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PROCESSING | INGREDIENTS | PACKAGING | IT | LOGISTICS
www.international-dairy.com

Dairy-Technology-Award

Award ceremony: February 2027 at Anuga FoodTec

Supported by the dairy trade publications **IDM International Dairy Magazine** and **molkerei-industrie** and the Society of German Dairy Engineers (Ahlemer Ingenieure), the Dairy Technology Award aims at highlighting successful innovations in dairy and food technology. The prize has been awarded since 2009 to companies in the dairy and supplying industry and relevant service providers.

The Dairy Technology Award focuses on processes, equipment, complete production units and problem solutions that are of benefit to the overall dairy industry.

JURY

Applications will be judged and awardees will be selected by a jury consisting of these renowned experts:

- Prof. Dr.-Ing. Jörg Hinrichs, Dep. Soft Matter Science and Dairy Technology, University of Hohenheim
- Dipl.-Ing. Klaus Schleiminger, KSI Engineering, Krefeld
- Prof. Dr.-Ing. Saskia Schwermann, University of Applied Sciences and Arts Hannover, Faculty of Mechanical and Bioprocess Engineering
- Prof. Dr.-Ing. Matthias Weiß, University of Applied Sciences and Arts Hannover, Faculty of Mechanical and Bioprocess Engineering

CALL FOR ENTRIES

The call for entries for the Dairy Technology Prize is now open and ends on September 30, 2026.

Awards will be made in these field

- Process & Automation Technology
- Packaging & Filling Technology
- Environment & Sustainability Improvement (saving of energy and resources)
- Process Management & IT
- Logistics
- Food Safety

HOW TO APPLY

Only in digital form, a condensed application is requested first. It should include:

a) Reason for application

b) Description of company/innovator with a short portray of the applicant and is professional background.

c) Title of the application and area of development

d) Description of the innovative project/the innovation on max. 3 pages A4 incl. illustration (photos, graphs, tables, sketches) centering on the special innovative development and, if applicable, quoting sources. (After checking, the jury might ask for further documentation or an on-site inspection)

Send applications to:
Anja Hoffrichter, Editor molkerei-industrie/IDM International Dairy Magazine, Email: ah@blmedien.de. Questions will be answered by email or phone: +49 178 23300474.

AWARDING

The prize winning developments will be presented at the trade show Anuga FoodTec in February 2027.

Awardees will receive a certificate, the winning developments will be presented to an international readership in the magazines **IDM International Dairy Magazine** and **molkerei-industrie** as well as on the websites **international-dairy.com** and **moproweb.de**.

2026: A difficult start to the dairy market

Monika Wohlfarth
CEO, Zentrale Milchmarkt Berichterstattung GmbH, ZMB, Berlin, Germany

The German dairy industry can look back on an overall very strong year in 2025. However, it is entering the new year with weak prices and high milk volumes.

In 2025, milk payout prices reached their second-highest level ever, even though returns declined steadily over the course of the year. While the ife raw milk value – an indicator based on returns from butter and skimmed milk powder – stood at 52.90 cents per kilogram at the beginning of the year, it fell to 30.9 cents per kilogram of raw milk by December. This was the lowest level since August 2020.

The high milk prices in 2025 were based on strong revenues from milk fat. Average annual prices for butter, semi-hard cheese, and whole milk powder – as well as milk payout prices – reached their second-highest levels in recent decades. Milk protein, however, did not benefit from this rally. In 2025, skimmed milk powder traded at a five-year low, and casein was also weakly priced. Whey protein followed a different trend: prices for whey protein concentrates climbed to new historic highs.

From August 2025 onward, prices for most dairy products came under increasing pressure. By the end of the year, prices for butter and semi-hard cheese had fallen to their lowest levels since summer 2021. Skimmed milk powder traded at its lowest level since spring 2020. Only whey powder ended the year at its highest price in three and a half years. Against this generally weak backdrop, 2026 is getting underway.

It is evident that developments in the dairy market in recent years have been primarily supply-driven. In 2024 and early 2025, stagnating – and at times even declining – milk volumes pushed prices for butter and other dairy products upward. The turning point was triggered by a surprisingly strong increase in milk production in Germany, Europe, and other exporting countries. Demand was unable to keep pace with the sudden surge in supply and became overwhelmed. Over the holiday period around the turn of the year, markets for liquid raw milk effectively collapsed as processing capacities reached their limits. Moreover, purchasing interest has remained relatively static in recent years. Key demand drivers – such as China's growing imports over several years – have largely been absent. Protectionist tendencies, including higher U.S. import tariffs, have added further pressure. Just before the start of the year, China raised tariffs on cream and cheese imports from the EU. The environment for EU exports to the global market is becoming harsher, while imports into the EU are increasing at the same time.

At the beginning of 2026, milk prices will inevitably follow the decline in returns. Signs of a near-term market recovery are currently difficult to identify.

However, 2025 once again confirmed that outcomes often differ from expectations – and that market forces do work. Supply and demand remain the dominant drivers of price developments. Who would have expected a year ago that milk volumes across Europe would be five percent higher in the autumn than the previous year? High prices stimulate supply, provided that crop failures or animal diseases do not hinder producers' responses. Lower prices will, in turn, curb production again – albeit with a certain time lag – and stimulate demand. Once more, low prices will prove to be the best remedy for low prices.

NEWS

IMCD GROUP
Modernised Food & Nutrition laboratory

The IMCD Group has modernised its Food & Nutrition application laboratory in Germany and officially reopened it at its Cologne site. The laboratory supports food and beverage manufacturers in the development and optimisation of formulations as well as in joint innovation projects.

With this reopening, IMCD Germany brings together three laboratory areas at one location for the first time: Food & Nutrition, Pharmaceutical, and Beauty & Personal Care. The aim is to enable closer collaboration across disciplines and provide application support, technical expertise and regulatory guidance.

The Food & Nutrition Laboratory covers a wide range of segments, including bakery, beverages, dairy, confectionery, savoury and nutrition. Its work focuses on formulation challenges related to taste, texture, nutritional profile and functionality and is embedded in IMCD's global laboratory network.

IMCD Food & Nutrition Laboratory in Cologne, Germany (photo: IMCD)

NEWS

SPX FLOW and SIG expand collaboration
Dubai Innovation Center upgrade

SPX FLOW is expanding its testing capabilities in the Middle East through its collaboration with SIG by enhancing its APV processing equipment housed at the SIG Test Filling Center - part of the SIG Customer Experience Hub in Dubai. This enhancement enables advanced trials, including fermentation, using APV technologies tailored to regional food and beverage needs.

Launched in 2021, the current APV pilot line includes a FlexMix Instant vacuum mixer for preparing complex formulations, followed by a multi-UHT pilot system for thermal treatment. This enables the line to process up to 1,000 liters (L) of test product per hour. This first installation introduced SPX FLOW's APV thermal and mixing technologies to the Middle East.

"Since installing our equipment, the growing demand for trials from customers overseas has revealed the need for broader capabilities," shared Thomas Leroy, Global Head of Innovation Centers at SPX FLOW. "With new fermentation and clean-in-place (CIP) upgrades now available, we're ready to support more customers with faster product development."

The latest expansion includes:

» A two-line APV CIP station to enhance sanitary product testing

Completed UHT line in Dubai (photo: SPX Flow)

» A new fermentation line that features a 1,000 L tank specifically designed for viscous products
» The line includes an APV plate heat exchanger cooler to support high-quality yogurt production from dairy or plant-based materials

With several successful trials already underway, the Center continues to serve as a strategic hub for SPX FLOW and SIG customers across the region - enabling end-to-end innovation from formulation to packaging.

Investments in the Asian market

Hydrosol expands technical infrastructure

"With our tailor-made solutions, we want to help manufacturers react quickly to regional market trends and consumer demands."

Dr. Dorotea Pein, Director Technology and Innovation

The demand for meat and dairy products as well as convenience products is rising in Asia, in step with the region's growth in population and prosperity. To address this growth even more effectively, ingredients specialist Hydrosol is continuing to invest in its regional locations, and maintains close collaborations with its local sales organizations. The expansion of its technical infrastructure is an important part of this, as a current example in Singapore shows. In addition to the existing plant in China, a UHT pilot plant is currently being installed in Singapore to better serve local manufacturers.

This state-of-the-art plant facilitates the development and improvement of formulations for dairy products. For example, with UHT milk and flavored milk drinks the stability, texture, and flavor need to be retained over an extended shelf life. With vegetable fat creams the focus is on optimizing whippability, viscosity, and heat stability. For yogurt and fermented milk products the goals are better mouthfeel, creamy consistency, and thermostable products.

In addition to its technical facilities, the company also wants to be a local sparring partner for its customers across the region. Through close collaboration, Hydrosol helps manufacturers meet challenges in formulation and processing, and ensures smooth transitions from pilot testing to large-scale production. "With our tailor-made solutions, we want to help manufacturers react quickly to regional market trends and consumer demands", emphasizes Dr. Dorotea Pein, Director Technology and Innovation.

Stern Ingredients Asia-Pacific's Singapore Offices

New markets in focus

Another objective is to conquer new markets. In the Chinese market, for example, milk products are gaining traction, particularly in the B2B segment. Due to oversupply in retail, leading Chinese dairies are increasingly focusing on food service with special product concepts. They are expanding their product lines with solutions for restaurants as well as coffee and tea franchises. Tea beverages are very popular, and milk bases and coffee whitener/creamers are frequently used in bubble tea shops. Coffee shops are also popular. Strategic partnerships of leading milk producers with chains like Starbucks illustrate the potential.

UHT pilot plant (photos: Hydrosol)

According to market research, in 2025 the coffee sector is projected to generate added demand for milk products on the order of 26.5 billion renminbi, or just under 3.65 billion USD. Demand for thick milk and milk bases for new tea drinks is forecast to rise by over 20 percent annually. Cheese is also seeing rising demand in Chinese food service. High-quality cream, butter, and cheese product categories are still dominated by international brands, but local vendors are gaining ground thanks to shorter supply chains, fresher products, and competitive pricing.

Health-oriented innovations for milk drinks are another growth market. For example, sugar-free options are in demand. According to Nielsen IQ, last year milk drinks were the only category in the Chinese milk market to show growth (+11.3 percent). With its stabilizing systems in the Stabiprime series, Hydrosol offers customers the ability to produce a wide range of milk drinks that can be enriched with micronutrients or proteins to offer consumers the added health value they are looking for.

photo: Cris Cantón

Top Trends 2026

Creative dessert ideas combine health and delight

Whether traditional compositions or exciting new creations, dairy-based desserts are in demand from consumers around the globe. Market statistics from Innova Market Insights show that last year the worldwide market for milk desserts and ice cream grew by 4.4 percent over the previous year. New product launches grew by just under six percent in the last five years. Western Europe is the clear leader with over 4500 launches, followed by Asia with around 3000 product introductions. Products with clean label claims lead the launches by a wide margin, followed by desserts with no added sugar, or which are good sources of protein. Reduced fat content is also important.

Furthermore, desserts offer enormous potential for other sales arguments that meet the central needs of consumers – health and delight. The 2026 Top Ten Trends from Innova Market Insights once again confirm that the market offers great opportunities for foods and beverages that promote physical and mental wellness. If they also check the "delight" box, they can do that much better. As experts in special indulgence moments, Hydrosol has developed stabilizing systems that dessert producers can use to meet the trends of tomorrow.

Top trend: Powerhouse protein

Innova calls the power for all-around wellbeing the most important trend for the year ahead. Consumers are looking for protein-rich products, ideally enriched with vitamins and minerals, that support mental fitness as well as gut health and the immune system. Healthy aging, weight management, and athletic performance are further important criteria. For these goals, Hydrosol has

developed a pudding concept specially designed for the Best Ager target group. This caramel-flavored pudding has ten percent protein and just one percent fat, and is free of added sugar. Enrichment with calcium, vitamin D3 and vitamin K2 allows various EU Health Claims. The same goes for the company's concept for a yogurt mousse with fresh lemon flavor, likewise aligned with the needs of Best Agers. The stabilizing system creates a light mousse that can be declared a source of protein due to its protein content of 3.6 percent, which corresponds to approximately 13.7 percent of the total energy content. The reduced sugar content and low salt content are further advantages.

photo: Buzz Factory

Top trend: Layers of delight

The many facets of delight are at the focus of the second Innova Top Trend. It is based on four pillars: Wellbeing moments, positive mood, rich delight for the senses, and healthy enjoyment. Familiar flavors and new creations alike are in demand, and Hydrosol offers the right inspirations for both. One example is Turkish and Arabian-style ice cream whose elastic consistency and good melt resistance set it apart. A suitable stabilizing system from the Stabisol series can be used to achieve this. It prevents the formation of ice crystals and gives a stable end product with characteristic mouthfeel. Meanwhile, exciting new sensory delights are promised by Hydrosol's functional system for vegetable fat cream. With a whipping volume of up to 300 percent and a creamy mouthfeel that is nearly identical to dairy whipped cream, it provides the basis for a whole range of dessert creations.

Polmlek invests in aseptic spouted pouch filling

Flexible packaging for ESL and low-acid dairy applications

The market for spouted pouches continues to grow rapidly. They are extremely easy for consumers to handle and manufacturers benefit from lower storage space compared e.g. with preformed cups. Polmlek was looking for a new packaging for the launch of its new low acid dairy products and desserts. According to the company IMA Fillshape is the only company worldwide able to supply the technology of a spouted pouch, aseptic, high speed rotary filling machine for high and low acid products.

These are the reasons why Poland's dairy company has chosen this consumer-friendly packaging for its' new products. The pouch filler Ermetika Aseptic EAS240 is a continuous motion rotary filler with a capacity of 240 pouches per minute. The machine works with premade pouches, spouts and caps.

Official opening: ribbon cuttening of the aseptic pouch filler Ermetika Aseptic EAS240 in October 2025. From left to right: Andrzej Grabowski, Polmlek Co-founder/ Owner, Enzo Bocelli, Sales Manager IMA Fillshape, Jerzy Borucki, Polmlek Co-founder/Owner

Spouted pouches are assembled at the welding carrousel and then sterilized internally and externally by means of VHP (Vaporized Hydrogen Peroxide). Caps are sterilized by means of VHP and applied after the filling is complete. Filling and capping are performed in the sterile isolator area. The machine features dedicated skids for the VHP preparation and for the chemicals preparation for cleaning and sterilization cycles (CIP-COP and SIP-SOP).

The new dairy products Pomlek Homogenized cheese strawberry, Pomlek Prebiotic on strawberry and desserts such as Pomlek Nut and Chocolate milk dessert, Pomlek Poezja LUX Strawberry flavored dessert are filled into spouted pouches. The machine allows the customer to produce: ESL products (Extended Shelf Life) by cold distribution chain for a shelf life up to 60 days and products in Full Aseptic mode for High Acid and Low Acid products: for a shelf life at ambient temperature for 6-12 months.

The practical pouches are an ideal solution for offices, hotels, cafés, fast-food chains, trains and buses as well as on-the-go. "We are very satisfied with this state-of-the art pouch machine." reported Monika Białobrzewska, Vice President Mazowiecka Spółka Mleczarska. „The inauguration of the new aseptic production line is a great milestone for Polmlek. The first spouted pouch aseptic rotary filler in Poland, gives us a step ahead to our competitors, introducing in the market brand new ESL and Aseptic (low acid) dairy products and desserts."

Portfolio of the new products filled on the Ermetika Aseptic EAS240 (photos: IMA Fillshape)

AMCOR supports Danish recycling initiative
Circular solutions for food packaging plastics

NEWS

Amcor announced the support of an ambitious three-year plastic recycling project led by the Danish Technological Institute. The co-funded innovation partnership Circular Recycling Innovation for Sustainable Packaging (CRISP) aims to establish the full-scale circular recycling of food packaging in polyethylene (PE) and polypropylene (PP) rigid plastics from household collections.

Besides Amcor, the project will involve major food manufacturers and waste management specialists. Amcor will bring recycling and technical expertise from its state-of-the-art CleanStream facility in Leamington Spa, UK, and their packaging production facility in Randers, Denmark.

The CRISP partnership has the potential to significantly contribute to the implementation of a circular plastic economy in Denmark. The effort is timely with the EU targeting a plastic recycling rate of 55% by 2030*. The Packaging and Packaging Waste Regulation (PPWR) stipulates that by the same year, the majority of plastic packaging must be designed for recyclability, allowing materials to be reused or recycled effectively.

It is anticipated that the CRISP partnership will help develop and mature a systemic solution to deliver food-grade packaging from post-consumer sources. Collaboration is the driver for this change and focus will also be on the documented traceability of food contact materials in the recycling loop. The goal is to create a new, fully circular, market for the circular recycling of food packaging in rHDPE and rPP.

All this aligns with Denmark's Extended Producer Responsibility (EPR) scheme, which obligates producers to pay for the packaging they place on the market, while also offering financial incentives for more sustainable product design and material selection.

photo: Amcor

SPX FLOW
SteamRecycle

NEWS

SPX FLOW has launched the APV Infusion UHT featuring SteamRecycle, an industry-first solution that recovers and reuses 100 percent of the steam used during the infusion UHT process. It eliminates the need for fresh steam after startup, helping dairy, nutritional beverage and plant-based producers reduce carbon dioxide emissions by up to 1,000 tons annually (calculated based on 6,000 operating hours per year) and cut water recirculation by up to 33 m³/h compared to traditional Infusion UHT systems.

The closed-loop system eliminates the need for continuous fresh steam input by using mechanical vapor compressors to recover excess low-pressure steam. It then converts it to high-pressure steam, making it suitable for reuse in the UHT process while still maintaining good-product quality.

SÜDPACK
Partnership with PPC Flex

NEWS

SÜDPACK is realigning its operations in the US market. As part of this effort, the company has sold its production facility in Oak Creek, Wisconsin, to its long-time industry partner PPC Flex. The sale is accompanied by a comprehensive strategic partnership designed to drive joint growth in the US market, with a particular focus on the meat and cheese segments.

With approximately 1,600 employees, PPC Flex ranks among the leading converters in North America and boasts excellent market access along with a broad technological footprint. The SÜDPACK facility north of Chicago fits ideally into PPC Flex's existing site strategy. Through this move, SÜDPACK is reinforcing its position in the US market while establishing a solid foundation for sustainable, long-term growth in the region.

Tetra Pak launches Integrated Heat Pump system

Up to 77 % energy savings

Tetra Pak expanded its Factory Sustainable Solutions portfolio with its new Tetra Pak Integrated Heat Pump system for pasteurizers, designed to help food and beverage (F&B) producers reduce energy use and cut costs.

Pasteurization is a critical process for food safety and quality, but traditional systems are energy-intensive, typically relying on fossil fuels for heating and electrical chillers for cooling. As F&B producers seek to improve efficiency and sustainability, optimising energy use in this process offers a clear path to reducing both costs and emissions through smarter heat recovery and reuse.

The new system builds on the company's existing pasteurization technology by introducing a high-efficiency electric heat pump that recovers and reuses heat from the pasteurization process. For every 1 kWh of electricity used, the system can recover up to 2 kWh of otherwise wasted heat – making it up to three times more efficient than a traditional boiler.

By combining heating and cooling in one integrated solution, the system also optimises energy use across the pasteurization process. It upgrades low-temperature waste heat to higher temperatures and generates ice water for cooling. This dual function helps lower total energy consumption and operating costs, while supporting producers in reducing reliance on fossil fuels and exposure to volatile energy prices.

F&B producers operating large scale pasteurization processes, such as fruit juice, chilled milk, cheese and ambient milk pretreatment pasteurization, stand to achieve substantial savings. According to Tetra Pak, a typical dairy production line, for example, could reduce energy consumption for pasteurization by up to 77 %, making operating expense (OPEX) savings of up to €230,000/year and reducing CO_2 emissions by up to 650 tonnes/year.

Tetra Pak expanded its Factory Sustainable Solutions portfolio with its new Tetra Pak Integrated Heat Pump system for pasteurizers (photo: Tetra Pak)

Industrial Production of Mozzarella Sticks

Process steps and production requirements

FS 510 forming system with VF 800 vacuum filling machine for the production of mozzarella sticks (photos: Handtmann)

Mozzarella is one of the most popular cheese varieties worldwide and is used both as a standalone product and in a wide range of convenience foods. Mozzarella sticks, in particular, have become established as a snack product in which the characteristic fibrous structure and melting behaviour of the cheese play a key role. For industrial production, cheese masses are prepared accordingly, shaped and processed into standardized portions before being further processed into breaded or fried end products. The technical processes involved vary depending on the desired product shape, production volume and the downstream processing line.

Handtmann offers automated processing solutions for the production of a wide range of cheese products. The systems enable the processing of pasty, particulate, hot or cold products and cover process steps such as mixing, size reduction, emulsifying, filling, portioning, forming, cutting, co-extrusion and dosing. The product spectrum ranges from classic cheese products to trend products and innovative cheese-based convenience foods, such as mozzarella sticks.

Production and preparation of the cheese mass

The production of hot and cold base masses for cheese products can be carried out using Handtmann Inotec technologies. Particularly efficient is the VarioMix system with independently controllable mixing spirals, which enables both gentle and intensive mixing. The system features automatic dosing of water and powders, heating via a jacketed vessel and steam injection, as well as cooling via the injection of cryogenic gases. Operation under vacuum is also possible.

Production with direct feeding into a breading and frying line

The basic process involves forming mozzarella sticks from shredded mozzarella cheese (reformed cheese) with the addition of butter. A practical performance example includes a Handtmann VF 830 vacuum filler combined with the FS 521 forming system. This forming system is designed for multi-lane production of skinless formed products and allows direct transfer into breading systems, water baths, oil baths or other downstream processing units.

With a portion weight of 9 g, a portion length of 120 mm and a diameter of 10 mm, a four-lane configuration achieves an output of 50 portions per minute, corresponding to approximately 120 kg per hour (without breading). The filling temperature is 13 °C and the filling pressure is 10 bar. The maximum production capacity is up to 250 portions per minute, depending on the downstream breading and frying line.

A key advantage of this process is that no pre-dusting is required. Unlike forming plate systems, where pre-dusting is necessary to bind excess moisture, this step can be completely eliminated. In addition, rejects and rework are minimized, as all sticks have uniform shape and consistent weight.

Production directly onto a conveyor belt

This production method for mozzarella sticks is based on a continuous process including portioning, grinding through the filler, dividing the product flow, forming and depositing directly onto a conveyor belt. The system solution consists of a Handtmann vacuum filler with integrated grinder and the FS 510 forming system including a product flow divider. Easy integration into downstream breading lines for both wet and dry breading completes the process.

The reformation of the cheese mass is achieved using filler grinder technology, while a wide variety of shapes can be produced using different nozzle and die configurations. The continuous, multi-lane production process from portioning to belt deposition ensures high output with precise individual portion weights. Production capacities of up to 250 kg per hour are possible.

With this solution, the following production parameters for cold cheese masses can be achieved, for example: six-lane production, portion weight of 12 g, diameter of 13.3 mm, hexagonal shape and a portion length of 80 mm.

Water efficiency in dairy membrane operations

Practical approaches to reducing water use in filtration and cleaning processes

Membrane technologies such as microfiltration (MF), ultrafiltration (UF), nanofiltration (NF) and reverse osmosis (RO) are integral to modern dairy processing. They enable the concentration and fractionation of milk and whey components, but they are also associated with significant water consumption. Cleaning-in-place (CIP), product displacement, seal water usage and diafiltration all contribute substantially to the overall water footprint of membrane-based dairy operations.

With increasing regulatory pressure, rising water costs and ambitious sustainability targets, dairy processors are looking more closely at how water is used throughout membrane systems. Rather than focusing on individual measures alone, a system-level approach to water management can unlock considerable efficiency gains while maintaining food safety and product quality.

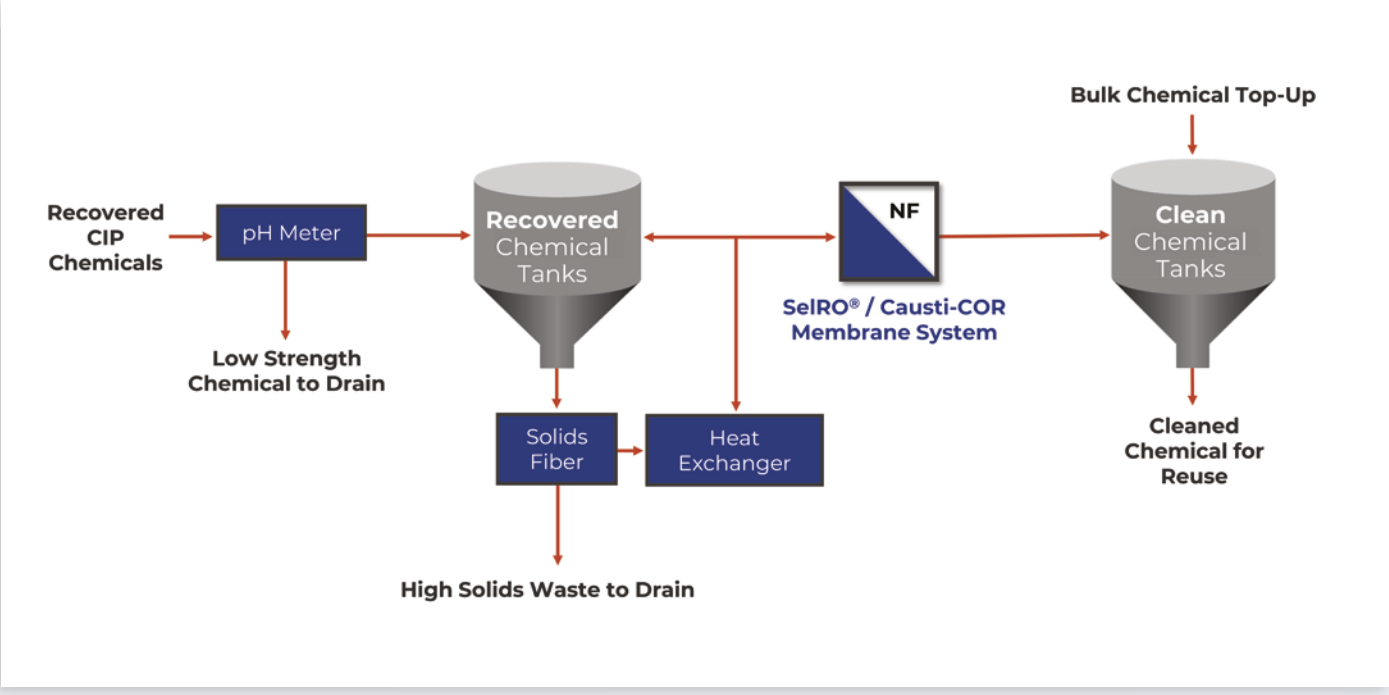


Figure 1: *Chemical recovery system integrated into CIP operations*

Chemical recovery as part of a circular CIP strategy

One key lever for reducing water and chemical consumption is the recovery and reuse of CIP chemicals. Nanofiltration-based chemical recovery systems allow caustic and acidic cleaning solutions to be reclaimed and reused under demanding operating conditions. By integrating chemical recovery into existing CIP circuits, dairies can reduce fresh chemical input, lower wastewater volumes and decrease the environmental burden associated with disposal.

As illustrated in Figure 1, recovered cleaning chemicals are separated, conditioned and returned to the process, supporting a more circular approach to CIP operations. In parallel, optimising CIP recipes themselves can further reduce water demand. Replacing daily full CIP cycles with reduced-step procedures, or shifting certain cleaning steps to a weekly schedule, can deliver significant cumulative water savings across multiple membrane skids.

Seal water reuse: addressing a hidden source of consumption

Seal water is essential for pump operation and for preventing contamination ingress, yet its continuous-flow design often leads to high cumulative water use. In membrane systems with numerous pumps, seal water consumption can reach several thousand litres per day.

A practical mitigation strategy involves collecting and reusing seal water via dedicated tanks equipped with level, temperature and conductivity sensors. These systems enable monitoring and controlled reuse of seal water without compromising hygiene or equipment reliability. Figure 2 shows an example of a seal water reuse concept, which can be implemented both in new installations and as a retrofit. In addition to reducing water intake, such systems provide valuable operational data that can support predictive maintenance and early detection of seal or pump issues.

Optimising product displacement to reduce losses and water use

Product changeovers represent another water-intensive phase in membrane operations, particularly in high-protein processes such as whey protein concentrate (WPC) production. Conventional displacement strategies often rely on extended flushing to ensure product purity, leading to excessive water use and yield losses.

More precise control of product boundaries using sensors such as Brix meters or turbidity probes allows displacement to be terminated at the optimal point. This reduces both displacement time and water volume while maintaining product specifications. The impact of these strategies is shown in Figures 3a and 3b, which compare volume concentration factors and water usage during product displacement steps for different WPC grades.

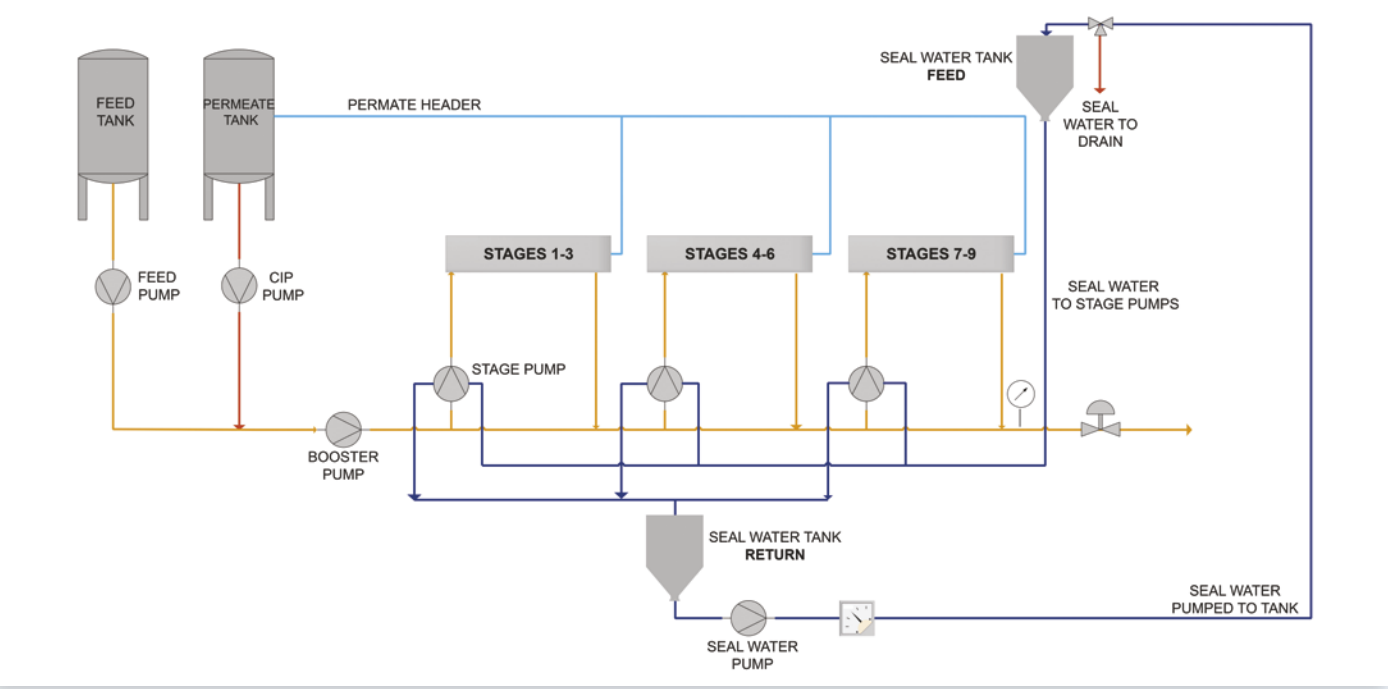


***Figure 2:** Seal water reuse system*

An alternative approach involves capturing so-called "white water" — rinse streams containing residual product solids — and reintroducing them into upstream processes, such as skim milk feed. This not only reduces water consumption but also improves overall product yield.

Water management as a strategic opportunity

Water use in dairy membrane operations is no longer viewed solely as an operational necessity but increasingly as a strategic performance indicator. By combining chemical recovery, auxiliary water reuse and smarter product displacement strategies, dairy processors can achieve meaningful reductions in water consumption without compromising hygiene or efficiency.

Rather than implementing isolated measures, the greatest benefits are realised when water management is addressed holistically, considering process design, instrumentation and operational practices together. In this way, improvements in water efficiency align closely with broader sustainability goals, cost reduction efforts and long-term operational resilience.

Based on the whitepaper "Water Conservation and Efficiency Opportunities in Dairy Membrane Operations": https://www.kovalus.com/technical-whitepaper-water-conservation-and-efficiency-opportunities-in-dairy-membrane-operations.

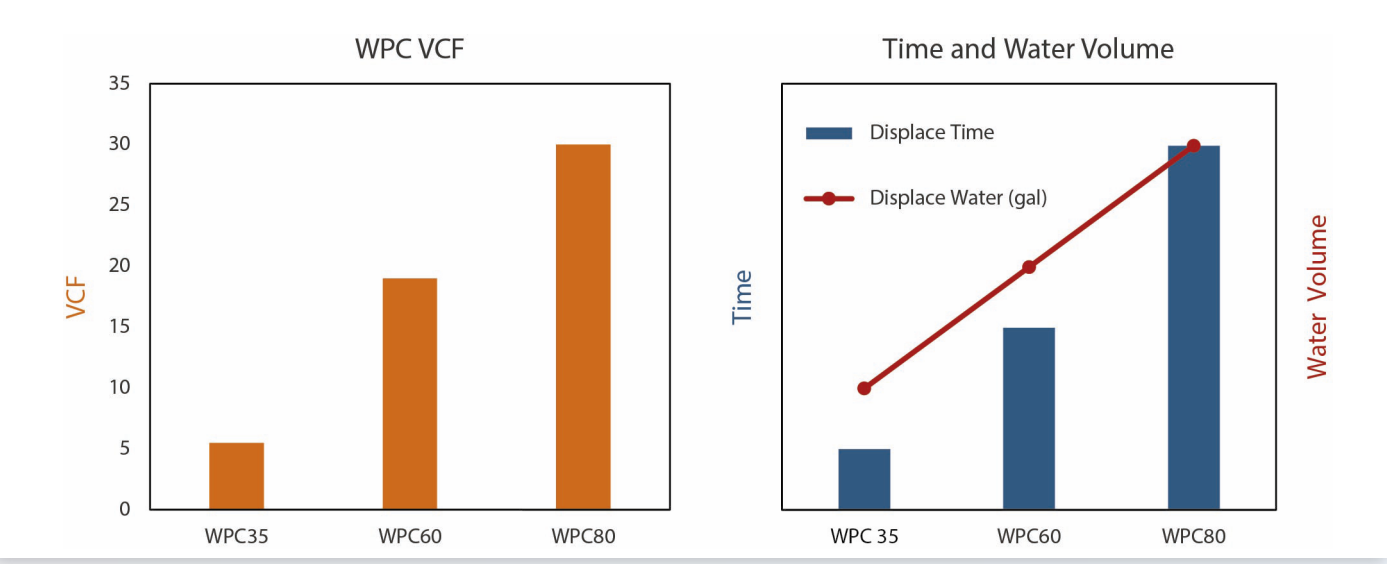


***Figure 3a & 3b:** Water volume and time during product displacement for WPC grades*

GNT expands Middle East operations
New application labaratory in Dubai

GNT has opened an application laboratory in Dubai to provide hands-on support for manufacturers using its plant-based EXBERRY® colors in the Middle East, North Africa, and Indian subcontinent.

Located alongside GNT's commercial and marketing teams in the UAE, it marks a significant milestone in the company's commitment to delivering localized technical assistance and faster turnaround.

The facility features state-of-the-art instrumentation and local formulation expertise, with services including color matching and stability testing. The laboratory also serves as a hub for product demonstrations, training programs, and technical consultations.

GNT's application laboratory in Dubai (photo: GNT Group)

interpack 2026

7 – 13 May 2026, Düsseldorf

interpack
PROCESSING & PACKAGING

A comprehensive **TRADE FAIR PREVIEW** will be published in the next issue. Look forward to our April edition, featuring detailed information on exhibitors, exhibits and key facts about the trade fair.

The interpack year has begun, and the processing and packaging industries are looking ahead with anticipation to their global industry gathering in 2026. At a time of fundamental decision-making shaped by regulation, automation and cost pressure, interpack provides a platform for jointly assessing trends, technologies and solutions.

What is driving the industry in the interpack year 2026? The packaging industry continues to undergo significant transformation. Artificial intelligence, automation and data-driven production models are rapidly gaining importance, while stricter regulations, rising costs, skilled labour shortages and geopolitical uncertainties are reshaping the framework conditions. At the same time, technological progress and growing demand, particularly for packaged food and pharmaceutical products, are creating new opportunities for companies that invest strategically in future-ready solutions.

At interpack, visitors can expect a broad range of exhibitors from all segments of the packaging industry. The exhibition spectrum covers packaging machinery and equipment, packaging materials, packaging aids and packaging production, as well as machinery and systems for the production of confectionery, baked goods, snacks and cereals, other food products, pharmaceuticals, cosmetics, and services related to the packaging sector. The trade fair thus offers a comprehensive overview of the entire value chain.

Sustainability is a key focus area at interpack. In response to increasing demand for environmentally friendly solutions, exhibitors will present innovative approaches to resource conservation and the circular economy. From sustainable packaging materials to resource-efficient production processes, the trade fair offers numerous ideas and solutions for addressing environmental challenges.

Around 2,800 exhibitors will present technologies and concepts for processing and packaging in Düsseldorf. Three hot topics will shape the exhibition content: Smart Manufacturing, Innovative Materials and Future Skills.

photo: Constanze Tillmann

Master mozzarella making

With optimized culture-coagulant pairings

Author: Pim Van Hee, Global Business Director Cheese Cultures and Surface Protection, dsm-firmenich

With milk costs remaining stubbornly high and margins tightening, mozzarella producers are under intense pressure to do more with less. In this environment, every liter of milk needs to work harder. Yet a familiar frustration persists on the production floor. Two mozzarella products, made from the same milk and run through an identical high-level process, can behave very differently – one delivering strong yield and clean slicing, the other losing moisture, meltability, or shelf-life stability.

That variability points to a deeper issue. While processes may be tightly controlled, ingredient interactions can be more difficult to predict. For example, cultures and coagulants are still frequently selected and optimized in isolation, despite operating as a closely-linked system. When interactions between the two aren't aligned, variability creeps in – turning yield, quality, and shelf-life into moving targets rather than dependable outcomes.

That's why dsm-firmenich is exploring how culture-coagulant pairings can become a powerful lever for reducing variability, helping cheese producers extract more consistent value from the same raw materials.

Where scale creates opportunity – and exposes loss

As one of the world's most widely produced cheeses, mozzarella is manufactured at enormous scale. That scale creates clear commercial upside: when volumes are high, even marginal efficiency gains can translate into significant value over time. But it also raises the stakes. At this level, there is little tolerance for variability.

Small fluctuations in milk quality or process control can quickly ripple through production. Variations in acidification rates between culture rotations affect fermentation speed and throughput. Inconsistent curd formation compromises internal structure, leading to uneven moisture distribution. The result is less predictable handling, slower processing, and higher losses during downstream steps such as slicing and shredding.

On their own, these deviations are often written off as routine variation. In reality, they accumulate. Over weeks and months of continuous production, minor inefficiencies compound – reducing yield from the same milk input, increasing cost per kilo, and steadily eroding margins.

Why optimizing ingredients in isolation falls short

For many years, mozzarella innovation has focused on improving individual ingredients. Starter cultures have become faster and more robust. Coagulants have become increasingly precise and efficient. These advances have undoubtedly moved mozzarella production forward. Yet for many producers, processing challenges remain.

Cultures and coagulants do not operate independently in mozzarella production. From the moment milk is set, they influence one another – shaping curd structure, acidification consistency, and moisture retention. When each is optimized separately, their combined performance becomes harder to predict, especially as production conditions shift.

Thinking about these ingredients as a single system is where a meaningful shift occurs. Culture-coagulant systems that are deliberately engineered for maximum performance can bring greater precision and control to mozzarella production. They help limit variability, extend the processing window, and support more predictable outcomes from make through melt. The result is mozzarella that performs reliably throughout its lifecycle – during processing, across shelf life, and at the point of use.

photo: shutterstock

photo: iStock

A winning combination

The potential of optimized culture–coagulant combinations is not theoretical, but proven. dsm-firmenich is setting a new benchmark in mozzarella performance with its uniquely designed culture–coagulant pairing – Delvo®Cheese CP-500 + Maxiren®EVO – which works in synergy to deliver the highest proven yield and texture stability in mozzarella production.

The strength of the system lies in how each component reinforces the other. Delvo®Cheese CP-500 provides fast, reliable acidification across rotations, helping producers maintain consistent process speed while supporting higher moisture retention in the curd. Its phage-robust nature protects performance under demanding production conditions, reducing the risk of slowdowns and keeping throughput predictable – an essential advantage in high-volume mozzarella operations.

Maxiren®EVO complements this with highly targeted protein action. As a 100% chymosin coagulant, it precisely converts αS1-casein into αS1-i-casein, promoting faster and more uniform curd knitting. This controlled structure improves water binding and emulsification, resulting in better moisture distribution and a more stable cheese matrix from early processing through an extended shelf-life.

Together, this purposeful synergy delivers mozzarella that is easier to handle and more consistent to process. More even moisture distribution and controlled protein breakdown reduce stickiness during slicing and minimize lump formation during shredding, giving producers greater flexibility to slice, shred, and sell when it best fits their operation.

The commercial impact is measurable. This integrated culture-coagulant system unlocks up to 1.7% more cheese from the same volume of milk and reduces cutting losses by up to 16%. For producers, that means higher yield, smoother operations, and more reliable output. For customers and consumers, it delivers mozzarella that performs consistently – on the line, in the oven, and on the plate.

The pizza payoff

For most consumers, mozzarella's success is ultimately judged on pizza – where functional performance becomes immediately visible, and small improvements make a meaningful difference at bake.

Mozzarella made with Delvo®Cheese CP-500 and Maxiren®EVO delivers consistent end-use performance where it matters most. It melts evenly with fewer hot spots and reduced oiling-off, stretches smoothly, and maintains a supple, creamy texture. Flavor develops cleanly, without bitterness, while controlled browning supports a uniform, golden appearance after baking.

For producers, these attributes go beyond appearance. Balanced melt and stretch translate into reliable performance across batches and baking conditions, reducing variability and increasing confidence that each product meets its target specification. For foodservice partners, it means mozzarella that behaves the same way in every kitchen – delivering a consistent pizza experience, wherever it's prepared.

Sustainability in every slice

Better control doesn't just mean better cheese – it means better resource use too. In a market shaped by rising milk costs, tighter margins, and growing scrutiny of environmental impact, efficiency has become a sustainability imperative. By increasing yield and reducing waste, producers can make more mozzarella from the same volume of milk, lowering the resource intensity per kilo produced.

Culture-coagulant systems offer a practical, scalable way to do more with less. By improving process stability and reducing losses from production through to slicing, shredding, and consumption, these systems help cheese makers cut waste, protect margins, and deliver consistent quality. The result is a more resilient operation – one that meets both the economic realities of today's dairy industry and the environmental expectations shaping its future.

Make mozzarella stretch further

Sometimes, the biggest gains don't come from changing what you use but from changing how it works together. Cheese makers who leverage science-backed culture-coagulant solutions that are already engineered for performance will be better positioned to boost yield, improve predictability, and future-proof mozzarella production; achieving stronger margins from every drop of milk. That's where dsm-firmenich's technical cheese experts come in: they work side by side with producers on the line to tailor support to each process, ensuring improvements translate into consistent, measurable gains.

photo: AdobeStock

GEA NIRO MSD spray dryer at Arla's milk powder factory Svenstrup (photo: Arla/GEA)

Reduction of CO_2 emissions

Arla Foods cuts spray dryer CO_2 with GEA AddCool system

The AddCool® heat pump solution from GEA significantly reduces CO_2 emissions associated with operating a spray dryer plant at Arla's milk powder factory in Svenstrup, Denmark, by 1,500 tons per year.

Spray drying is one of the most energy-intensive processes in dairy production – and a big contributor to CO_2 emissions. At Arla's milk powder factory AKAFA in Svenstrup, Denmark, the challenge was clear: reduce CO_2 emissions without disrupting production or profits. To solve the challenge, a collaborative partnership between Arla and GEA was formed. Together, the partners have achieved a world first: the integration of GEA's AddCool high-temperature heat pump system into an operational spray dryer. The result is a 59% reduction in natural gas use for heating of primary air, cutting 1,500 tons of CO_2 emissions in the first year of operations.

The challenge: significantly and profitably reduce CO_2 emissions in spray drying

As a longstanding GEA customer, it was straightforward to organize a joint investigation into possible options for decarbonizing the plant with the Arla team. This was carried out by means of a holistic energy audit, which was conducted in 2018. The challenge of reducing CO_2 emissions by means of profitable investment was evident from the subsequent analysis, however the findings also presented less obvious opportunities to the partnership that would prove to be impactful. "Arla has committed to reduce scope 1 and 2 by 63% by 2030 and the high temperature heat pump project at AKAFA is a key step in that journey," says Line Brandt Pedersen, Director, Supply Chain Sustainability, Arla Foods.

"Arla has committed to reduce scope 1 and 2 by 63 % by 2030 and the high temperature heat pump project at AKAFA is a key step in that journey"

Line Brandt Pedersen
Director, Supply Chain Sustainability, Arla Foods

The solution: integration of a tailor-made high-temperature heat pump system

Having identified energy consumption as an area of significant importance, a highly focused team of GEA and Arla experts worked closely to design a tailor-made solution which could achieve outstanding reductions of natural gas consumption and therefore CO_2 emissions. Through a combined heating and cooling process delivered by a high-temperature heat pump system, the GEA AddCool solution at Arla's Svenstrup site became the first installation of its kind in a dairy production plant globally.

As GEA designed both the heat pump and the integrated heating and cooling concept, Arla received stringent performance guarantees over six years. An independent energy advisor, selected by Arla, validated the design and guarantees ahead of installation and after commissioning the system passed its site performance test on the first attempt. Its performance is being continuously monitored through the GEA InsightPartner® and is on track to deliver the promised savings within the forecasted payback time.

"The collaboration with GEA has been very positive because we have developed as a team together. We have met a lot of obstacles and some complex situations, but together we have developed creative solutions to overcome them. That's only possible when you work very closely together and understand each other. The spray drying process is highly complex, and GEA's expertise within this field has shown us that they were the right partner," remarks Jens Løkke Ganderup, Project Manager, Arla Foods.

At Arla's milk powder factory in Svenstrup, Denmark, GEA's AddCool heat pump solution reduces spray dryer–related CO_2 emissions significantly (photo: Arla/GEA)

The results: outstanding decrease of CO_2 emissions and operating costs in spray drying

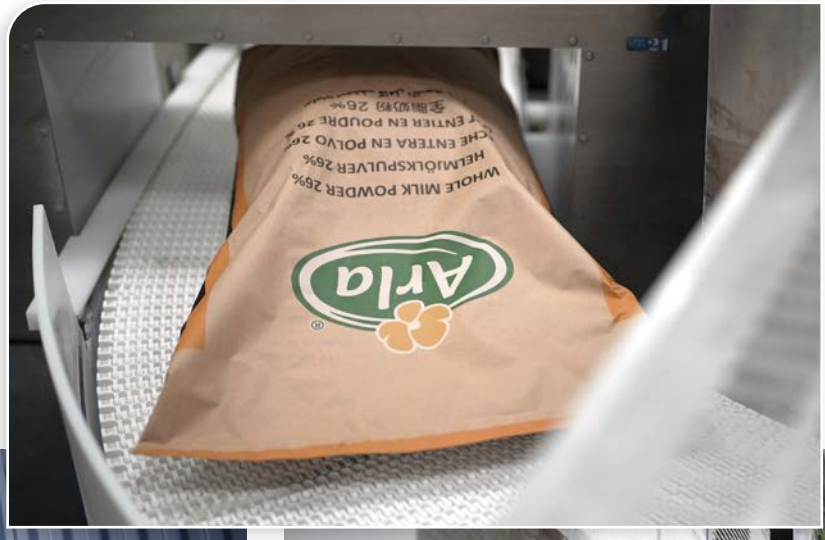
The GEA AddCool system provides several benefits to Arla:

- Reduced demand for natural gas for heating of primary air of 670,000 Nm3 per year, equal to a 59% reduction compared to the previous operation. This results in the abatement of 1,500 tons per year of CO_2 emissions while operating with electricity from renewable energy sources.
- Electricity savings on the existing chiller installation, achieved by providing 430 kW of useful cooling while delivering high-temperature heat to the dryer.
- Reduced load and noise from the existing cooling tower, achieved by precooling the wastewater from the system.
- Clear overview of the current and historical performance of the system by means of GEA InsightPartner monitoring solution.

"A key learning from the AKAFA project is that sustainability and performance, including financials, can go hand in hand," adds Line Brandt Pedersen.

The future: Resource efficient spray-drying for lower carbon footprint

At Arla's Svenstrup site, the AddCool integration shows that meaningful reduction of CO_2 and dependable operations can advance together when expertise and partnership align. Building on this result, both Arla and GEA are exploring a phased rollout of additional spray-drying plants at the AKAFA site, where the business case and emissions impact are strongest.



Spray dried milk powder by GEA NIRO MSD spray dryer ready for shipping. (photo: Arla)

GEA's AddCool heat pump solution in action (photo: Arla/GEA)

Insect Larvae as Industrial Associates:

How REPLOID Turns Residual Side Streams into Regional Valuable

Rising raw material prices, increasing regulatory pressure, and the growing expectation to use resources more sustainably are fundamentally changing the operating environment for manufacturing companies.

Anyone generating organic residual side streams today faces the same challenge: how can an unavoidable by-product be utilized efficiently and economically?

REPLOID Group AG provides a new, industrially scalable response to this question.

The company with origins in Wels, Austria, has developed a system that converts organic residual side streams, including by-products from dairy processing, into high-value proteins, fats, and organic fertilizers by the help of Black Soldier Fly Larvae (BSFL).

A solution that delivers both ecological and economic value.

The ReFarmUnit: Decentralized Circular Economy

With the ReFarmUnit (RFU), REPLOID operates a modular system that processes approximately 9,500 tons of organic residual material per year into valuable products while operating with exceptional resource efficiency.

Each RFU produces annually:

- up to 2,000 tons of fresh larvae
- approx. 2,300 tons of organic fertilizer

All based on natural, regionally available by-products.

Therefore, the industrial RFU system is particularly attractive for companies that generate continuous residual side streams, such as food producers, beverage manufacturers, and dairy processors.

What Makes Dairy Processing a Perfect Fit

Dairy processors typically generate homogeneous and foreseeable residual streams such as whey, plant-based residues, off-spec products, or plant-based alternatives.

These materials are ideal feed substrates for larval rearing: rich in valuable nutrients, reliable, and consistently available. REPLOID explicitly lists whey and related materials as typical feed components for larval production in RFUs.

As a result, what was previously a cost factor becomes a strategic advantage: residual side streams are transformed into high quality raw materials.

Triple Value Creation from One Integrated System

1. Proteins for Feed and Industrial Applications
Fresh larvae and processed larval products (protein meal, fats, whole dried larvae) are supplied to the pet food, poultry, pig, and aquaculture industries.

Demand is growing steadily. The pet food sector alone is one of Europe's strongest protein consuming markets.

2. Organic Fertilizer for Agriculture
The insect frass generated in the process is used as a high-quality biostimulant.

Driven by CBAM and rising prices for imported fertilizers, demand for regional alternatives is increasing significantly.

3. Oil and Fat Fractions for the Chemical Industry
REPLOID is developing new applications together with industrial partners, for example in biodegradable polymers.

"A disposal issue becomes a sustainable, value-creating resource solution."

Philip Pauer, CEO, REPLOID Group AG

A System That Scales Economically and Sustainably

The ReFarmUnit is designed for minimal operating costs. It operates:

- with only one person in single-shift operation
- with a high degree of automation
- using robust, patented components
- with commissioning times of just a few months

REPLOID does not merely deliver the plant system but supports the entire process: supply of young larvae, substrate optimization, input sourcing, offtake of produced goods, and market access. For operators, this means: predictable revenues, secured offtake, and a genuine circular approach.

Relevance for the Dairy Industry and Beyond

Many RFUs currently under development are strategically located in food producing regions.

Dairy processing is among the most attractive partner industries. However, RFUs also provide a clear solution for bakeries, vegetable processors, beverage producers, and animal feed manufacturers:

Organic residual side streams are no longer disposed of, they are upgraded into high-value raw materials.

This creates a new form of regional, industrial circular economy: economically viable and environmentally measurable.

Interested in how a ReFarmUnit could fit with your operations?

Your contact:
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Fi Europe 2025

Review of the 30th edition

The 30th edition of Fi Europe in Paris attracted 24,351 trade visitors from 134 countries. With 1,470 exhibitors from the food, beverage, nutrition, food technology, and pet food sectors, the event continues to rank among the leading international industry gatherings. In addition to technical presentations and networking opportunities, the exhibition provided an overview of key trends expected to shape the industry in the coming year.

A central focus of the anniversary edition was exchange within the industry. Formats such as the Community Hub, expert presentations, and networking events facilitated dialogue between companies, research institutions, and other stakeholders. These activities were complemented by sensory product showcases and the presentation of the Innovation Awards.

Key topics included functional foods and beverages, health and wellness concepts, and food upcycling. Panel discussions and guided tours addressed developments such as personalised nutrition, the relationship between diet and health, and more sustainable use of raw materials.

The next Fi Europe will take place from 17 to 19 November 2026 in Frankfurt, before returning to Paris in 2027.

photo: Innova Markets

WINNERS of the 2025 Innovation Awards

As part of a celebration marking the 30th edition of Fi Europe, the winners of the exhibition's Innovation Awards were honoured. From dairy alternatives and plant-based breakthroughs to innovations in food technology, the awards and their recipients reflect the diversity and depth of innovation shaping today's food and beverage industry.

photo: Informa Markets

The winners selected by the jury are:

- Dairy Alternative Innovation Award: Time Travelling Milkman (Oleocream)
- Food Manufacturing Innovation Award: Tetra Pak (Air Jet Cleaning System for powder handling equipment)
- Future Foodtech Innovation Award: AKA Food (Intelligence platform for application development)
- Health Innovation Award: ADM (Lactobacillus Gasseri CP2305 for mental health)
- Plant-based Innovation Award: ICL Food Specialties (ROVITARIS SprouTx: a revolutionary textured soy protein)
- Sustainability Innovation Award: ofi (Driving industry impact through Cocoa Compass)

The competition recorded a record number of entries, supported by Fi Europe's new simplified "easy entry" submission forms. With six categories strategically aligned with key themes in the food and beverage industry, the Innovation Awards recognise outstanding ingredients and achievements from the past two years.

The 2025 judging panel consisted of eleven renowned industry experts from around the world who, under the leadership of Prof. Dennis, evaluated a total of 177 submissions. They represented leading organisations such as Campden BRI, EAS Strategies, and Giract.

Arla Foods Ingredients: Milk and whey protein solutions

AResearch shows that more than 40% of health-conscious consumers choose dairy products to increase their protein intake, while over 30% opt for them for guilt-free snacking. At the same time, there is growing interest in innovative dairy formats that target specific nutritional needs. At the fair, Arla Foods Ingredients demonstrated how its portfolio of milk and whey proteins can meet these needs. In the Innovation Spotlight area, five new application concepts were presented, including a high-protein, transparent yogurt, a drinking yogurt with hydrolyzed whey protein offering 25g of protein per serving, as well as Milky Spark, a carbonated, flavored milk drink made with pure whey protein.

In the Innovation Spotlight area, five new application concepts were presented (photo: Arla Foods Ingredients)

Visitors to Fi Europe had the opportunity to try a variety of additional concepts from the company for functional, nutritious foods and beverages. These included squeezable cheese, drinking yogurt, and a UHT drink for children containing Nutrilac Milk Fat Globule Membrane (MFGM). MFGM, rich in complete whey protein, also provides healthy lipids, including omega-3 fatty acids, vitamin B12, and choline.

BRENNTAG: Ingredient solutions

Brenntag presented innovative solutions in Paris to meet the growing demand for healthier and more sustainable products. Visitors to the booth could discover ingredient solutions that help manufacturers improve nutritional profiles and address key consumer trends such as protein enrichment and sugar reduction. Among the products showcased was a high-protein sandwich made with faba bean and rice protein, enriched with Orafti Inulin for added fiber content. Another highlight was the sugar-reduced vanilla pudding, which contains 30% less sugar while increasing the fiber content, thus improving the nutritional profile. Additionally, a ready-to-drink meal replacement with a chocolate flavor was presented, combining protein and fiber and supporting a reduced blood sugar response through Palatinose.

LALLEMAND SPECIALTY CULTURES: New cultures for cheese

Lallemand Specialty Cultures (LSC) presented new solutions at Fi Europe 2025 that address the challenges faced by the food industry. The company focuses on innovations in food safety, sensory quality, and adaptation to new trends, particularly in bioprotection and specialty cultures for meat and dairy products. For the latter area, LSC introduced new cultures for hard cheeses, such as FLAV-ANTAGE PF06, which ensures controlled hole formation and provides a balanced flavor without compromising texture. This culture is also stable at the high temperatures typical of Swiss-type cheeses. The culture VELV-TOP PC PR2 produces an even, white rind on cheese and shows particularly good results on goat cheese. Packaging can take place after just 7 days, and shelf life is extended to over 80 days.

BENEO: Solutions for weight management and sustainability

BENEO showcased various products designed to help manufacturers improve nutritional profiles and meet the growing demands in the area of weight management. The booth featured product samples demonstrating the use of functional ingredients like plant-based proteins and prebiotic fibers. The products address current consumer trends such as the increased demand for protein and reduced sugar content.

One example was a high-protein sandwich containing faba bean and rice protein, enriched with Orafti Inulin as a fiber-rich ingredient. Another highlight was the sugar-reduced vanilla pudding, which contains 30% less sugar while also increasing the fiber content. Finally, a ready-to-drink meal replacement with a chocolate flavor was presented, offering protein and fiber, and supporting reduced blood sugar response through the use of Palatinose.

One example was the sugar-reduced vanilla pudding (photo: New Africa_shutterstock)

A synergistic shield that blocks phage attacks

IFF Food Biosciences has mapped the immune system of Streptococcus thermophilus

IFF Food Biosciences has managed to map the immune system of *Streptococcus thermophilus* – one of the most widely used bacteria in dairy fermentation – to better understand its 28 defense systems, including three unique CRISPR systems. By integrating many of these defenses into the bacteria's native genome, they created a synergistic shield that blocks phage attacks without compromising milk acidification or bacterial growth – essentially hacking evolution to protect these microbial heroes that do so much for our cheese and yogurt. IDM spoke with Dennis Romero and Damian Magill from IFF Food Biosciences about their findings.

IDM: Dairy cultures are sensitive to bacteriophages, till now the industry uses culture rotation at a quite high expense. Do you think that dairy cultures can be made immune to phages one day?

Romero: If I may clarify the first statement, "culture rotation" is indeed a key strategy the industry employs to address bacteriophages; something that has been practiced for decades, as elaborated below. This practice will likely continue being used in the foreseeable future, despite new recently discovered technologies. The "high expense" should be put into context as the dairy processor does not necessarily realize this cost.

Regarding the question, consider human vaccinations as an example. As with influenza and now Covid, a person can be vaccinated against the current virus that's prevalent at a given time. It's the same with dairy cultures in that we can introduce a specific phage defense system (vaccination) against the current phages in the industrial dairy environment. However, given the opportunity (a susceptible host) and time, the phage will adapt and mutate to overcome the defensive system. This is what's happening with influenza and Covid; the virus mutates and people need to be vaccinated against the new viral variants.

The rotation scheme employed by the dairy industry effectively reduces the opportunity for phages to mutate by reducing the time a susceptible host is exposed to a given phage.

Magill: I am going to answer the question in regards purely to eliminating the phage problem, factoring in more than just rotation in this strategy. I believe that as long as we rely on life in its natural form to drive our industrial processes, we will continue to face the various challenges that come with it. Perhaps one day the use of purely synthetic organisms will remove all disadvantages and allow for precision fermentation, but the surprises that come with using natural organisms have allowed us to discover new functionalities, bringing unique products to our customers. It would be bold to assume that in a matter of 100 years we can completely eliminate what has arisen over the course of billions of years of evolution, but the application of multilayered strategy including rotation and use of bacteriophage insensitive mutants allows us to effectively manage the phage problem.

IDM: What is your concept for making *S. thermophilus* more stable against bacteriophages?

Romero: Interaction between host (S. thermophilius) and bacteriophages has been ongoing since the beginning of time. To survive a phage infection, *S. thermophilus* had to develop a resistance (defense system) to that phage. Our work has shown the diversity of defensive systems that have naturally arisen. Conversely, for the phage to survive, it must find a way to overcome those host defenses. The pressure is quite strong – adapt or cease to exist. This interplay between host and phage will continue as long as both exist in the same environment.

Our research has been directed towards discovering the myriad ways S. thermophiluis has evolved to protect itself against phage infection; the presence of these

systems varying between starter culture strains – hence one potential reason for their phage sensitivity. By identifying and characterizing these defensive systems, they can be introduced into the phage sensitive strains – similar to a vaccination – thereby protecting them against phage attack.

Magill: I agree with Dennis on the core principle of understanding the phage host relationship and steering it in our favour. This is exemplified by the use of naturally occurring defense mechanisms as a means of vaccination. Referring back to the concept of rotation and construction of multi strain starter cultures, these are built so no phage overlaps exist between components; something determined by lysotyping strains. A strain's lysotype is the permissibility of that strain to be infected by certain phages and is a complex product of recognition factors and defense mechanisms. This falls under the spectrum of the phage-host relationship and is ingrained in everything that we do. Understanding this relationship gives us multiple tools towards managing the phage problem.

IDM: Is it some kind of genetic modification?

Romero: Strictly speaking, genetic modification is defined as any change in the genome of a living organism. Even a single change in the roughly 2,000,000 nucleotides in a typical *S. thermophilus* genome would be a genetic modification.

Hence, introducing a natural phage defensive system from one strain into a strain that was lacking that system would be a genetic modification by the strict definition. It should be noted that the presence or absence of any of the phage defensive systems naturally occurring in *S. thermophilus* varies between strains and is a consequence of a particular strain encountering a particular phage and surviving.

Magill: I presume the question refers to the development of GM constructs, to which the answer is no. As Dennis states, these are naturally occurring defense systems that are distributed in various manners

"We work with many culture organisms"

Dennis Romero

"Nature provides variability, and we steer it in the desired direction"

Damian Magill

across strains. The presence, absence, and abundance of these reflect the local phage landscape of a given strain and, indeed, diversity amongst a population of different strains, which allows for a certain plasticity in the immune profiles present. Characterising these systems and transferring them via natural non-GMO approaches allows for a targeted approach towards immunizing our strains in response to a dynamic phage landscape.

IDM: If so, how do you think consumer acceptance can be assured?

Romero: I think that once properly explained, the consumer will be accepting starter strains made immune to phages. As mentioned, the defensive systems occur naturally in *S. thermophilus* strains that have survived phage infections; our work is transferring those systems between strains. In nature, such an exchange could happen under normal conditions, such as from exposure to a bacteriophage attack.

Magill: We speak not of GMO organisms but of naturally occurring systems. Even customers using artisanal undefined starter cultures are using strains containing defense mechanisms such as these against phages. Our research is focused on the discovery and understanding of these mechanisms so that we can best apply them (but in a sense, as alluded to by Dennis, this is already occuring). A natural parallel can be made between the processes of natural selection and selection by humans. Nature provides variability, and we steer it in the desired direction. This could be considered an extension of that and, as such, should be readily acceptable.

IDM: Do you work with more culture organisms or do you target only yogurt bacteria?

Romero: We work with many culture organisms. For fermented foods (such as yogurt, cheese, kefir, sour dough, pickles, salami, etc.), the majority of these organisms fall into a class of microbes called Lactic Acid Bacteria (LAB). As their name implies, LABs ferment sugar into lactic acid, which acts as a preservative, inhibiting spoilage and pathogenic bacteria, while also imparting texture and flavor to the fermented food. *S. thermophilus*, along with the closely related Lactococcus species, are amongst the most commonly used LABs for food fermentations.

photos: IFF Food Biosciences

APV LAUNCHES COMBI MP PILOT LINE
Integrated microparticulation platform

NEWS

APV has commissioned a Microparticulation (MP) pilot line at its Innovation Center in Silkeborg, Denmark, to support the development of functional whey protein ingredients. Once considered a by-product of cheesemaking, whey is now widely recognized as a valuable source of nutritional compounds. The new system enables producers to test and optimize formulations either on-site or through short-term rental for use within their own production facilities.

The "Combi" setup integrates two APV microparticulation technologies — LeanCreme and Cavimaster — within one platform, allowing flexibility in testing and comparison. This dual design provides a practical framework for evaluating process efficiency and product characteristics under different conditions.

"Our aim is to give customers more options for controlled, small-scale testing," said Thomas Leroy, Global Head of Innovation Centers at SPX FLOW. "By combining two microparticulation methods in one pilot line, producers can refine their formulations, reduce product loss during trials, and adjust whey protein properties for specific end uses."

Whey protein continues to be one of the most in-demand ingredients in the food and nutrition sectors, valued for its functional and nutritional properties in products such as ready-to-drink beverages, desserts, and fermented dairy. With a flow rate of approximately 150 liters per hour, the Combi MP line allows for efficient pilot-scale experimentation using limited material quantities while collecting process data relevant to full-scale production.

GEA
Acquisition of Hydract

NEWS

GEA has signed an agreement to acquire the business of Hydract A/S, a Danish specialist in water-hydraulic process valves. With this transaction, GEA is expanding its valve portfolio for the beverage, dairy and pharmaceutical industries with a technology that can significantly reduce the energy demand required for operating process valves, thereby enabling more efficient, resource-saving process plant concepts.

GEA has signed an agreement to acquire the business of Hydract A/S, a Danish specialist in water-hydraulic process valves (photo: Hydract)

Hydract valve actuators use water as the actuation medium, eliminating the need for compressed air which is typically provided by energy-intensive compressors for pneumatic valve operations. Water-hydraulic actuators can be regulated at any intermediate position, providing precise, stable flow regulation across the valve.

In reference plants – such as the Carlsberg Brewery in Fredericia, Denmark – hydraulic valves enable continuous inline blending. They accelerate switchovers in batch production, accommodate late product differentiation and optimize resource usage. In this way, they are an important contributor to achieving efficiency and sustainability targets in brewing, dairy and pharmaceutical processes – especially in cases where various products are processed by the same process plant.

GEA intends to integrate Hydract's technology into its Valves & Pumps Business Unit within the new Division Pure Flow Processing.

Scale, capital and survival: Eastern Europe's dairy shakeout

From fragmentation to scale

For decades, backyard and small private farms were the backbone of the dairy industry across Eastern Europe. A rapid industry transformation makes countries like Poland and Estonia more competitive in the EU and global markets, but it consistently narrows the playing field for smaller players. Backyard farming is on the path towards extinction across many Eastern European countries.

Poland, Europe's third-largest dairy manufacturer, has been witnessing a mass closure of dairy farms for more than two decades. An average farm, employing two people, needs to sell around 360,000 liters of milk per year to earn the national minimum wage per month, estimated Martin Ziaja, Chairman of the Economic Council of the Polish Farmers' Association. Given the average yield in Poland of 9,000 liters per year, this means the farm

Dairy industry in the Baltics navigates turbulent waters (photo: Munters)

needs at least 40 cows. In fact, this means that small backyard farms breeding only a few cows can no longer maintain sufficient business profitability. "If someone assumes we need solutions to encourage young people to engage in dairy farming, I disagree with that. Of course, everyone has the right to do what they want; they can raise two or five cows, but it's their choice to do something they don't earn money from," Ziaja stated.

Since Poland's EU accession in 2004, the number of dairy farms has dropped by nearly 80%, primarily due to the mass closure of backyard farms over recent years. The trend has been similar across the region, though the transition is not smooth everywhere. For example, in Moldova, the number of cows dropped by 95% to only 70,000 heads over the last year alone, as reported by the local press. In Moldova, which is not part of the single EU market, backyard farms have long provided a means of livelihood for thousands of families in rural regions.

However, this changed in 2025, when extreme drought burnt pastures, with the impact primarily felt in the southern regions. Farms quickly discovered that getting rid of their livestock was a more economically justified option than buying expensive feed on the open market.

Small players are also being pushed out of business across the Baltic region. In 2024, Pajumäe talu, a high-profile dairy farm focused on organic product manufacturing, permanently shut down, unable to cope with heavy financial strain. According to Viljar Weidenberg, the farm owner, the math didn't add up, even for a firm with significant popularity whose operations were widely covered by local media. "Looking at the numbers, it seems reasonable to end it now so that we don't have to give away all the land and forests to the banks," Weidenberg admitted.

Across the EU, milk output was broadly stable, and yield per cow continued to rise, commented Nandini Roy Choudhury, client partner at Future Market Insights, a market research firm. "Eastern Europe fits the same template: fewer cows in several countries, higher yield per cow, and a gradual shift toward fewer but more productive animals. In the Baltics, this dynamic is especially visible

Larger farms have better chances to withstand the storm (photo: AgroStar Trade)

Dairy industry in Baltic industry tends to consolidation (photo: AgroStar Trade)

as the sector is now consolidating through mega-mergers and exits. "Smaller units leave, newer units expand, and mid-sized farms either professionalise quickly or get squeezed," Choudhury stated.

Clearing the way

The dairy industry in Eastern Europe is going through a transition that Western EU members completed decades ago. For example, in Lithuania, the average dairy herd size was only 12 cows in 2020, compared to the European average of 58, Edmundas Pesarskas, partner of Economic Consulting and Research, a Vilnius-based think tank, indicated. "We see that the structural changes in Lithuania [dairy industry] are taking place more slowly than in the EU on average," Weidenberg stated. Under current forecasts, industry consolidation could allow Lithuania to boost milk production by 58% to 800,000 tonnes by the end of the decade.

Dairy farms Eastern Europe (photo: Przerzeczyn)

In general, several countries in Eastern and Central Europe can unlock the dairy industry's potential in the coming years. "Despite a decline in milk production across the EU, milk volumes from Poland, the Baltic states, Hungary, the Czech Republic, Romania, and other countries where cow productivity potential has not yet been exhausted should increase," Weidenberg forecasted. "When farms are fragmented, and processors and retail are concentrated, the farm gate becomes a price taker by default. In volatile periods, that worsens. Farms built or rebuilt in the last decade tend to have better labour productivity, tighter quality control, and a clearer pathway to automation. They are more likely to survive the downcycle and buy growth when peers exit," Choudhury said. Consolidation is also gaining steam among Poland's dairy cooperatives.

In 2024, Mlekovita Group, a prominent player in the Polish dairy industry, finalised the acquisition of KaMos Dairy Cooperative. As a result, Mlekovita, already the largest dairy company in Central and Eastern Europe, significantly expanded its operations, managing a total of 26 dairy plants.

Dairy cooperatives are the backbone of Poland's milk processing sector, with major players like Mlekovita, Polmlek, and Mlekpol dominating the market, collecting high-quality milk from thousands of farmers, processing it in modern facilities, and exporting a significant portion of their diverse product range.

Weathering the storm

Consolidation looks inevitable for the dairy industry across Eastern Europe, which is facing new challenges on the export and domestic fronts. Ukraine's conflict has become a stress test for dairy businesses in neighboring EU countries. "The war hit dairy mainly through input economics and risk, more than through end-demand. Ukraine is deeply linked to European feed and grain flows. Disruption raised price volatility and tightened supply assumptions. Farms with high purchased feed dependence faced the sharpest margin compression," Choudhury said.

More importantly, the proximity to the Ukrainian battlefields has affected investment flows into the industry. "Proximity to the conflict increased perceived risk. That shows up as tighter credit, delayed capex, and a faster shakeout among marginal operators. This matters because dairy competitiveness is capex-heavy. When investment pauses, performance gaps widen," Choudhury indicated.In general, Choudhury continued, energy is now a competitive variable. On-farm energy strategy, efficiency upgrades, and manure-to-energy economics are becoming structural differentiators. "Western Europe had earlier adoption in many regions and deeper project finance ecosystems. Parts of Eastern Europe still have runway, but the pace will be determined by capital access and execution capability," Choudhury said.

At the same time, more challenges are on the horizon. The consequences of the Chinese decision to impose anti-dumping duties on EU dairy exports can have a severe consequence on Poland's dairy exports, Marcin Hydzik, President of the Polish Dairy Processors Association, said. Poland, Eastern Europe's largest dairy exporter, produces on average 24% more milk than it consumes. The problem is not limited only to the loss of the Chinese market, Hydzik said, explaining that the consequences will be broad. "Products that don't reach China will have to find alternative markets. In practice, this means oversupply, particularly in the cheese segment," Hydzik said.

EU exporters may be forced to drastically lower their prices. For consumers, this will mean lower prices on grocery shelves. However, for dairy processors, this will result in lower margins, inevitably pushing small players out of business and fueling further industry consolidation, Hydzik warned. In fact, intra-EU competition will intensify significantly, with products from Eastern Europe increasingly competing with imports from Germany, France, and the Netherlands, Hydzik stated. The looming oversupply crisis can push even more small dairy farmers out of business. "The only question is how deep this potential crisis situation, which we are most likely already at the beginning of today, is going to be," said Yanis Sholks, director of the Central Union of Latvian Dairy Producers. In fact, the leading European exporters, namely Poland, Germany, and France, will likely flood their products into markets in other EU countries, where industry is less consolidated, and farms are more vulnerable to market fluctuations, according to Sholks.

Despite the challenges, the base-case scenario for the dairy industry in Eastern Europe is relatively optimistic. According to Choudhury, it involves a continued gradual herd decline in several countries, offset by yield gains and efficiency. "Poland likely remains more resilient than the Baltics on volume, but still trends toward fewer, larger, more professional farms. Cooperative reliance and processor integration increase," Choudhury stated. For rural communities, the decline of backyard farming marks the end of an era. But for the industry as a whole, consolidation may offer a path toward resilience in a market shaped by volatility, geopolitics, and rising costs. Eastern Europe's dairy future is likely to be leaner, more professional – and far less forgiving.

EU-UK SPS Agreement

A unique opportunity to shape a future-proof trade framework

Author: Fanny Courivaud, Policy Officer – Regulatory Affairs

The UK is one of the EU dairy sector's most valuable external markets, serving as a major destination for a wide range of high-quality European products. These include not only well-known staples such as cheeses and butter, but also specialised nutritional, functional, and ingredient-based dairy products that are essential to modern food manufacturing. The depth and breadth of this trade reflect long-standing commercial ties, shared standards of quality, and strong consumer demand for EU dairy across the UK market.

Strengthening this trade relationship delivers clear and tangible benefits for EU farmers, processors, and exporters. By preserving stable market access, supports predictable demand, and sustains rural economies.

UK-based food manufacturers and retailers, in turn, depend on the reliability, consistency, and diversity of EU dairy supplies to meet consumer expectations and remain competitive in both domestic and international markets. Access to a broad portfolio of EU dairy products supports product quality, innovation, and value creation throughout the UK food chain. Altogether, this interdependence is a clear sign of the enduring strength, resilience, and attractiveness of the European dairy sector – on both sides of the Channel.

The European dairy sector welcomed the tariff-free basis of the EU-UK Trade and Cooperation Agreement (TCA) as a strong and necessary starting point in the post-Brexit context. It was a vital achievement, preserving continuity and stability across

Pictured (centre) Lizzie Chaterjee of DEFRA and Reece Connelly of the UK Mission to the EU, meeting EDA and other EU stakeholders , 1 October 2025, Brussels

one of Europe's most important and deeply integrated agri-food trade corridors.

However, for the dairy sector, tariff-free trade alone is not sufficient to ensure genuinely smooth and efficient market access. The reality on the ground continues to be characterised by diverging rules, redundant inspections, and excessive administrative paperwork. These challenges, combined with the risk of potential – but entirely avoidable – border delays, create additional costs and uncertainty for operators and undermine the efficiency of dairy supply chains that depend on speed, predictability, and trust.

On 19 May 2025, Brussels hosted the long-anticipated EU–UK Summit – a pivotal moment to reinforce our future-oriented trade relationship and address persistent non-tariff barriers that still continues to hamper frictionless commerce in agrifood, including dairy.

An ambitious agreement on Sanitary and Phytosanitary (SPS) measures – based on mutual trust and streamlined processes – is within reach. The EU has successfully implemented such models with other close trading partners, demonstrating how high food safety and animal health standards can be maintained without needless bureaucracy. Such an agreement would not only streamline trade processes but also help ease dairy trade flows on the island of Ireland and facilitate smoother east-west and west-east dairy movements that rely on the UK land bridge – a crucial artery for time-sensitive and high-value products.

Such an ambitious project is not without challenges, and its successful implementation will require sustained engagement and commitment from both legislators and stakeholders. It is now essential that all parties support a smooth and well-managed transition, guided by the principle of dynamic alignment, to ensure continued and effective cooperation between the EU and the UK on food safety standards.

Since the EU-UK Summit, EDA has played an active and constructive role in the ongoing dialogue between the EU food industry and the British authorities. Through this engagement, EDA has sought to provide practical support, share sector-specific expertise, and put forward concrete recommendations to inform the development of the forthcoming agreement, with the aim of achieving a balanced, workable, and future-oriented outcome.

NEWS

Natural ingredients and emotional drivers

Key factors reshaping the global nutrition market

The global food supplements and nutrition market, including protein-enriched beverages and fortified drinks, is expected to reach $758.99 billion by 2034, expanding at a CAGR of 7%.

To help food and beverage brands better understand the evolving needs of health-conscious consumers and identify opportunities for innovation and growth, Tetra Pak surveyed consumers across the globe, uncovering the trends and regional preferences shaping the future of the category.

Tetra Pak's latest research reveals that consumers increasingly view food supplement and nutrition (FSN) products as part of a holistic wellbeing approach – valued for both functional benefits and emotional reassurance.

Top motivations include supporting physical health (58%), ensuring daily nutrition (51%), and maintaining energy (47%). Emotional benefits such as peace of mind and feeling balanced are equally important.

Practicality also drives demand: 21% value convenience on the go, while 18% appreciate saving time. Liquid formats are gaining strong traction, with 59% preferring ready-to-drink products that fit active lifestyles.

Anna Larsson, Category Leader at Tetra Pak, says: "Convenience is just the starting point. With 71% of consumers preferring natural, gradual results and willing to pay a premium, we're seeing a shift towards value-driven products that support long-term wellbeing."

photo: Tetra Pak

Cheese Cutting Machines

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NEWS

SPX FLOW
Updated SmartDry System

The SmartDry System, released by SPX FLOW's Anhydro brand, now offers even more benefits for spray dry automation. The latest version integrates smarter optimization algorithms to boost throughput and increase a spray dryer's capacity by up to 8 %, double that of the previous model.

The SmartDry System offers accurate and precise control in productions that can be highly variable and fluctuate due to environmental conditions. For the wide variety of applications that use spray dyers – including the dairy, food, beverageand chemical sectors – this "Plug-and-Produce" system utilizes automation to provide enhanced efficiency, data and ompatibility with reduced costs.

Updated SmartDry system (photo: SPX FLOW)

Benefits of the updated Anhydro SmartDry system include:

» Enhanced efficiency and productivity: Achieves immediate production gains through weather-based capacity adjustments, with up to 8% production improvement. Efficient resource utilization means improved cost-effectiveness.

» Control and data ownership: Providesprotecteddatamonitoringwith real-time data parameter modifications. Secure information control ensures privacy and data integrity.

» Seamless integration and adaptability: Integrates easily into existing setups and is compatible with various automation needs and processes. The system is suitable for medium and large-scale spray dryers with frequent product runs.

photo: VEGA

Flexible level measurement in the fruit yoghurt mixing tank
Technology/IT

photo: GEA

Modern strategies for optimizing whey pretreatment
Technology/IT

interpack
PROCESSING & PACKAGING

photo: interpack

Preview Interpack
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More flexibility and process reliability for milk
Technology/IT

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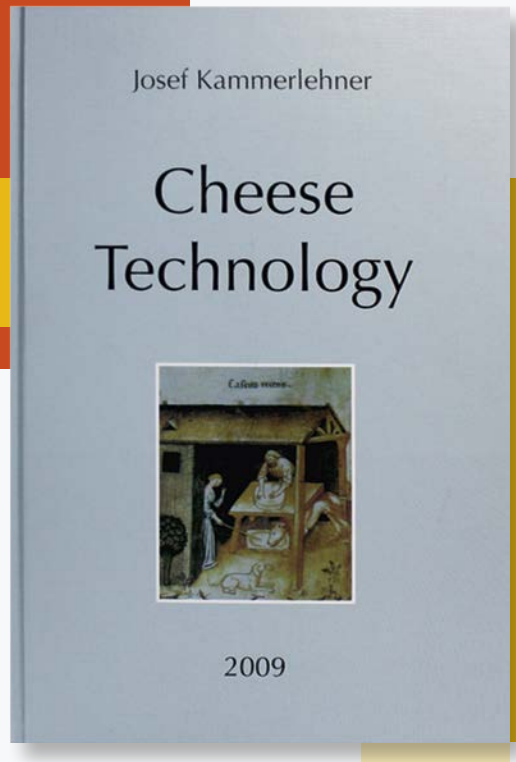

THE BOOK HAS 9 CHAPTERS

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

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