loading system. The silo vehicle is, during loading, in a closed and air-conditioned room.

Product safety

All products are compliant with the highest requirements on foreign bodies before they are packed in bags, big bags or silo vehicles. For this reason, sieves, metal detectors and rotating permanent magnets are installed.

Process IT

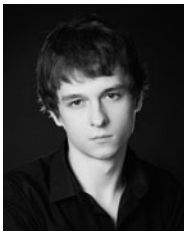
Control of the plant is managed a Siemens S7 PLC with a distributed peripheral edge. Plant operation and process visualisation are carried out via a process control system based on WinnCC with redundant servers. Thanks to the integrated remote maintenance, a diagnosis of the hardware and software as well as support of the operating personnel by Derichs is possible at any time.

Dust-free system

The dust-freeness of a system depends to a large extent on the quality of the system concept and the components used. Derich's experience with similar systems has been a key factor in achieving this goal. For example, all silos are kept at a slight vacuum to limit the dust load to an absolute minimum. In addition, the exhaust air from the filters is not led into the building, but to the outside. This, in conjunction with the experienced and conscientious operating team, led by Mr. Wiedemann, ensures that the company always meets the requirements of its customers.

Product separator (photo: Derichs)

Russia's dairy industry split into several new segments



Author: Vladislav Vorotnikov, IDM Correspondent, Moscow

In August Russia's government and dairy manufacturers celebrated the third anniversary of the so-called food embargo – the special Presidential decree that banned import of almost all food products from the European Union, the U.S., Australia, Canada and Japan. Although the measure originally has not been designed to last forever, there is no certain time frame of when it may be actually cancelled. In the meantime, the market landscape has changed significantly since then and it is hard to say that the ordinary consumers are happy with these changes yet.

Speaking about food embargo Russia's officials use to make rather controversial statements. At a St. Petersburg Economic Forum Russian President Vladimir Putin said that "sanctions brought nothing good" to anyone, but several months earlier speaking to agricultural producers he promised to "keep sanctions for as long as possible". Agricultural Minister Alexander Tkachev in a February 2017 governmental meeting said that in his opinion it is worth to keep the current market conjuncture for another 1-2 years. After this Russia will not cancel the entire embargo at once, but most likely will remove restrictions on some particular goods only, he said.

The Russian food embargo is an important element for the foundation of several new segments in the dairy market

In the meantime, it has become clear today that the food embargo is an important element for the foundation of several new segments in the dairy industry.

Dairy products without milk fat

Nearly 25% of all dairy products on Russia's grocery shelves, like cheese, sour cream or butter don't contain any milk fat at all, a study of the governmental Auditing Chamber released in mid-April 2017 revealed. In most cases, the processing plants replace milk fat with substitutes, like palm oil, while, however, not changing the label, or at least making only some unclear changes on the label in a bid to confuse the customer, the study suggested.

Russia's media use to describe the segment of dairy products without milk fat as "dairy surrogates" and this is a brand new niche in the country's market. Russia's sanitary body Rospotrebnadzor in May 2017 estimated illegal surrogates account for 4.3% of the domestic market of dairy products, while veterinary watchdog Rosselhozndzor in 2015 was claiming the counterfeit cheese occupied nearly 80% of the Russia's market. At the same time, consumer protecting organizations mostly support Auditing Chamber and Rosselhozndzor, as their studies in various regions show that between 20% and 60% of dairy products don't contain milk fat.

There are two different opinions on what to do with the dairy surrogate: either to enhance control in the market to wipe them out completely, or to amend legislation to take them out of the shadows.

Artem Belov, executive director of the National Union of Dairy Producers, estimated that in some particular segments, like fermented dairy products the share of surrogates is not so high, while in the cheese and butter segment it ranges from 15% to 25%; provided producers make the proper labeling, mentioning of all ingredients included, everything is completely legal.

"In addition to palm oil Russia's dairy plants replace milk with coconut oil and sunflower oil. Why does that happen? Because the purchasing power of citizens [in Russia] is not growing, on the contrary, it is even falling, while the people's appetite remains the same. And this is why for products with replacement of milk fat there is a huge demand in

As there is a lack of legal standards, consumers cannot be sure about the nature of products labelled as being "organic"

Russia – because it is cheaper, compared to the products made in accordance to the "classical" receipts, so more people can afford it. At the same time, it would be wrong to think that Russia's dairy industry completely shifts to the "dangerous" palm oil," Belov said.

"We believe that some basic milk products should not contain palm oil in any form. These are cottage cheese, milk, sour cream, cheese. These product names should be protected, and there should not be any exotic plant component included" Dmitry Yanin, chairman of the International Confederation of Societies Consumers, argued. "In other words, if a product contains palm oil, producers should not be allowed to name it 'sour cream', 'cheese', but chose some other name instead."

Russia's Agricultural Ministry suggested to amend the legislation introducing stricter liability and in particular bigger fines for manufacturers for replacing milk fat and not providing proper declaration. The ministry also targets to make labels more transparent to consumers, but it is not known yet, when those changes should see the light.

Organic products which are not truly organic

As opposition to the dairy surrogates in the market several Russian producers started manufacturing so-called eco-products, which is believed to be organic. In most cases, manufacturers put an eco-label on the package, also assuring customers their products don't contain any antibiotics, GMOs and milk substitutes. But the trick is that in Russia there are no official organic standards yet and anybody can use eco-labels.

"A customer basically does not see the difference between organic, ecological or product from the peasant farm. As far as the situation is not regulated by legislation at the moment, any product can be described as eco, organic and so on. Currently, there is no relevant law. It was submitted for consideration last autumn and was sent for revision to the Ministry of Agriculture, and I think by the end of the year the law eventually should be adopted," Sergei Korshunov, head of the Russia's Union of Organic Agriculture (RUOA), said.

According to the All-Russian scientific research institute for agricultural economy, at the moment only 0.2% of the Russian agricultural land passed organic certifications. In the meantime, the share of dairy products in the country's market labeled as organic reaches 4-8%, according to various estimations, whilst in fact at least every third dairy producer uses some eco-friendly rhetoric to assure customers that his product is healthier than that of competitos.

Still, official RUOA estimations show that at the moment the average consumer in the country spends only EUR 0.8 per annum on organic food products and in most cases these are imported products, compare to EUR 10 on average in the world and EUR 110 in United States. The heads of organization harbor some hopes that the new law will bring some order into the market and will establish some framework for the development of an organic market in Russia, including dairy products. RUOA believes that in future one in ten dairy producers in the country will be actually engaged in manufacturing of organic products.

European products with Russian taste

Since 2015 the so-called niche of European dairy products, in the first place European cheese, has been booming in Russia. Russia's cheese plants started producing Camembert, Mozzarella, Brie and everything else, except Parmesan. However, coming from Europe, Russia's tourists are still allowed to carry up to 5 kg of cheese with them, tax-free.

"In general, Russian-made 'Euopean' cheese is not so bad, and in some particular cases it is even good, but almost every time it has almost noting to do with the original taste of European cheese," Mikhail Dementiev, spokesperson of the Russia's Union of Consumer Right Protection said.

"It is a pity indeed that no legislation in this area has been introduced in Russia, prohibiting the use of names of some dairy products, when manufacture is not adhering to some basic receipt. There are several producers whose cheese taste like rubber, or like plasticine, but definitely not like the cheese under the same name that is imported and these manufacturers cast a shadow on the entire niche," he added.

Ilya Izmailov, chief technologist from the small cheese factory Ingala in Tymen Oblast, complained that in Russia it is hard to produce premium dairy products and cheese of popular sorts, because of the shortage or better say almost complete absence of quality raw milk. The same problem in the past has been pointed out by Valio, as the company spent nearly three years to negotiate with potential suppliers in St. Petersburg region and eventually authorized only two farms that were delivering raw milk with the proper quality.

Mika Koskinen, general director for Russia and CIS in Valio, also stated that the price for milk in Russia despite the quality is one of the highest in the world reaching almost EUR 1 per liter, he told the local Russian media in June 2017.

And after all, it would be wrong to think that all particular segments at the new Russian market exist separately, as there were precedents when cheese of Russia-origin under some popular European brands has been found not containing any milk fat at all, only the named substitutes.

It is quite possible that someday or another such product will carry the organic label as well.

Most of Russia's trade organisations think that basic milk products incl. cheese should not contain palm oil in any form

Milk protein fractionation by means of microfiltration – Part 2

How to characterize polymeric microfiltration membranes – a new approach using a stirred test cell



Authors: Martin Hartinger[1] (left), Hans-Jürgen Heidebrecht[1] (middle), Felicitas Arndt[2], Hermann Nirschl[2], Ulrich Kulozik1 (right)
[1)] Chair of Food and Bioprocess Engineering, Technical University of Munich
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Polymeric spiral-wound membranes (SWM) are the most frequently used membranes in the dairy industry because of their relatively low price compared to ceramic membranes. They are mostly applied to concentrate complex media like protein solutions to increase dry matter before spray drying. In microfiltration (MF) applications, however, the filtration task is to selectively fractionate proteins of different sizes.

Up to now users of microfiltration membranes decide on the best membrane specification for their purpose mostly based on the nominal pore size (nps). The nps is defined as the pore size most frequently present in the membrane. Nevertheless, comparability of different membranes is poor due to non-standardized measurement methods to assess the pore size.

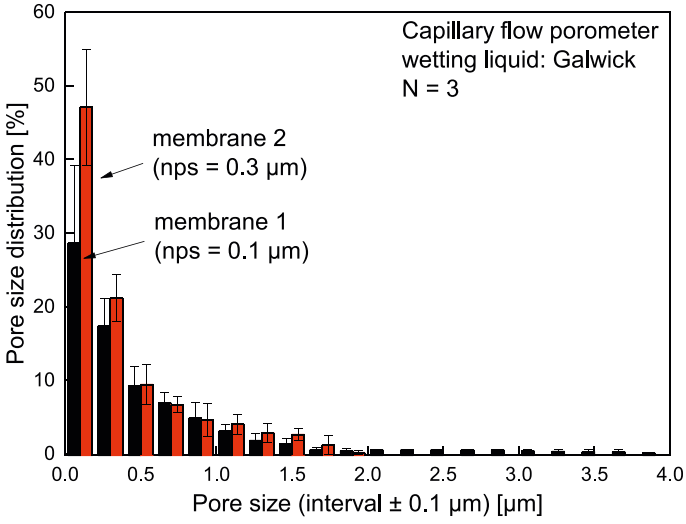

Fig. 1: Pore size distribution of two different microfiltration membranes (membrane 1: nps = 0.1 µm; membrane 2: nps = 0.3 µm).

Furthermore, the pore size is not a distinct value, but is distributed around a mean value in each membrane specifically (Ulbricht et al., 2007), depending on variations in membrane manufacturing conditions. It is common experience that the prediction of the filtration properties only by means of nps is barely possible or meaningful. This is why the objective of this work was to develop a standardized protocol to better characterize polymeric MF membranes using the example of milk protein fractionation.

Pore size distribution measurement by means of capillary flow porometry

A pore size measurement using capillary flow porometry (CFP) was conducted for two different membranes made from polyvinylidene fluoride (specified in the data sheets as nps = 0.1 µm and nps = 0.3 µm, respectively). The results are shown in Fig. 1.

Both membranes exhibit pores substantially larger than the nominal pore size (largest pore 3.9 µm and 1.9 µm, respectively). Surprisingly, the membrane with the larger specified pore size showed smaller pore sizes. This is possibly due to the usage of different measurement methods by the manufacturer for qualifying the membranes. The large pore size distribution was found in seven different commercial membranes. In addition, other studies showed the same phenomenon (Ulbricht et al., 2007; Wang et al., 2008). The conclusion is that it is not possible to determine a membrane´s characteristics based on non-standardized methods.

Characterization of polymeric membranes by a stirred test cell

This is why the next step was to investigate the influence of different pore sizes on filtration performance of polymeric membranes. This was done by means of a stirred test cell (transmembrane pressure Δp_{TM} = 0.5 bar; test volume V = 50 ml; temperature ϑ = 20 °C, stirring rate N = 700

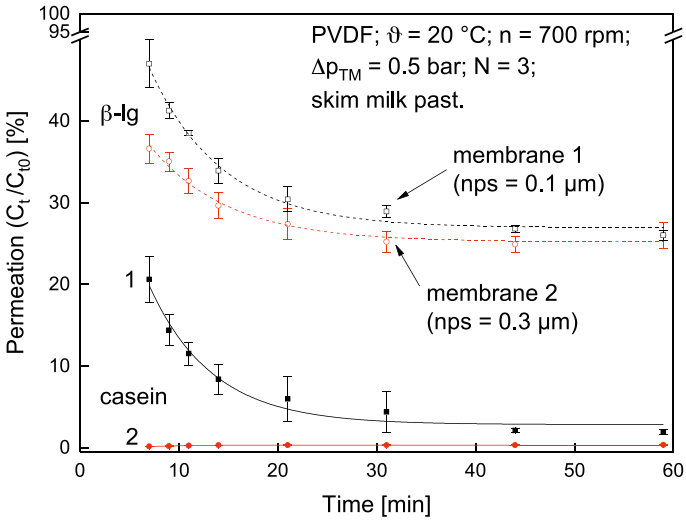

Fig. 2: Permeation of ß-lg and casein as a function of time (black: membrane 1, red: membrane 2).

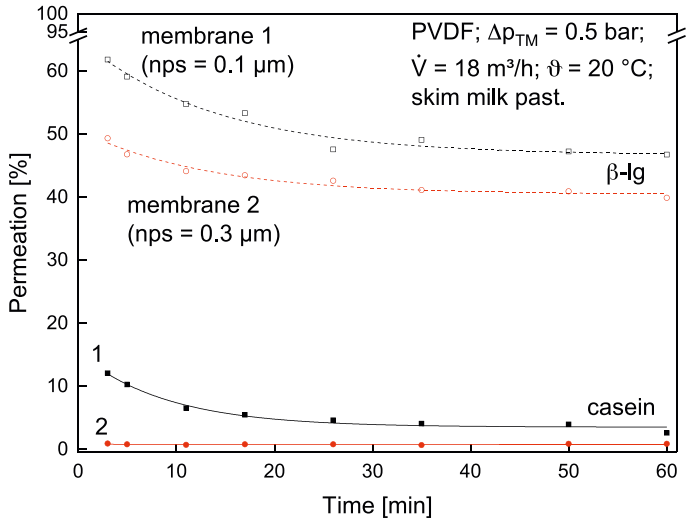

Fig. 3: Filtration performance of polymeric microfiltration membranes used in SWM (black: membrane 1, red: membrane 2).

rpm, active membrane surface 12.6 cm²). Even though it is known that a stirred test cell is not able to completely reproduce the filtration behavior of a SWM it is suitable to deliver a meaningful result for comparison of different membranes under identical conditions. For the filtration tests, skim milk at 20 °C was used and protein permeation was measured using reversed phase high performance liquid chromatography (RP-HPLC). The permeation is defined as the ratio of a certain component in permeate and retentate and is a characteristic for filtration efficiency. The main goal in this specific fractionation process is a high permeation of whey proteins, i.e. β-lactoglobulin (2 – 8 nm) as the main component, while caseins (80 – 400 nm) should be held back completely at the same time. The filtration performance of both membranes regarding permeation of caseins and β-lactoglobulin (β-lg) is depicted in Fig. 2.

Initially, the permeation of both casein and β-lg drops due to deposit layer formation as it can be seen in Fig. 2. After 30 min the permeation is constant and a steady state is reached. Permeation of β-lg was 27 and 25%, permeation of casein 2 and 0% for membrane 1 and 2, respectively. α-lactalbumin (α-la) showed the same trend in permeation as β-lg for both membranes with slightly higher absolute values (data not shown). These results could not be predicted only by nps, since it was expected that the membrane 2 with the wider pore size would result in a higher permeation of caseins. The actual pore size distribution by means of capillary flow porometry gave a first hint, but a complete retention of casein by membrane 2 was unexpected. A possible explanation for this is that the larger pores of membrane 2 (Fig. 1) were blocked initially directly after the filtration began. This effect does not occur with membrane 1 probably because of some pores being too large for blockage.

Filtration performance of polymeric microfiltration membranes in SWM

To verify whether the findings obtained by the stirred test cell can be transferred to industrial scale SWM, the filtration performance of the same both membranes was investigated using SWM type 6338 having a diameter of 6.3" and a length 38". Results are shown in Fig. 3. As already seen in Fig. 2, a complete retention of caseins for membrane 2 and the initial reduction of permeation of β-lg for both membranes were observed. Permeation of β-lg was 47 and 40% for membrane 1 and 2, respectively.

Thus, despite the fact that permeation in a stirred test cell occurs differently in terms of absolute value compared to SWM, the stirred cell is a powerful tool to characterize membrane filtration performance. It is suitable for comparing different membranes by means of protein permeation and retention.

Acknowledgements:
This project of the FEI (AiF 16836 N) is supported via AiF within the programme for promoting the Industrial Collective Research (IGF) of the German Ministry of Economic Affairs and Energy (BMWi), based on a resolution of the German Parliament.

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State-of-the-art cheese shredding line

Groba's move into robotics

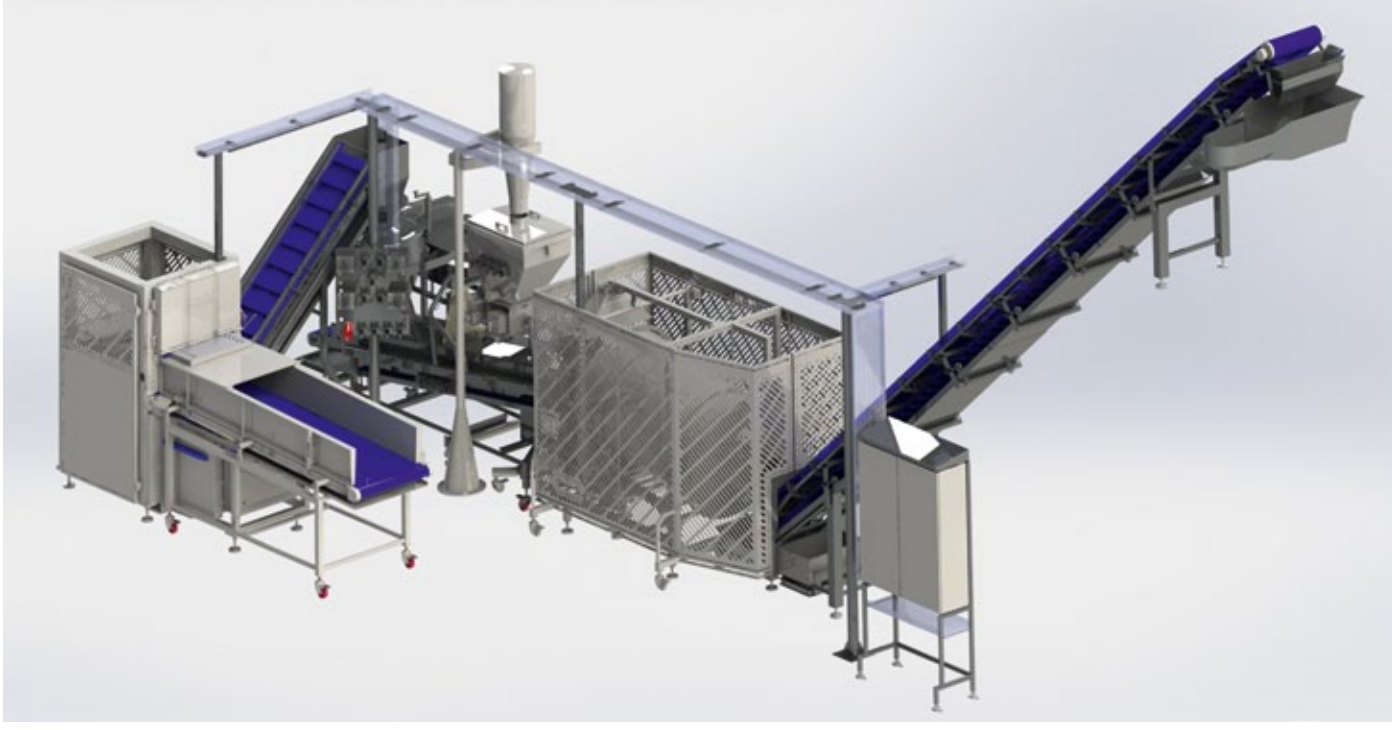
Dutch specialist for cutting and handling of cheese, Groba B.V., has increased its staff after moving to new premises in Nederweert, the Netherlands. The company is now able to handle projects better than before in terms of more flexibility for customer requirements and speed of project management. IDM paid a visit to the "new" Groba company.

"We celebrate our 40th anniversary this year and have, meanwhile, moved to the fourth building," comments Groba CEO Robin de Groot on the continued growth of the company. "After entering the new Nederweert facilities, we have upped our workforce by 5 to 40 workers. Six employees manage engineering and one worker is solely responsible for modularization of our equipment. Two other members of staff are fully engaged on software and robotics."

Projects and robotics

Robotics is taking an ever bigger part in large projects carried out by Groba. The start was made by the cheese de-rinder Omega which the company has developed some two years ago and which is now going out into field tests. Here, Groba acquired significant expertise in robotics which is now carried on to the bigger projects. Another important step was a cheese shredding line for an Australian manufacturer with a capacity of 6 tons per hour whereby the shredded cheese feeds three multi-head weighers. And there was a large line for cutting cheese into cubes and shapes that Groba supplied quite recently.

"None of our large lines resembles the other as we tailor our equipment according to customer requirements," says Sales Manager Bart van der Vleuten. This was clearly to be seen at a brand new



Groba SIGMA high-capacity cheese shredding line (photo: Groba)

Robin de Groot, Groba CEO, and Sales Manager Bart van der Vleuten demonstrate the new laser scanner that regulates potato starch dosing (photo: IDM)

cheese shredding line that was in assembly during the time of IDM's visit. As the customer has almost no space left in his cheese plant, the line has an extremely small footprint, although the capacity is 4 tons per hour. Groba and the customer decided for a square design with two 90° redirections of product flow.

The cheese, in this case leftover of trimming cuts of cheese bars, is done manually. First, the cuts are fed into a cube cutter made by Groba. The machine works according to the Guillotine principle, guaranteeing for exact cube dimensions. Then, the cubes enter a Urschel cheese shredding machine model CC-DL before being transported off on a completely new designed conveyor formed as a through in which potato starch as separating agent is dosed on the shredded cheese from a Big Bag. A laser scanner measures the thickness of the cheese layer on the conveying belt across the entire width of the belt. An automation system calculates the necessary revolution speed of the spiral conveyor that transports the starch. Compared to standard ultrasound measuring, Groba's solution works with a guaranteed accuracy of +/– 0.3 %. All measurement data are documented for later evaluation.

The shredded cheese with added starch enters a mixing drum and from there via a conveyor the multi-head weighers in a height of 6.5 m. All conveyors are executed in a steep angle to save as much space as possible. Groba was also able to fulfil special customer requirements in wiring and execution of adapters.

Digitalisation

Groba has cooperated in the cheese shredding line project with a number of established manufacturers of cutting, weighing and packaging equipment. The company, however, likes to resort to own machines whenever possible. The portfolio covers automated defoiling, trimming/block/portion cutters, feeding of slicers and production lines for cheese snacks. The supplier benefits in all projects from the common language with its customers. One may be intent of what the Dutch tinkerers will present in future to ease customers' jobs in handling of cheese. Surely, much of it will be digitalisation.

No industry is more dynamic

Different requirements for robot-based automation

Author: Michael Fraede, Marketsegment Manager Consumer Goods, KUKA Roboter GmbH, www.kuka-robotics.com

For many years, robots have been processing, commissioning, packing, stacking, labelling, palletizing and commissioning efficiently and successfully in the production of so-called fast moving consumer goods (FMCG), the goods of daily consumption. While at the beginning of the chain robot-based automation is primarily used with regard to extremely short cycle times, the use of robots in the downsteram area is mainly due to high load carrying capacity.

Complex manufacturing process

Before consumers can select products from shelves, each product will go through a complex production, packaging and logistics process. This consists of the four stations:

1. processing, the production and initial processing of plant, animal, textile and pharmaceutical products,
2. Primary packaging
3. Secondary packaging, sorting of pre-packaged product and
4. palletizing and de-palletising.

Cycle time and product weight work along this process chain in the opposite direction. At the beginning, fast cycle times and low weights dominate and change to palletizing and de-palletising to high weights and slow cycle times. Processing and primary packaging also require compliance with statutory hygiene standards. Because of easy-to-clean materials and the use of food-compatible lubricants, robots are increasingly used where direct contact with the product is created.

Automation degree along the process chain

Raw products are conveyed in unsorted form via an assembly packaging line. At an average cycle time of 120 items per second (cycle time: ½ second), vision-assisted robots are used to correct the quality and position of the products on the assembly line. Grouping of packaged raw products is the first step in secondary packaging. In this case, the handling weights increase in opposite to the cycle time. High speed is still required, but the cycle time is considerably slower with approximately two seconds. Fast, small industrial robots with a still low load capacity and a compact work area are predestined for this step. The packaging enables direct contact of the robot with the product without too high hygiene concerns. The products packed in cartons and grouped together in the fourth step of the process chain must be assembled on pallets. Cartons can quickly reach weights of 50 to 250 kilograms, with the weight of the gripper still having to be added. Often, the robot also uses the same gripper to place the intermediate layers, or take empty pallets from the stack. The cycle time for this step is generally about five to eight seconds. Every year, thousands of robots are used in the FMCG industry along the process chain. But even in the emerging markets, robot-based automation is increasingly gaining ground.

Robots are increasingly being used in "normal" dairies (photo: KUKA Robotics)

Hygiene standards

The shortage of personnel in the industry has a serious impact during seasonally induced peaks. Despite the increase in the number of units to be produced, manufacturers still have to serve market quickly to withstand the dynamic. The KUKA KR AGILUS HM (Hygienic Machine) fulfills strict hygiene regulations as well as the requirements of the sesonal business. The new KR AGILUS HM is specially designed for direct contact with foodstuffs and minimizes direct contact between the employees and the product – e.g. when handling cheese. Its design is kept in food-safe whiteness, which underlines its hygiene function. Lubricants are exclusively food grade oils; the protection class is at least IP 67. The use of hexagonal screws prevents the penetration of food residues and thus reduces the formation of bacteria to a minimum. The KR AGILUS HM is also resistant to all commonly used cleaning agents and does not require any protective cover.

Palletizing

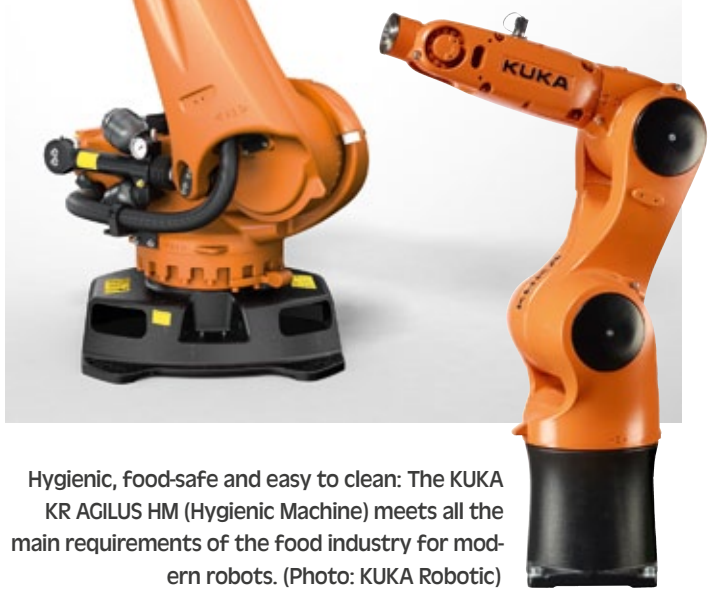
Thanks to a network of specialized system partners, KUKA develops the tailor-made solution with the right robot model for every requirement. Several special PA (palletizer) robot types from the KR QUANTEC series are available, with a wide range of load capacities and ranges for palletizing and depalletizing applications. The robots of this series are characterized by dynamics and extreme stiffness. They are also optionally available with food-grade lubricants or as special versions. The KR QUANTEC PA Arctic is specially developed for deep-frozen palletising in extreme conditions down to -30 ° C. 120, 180 or 240 kg load capacity – these specialists work reliably, quickly and without a protective sheath in the entire cold range without mechanical heating.

Individualization and the production of tomorrow

The next generation of robots will, in addition to palletising and packaging, also open up new areas of application along the process chain, where both human-robot collaboration (HRC) and mobility are in demand. The consumer today wants to assemble his products on the Internet. Foodstuffs such as e.g. Muslim mixtures – many things are already real today, other offers are under development. As the most flexible production element, the robot already collects the data in production and delivers it to the IT system. He is the arm of IT in production, the link. In the future, IT will process these data and return them to production via the robot, which can then be successively optimized. No other component in the production process is currently able to fill this supporting role as well as modern industrial robots.

Robots are already an integral part of the production of consumer goods in many areas. They are regarded as proven professionals in primary and secondary packaging as well as in palletising and de-palletising. Through new developments in gripper technology, hygienic design and integrated image processing, the robot reliably performs new tasks in direct contact with food. In addition to technical innovations, the ongoing lack of personnel in the industry will intensify the drive for automation. Through human-robot collaboration and mobile robotics, new areas of application for a new robot generation in the vicinity of "Industry 4.0" will be opened in the medium to long-term. The scenario that consumers directly order individualized products from manufacturers via the Internet, which are then manufactured and delivered directly will increasingly become a reality for many everyday products. Robotic systems will play the key role as the arm of IT in production.

The KUKA KR QUANTEC PA Arctic can be used in temperatures as low as -30 ° C. Its insensitivity predestines the robot for use in the food distribution area (photo: KUKA Robotics)



Hygienic, food-safe and easy to clean: The KUKA KR AGILUS HM (Hygienic Machine) meets all the main requirements of the food industry for modern robots. (Photo: KUKA Robotic)

SPX FLOW

People

SPX FLOW, Inc. has appointed Pierre Sbabo as Vice President of its Food and Beverage business in EMEA. Sbabo comes from the water and process technology markets and has gathered international experience. With a Master's Degree in Marketing and International Business from ESC Chambery, Sbabo has worked for global leaders in water and fluid treatment and processing, most recently with Pentair, and joined SPX FLOW in May 2017.

New pack design and automated processes

Norrmejerier

Norrmejerier uses a packaging line that was designed by an international project group, which received input throughout the project from twelve different suppliers (photo: Multivac)

With a new product design, a consumer-friendly packaging and new pack sizes, Norrmejerier has further consolidated its position in the cheese market. The use of more robots and thermoforming packaging machines, instead of pouch packaging solutions, are just two of the innovations in Norrmejerier's new factory in Umeå, Sweden, where cheese blocks are portioned, and the product is then packed in primary and secondary packaging.

The new packaging system over an area of approx. 2,300 m² with an output of up to 9,000 tons per year in the Umeå factory comprises three lines for processing cheese blocks, as well as a line for manufacturing grated products.

After thorough project planning, before the line was put into service, the top speed of the packaging line has been almost doubled, now amounting to just over 60 packs per minute on the 750-gram line.

The old system was pretty worn out, a new packaging line with cutting-edge technology was the only way for Norrmejerier to increase output, cut lead times, minimise wastage, optimise work environment and regain control of the entire production process. In total, the company invested approximately SEK 200 million in the project. Which has an estimated that amortization of six years.

Modern operating concept

The new packaging line was designed by an international project group, which received input throughout the project from twelve different suppliers. The output capability of the system is impressive. It takes only approx. 10 minutes for a cheese block, which can weigh up to 18 kg, to be completely cut up and packed. The product runs through the following stations: cutting, weighing, 3D scanning, loading into the pack cavities, quality inspection, sealing the pack, labelling, outer packaging and palletising.

The handling processes are performed by more than twenty robots, which ensure a high level of precision. Thanks to automation, the number of operators on the line has been significantly reduced. Today the system can be operated by just twenty people. Due to further improvements on the line, operation is due to be switched from treble shift to double shift.

New design, new packaging

A number of efficient product solutions have been integrated into the new system.

Norrmejerier has found an efficient and comprehensive solution, which presents cheese in a way that is both attractive and customer-friendly (photo: MULTIVAC)

With three new thermoforming packaging machines, two MULTIVAC R 535 machines and one R 245 machine, Norrmejerier has developed a practical solution for a consumer-friendly pack with a completely new visual design. The project got started when a large order was received for Herrgårdost, Prästost and Grevé, which Norrmejerier produces using milk from the Norrland region in the north of Sweden.

The label on the pack will make the Norrland dairy region a household name throughout Sweden. And the Västerbotten cheese pack, the star of the quartet, has a new black-gold design intended to support the launch of the product on export markets.

Norrmejerier was looking for an efficient and comprehensive solution, which would present the cheese in a way that was both attractive and customer-friendly. The shrink bags that had been used to date were not suitable. "The new technology stands for a more intelligent and cost-effective approach in the packaging: the material costs are lower, and there is no longer any need for a separate labelling process for the packs," says Thomas Rahmner from MULTIVAC Sweden in Lund, who was responsible for the delivery and installation of the system.

Basis for growth

The packaging procedure itself starts with a MULTIVAC Delta robot, which loads the pieces of cheese into the pack cavities, before the upper web is sealed. In order to be able to run different sizes of cheese, the three thermoforming packaging machines were equipped with a total of nine format sets. This means three pack shapes for each of the 450 g, 750 g and 1000 g weights can be produced.

"Conversion of the machines takes between 20 and 30 minutes. In the case of the large machines, the different forming dies are already built into the machine. Here the die change is carried out via the machine control and can be performed at the push of a button on the HMI," explains Martin Lunblad, the MULTIVAC technician, who was involved in the installation in Umeå

Using two MULTIVAC R 535 machines and one R 245 machine, Norrmejerier has developed a practical solution for a consumer-friendly pack with a completely new visual design (photo: MULTIVAC)

IDM correspondent Claudia Vasquez Alarcon reports.

Claudia Vasquez Alarcon is a BtoB Agrifood and Food free-lance journalist and also founder of Origenal Story, a marketing consultancy agency specialised in BtoB Agrifood products.

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Healthy? Steady? ... Go!

You have certainly kept an eye on your diet and health this summer! So let´s explore on the farm´s diet and feeding strategy. Also, let´s have a look at $C0_2$ emission, the cow´s productivity and Danish dairy initiatives.

FAO AWARDS

Dominican Republic´s milk sector awarded

At the FAO awards – related to global food security, nutrition and sustainable agriculture – celebrated in Rome (03-08 July), the Dominican Republic's Dairy Council, represented by its Director, Mr Arnaldo Gómez, was recognized for its contribution in a multi-stakeholder FAO project to improve the production, collection, inspection and marketing of milk on the island. Although technology and artificial insemination are still weak points in the Dominican Republic's dairy sector, the country has become competitive over the last years. The island imports significantly non-fat dry milk from the US (in total more than 655,700 milk litres were produced in 2015, whereas more than 518,500 milk litres were imported, non-official data). Currently, the U.S. market share is approximately 53 percent, whereas the European Union and New Zealand are the major competitors.

Mr Arnaldo Gómez receiving the FAO Award (photo: FAO/Carlo Perla)

Gen-O Exchange

Network of US and UK farmers

A group of young organic farmers and part of one the US leading organic brands, Organic Valley, travelled end of July to network with their peers from the UK and share ideas about organic farming. During eight days, six Gen-O farmers – part of third, fourth, fifth and even sixth generation farmers – explored the southwestern English countryside from Bristol to Birmingham, learning from expert veterinarians, observ-

Campbell farm in Wisconsin (photo: David Nevala for Organic Valley)

ing cheese making and touring seven diverse organic farms. Founded in 1988, Organic Valley is a cooperative representing 2,000 farmers in 36 U.S. states. Organic Valley farmer-owners make up 15,6 percent of all certified organic farms in the U.S. and is responsible for 11 percent of all U.S. certified organic acres. Based on its sustainable agriculture model, milk is produced, bottled and distributed in the region where it is farmed to ensure low footprint and to support the local economies.

ABOUT EMISSIONS AND PROFITABILITY

Inspiring initiatives held in the US and NZ

On-farm emissions is one of the major challenges dairy sector is facing today. The US dairy industry has committed to a 25% reduction of GHG by 2020 compared to 2009. To reach this goal, researchers from University of Wisconsin-Madison (US) have published an article[1] stating that Wisconsin organic dairy farms with well-managed grazing practices and herd feeding strategies can both increase farm profitability and reduce Greenhouse Gas (GHG) emission per kilogram of milk. According to the authors, the difference relies on changing substantially the productivity of the herd, by keeping adequate levels of concentrate in diet. As research is also needed in "farm profitability", a New Zealand initiative might also inspire with new findings. More than 150 New Zealand farmers will be part of pilot tests to share their performance and some of them will attend workshops and discussion groups between June 2017 and November 2018 to share the outcomes of GHG emissions and farm profitability. Fonterra, New Zealand multinational dairy co-operative, will be highly implicated in the experimental trials.

Grazing practices and herd feeding strategies are crucial (photo: colourbox)

WORLD FOOD SUMMIT IN Copenhagen

Dairy initiatives shared at the breakout sessions

Conscious of the influence of gastronomy in consumers´ lives, Danish Ministry of Environment and Food invited in Copenhagen, on 24-25 August, government representatives, decision makers, experts, professionals, chefs, scientists and CEOs to discuss about sustainable development initiatives at the 2nd edition of "World Food Summit 2017 – Better Food for More People".

World Food Summit 2017 in Copenhagen

"More than 244 million people lived outside their country of origin and more than 40 % of food waste in industrialized countries occurs at retail and consumer levels", reminded the Ministry. Hundreds of conferences, food activities, a food festival and a trade fair congregated professionals and consumers to celebrate the gastronomy´s event. Among the four pillars highlighted at the summit, Cees de Jong, CEO at Chr. Hansen, participated at the "Prevention of Food Waste" breakout session by sharing actions done to reduce food waste in the dairy sector. In the "Safer food" breakout session, Tim Ørting Jørgensen, Executive Vice President, at Arla, presented food safety challenges faced by Arla when producing food to people around the world. According to the Danish Agriculture & Food Council, dairy category leads the ranking in the food consumption, and 33% of the Danish dairy consumption is organic.

[1] *D. Liang et al, "Effect of feeding strategies and cropping systems on greenhouse gas emission from Wisconsin certified organic dairy farms", Journal of Dairy Science (2017). https://doi.org/10.3168/jds.2016-11909*

EDA/ASSIFONTE Annual Convention 2017 28–30 September, Stockholm

HOSTED BY: LRF DAIRY SWEDEN

The European Dairy Association (EDA), ASSIFONTE and LRF Dairy Sweden, invite you to join the EDA/ASSIFONTE Annual Convention 2017, held in Stockholm (Sweden), under the headline 'European Dairy: Local Roots & Global Business'.

The European Dairy Platform, flagship event of the Annual Convention, will be THE opportunity to dive into a high-level discussion on our dairy industry, on Friday 29 September. Swedish Secretary of State, Elisabeth Backteman, has accepted our invitation to outline for us the 'National Food Strategy for Sweden' that was approved this summer. The Swedish government has set up a national strategy for more jobs and sustainable growth of the Swedish food sector based on two pillars: productivity and sustainability.

'Local Roots for Global Dairy: policy and competitiveness'

The first session chaired by the Director of the Milk department of the German Farmers' Association (DBV), Ludwig Börger, will offer a unique opportunity to exchange on the future of dairy and food in a European context, along a concrete national strategy.

Annette van Velde (a Dutch dairy farmer and member of the Council of the European Dairy Farmers) will highlight how dairy farmers can adapt to the national policy frameworks, while Thomas Magnusson (Chair of COGECA) will share his insight from a EU perspective and the president of the Young Farmers Association (CEJA), Jannes Maes, will make sure that we keep on track for the future of farming.

'Global Trade for Global Dairy'

The international trade landscape has changed tremendously over the past years. For the European dairy industry, international trade is – besides the EU Single Market – the key for continuing our success story in the future. In times of a high level of geopolitical variables, continued European leadership is paramount for dairy, for Europe and for the global community.

In the session moderated by Catherine Paice (Dairy Industry Newsletter, UK), we are proud to have EU Commissioner Cecilia Malmström, the global leader in trade policy. With her 'Trade for All' strategy, EU Commissioner Cecilia Malmström cleared the path for an ambitious EU trade policy, and positioned the EU in a leadership role. Her commitment to trade and to its capacity to deliver real economic results and value for all trading partners created a new dynamic in trade policies and negotiations. EU Commissioner Cecilia Malmström will discuss our trade issues and ambitions with CEOs from all over Europe: Annikka Hurme (CEO Valio), Peder Tuborgh (CEO Arla Foods), Ingo Müller (CEO Deutsches Milchkontor – DMK) and Bernard Ducros (President Europe, Danone).

"Sustainable dairy: challenges and commercial opportunities"

Our third session will be moderated by Anna-Karin Modin Edman (Sustainability Manager, Arla Foods) and will offer a platform to discuss the most important positive environmental impacts and the most pressing environmental challenges of EU dairy production, answering the question: 'how do companies in the dairy value chain meet these challenges and turn them into business?'.

The scientific perspective will be given by Dr. Joan Reijs (Senior researcher in sustainable dairy production at Wageningen University), focusing on environmental opportunities and challenges for EU dairy production and proposing what to fo-

cus efforts on, going forward to improve environmental performance. The business perspective will be given by representatives from two international companies with strong sustainability profiles: Fredrik Wellendorph (Tetra Pak Business Stream Director for Dairy, Tetra Pak) and Patrik Hansson (Head of Arla Sweden). They will present how they take on the environmental challenges and opportunities in their respective company and how they turn that into business opportunities.

"EDA Break-Out Sessions" on Thursday, 28 September 2017

Our Sustainability Break-Out Session will be chaired by Richard Laxton, sustainability manager at Arla Foods, who drives as chair of our EDA Sustainability working group the pre-competitive work on our sustainability agenda:

"If we don't have the right answers to the sustainability challenges for the dairy sector, we will not stay the leading dairy industry at global level. This Sustainability Break Out session will focus on the basis of basically all agricultural activity: land and soil. I am convinced that those questions will be become an important, if not the most important issues in the future debates. Within the EDA Sustainability Working Group, we do prepare for these discussions. I invite you to experience the EDA Sustainability Break Out Session and to get ready for the future."

With Pierre Barrucand (ATLA) we will dive into the topic of "Dairy & Biodiversity – our natural capital", and Anna-Karin Modin-Edman (Arla Foods) will update us on the latest science on "Pasture land and carbon sequestration". Jaap Petraeus (FrieslandCampina) has accepted to brief us on the Dairy Sustainability Framework and its B2B tool.

Our Trade & Economics Break-Out Session will be chaired by Wim Kloosterboer, corporate manager trade and dairy affairs at FrieslandCampina, who is the leader of our EDA Trade and Economics Committee.

Wim did set up a program that reflects both, the broad range of pre-competitive trade and economic topics on our daily dairy agenda and the in depth assessment of those dossiers within our EDA work.

Wim Kloosterboer will open the session in giving an insight on where the European 'lactosphère' stands vis-à-vis some of our 'hot' topics, like the discussion on the future of the Common Agricultural Policy (CAP) in the Union, the positioning of the dairy sector within the BREXIT dossier or the changes in the global trade landscape.

With Pablo Recio Gracia, Eibens consulting Beijing, we have one of the most experienced specialist on the Chinese dairy markets who is ready to share with us his overall assessment of the market developments and outlook in China.

Prof Dr Holger Thiele, ife institute, Kiel will fuel our discussion on the future CAP with his essential knowledge on dairy markets and price volatility.

The EDA Annual Convention in Stockholm will not only provide you with enriching presentations from high level speakers and give you an update on key dairy subjects, but will also offer you an excellent opportunity to meet colleagues from the European and global dairy sector.

Register now on www.eda2017.eu

Turning rennet and acid whey into desserts and trendy foods
Hydrosol


(photo: Hydrosol)

With Stabisol JOC stabiliser and texturing systems, rennet and acid whey can profitably be made into new products. Hydrosol's new functional systems turn whey into a wide range of new products. For example, rennet whey can be used as a basis for pudding desserts, drinks, fermented desserts and sour cream. Acid whey can be used to make alternatives to yogurt.

The end products feature appealing mouth feel and creamy texture. The fat content can be adjusted either with cream, or with vegetable fat. The desired viscosity can be achieved using functional stabiliser and texturing systems. Like yogurt, the whey alternatives can be mixed with various ingredients, such as flavourings and colours. Through its close cooperation with its sister companies in the Stern-Wywiol Gruppe, Hydrosol can offer individual solutions. With its sister company OlbrichtArom, stabiliser Hydrosol can also offer all-in compounds with customer-specific flavouring. **hydrosol.de**

Residual oxygen under 2%
GEA

GEA was awarded a complete milk powder processing plant to Open Country Dairy in New Zealand including Modified Atmosphere Packing (MAP) that consistently provides a residual oxygen (RO) level in the sealed 25 kilograms bags of just two percent at the time of packing. The total project value was in the lower double-digit million EUR range, of which EUR 3 million was for the MAP technology.

Open Country Dairy is the second largest global exporter of premium whole milk powders. The company's dairy products are valued for their quality around the world. As with all milk powders, oxygen is the adversary when the product is transported or stored awaiting final processing or retail packing. If the product is exposed to high levels of oxygen it can seriously affect its flavour and shelf life. GEA's MAP technology ensures that the residual oxygen level in the 25-kilogramme package is sufficiently low as to prevent any significant deterioration in product quality while in transit to its key marketplaces of China and the Middle East.

This is the sixth milk processing plant GEA has supplied to Open Country Dairy in New Zealand since 2007, across four sites, each processing eight tonnes of milk powder per hour. This is, however, the first time the scope of supply from GEA has included the MAP system. Based on test results from existing MAP machines, GEA was able to show its ability to get the RO consistently down below the required level; this lower RO in the bag provides an additional benefit to the customer compared with that at the other sites. "Our system does consistently achieve the RO level required by the customer and we can demonstrate it," said Greg Martin, Head of Application Centre Dairy Pacific for GEA.

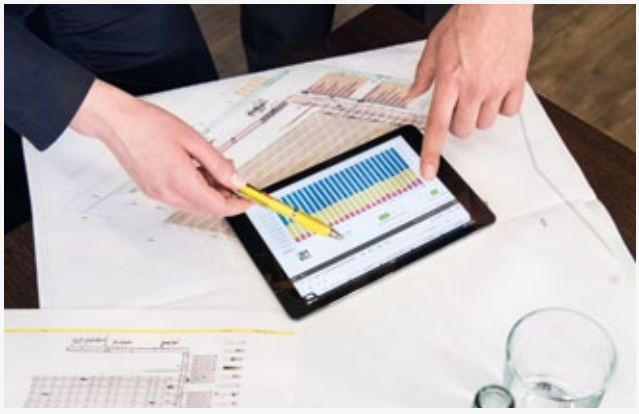
Open Country Dairy, the second largest global exporter of premium whole milk powders, will install a RBF 1200 Li machine for bagging (photo: GEA)

Pre-gassing with inert gas to exclude oxygen

The key to achieving the required RO is in the process. GEA has used its RBF 1200 Li (Limited Intervention) packing line at Open Country Dairy. The system uses pre-gassing, in which the bag is filled with inert gas to exclude oxygen prior to filling. The bag is then held steady by the top thereby reducing movement and any air disturbance in the product. The bottom up filling technique prevents additional air being introduced into the product during filling and the bag sealer forces out any remaining gas on final closure. The new plant will come on stream in September 2018. **gea.com**

Interactively and optimally customized intralogistics

SSI Schäfer



LogiVision offers numerous tools to provide a complete project overview with informative analysis data (photo: SSI Schäfer)

SSI Schaefer is making advising on, planning, and implementing logistics systems even more efficient with an innovative software platform. "LogiVision", the interactive framework, offers numerous tools for taking a holistic view of a project with reliable analysis data and a thoroughly interconnected project flow. LogiVision is designed as a platform that, on the one hand, integrates data from various sources and combines them into one overall picture. On the other hand, its client server architecture allows all those involved in the project to access the relevant planning data from anywhere in the world via laptop, smartphone, or tablet, in order to modify this data to create the optimal solution based on key figures. Using analysis and simulation algorithms, projections of future developments can also be integrated into project planning.

The LogiVision framework is an innovative instrument that makes SSI Schaefer's consultancy and planning projects even more efficient. With LogiVision, SSI Schaefer guides and supports the user throughout the whole project – starting with concept evaluation and workshops before the project even begins, through in-depth advice during the implementation phase right up to start-up. Even potential future enhancements can be checked and planned using LogiVision. The platform can incorporate, prepare, analyze, and display the results of simulations.

The analysis and simulation platform LogiVision, a tool that uses the latest technology now aids intralogistics consultants. The IT program offers the advisors, project engineers, sales team, and the customer's specialist departments direct access to the current plans via a web browser. The basis for this is a Business Discovery Platform, where the data is stored and visualized. Using dashboards, the relevant framework data and key figures can be interactively edited with different tools and their results can be analyzed – even by the customer.

Alongside this, the planners and consultants at SSI Schaefer can access the latest data model, integrate the customer's suggestions directly into this model and display the effects. **ssi-schaefer.com**

Protecting valves with correct maintenance

SPX

To ensure valves continue to operate as they should, they require routine maintenance. To help its customers keep processes running smoothly, SPX FLOW has released a series of step-by-step video guides to maintaining its products. The latest of these covers disassembly, seal replacement and reassembly of its APV Delta RUF Check Valve.

The APV Delta RUF check valve is used where the prevention of backflow of product is critical to the production process. The non-return valve offers high operational assurance in a compact design and is widely used across the brewery, dairy, chemical and pharmaceutical industries. Designed for easy maintenance, the valve has robust bearings and profile seals that eliminate any gaps through which product could leak.

The new SPX FLOW maintenance video (available on youtube) walks the viewer through every stage of valve disassembly, seal removal and replacement, and reassembly. It explains in detail the tools and processes needed to ensure correct maintenance without damaging the **valve.spx.com**

SPX has issued a video guideline for valve maintenance (photo: SPX)

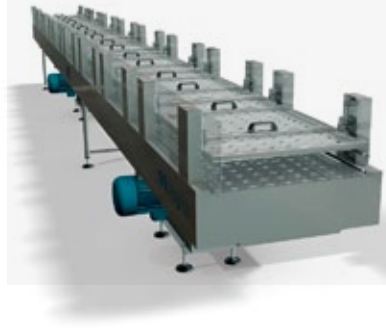
Safe handling made possible

Magnoni

Magnoni's air blowing conveyor belt uses a high production speed (up to 160,000 cph) and low noise level (‹ 82 dB at 1 meter distance) system that aligns products in single or multiple rows. Thanks to the low pressure used, the air blowing conveyor belt reduces damage to containers and is functional to the feeding of the rinsing machines.

Made of AISI 304 stainless steel, it comes with removable side protections of Lexan, height adjustable lids (either manually or electrically), silenced filters and fans connected to single disconnection switches.

The air-blowing conveyor belt also features different blowing zones and is used in pre-rinsing, pre-filling and post-depalletizer phases.



Thanks to the low pressure used, Magnoni's air blowing conveyor belt reduces damage to containers (photo: Magnoni)

Cheese cutting machines

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