Consumer-driven Innovation – local and global

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Danish Dairy & Food Industry

worldwide

27

Marts 2018

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Danish Dairy & Food Industry
worldwide

27
Marts 2018

Denmark - March 2018

Consumer-driven Innovation
– local and global

Dear reader,
Welcome to the 27th edition of Danish Dairy & Food Industry .... wordwide. It is a pleasure for us to bring food professionals into the Danish dairy universe with editorial and technical articles focusing on the relationship between customers, dairies and their suppliers.

The production of Danish dairy products is characterized by very high quality standards. This can be explained by many factors, as evidenced by the contributions to this magazine. Among several things Danish Minister for Environment and Food points out, that the effective food control by the state has contributed to a sector with a high self-regulation. He also highlights a strong collaboration between public research institutes and food producers, who succeed with creative innovation environments, that both dare to take on leadership in developing new products - and who listen carefully to the actual consumer trends.

No doubt that Arla Foods is among the leaders in product development. This applies to both new everyday products and to advanced ingredients, that can provide new functionalities in other foods. Arla has just opened a large innovation center in Denmark with many tools to test consumer wishes and behavior - both locally and globally, Vice President Sven Thormahlen tells.

Because consumers are moving constantly, and new trends become rooted. Future researcher Birthe Lindahl Jeppesen reviews the latest trends, that may challenge traditional food productions. Growing interest in vegetable products calls for professional communication from dairy producers, who must explain the qualities of their products - and the sustainability and ethically correct production set up at the same time.

Danish dairies are strong in this coherence. This can be explained by many conditions, and large investments in production plants based on new green technologies are one of them. In this magazine there are numerous examples of the new technology, that honors consumer demands for green and safe products. Water must be recycled, excess heat must be collected and production must be more efficient and use less energy. And 'Industry 4.0' is a part of many new operating systems, that ensure product monitoring all the way to the consumer - and back again in case of errors.

We hope you find inspiration to face both your customers and the end consumer by reading the professional statements in this magazine, so your company is well prepared to meet the consumer needs of tomorrow.

Happy reading.

Anne-Sofi Christiansen
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Lars Winther
Editor

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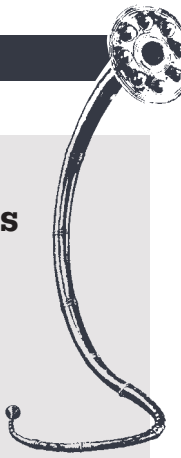

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QUICK FACTS ABOUT AU2MATE

- Au2mate was founded in Denmark in 2001.
- 100 employees at offices in Denmark, Norway, Sweden, UK and Dubai, holding more than 600 man years of experience in dairy automation.
- Project-oriented, has delivered more than 1600 projects, PLC, SCADA, MES and ERP integration to dairies worldwide.

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About 50% of the students in the program have an international background and the teaching maintains a global outlook on dairy science and technology.

You will:
- Learn about process technologies that convert raw milk into nutritious products
- Understand how the individual processes affect the product
- Become knowledgeable about the whole production chain
- Achieve in-depth understanding of the effect of the processes on quality.
- Gain insight into the underlying dairy chemistry
- Obtain a deep understanding of microbiology, starter cultures and enzymes

Structure
The structure of the program is shown in Figure 1. The following courses form the core part of the program:
- Food process equipment
- Dairy processes and equipment
- Milk processing
- Integrated thematic course
- Dairy product technology 1 and 2
- Food quality management and control
- Microbiology of fermented food and beverages
- Dairy microbiology

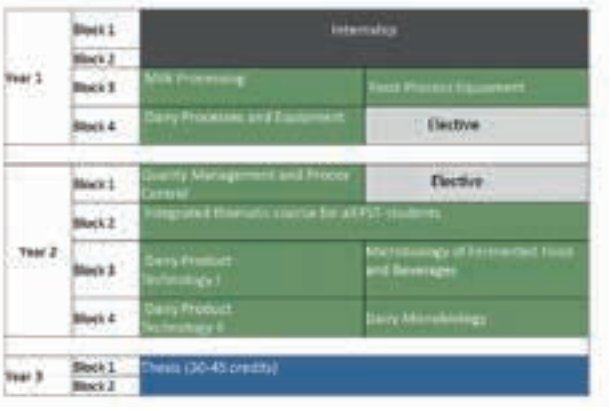
Requirements?
The program will fit students with a background equivalent to a B. Sc. in Food Science.
The 6 months dairy internship should be completed prior to initiating the M.Sc. program at University of Copenhagen. All teaching is conducted in English.

Teaching
The teachers are all experienced researchers with a comprehensive knowledge of the science and practice of dairy technology. In addition, numerous guest lectures will be given by representatives from industry.
Lectures and laboratory work are supplemented by pilot-scale practical experiments and visits to production sites. Your M.Sc. thesis will invariably involve close collaboration with a company.

About the Department of Food Science
The Department of Food Science, Faculty of Science, University of Copenhagen performs research and conducts teaching at the highest academic level in the area of food science.
More at http://food.ku.dk/english/

Schedule
The program starts in September each year.

How to attend?
For more information on the program: http://studies.ku.dk/masters/food-science-and-technology/programme-structure/specialisations/dairy_technology/
Please also take a look on the faculty homepage under education: http://www.science.ku.dk/english/
Other questions, please contact, Professor Richard Ipsen at ri@food.ku.dk



Nordic countries
- close to tomorrows consumer trends

By Esben Lunde Larsen, Minister for the Environment and Food of Denmark

Denmark and our Nordic neighbours are wellknown for their high food innovation. Just a few years back no one outside Iceland had heard about skyr. Now it comes in a variety of flavors. Just take a look at the dairy shelves at your local supermarket. In my view it is one of the best recent examples of market development being driven by the development in consumer demands.

An ever increasing diversity in the supply of food to meet consumer demands is in my view one of strongest and most interesting trends over the past decade. And there is no sign that it should weaken in the years to come. It is a trend nourished by a very strong consciousness in some consumer groups with regards to food, and it is seen both in Denmark and in markets across the world. There seems to be an increasing demand for food that is produced locally, sustainably and is healthy, convenient and tasting well. In my book, this is very positive.

Food safety, consumer trust and innovation go hand in hand

I want to ensure that such trends and developments can thrive and be developed to the mutual benefit of consumers and the food industry. Food safety, consumer trust, business development and growth go hand in hand. The Danish dairy producers are highly recognized on the global market. This is the product of continued efforts and should be in focus as we move forward.

Spotting trends and developing businesses

In my view, the ones best qualified to spot the next trends and predict the next "skyr" are the companies in close dialogue with the consumers. Perhaps it will be artisanal cheese, or maybe it will be something else. It is no simple task to foresee and meet future consumer demand. Production systems might need to be adjusted and new methods tested. The Danish dairy companies have proved their ability to adapt over the years. Skyr is just one of the latest examples. We see new production methods emerge and old ones being brought back to life, and we see creativity in relations to new products – one of the latest being high priced snail caviar.

Esben Lunde Larsen.
Foto: Claus Bjørn

Governmental dialogue

The role of government is to provide a level playing field for the industry and to encourage development and ingenuity. The focus on food safety and consumer trust will remain a cornerstone. A reliable food control system is therefore very important still. At the same time we must provide an environment supportive of innovation and remove unnecessary barriers and take action to ensure, that Danish companies are not met with demands that their European colleagues are not. The dialogue between the public authorities and the Danish food industry is crucial in Denmark. We meet with all types of businesses - from the very small, local producers to the multinational companies - both on an ad hoc basis and in formal partnerships. We also cooperate with research institutions. This provides an indispensable source of knowledge and is a key element in our understanding of the needs of the food business. It allows us to develop guidance and provide clarity for the small, local and innovative producers of i.e. artisanal cheese. And it is key in opening new markets for safe and exciting Danish dairy products. ■

Communication is essential to innovation

Listening to the consumers and satisfying their needs are crucial at Arla Innovation Centre. Sven Thormahlen, Senior Vice President, Arla, explains why — and how the company reacts to the needs.

By Lene Mikkelsen Walsh

Sven Thormahlen, Senior Vice President, Arla, is head of the new innovation center in Aarhus. The center is the heart of Arla's product development to different countries and various consumer segments.

How do you work with innovation? What are the actual issues? And which products will we see in the future — driven by consumer needs? That's some of the questions he answers, on the doorstep to 2018.

- Milk consumption is declining in Europe and USA. It is important to find out why costumers turn away from milk products and what they are turning to, he starts out.

- We do a lot of interviews with consumers and trend analysts and we observe, that people forget the nutritional values they get from milk. They listen to other voices; the social media and other unedited sources.

Sven Thormahlen thinks that the new forms of communication make a big difference in people's attitude toward dairy products. Therefore, Arla has decided to step up their communication to consumers and give more information about the value of milk, dairy sustainability and also the fact that Arla is a farmer owned owned company.

Food as identity

Beyond trends, another important issue is consumer behavior. Arla has especially investigated the generation born around the millennium, who are now the young and future consumers.

- We observe that the young generation have a different behavior. They are less willing to compromise, they want

Arla Foods Innovation Centre.

Arla Innovation Centre - facts

Arla Innovation Centre is the headquarter for the company's product development worldwide. It's located in the northern part of Aarhus, Denmark's second largest city. The newly built Centre opened in February 2017 and contains e.g. a science and consumer's lab and a 2000 m_2 pilot plant with the most advanced technology. The total area of the Centre is 10.000 m_2 and 150 employees from all over the world work here. The overall investment totals almost 347.000 Euros

everything immediately, they want good taste, good health and they want it in an easy way.

- The new generation are very connected to peer groups and social media, they are always looking for the new trend, that will help them create an identity. To our surprise, food has become an important factor in establishing their identity. They talk about what they eat, how and why. Food is at the center of discussion, where it once used to be music and dress code.

In Arla, we want to make sure, that our products are relevant in the minds of these consumers, so that they don't say "this old-fashioned milk is not for me:" Product development and communication are important in regards to this target group, Sven Thormahlen says.

Milk for every age

Arla aims to reach every age group with the message that milk has something good for them nutritionally.

- We all know about the importance of milk for children and the elderly, but now we also study the value of dairy for young adults and adults in general, when it comes to weight management, or as a protein alternative to meat. We have decided to look into all aspects, where milk is relevant to consumers in all ages, Sven Thormahlen says.

He sums up Arla's innovation strategy with what he calls The Consumer's Loop: You have to understand the consumers, then you have to talk to the consumers — then make products, that live up to their expectations and make them satisfied and say "Yes, this is exactly what I needed."

- We study this loop more and more, through sensorial tests and interviews. But we also try to push the boundaries – if we can influence consumer's behaviour. E.g. we know that people like sweet taste, but when we interview them, they are aware that they should reduce their intake of sugar. Therefore, we have introduced products, with lower levels of sugar, than you would find in the marked on average, he explains.

The balance between changes and steady production

Innovation doesn't need to be brand new products or high technology. E.g. interviews with consumers in Europe revealed, that they would rather have a round white cream cheese instead of the usual triangle shaped one Arla produces.

- You listen to the consumers and act on what you hear. But what sounds simple is also an investment. Our production lines have to be changed. Production facility in our dairies might like to run the same product day after day, year after year — that is where we get profit for scale. But if we refuse to make the changes, we can never really satisfy the consumer, so we need to find the right balance to react on consumer needs and still make sure, that we have profitable production, he explains.

- It is not only the consumers that guide the direction of Arla's development. New technology or ingredient solutions can also lead the way to new products, Sven Thormahlen adds.

New markets with milk curiosity

The first mentioned consumer trend in this article with people turning away from milk, is mainly a phenomenon in the western world. In the Chinese market for example, Arla experiences a curiosity toward milk based products.

- China is a fast changing market, people are well educated, sophisticated and have the ability to buy. They are curious toward products we have used in Europe for centuries. They have now discovered cheese and yoghurt, but they have a completely different taste culture. So we have to reinvent the products to the market, Sven Thormahlen says.

Africa is also a target marked to Arla, which has a powder plant in Nigeria. In Africa the innovation strategy is to produce products that are rich in nutrition.

Future products and markets

- In our long term strategy, we look at which products we want to grow and in which markets. E.g. we want to expand in Mozzarella. There is a steep increase in the fast-food chain restaurants and Pizza consumption is growing very rapidly in the world. Mozzarella is a big ingredient and we want to continue being one of the important suppliers.

- If we refuse to make changes, we can never really satisfy the consumer, so we need to find the right balance to react on consumer needs and still make sure, that we have profitable production, says Sven Thormahlen, Senior Vice President, Arla.

Arla also want to grow and develop yoghurts. Sven Thormahlen admits, that though there are good products in Scandinavia, Arla is a bit underdeveloped in the international market, where competitors have a much larger business with e.g. yoghurt for health, stomach and dieting.

- We are increasing in protein and we have made protein our key ingredient in our protein and skyr yoghurts. This was done to respond to new consumer needs. Active people or people who want to reduce their meat intake are looking for protein sources, he says, and adds that also a lot of Yoghurt products to be used in cooking are under development.

Last but not least, Sven Thormahlen sees a large cheese business opportunity in the area of snacking. In the cheese area, Arla is also working on reducing salt, and preparing more low-fat cheese with the the taste of full fat. ■

Sense and sensibility in future dairy

Futurist Birthe Linddal Jeppesen outlines the actual current consumer trends, which entail various challenges for the dairy industry, such as establishing a better dialogue between consumers, agriculture and the industry. However, the future also offers exciting opportunities if the dairies continue to develop their products.

By Lene Mikkelsen Walsh

What are the consumers' needs and wishes for food of the future? And how can the dairy industry actually fulfil them? These are some of the questions Birthe Linddal Jeppesen has specialized in answering, working as a futurist researcher for almost 18 years.

Birthe Linddal Jeppesen is not looking through rose-tinted spectacles, when she draws a picture of the challenges and opportunities that the dairy industry currently faces. For instance, she emphasizes consumption shifting from animal to vegetable products as a very large consumer trend in the Western world. People tend to cut down om meat and dairy products, not dramatically but still.

— One of the reasons is that cattle consumption and thus dairy farming has a huge environmental impact in regard to the emissions of CO_2. Consumers have rightly started to confront this problem. More and more regard themselves as flexitarians, which means that they still eat meat and dairy products, but to a lesser extent, and not every day, she explains.

This development could initially be seen as a threat to the dairy industry, but as an example of the opposite Birthe Linddal Jeppesen points to a new survey (Mintel 2017 red), which shows that 90 percent of those who buy vegetable drinks also buy milk form cows.

— The Flexitarians are pragmatic and the term is not a "either or". It's a "yes to both", she says.

Health scams and facts

Climate concerns are not the only reason why vegetable foods are gaining ground. The so-called "First movers" who set

the trends are also very interested in health matters.

— The explanations concerning dairy, health and nutrition pointed out by scientific researchers are difficult to grasp. Instead people are listening to "new gurus ", who are questioning the health value of milk. Opposed to the scientific researchers, the new gurus are good at listening and talking to ordinary people, Birthe Linddal Jeppesen says and emphasizes that many individuals actually experience benefits from cutting down on milk and meat.

— A glass of milk from a cow is heavier in the stomach than a vegetable drink, and meat is harder to digest than cabbage, she says.

License to produce

As yet another challenge, Birthe Linddal Jeppesen mentions the term "license to produce".

— The agricultural success in Denmark and other Western countries has also been its own downfall; it has become so effective that consumers question methods of production, including animal welfare.

— You can not ask a cow how it feels; therefore, consumers use their feelings or perhaps common sense to ask themselves: How would I feel better, on grass or in a stable?

Birthe Linddal Jepepsen does not blame people for following their emotions. We all do in many matters - when we marry or when we buy cars, clothes or food.

The future-researchers point out that farmers must achieve the consumers' "license to produce" attitude.

— People want nature and grazing cows and many are willing to pay for "the good story". They want a transparent value chain, she says, and states that the agricultural industry must remember that it exists for the sake of the consumers.

Birthe Linddal Jeppesen adds that agriculture must be better at communicating with, and at understanding, the consumers — otherwise it can not obtain the consumers' license to produce.

On the other hand, Birthe Linddal Jeppesen can not imagine a future without cows.

— People love cows and want to be part of an agricultural narrative, she says.

Innovation that meets needs

From talking about consumer trends, Birthe Linddal Jeppesen turns towards the development of specific dairy products. In general, she thinks that Denmark produce good dairy products. For example, dairies managed to react to consumers and have reduced the sugar content in e.g. yogurt. Lactose-free products have also been a major trend lately and shows that technology can do a lot with the raw materials - thus fulfilling the wishes and needs of differentiated consumers. She also notes that dairies have been very successful in developing products with functional properties, e.g. with probiotic bacteria that stimulate a healthy intestinal flora.

Danish dairy successes

If Birthe Linddal Jeppesen should mention some huge Danish dairy successes over time, she would opt for the brands Kærgården (a spreadable butter blend) and Lillebror (a mild snack cheese for children) though the success of these products are not due to radical innovation. She also mentions that Arla recently has been very successful with their Unika Cheese (special gourmet cheeses in small-scale production), which has raised the image of Danish cheese in general. To the futurist, the Unika brand is an example that one sometimes can be more successful when not attempting to please everyone..

— Consumers are becoming more differentiated and innovation is increasingly situational, she highlights.

At the same time, she calls for a larger yogurt assortment, a delicious cocoa for children's' birthday parties, more exciting ice cream products and a variety of cheese snacks for the rising market of convenience products for people on the move.

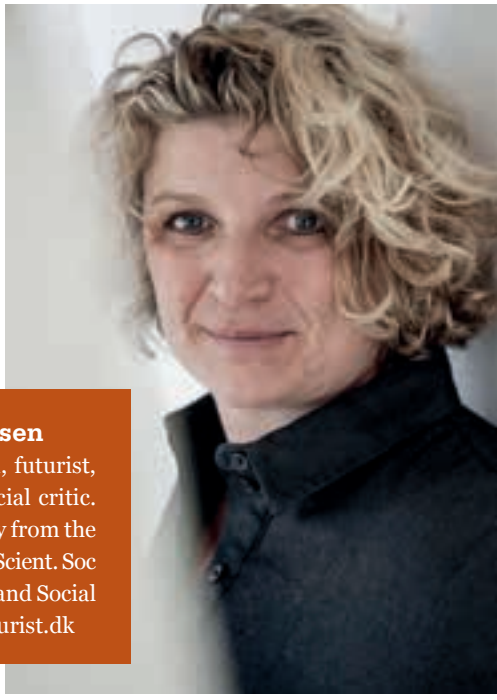
Innovative alternative products

In general, Birthe Linddal Jeppesen would like to see a larger and more innovative variation of dairy products. She points out that the many - and partly competing - vegetable food products that have been launched recently, are very innovative in both content, marketing and design.

A major barrier, when it comes to recognizing innovation in the dairy industry, is also that the supermarkets do not provide much space and time for new products to break through. Therefore, as a consumer, it can be difficult to observe the full scale of the innovation that actually is going on at the Dairies.

Birthe Linddal Jeppesen admits, that she sounds very critical to the Dairy Business but adds:

— If the Dairy Industry is to develop, one has to criticize: "You have to be cruel to be kind. would not be doing my job properly, if I only praised the industry." ■



Facts – Birthe Linddal Jeppesen

Born 1974, is a sociologist, historian, futurist, lecturer, debater, moderator and social critic. She has a Master's degree in Sociology from the University of Amsterdam and is Cand. Scient. Soc from University of Roskilde (History and Social Sciences). Read more on www.thefuturist.dk

Protein
- a key element in dairy product innovation

Product innovation is key in a highly competitive market and is frequently driven by changing consumer trends. Protein-rich dairy products are a good example of products that appeal to the health and wellness customer segment, who continue to seek for new, improved high-protein variants. Protein is money, and that's why it's interesting for processors to be able to control, standardize and utilize the protein of their product streams to secure the highest revenue.

By Tetra Pak Filtration Solutions

From fat standardization to protein standardization

Milk has been recognized as an important nutrient for thousands of years. Since the Industrial Revolution and many years onward, milk fat has been considered the most important and valuable fraction of milk. Milk was collected and separated into skim milk and milk fat, the latter being used for butter. Since the late 19th century it has been common to standardize fat content in liquid milk.

In the late sixties it became possible to standardize protein content as well. It started in cheese dairies, where protein standardization compensates for seasonal fluctuations in the protein content of milk. As a result, the cheese process is easier, yield is higher, and costs are lower.

Protein standardization is defined as the changing of ratio of protein and dry matter and is most often done by membrane filtration, a completely mechanical process that separates milk components by molecule size into fat, protein, and water. Membrane filtration is used in nearly all dairy processes to get the highest value out of each milk component, protein being by far the most valuable.

Cashing in on the protein

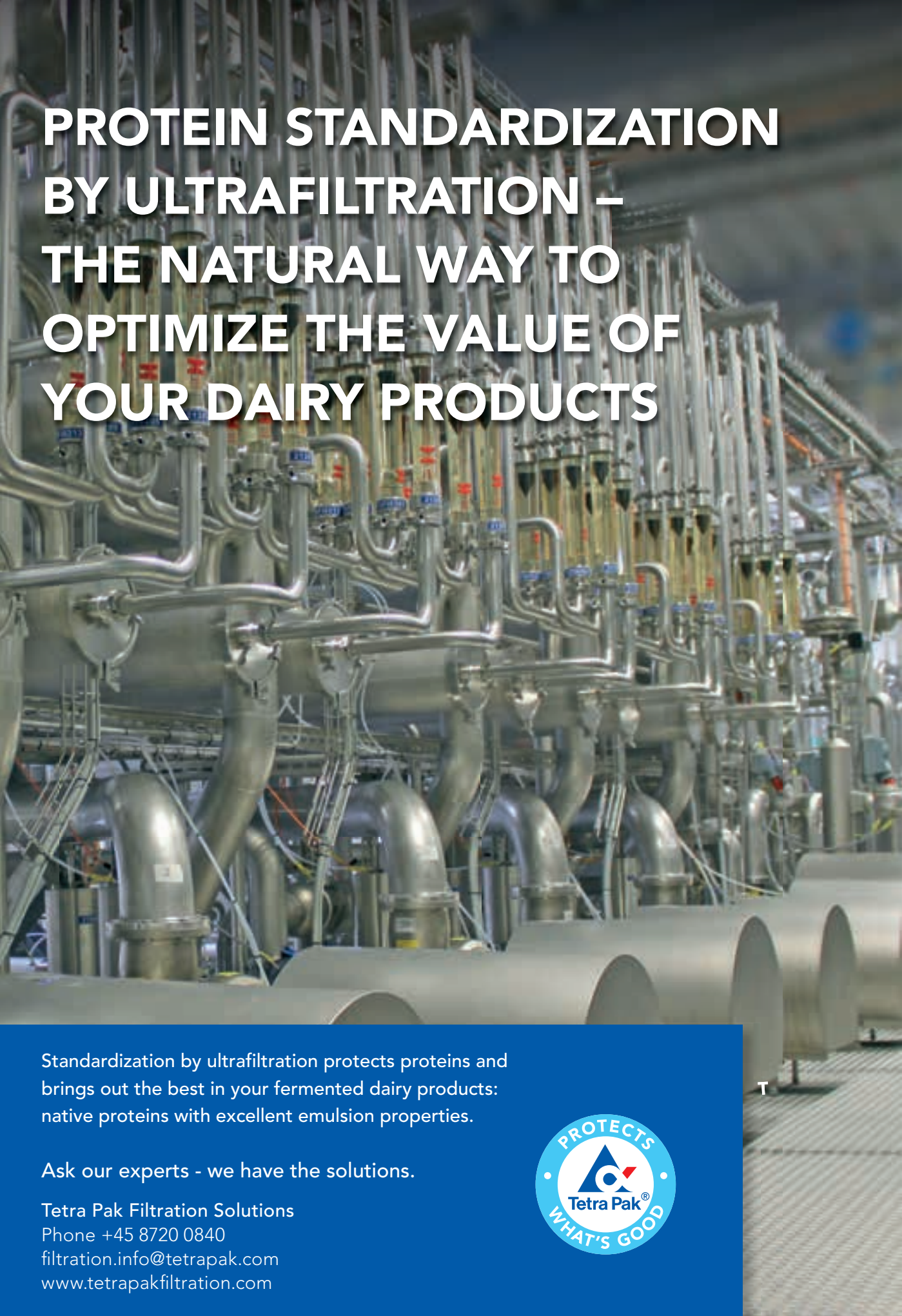
Protein standardization is a common process in most cheese making dairies in Europe. In addition, protein standardization is used in liquid milk, milk and whey based powders and fermented dairy products like Greek style yoghurts and milk drinks. Protein standardization by membrane filtration is the most effective way to adjust the protein content to the required level, ensuring the highest revenue. Surplus protein can be allocated to products that yield the highest profit to fully cash in on the value of the protein.

Gaining from the by-product

A valuable by-product from the filtration process is lactose-rich permeate. Large dairy processors are likely to be able to utilize the lactose for other products in their portfolio. Others can profit from selling the surplus lactose for further processing, for instance into flavoured milk.

Next step possibilities with membrane filtration

Protein standardization is only one of the nearly limitless possibilities with membrane filtration. Filtration and separation with new types off membranes offer an abundance of new applications that will continue developing over the next years, processes that can take nutrients apart – and put them together in entirely new ways. ■



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Co-Development is Innovation

AAK has a strong heritage and a dedication to vegetable oils and fats that fit traditional applications, replacing milk fat partly or fully. We also develop new solutions, that are specifically designed to meet the needs within Plant-based Dairy in close cooperation with each single customer. Together we find unique solutions, that enable your products to meet the consumer demands.

By
Martin Persson
Commercial Product Manager Dairy, AAK

Dairy Evolution

For decades, vegetable oils and fats solutions have replaced, partly or fully, the milk fat in dairy and ice cream applications. In recent years we have seen an increase in popularity of plant-based diets which very much has settled within the dairy segments. When eliminating all animal-originating ingredients several challenges appear. One such challenge is to develop new products with the right taste, flavor, and texture experiences while at the same time deliver upon the core values of sustainability, responsible sourcing, and good corporate citizenship.

AAK is an ingredient producer with a strong heritage and a dedication to vegetable oils and fats. We have solutions that fit both traditional applications replacing milk fat partly or fully and solutions that are specifically designed to meet the needs within Plant-based Dairy. We embrace the plant-based segment and acknowledge its need for unique solutions that enable products that meet consumer demands. Today's consumers are characterized in many different ways, for example by being a vegan, vegetarian, or flexitarian.

To stand out in an increasingly competitive market you need a partner who understands the market dynamics and that can work in close collaboration to enable best-in-class consumer products.

True Co-Development

At AAK, we understand how important it is to have a partner that can collaborate across the value chain. From idea generation to launch, our valuable expertise and knowledge can help customers seize new opportunities and overcome challenges in the market. Using our Co-Development approach, we work alongside our customers to explore every opportunity together – every step of the way. We apply our skills and capabilities in different stages across the value chain to understand our customers' businesses and help them make the most of their products. By creating maximum value for our customers and their businesses, we, together, achieve long-lasting results; today and for years to come.

How can we support Co-Development in practice?

By spending time in the market – understanding its dynamics and listening to our customers – we get a detailed understanding of what our customers' needs are. By closely listening to these needs and not entering a solution mode too soon, the time to address the real needs is time well spent to fully understand the customer and the true market need. When there is a mutual

The 5 value-adding stages of our Co-Development approach

Ideate: We ideate market-driven solutions together with our customer's, maximizing the product's potential

Create: We create customized solutions, meeting customer's specific needs

Prove: We test the solution and prove it in our customer's product, ensuring the right functionality before production begins

Implement: We offer guidance, all the way from pilot testing to full-scale production, ensuring full support and a shorter time to market

Launch: We provide market knowledge, guiding the success of our customer's product launch

We are AAK – The Co-Development Company!

understanding on what the customer's needs and requirements are, AAK can concretize a product concept at one of our Innovation Centers for Dairy.

When a product specification has been found to meet the customer's needs, we support the customer during the trial period to verify and validate the solution in order for it to be ready for commercial production. This is done by having our Customer Innovation Managers, application experts within Dairy, at disposal at our customer's site.

By having a detailed project plan and dedicated resources and competencies working closely together with our customer's, AAK minimizes time-to-market and secures a successful product launch.

Innovation Center for Dairy located at AAK's production site in Karlshamn, Sweden

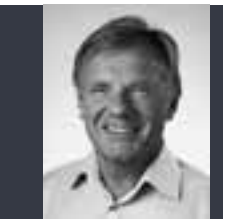
Innovation Centers

At our Innovation centers we have in-house capabilities and resources to support customers throughout the Co-Development process. By applying AAK's expertise within oils & fats for the end application and customer's product knowledge, we together can trial concepts in pilot scale and spend time in product trials, supported by lab and sensory testing at one location. Our main Innovation Center for Dairy is located in Karlshamn, Sweden and we have regional Innovation centers in the other continents where AAK is operating.

Get in contact to discuss how AAK can support you and your business. ■

Almarai factory situated in Al Kharj in Kingdom of Saudi Arabia.

Almarai is in control with Au2mate



By
Klaus Dam,
Managing Director,
Au2mate A/S

Au2mate delivers a fully integrated MES system for a new factory for Almarai in Al Kharj in Kingdom of Saudi Arabia, inclusive SAP integration and OEE measurement.

Project facts

- Complete MES & OEE solution for 8 lines + Incubation cooling tunnel & washers
- Integration to SAP (process orders + feedback + maintenance hours/ energy consumption)
- Integration to EWM (Finished good)
- Integration to process area/cold store
- Control and execution of work orders
- Extensive reporting (OEE, KPIs, batch and energy etc.)
- Connection to 90 line PLCs
- Barcode readers for track & trace/data storage
- MES and SCADA software from Wonderware
- Control equipment from Siemens

The Almarai Al Kharj factory opened in 2017 with several services from Au2Mate from design to implementation process for the highly advanced MES system.

The client

Almarai is one of the largest integrated dairy food companies in the world with an unrivaled reputation, synonymous with excellence delivery and quality across its entire range of products. Currently operating across the gulf region, Almarai employs over 45,000 employees, servicing more than 100,000 retail outlets.

Almarai began in 1977, based in Riyadh, the capital of the Kingdom of Saudi Arabia. Almarai Company network extends throughout the Arabian Peninsula, leading and influencing the agricultural, dairy processing and food distribution industries.

New dairy plant

In 2017 Almarai extended its production capacity with a new dairy production plant located in Al Kharj, Saudi Arabia. The product range includes milk, laban and yoghurt in bottles and cups. The production plant is divided into two areas: The processing area and the filling and packaging area. The processing area handles milk reception and production of drinking milk, laban and yoghurt. The packaging area includes eight filling and packaging lines, cooling tunnels, incubation room, pallet and crate washing lines as well as a cold store.

Background

Almarai had identified OEE (Overall Equipment Effectiveness) measurement and ERP integration as a strategic focus area for increasing the productivity at the Almarai production sites.

Au2mate has in connection with a new Almarai production plant in Al Kharj supplied a complete MES solution for the filling and packaging area with integration to SAP and OEE measure-

ment at eight filling and packaging lines and various supporting processes. The solution includes an advanced barcode scanner solution for pallet identification as well as data tracking and handling.

Full SAP integration

Almarai required a fully automated control and IT solution for the new production plant with SAP integration, OEE measurement and full traceability.

The following success criteria and focus points were identified in connection with MES solution for the filling and packaging area:

- SAP integration (receiving released orders from SAP and giving production response back to SAP regarding filled/packed material/amounts and locations).
- OEE package for monitoring and improvement of line performance.
- Plant/line performance reporting.
- Track & trace of products.

The goal for the project was to reduce line waste and downtime while improving performance, availability and quality. This was to be demonstrated by a 5% improvement of the line OEE.

Implementation of the MES project

The contract was signed in June 2016, commissioning started in February 2017 and full production planned for April 2017 and go-live with EWM system in August 2017. The project was generally executed according to Au2mate QA-manual complying with leading international standards and methodologies including development of test sheets for quality assurance. The plant is complex both in terms of processes and applied automation technology and at the same time the performance requirements are set very high; this includes user friendliness, process optimisation and plant uptime.

The plant automation solution is based upon the latest proven technologies and equipment from leading manufacturers, ensuring the investment and future development of the plant.

Training of staff

The software solution is designed according to S88/S95 which forms a robust platform supporting superior management of the dairy including a i fully integrated manufacturing order execution.

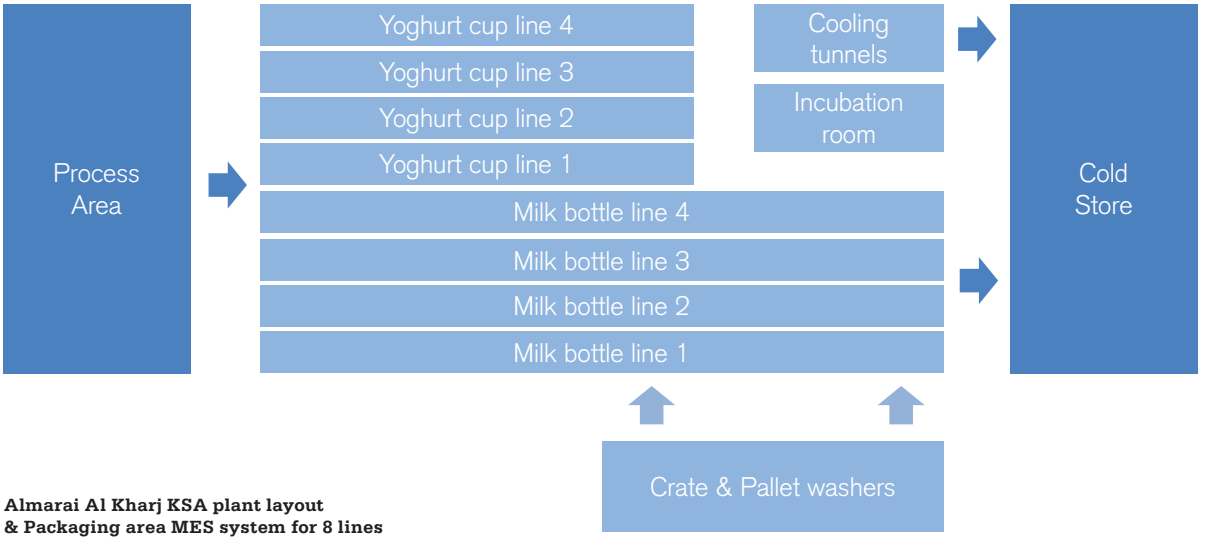
The solution designed and implemented at the Almarai factory is embedding the joint Au2mate expertise and good automation practice gained from conducting major MES projects for more than 15 years.

Training of the Almarai staff was done in dedicated training sessions as well as in parallel with the project execution, in order to develop the skills required to operate, run and execute maintenance of the plant independently of external support. ■

4 quick facts about Au2mate A/S

- Founded in 2001.
- 100 employees at offices in Silkeborg, Dubai, England, Norway and Sweden, holding more than 600 man years of experience in dairy automation.
- Project-oriented, has delivered more than 1800 projects; PLC, SCADA, MES and ERP integration to dairies throughout the world, including Nordic countries, Europe, Middle East and Africa, America and Asia.
- Supply solutions based on open standard platforms and internationally recognised methods for software development and project management.

For further information – see www.au2mate.com or contact us at +45 8720 5050



Almarai Al Kharj KSA plant layout & Packaging area MES system for 8 lines

Mapping Skills Needs and Supply in the Dairy Sector

How to close the skills gaps between the education suppliers and the demanders of the European dairy sector? This question is a major concern among dairy stakeholders in Europe. For this reason, AEDIL which is a network of European stakeholders, designed a project to find answers to the question. The project runs over three years and is presently initiating its second year.

By Isabel Sande Frandsen

The European dairy sector is rapidly changing towards more concentrated and specialized production, and the global demands for dairy products are growing. This situation is matched with an education supply that is not fully geared to provide the skills needed by the labour market, which displays a strong and growing need for comprehensive knowledge on 'skills demands' and 'skills supply' within the European dairy sector. Only with this knowledge it will be possible to generate recommendations for educational institutions to match the needs of the industry.

Researching demands for dairy skills

At present the project is in the research phase where dairy plants and educational institutions across 13 European countries are interviewed based on a comprehensive questionnaire. The questions aim to bring light on how the dairies experience the feasibility of recruiting qualified employees, which skills they require for the future and which trends they see in dairy demands. During the research a special focus will be on digital and green skills.

Once the research is concluded a group of highly qualified people with analytical skills will analyze the data and create models which will help to clearly depict gaps and shortages in the sector. The findings then will be used to generate recommendations for the dairy sector to ensure a competitive European dairy sector where the industry and education sector collaborate to meet changing demands and trends. ■

Early finding from the Research

- Some countries within the EU lack facilities to train professional dairy employees. These countries have simply run out of qualified professional dairy operators, technicians and leaders.
- There is a need to invest in training facilities and update pilot dairy equipment including those connected to green and digital outputs.
- New learning is required in **addition** to good dairy skills (Science, Process, Quality and packaging)- automation, continuous improvement, cost of production, fault finding, team leading, Route Cause Analysis, and quality systems.

Co-fundet by the Erasmus+ Programme of the European Union

Innovating to help consumers **reduce dairy waste**

CHR. HANSEN
Improving food & health

Reducing food waste has been identified by the UN as a Global Goal for Sustainable Development. Although consumer awareness of the impact of food waste is growing, a study published in 2016 showed that only 53% of US consumers* were aware that food waste is a problem – even though they throw away approximately 36 billion kilos of food every year. Much of the waste is related to shelf-life, so how can food manufacturers meet the clean label consumer trend, whilst also keeping food products fresh for longer? Global bioscience company, Chr. Hansen, recently launched a new generation of natural dairy cultures to help dairy manufacturers – and consumers – tackle the food waste dilemma.

By
Debbie Spilane
Communication Partner, Corporate Communication

With nearly 70% of the study respondents believing that food should be thrown away when reaching the sell-by date to avoid foodborne illness, extending shelf-life can help avoid vast quantities of food ending up in the thrash. The R&D teams at Chr. Hansen developed a new generation of cultures to protect dairy products from yeast and mold. Known as bioprotection, this natural solution can help dairy products stay fresh for longer and embrace the clean label trend.

Dairy products stay fresh for longer

- We recently launched an entire new generation of bioprotective cultures within our FreshQ® range. Our innovation focused on finding food cultures with even higher performance while also optimizing the fit to more dairy products and conditions around the world, says Peter Thoeysen, Director for Dairy Bioprotection at Chr. Hansen.

- In addition to yogurt and sour cream, other dairy products including white cheese, pasta filata, kefir and other fermented milk products can stay fresh for longer. Now many more dairy consumers all over the world can enjoy longer lasting fresh and natural products, he says.

FreshQ® inhibits or postpones the growth of yeast and mold, which are the most common types of spoilage in fermented dairy products. The cultures protect quality throughout the supply chain, which is particularly beneficial in regions where optimal refrigeration is difficult to secure.

Reducing yogurt waste by 30%

In Europe, food waste reduction is high on the political agenda. An impact study, conducted for Chr. Hansen by a third party consulting company, found that 17% of all European yogurt production goes to waste. 80% of the waste is related to the sell-by date – to products that expire in the supply chain or in the consumer's fridge. The impact study demonstrated that shelf-life extension by only 7 days – a very conservative estimate of the potential with FreshQ® – can reduce yogurt waste by as much as 30% in Europe.

Consumer-driven innovation

- Consumer awareness of food waste is

on the rise – and no one likes to throw away unopened products. Our goal with the new FreshQ® cultures is to help dairy producers around the world to offer longer lasting and great tasting products to their consumers – without compromising their product label, says Thoeysen.

- Now even more consumers can enjoy longer-lasting fresh dairy that is free from unwanted artificial preservatives, he says.

Chr. Hansen offers bioprotective cultures that keep food fresh and safe for dairy, meat, smoked salmon and ready-to-eat salad. ■

***Household Food Waste: Multivariate Regression and Principal Components Analyses of Awareness and Attitudes among U.S. Consumers - PLOS research article - Published: July 21, 2016**

Mixing with a Minimum of Energy Consumption

By
Erik Dath Harbo,
Sales Director,
Daniatech

Daniatech from Denmark and Packo Pumps from Belgium gathered their expertise in mixing and pump manufacturing and have set a new standard in high-shear pumps and high shear mixers.

The patented rotor-stator design was optimized with CFD and gives the pump an unrivalled energetic efficiency.
"The energy consumption is 40 % to 50 % lower compared to other high-shear pumps and mixers", a manufacturor informs.
"This high efficiency does not only result in a lower energy bill for every hour the pump is in operation, but also reduces the initial investment. The high-shear pump can be fitted with a smaller motor and the possible frequency convertor is also smaller and cheaper. The optimized flow through the rotor-stator also results in a very quiet operation."

Based on Packo FP Pumps

The Daniatech MixMaster pumps and mixers are based on the well-established Packo FP pumps and they share consequently all their valued unique advantages. All the options of the FP pumps are also available on the Daniatech MixMaster & mixers and they have almost all spare parts in common (motors and seals are normalized).

The Daniatech MixMaster are plug-and-play mixing units that combine the mixing and pumping function in one machine, hence saving maintenance, floor space and the need of a booster pump. They have pumping capacities up to 200 m³/hour and up to 80 m differential pressure. These features, together with the hygienic design, make the Daniat-

Company Background
The mixer unit has been developed together with Belgium Pump Manufacture Packo Pumps. The core of the company is two of the founders behind Daniatech. With more than 40 years of experience in the mixer industry, they are the backbone of Daniatech.

Daniatech
By Cabinplant

ech MixMaster the favorite in dairy, ice cream, prepared food, beverage, bakery, marmalade and similar industries.

Reduce mixing time

Where static mixers, dynamic mixers and agitators can give satisfactory results for simple duties such as blending liquids of similar viscosity and density, the high-shear pumps can reduce mixing times up to 95% in processes where stable emulsions are needed, particle size has to be reduced or texture agents (e.g. xanthan, alginate, pectin, carboxymethyl cellulose, carob, gelatin,...) have to be mixed without any lumps forming.

Replace the homogenizer

Thanks to the recently elevated shear rates of up to 95.000 s-1, the Daniatech MixMaster and mixers are even suitable for processes where traditionally a homogenizer was needed. Thanks to these ultra-high shear values, the Daniatech MixMaster gives enough mechanical power to the pumped liquid to transform yoghurt into drinking yoghurt or e.g. produce lump free stabilizer solutions. The Daniatech MixMaster with a low shear action can be used as a creaming device for yoghurt. The viscosity of yoghurt can be controlled with the use of Daniatech MixMaster and an inline viscosity-meter to control the final viscosity of the yoghurt.

Low complexity

The high shear device used as a high shear mixer in combination with a tank offers multiple advantages. Service wise, the mixer unit is direct driven flanged into the bottom of the tank. The number of spare parts is reduced to a shaft seal arrangement and two elastomers (O-Rings). The unit has the same complexity as a standard centrifugal pump e.g. no bearing arrangements except for the bearing in the standard norm-motor used, and no pulley system. Daniatech and Packo pumps have reduced the complexity of the unit and the cost & time of service to a minimum. ■

Anuga FoodTec

Please meet Daniatech at the Anuga FoodTech in Cologne 20. - 23.03.2018 in Hall 10.2 at D-109.

Arla Foods Upahl brought up-to-date

In 2015 Arla Foods decided to centralise their production of Quark and Skyr and expand the production capacity at their main facility in Upahl. Therefore, Arla Foods Upahl asked Eltronic to deliver a solution for their production IT. The requirement was 100% integration and full traceability throughout the whole production.

By
Claus Sass Hvass,
Business Director

Arla Foods Upahl

In the north-eastern part of Germany, Arla Foods Upahl is located and employs about 500 people. The Upahl site is beautifully located in the countryside and contains state-of-the-art production facilities. The core competences of Upahl is organic products as well as Skyr and quark. The site contains many years of experience within the production of fermented fresh products. Many of the products manufactured at Arla Foods Upahl are exclusively for the European market.

Background

Arla Foods wanted to include all production areas of the facility in Upahl into one central IT solution, and they therefore requested a stable, reliable and scalable platform created in their own template. It was a requirement from Arla Foods that the IT solution was to be created in Arla Foods own standard template as this would reduce future costs of maintenance, further development etc.

Technical Solution

The solution delivered to Arla Foods in Upahl is based on software from Wonderware. Basically, the solution is a computerized system used in the production. The system enables Arla Foods to trace and document the transformation of ingredients into finished products. Additionally, it provides information helping the decision makers understand how to optimize the current production conditions to improve the production output. The solution works in real-time and enables control of multiple elements of the processes. Additionally, the solution included printers which are able to print dynamic values on the products according to the data provided from the production line, such as name, weight, expiry date etc. The solution was based on Siemens SIMATIC S7 series (S7-1200 & S7-1500) combined with Wonderware System Platform, InTouch and Wonderware MES Operation.

Outcome

For Arla Foods in Upahl, the project has resulted in an increase of the production output and a reduction of production costs. Production data has been made available to assist the operators in their

Technical facts about the project:

- 8 filling and palletizing lines in quark + subsequently 16 filling and palletizing lines in milk.
- Line Controller for standardized machine interface.
- Traceability.
- Automatic OEE collection.
- Label, product and pallet print.
- Full integration from ERP to machine.

Eltronic

IT & AUTOMATION

Quote from Arla Foods Upahl

"The site is satisfied with the implemented solution. It adds value to our production, making processes easier and less error prone. All units in the production line are receiving their data by the automated system. The automated efficiency data collection is the base for future ongoing improvements of our production lines.

The cooperation with Eltronic was professional and constructive, always being able to react flexible on changes. The delivery was implemented on time. Also, a big advantage of driving projects with Eltronic is the great manpower and the many different subject areas they can deliver on. Hardware-Engineering, cabinets, software developing for PLC- and MES-Solutions, all together from one single hand."

daily work and to enable continuous optimization of the processes. The system has been designed in Arla Foods' own template making it possible for Arla Foods to make all maintenance and further development of the system on their own.

Overall, Arla Foods in Upahl is very satisfied with the solution supplied by Eltronic. Not only has the requested production expansion been achieved, Arla Foods has a future-proof production with full traceability. ■

Test Mixer from GEA **with new standards**

By
Claus Patscheider, Product Manager Hygienic Mixing, PTC Liquid Processing & Filling, GEA.

BATCH FORMULA® Test Mixer offers improved hygiene, flexibility, efficiency and easier installation.

GEA has redesigned its market leading BATCH FORMULA® Test Mixer to meet customer demand for the highest possible levels of efficiency, flexibility and hygiene. While redesigning the mixer, GEA has been able to reduce its footprint by at least 25 percent compared to previous models. This now means that the equipment can easily be located within a plant, through normal door apertures, without dismantling. The equipment provides users with the opportunity to test recipes and processes ahead of full-scale production: proving product recipe, optimizing product functional properties, design large scale production process and product validation. This helps customers to prepare recipes and establish process parameters before investing in full-scale plant thereby bringing new products to market more quickly and profitably. The new design has addressed four key areas: hygiene, flexibility, efficiency and footprint.

New design and technology

The hygienic design has been updated to meet the strictest requirements of the food and dairy industry. This has been achieved through a series of detail changes, for example reducing the opportunity for dirt traps in the system, that helps to prevent cross contamination through the high-shear device. The BATCH FORMULA® Test Mixer now features direct steam injection. With this new development the equipment allows for production of soft cheeses and sauces that require steam injection as part of the process. Moreover, the direct steam injection has increased the flexibility of the equipment allowing users to produce an even greater range of products on the same machine. Easy and efficient cleaning prevents cross contamination or product carry-over when switching batches.

GEA has used the Computer Fluid Dynamics (CFD) techniques, more usually used when designing full-scale equipment, on the new BATCH FORMULA® Test Mixer. This allows the operation of the machine to be refined for maximum efficiency and to more closely harmonize with the results achievable on larger equipment.

Efficient CIP and flexibility

A key feature of the BATCH FORMULA® Test Mixer is its integral CIP system. This further reduces the overall footprint of the plant as no separate CIP system is required. Integral CIP makes product changeover faster and both water and chemical consumption is reduced to a minimum.

For many years the BATCH FORMULA® Test Mixer has been the benchmark technology for processors that require the flexibility of small batch production with easy scale up and trusted GEA technology. While the redesign has improved some key features, the core functions of the mixer remain the same. These include: high-shear operation to limit exposure to air which improves product quality and shelf life; and lowest point drainage for maximum product recovery. The BATCH FORMULA® Test Mixer Functions also introduce powders below the surface which means they are wetted more efficiently for fast processing and better mixing. The combination of these core functions help to reduce batch cycle times, improve product homogeneity, increase shelf life and reduce the time for new products to reach the market. ■

ANUGA FOOD TEC

Test and meet GEA

BATCH FORMULA® Test Mixer will be on the GEA stand at ANUGA FoodTec in Cologne from 20-23 March 2018.

The BATCH FORMULA® Test Mixer is also available for testing at the GEA test facilities at Ahaus in Germany.

New BATCH FORMULA® Test Mixer

– designed for hygiene, flexibility, efficiency and easy installation

The all new BATCH FORMULA® Test Mixer from GEA – the ultimate in hygiene, efficiency and flexibility. Combining trusted technology with innovation, the BATCH FORMULA® Test Mixer now features steam injection, integrated CIP and is 25% smaller for easy installation, even in confined spaces.

- Trusted technology for the effective mixing of food, dairy and beverage products;
- Ideal for testing recipes and processes ahead of full-scale production with seamless scale-up;
- Reduced dirt traps to prevent cross contamination;
- Optional direct steam injection for making soft cheeses and sauces;
- Integral clean in place (CIP) for fast product changeover, ultimate hygiene and minimal use of water and chemicals.

We look forward to meeting you at Anuga FoodTec Hall 10.2 – booth A-090-C-119 in Cologne, Germany from 20 – 23 March 2018.

GEA engineering for a better world

gea.com

Jorgensen protects **your brand**

Consumers and authorities respond promptly to safety failures in the food industry, which creates growth at Jorgensen. Here, the many engineers create operational and safe production lines for infant formula and other powder products.

By Lars Winther

Six years ago, Jorgensen moved into a brand-new domicile in the eastern part of Odense. A modern building combining the large production halls with administration and management using transparent, clean and hygienic layout. Last autumn, the excavators were started again as the 7800 square meters had become too tight, so another 3000 square meters are under construction. It will provide room for more engineers and the opportunity to build even bigger filling and packaging systems for the infant formula industry and related industries within dairy production, human food, pharmaceuticals and pet food.

Inceasing demands for food safety

Thus, Jorgensen has experienced a solid growth, which places the company among the market leaders when it comes to complete packaging and filling systems for infant formula. This is due to increasing demand for new plants, as the requirements for quality food are constantly sharpened.

- No doubt that infant formula is among the product areas with the highest safety requirements – not least in the wake of several major scandals - both in China and in Europe. Both consum-

Measuring equipment. Jorgensen leak tester provides reliable quality assurance.

Close interaction between engineers and the production provides a creative environment.

ers and authorities respond promptly if they experience product irregularities influencing consumer health and brand reputation. At the end of the day this can cost not only millions but billions of euros for the companies, explains Per Vedel Rasmussen, Sales Manager at Jorgensen. Part of the global production of infant formula takes place on relatively old plants that may be vulnerable to changes. In addition to new state-of-the-art lines, Jorgensen is an expert in implementation of contemporary updates and line optimization on old plants.

Closed environments fully automated

- One of the strengths of our solutions is that the production takes place in safe and completely clean environments that are fully automated, focusing on cleanliness and hygiene. Furthermore, powder products from a Jorgensen plant have the lowest oxygen content, which is documented by the integrated measuring equipment, Per Vedel Rasmussen explains. Another facility is the use of data matrix codes, which makes it possible to trace problems back to the source of the error.

- In case of errors affecting product quality, it is crucial to quickly track the affected products and find the source of error, which our tracking system provides optimal opportunities for.

Turnkey deliveries

When Jorgensen delivers production lines, it is a complete solution A to Z, i.e. from empty can intake to canned goods' delivery. Most of the machines and equipment are manufactured in Jorgensen's workshop but some of the key machines have been purchased from various sub suppliers and subsequently assembled and tested in Odense before the installation is completed at the customer's site.

Jorgensen's installations are pretested, because they can test the entire plant in their own factory and correct the errors, so Jorgensen can guarantee delivery on time and that the system is running trouble-free from start-up. This testing also allows Jorgensen's many automation specialists to optimize the control systems for the many different machines and robots that will work together in production.

Jorgensen has developed their own control system over a number of years, so now they have a very strong control concept to give a full and well documented production overview and outcome. ■

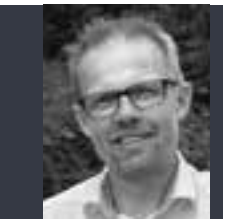
Jorgensen's engineers testing a robot in the workshop.

JORGENSEN - FACTS:

- Jorgensen Engineering develops and produces packaging handling systems for the food, pet food, health care and milk powder industries.
- Among the world's biggest and leading in production lines for infant formula.
- 150 employees, engineer capacity is more than 50%
- Annual turnover of approx. 45 million €
- Project know-how since 1933
- Owned by the XANO Group.
- Member of SEDEX (Supplier Ethical Data Exchange)
- SMETA certified (Sedex Members Ethical Trade Audits).

Experience food, technology and the dairy world at FoodTech

Food Tech is the largest food technology trade show in Northern Europe - a melting pot for people from every branch of the industry. And a unique opportunity for you to get insight into future trends and technologies during 3 days.



By
John Dørr Jensen,
Project Manager,
MCH.

Strengthen your customer relationships. Generate new leads and business partners. Network with decision makers. Acquire new knowledge and inspiration. And promote your company and build trust. These are some of the most important reasons for participating in Food Tech, which is held every second year in MCH, Herning in Denmark. This year, FoodTech offers the traditional exhibition of food technology, the big dairy contest, International FOOD Contest, which is expanded with several new food categories, competitions and the new IFC World Congress, which as a new initiative will focus on process water and wastewater.

FoodTech with Tech City

The FoodTech Exhibition consists of more than 300 technology companies, which cover machines, technology and knowledge for all food categories. Apart from the many stands, FoodTech offers presentations of laboratory equipment and experiences for both the food and pharmaceutical industry. The FoodTech Challenge is an international competition among students, who are developing solutions to challenges formulated by big food companies. This year the FoodTech Challenge is collaborating with Innovatefood.dk with expectations of attracting talents and experts from all over the world to develop new food solutions. The innovation contest this year will be held in Tech City, which becomes an innovative area for leading Danish and international networks, educational institutions and knowledge companies in the food industry.

International FOOD Contest

International FOOD Contest (IFC) is a traditional exhibition with more than 1500 dairy products, which compete on quality based on professional criteria. The jury is composed of the industry's own people, professional users and specialists. The best products in the competition will be prized. Dairy farm gourmet prize, honorary prizes, gold, silver and bronze medals. In the later years the dairy section has been expanded with several other food categories, which are evaluated after similar criteria. For 105 years, IFC has been working on quality assessment and further training of industry professionals. It is a meeting place with great traditions and renewals.

IFC World Congress with focus on wastewater

The IFC, Maelkeritidende and MCH are developing a new congress to be part of the IFC. IFC World Congress is the name of the new initiative that will put the spotlight on challenges, trends and technological innovation within the food industry. One of such challenges and major areas of research and innovation is the use, reuse and reduced use of water, wherefore this first congress will focus on these topics. IFC World Congress will also take place in Tech City. ■

1500 dairy products are evaluated and exhibited at FoodTech.

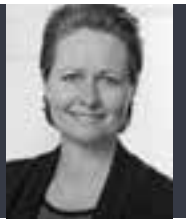
Facts – FoodTech (2016)
Number of exhibitors: 297 - from abroad: 46
Exhibition area, gross m_2: 36,000
Number of visitors: 8,675 - from abroad: 1,076

Most represented occupations:
- CEO / Managing Director / Director
- Technician
- Consultant
- Head of Department
- Dairy Technician
- Project Manager
- Engineer - Machine engineer
- Technical Manager
- Production Manager
- Engineer

Most represented industries:
- Dairies
- Machinery and equipment for food production
- Preparation of ingredients
- Packaging industry
- Bread and confectionery industry
- Chemical industry
- Research, education and knowledge centers
- Manufactory of meat and poultry products
- Brewery and soft drinks industry
- Fishing Industry

NIRAS
– from idea to realisation

Highly experienced Food and Beverage specialists are ready to boost your competitive advantage



By Charlotte Staack Schlegel, Senior Communication Partner

There is a good chance that you have already encountered **NIRAS**. With more than 700 dairy projects under the belt, **NIRAS** is the leading engineering consultant to the dairy industry.

NIRAS' specialists have a genuine passion for taking the dairy industry forward and work to improve production effectiveness and commercial performance for customers all over the world.

When time is of the essence

Often considered to be relatively conservative, the dairy industry develops rapidly. Consumer trends, demographic developments, new products and technologies are some of the important drivers of the industry dynamics. Dairy companies are under constant pressure to get competitive edges throughout the entire value chain. Market Director Morten Aae Olander of **NIRAS** explains:

-Sometimes time-to-market is the most dominant factor in a project, and our proven design methodology streamlines project execution. We take an idea to realisation through a stage-gate design model that reduces financial risks for the dairy producer while executing the project efficiently.

Factory design excellence

Designing a modern, future-proof food processing facility includes several considerations; design requirements deal with the flow of goods and products right from the incoming raw material, processing lines and packaging to design of end-product stock facilities. On top, the hygienic zones layout must be designed and integrated to floor plans and staff mobility to support the product and consumer application. Last-mentioned is particularly important at factories producing ingredients for infant formula or use in pharmaceutical products. Rolf Pedersen, Expertise Director of **NIRAS**, adds:

- Our experience is probably our biggest asset. The fact that we have made factory designs for all kind of dairy products and know exactly how to incorporate both financial, technical, and hygienic aspects to the design of factories, enables dairy producers to realise ideas at competitive conditions.

The difference a dynamic master plan makes

A modern facility design includes a master plan for production expansion with minimal interruption of production. More complex businesses typically with multiple production sites can benefit from developing a dynamic master plan. Such a plan matches long-term sales forecasts with production capacity at several sites and enables producers to optimise production and distribu-

VMEngineering is the expert on process and packaging engineering and has its headquarters in the Netherlands. The company has 40 employees divided between their offices in the Netherlands and the UK.

NIRAS covers all disciplines as consulting engineers and has its headquarters in Denmark. The company has approximately 2,200 employees and holds offices in 21 countries with Sweden, UK and Norway being the largest ones outside Denmark. NIRAS is one of the leading advisors and engineers to the Food & Beverage industry globally.

tion. With milk as raw material, it is of utmost importance to plan production changes well ahead. A dynamic master plan helps you get an overview of milk solid balances and avoid overspending in capital investment and operational. Rolf Pedersen continues:

- A dynamic master plan essentially breaks down all costs and production capacities and help producers to maximise profit from a given milk pool.

Decades of passion for innovation

NIRAS' specialists have been involved in the design of dairy factories since 1946 and have a strong tradition of working with the industry. With the recent acquisition of the Dutch company **VMEngineering**, **NIRAS** is now considered to be a leading consultancy engineering and advisor to the dairy industry globally.

- We have strengthened our position considerably in a very attractive market. The dairy industry is significant in the Netherlands and its neighbouring countries, and in general, the Food & Beverage industry holds great potential in the region. This potential we look forward to growing further, says Senior Vice President of **NIRAS** Thomas B. Olsen and concludes:

- Together, **NIRAS** and **VMEngineering** will be able to offer an even broader range of services, especially in the fields of process, packaging and utility engineering as well as operational optimisation within the dairy, beverage and food ingredients industry.

NIRAS' Food & Beverage team operates globally out of 51 offices in 27 countries. Main offices are situated in Denmark, the Netherlands, UK, Australia, Sweden and Norway. ■

Stabilising Ice Creams with Unsaturated Fat

For consumers, a healthy lifestyle is becoming increasingly important. But that doesn't mean we shouldn't enjoy a sweet treat once in a while — doing so is good for our wellbeing. This article explains how, by adjusting recipes and applying the right combination of emulsifiers and stabilizers, manufacturers can produce healthier ice cream.

By Hanne K. Ludvigsen, Global Product & Application Manager for Dairy & Ice Cream, Palsgaard A/S

These days, to maintain a healthy lifestyle and still enjoy indulgent foods, all consumers need to do is choose products with more wholesome profiles. However, just being healthier isn't enough. Healthy products must also have high-quality sensory and storage properties for consumers to view them as suitable alternatives.

Less is better

Traditionally, ice cream is made from dairy cream, but nowadays, manufacturers usually use vegetable fat, which typically contains 80 – 90% saturated fat — the type nutritionists say we should eat less of.

Fat is, of course, a vital source of energy. So, it shouldn't be entirely excluded from diets — our bodies need fat to absorb vitamins and minerals, and to structure cell membranes.

When it comes to general health, however, some fats are certainly better than others. For example, nutritionists consider mono- and polyunsaturated fats to be good, while they view saturated fats, and especially fats containing trans-fatty acids, to be unhealthy.

Consequently, due to its well-documented contribution to disease, primarily cardiovascular, health authorities in many countries recommend that consumers decrease the amount of saturated fat in their diets. In fact, FAO/WHO recommends consumption should be restricted to a maximum of 10% of daily energy intake.

Stable shelf life

Saturated fat has long been an important ingredient in ice cream production. It contributes not only to a creamy, smooth texture and pleasant mouth-feel, but, together with milk proteins and emulsifiers, saturated fat is also a primary structuring ingredient. Note that ice cream is, effectively, frozen foam, so its stability is crucial for maintaining quality throughout its shelf life.

Reducing the level of saturated fatty acids in the fat used when making ice cream will, other factors being equal, compromise the ice cream's structure, mouth-feel and stability. This is because there is less crystalline fat available for building structure.

Making ice cream

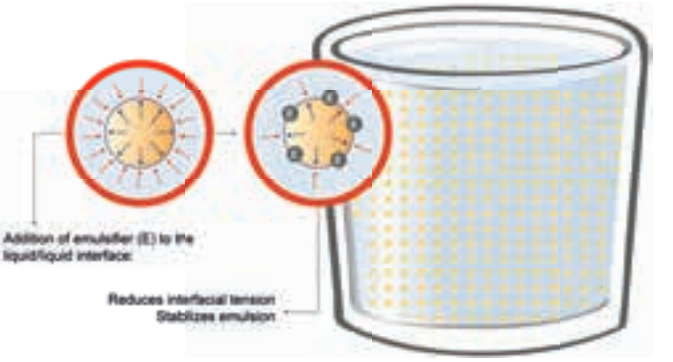
During mix production, proteins cover the fat globule surface, but during ageing, they are displaced by an emulsifier, destabilising the fat globule membrane formed during homogenisation.

Such destabilisation is necessary for the agglomeration and coalescence of fat globules when whipping (and freezing) the mix. During the whipping and freezing process, from the fat globule membrane, the emulsifier facilitates the formation of a three-dimensional structure of fat crystals around air cells. This stabilises air bubbles in the ice cream and produces a smooth and creamy texture. It also influences the ice cream's melting behaviour and heat-shock stability.

However, as already mentioned, when the level of saturated fat is reduced, there is less crystalline fat available for structure building; hence, adjustments in the recipe — especially in the composition of emulsifier— are necessary to ensure good structure and storage stability.

Emulsifiers in ice cream

The most common emulsifiers used in ice cream are mono- and diglycerides



(MDG), which are produced from vegetable fats. Mono- and diglycerides can be further esterified into, for example, lactic acid esters of mono- and diglycerides (LACTEM).

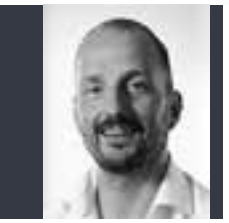
Compared with MDG, LACTEMs are more hydrophilic, and they are relatively uncommon in ice cream production. However, in combination with MDG, LACTEMs have a significant influence on foam stability and texture. Manufacturers can utilise this fact to produce ice cream with lower levels of saturated fat. As always in ice cream production, stabilizers are added together with the emulsifier. The stabilizers are then hydrated and dispersed during the water phase. This reduces the amount of free water in the ice cream, which lessens the risk of ice crystals growing and improves the ice cream's sensory properties.

Better health ahead

With much of today's ice cream containing 80 – 90% saturated fat, and lifestyle diseases on the rise, the task is clear: Manufacturers must change their products to protect both consumers and their business viability.

We're hard at work in Palsgaard's state-of-the-art laboratories around the world, optimising blends of emulsifiers and stabilizers to create ice cream recipes that can counterbalance lower crystalline levels. For consumers, this means they can enjoy high-quality, healthier ice cream treats with only 40 – 50% saturated fat. And it enables ice cream manufacturers to keep up with market priorities while supporting sustainability goals, too. ■

High Precision Filling Machines for the Food Industry



By
Lars Henriksen,
Sales Director,
Primodan

Primodan is a Danish manufacturing company incorporating more than 65 years of experience within the dairy and food processing industry.

Worldwide

Primodan is an order-producing company of filling and sealing machines for premade cups, buckets and bottles. The company also manufactures complete white cheese (feta style) filling lines and machines throughout the world.

Primodan is tailoring the equipment to fit the clients needs - and like our machines, we are known as the flexible partner in the business. Our machines are installed for customers worldwide, and are engineered to work 24/7 in highly efficient production lines.

High precision fillers by Primodan

Primodan strives to be the preferred supplier of filling machines to the food industry –and we are proud to present our new range of ultra high precision fillers. Our new lines utilize a technique where our dosing units are connected to first class loadcell systems and adjusts itself automatically. It results in the maximum benefit and profitability for our clients, by significantly reducing the "give aways" from the production lines.

Whether your product is produced in a batch process where the density of the product changes from one batch to another or if your production is an inline continuous production - then the Primodan filling lines greatly enhances the filling performance by matching the individual weight of a package with the actual nozzles which filled that specific package.

The dosing system instantly adjusts the filling volume based on the weight of each package.

The same checkweighing system is also utilized to optimize the running state of the dosing system by comparing the filling data from the individual nozzle with the data from the loadcells. Discrepancies in the data can detect broken gaskets or other malfunctions in the dosing system.

The development of the ultra high precision fillers proves our ambition to be the market leaders in filling equipment. ■

For more information concerning Primodan filling lines – please contact info@primodan.com or see www.primodan.dk

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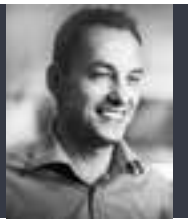
Reliable water treatment
for the food and beverage industry

Danone Ukraine, a large international manufacturer of dairy products, and the company RUD, a leader among the Ukrainian producers of ice cream, are both realizing the benefits of reliable water treatment from SILHORKO-EUROWATER.



By
Jens O. Gjerløff, Marketing Manager, SILHORKO-EUROWATER A/S

One of the most important issues within the food and beverage industry is a reliable daily supply of the desired water quality and quantity. It is vital for ensuring high-quality products as well as dependable production with no downtime. The focus of Danone Ukraine is to follow extremely high international standards providing the best dairy products for the Ukrainian market. And the aim of RUD is to ensure high water quality to produce one of the best ice creams in Ukraine.

Designing, manufacturing, delivering, and servicing water treatment plants with high reliability of operation is EUROWATER's mission. In other words, what these two companies wanted characterizes exactly why EUROWATER is here: "We treat water" - and have been doing so since 1936. That is more than 80 years of proving the quality of our solutions, confirmed by a very high repurchase rate from existing customers.

Pre-engineered filtration units for RUD, Ukraine

The Public Joint-Stock Company "Zhytomyr Butter Plant" – known as RUD is an industry leader among the Ukrainian ice cream producers. "Ice Cream No. 1" is not only considered to be the publicity slogan but also the goal of the company's activities.

A reliable supply of 2 x 25 m³/h of clean water was needed for several purposes; ingredient water for the ice cream production (mixing with dry milk), water for rinsing and water for push-out between production batches.

The raw water is municipal water sourced from a river. Therefore, to secure a good inlet water quality the first treatment step is to treat the water for mechanical impurities. This is done in pressure filters designed and manufactured at one of EUROWATER's own vessel factories. The filters are quite unique in design, offering very efficient backwashing for continuous and trouble-free operation.

The second treatment step is nanofiltration. Nanofiltration is a membrane technology, which is constructed and operates like reverse osmosis, but only retains divalent ions and larger molecules. It leaves some hardness in the water, which is a requirement for this specific application. The technology operates with a lower pressure than reverse osmosis (RO), typically less than seven bar, resulting in a lower energy consumption per volume of treated water.

The delivery included several units: pressure filter, dosing units, nanofiltration units, CIP unit, and central PLC control cabinet. The scope of supply included installation and start-up, undertaken by the EUROWATER sales and service team in Ukraine.

Complete water treatment solution based on pre-engineered EUROWATER units for RUD, Ukraine.

Custom-made reverse osmosis unit in sanitary design for Danone Ukraine

The products for RUD were pre-engineered, meaning that they were selected from a catalogue of standard units based on the requirements. The EUROWATER modular-built standard system includes all necessary documentation such as certificates, instructions manuals, and spare parts lists. Danone Ukraine wanted a solution that was not directly available in the standard product range; a reverse osmosis (RO) unit in sanitary design and equipped with a selection of customer-defined measurement equipment following the very high

Danone standards for all components.

The production needed a reliable supply of 12.5 cubic meters of demineralized ingredient water per hour.

The supplied RO unit is custom-made for Danone Ukraine. The horizontal pressure vessels holding the membranes as well as the pipe system and valves are in stainless steel, quality AISI 316L. The unit also includes a UV disinfection unit as well as a cartridge filter on the inlet, and is equipped with a range of very high-quality instruments for measuring flows, conductivity, and redox. The inlet water for the RO unit is pre-treated in existing sand filters and ultrafiltration units.

In addition to the RO unit the solution includes a CIP unit for the RO as well as installation and start-up. The unit has been supplied to the Danone facility in Kremenchug, 300 km south-east of Kyiv and is ready to be installed, again by the EUROWATER sales and service team in Ukraine. A factory acceptance test (FAT) has been performed in Denmark before delivery. ■

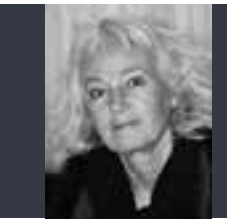
Pure water treatment since 1936

SILHORKO-EUROWATER has more than 80 years of experience within the fields of developing, manufacturing, selling and servicing complete water treatment plants for the food and beverage industry, heat and power plants, waterworks, hospitals and other industries. The main applications are product water, boiler water, process water, cooling water, rinse water and drinking water. SILHORKO-EUROWATER has almost 400 highly qualified employees at 23 sales and service offices around Europe. For more information, please visit www.eurowater.com

EUROWATER custom-made reverse osmosis unit in sanitary design for Danone Ukraine.

Sustainable Solutions for the Future

SPX FLOW to Highlight its Sustainable Solutions for the Future at Anuga FoodTec 2018



By Irene Constantin, Marketing Communications Manager, SPX FLOW, Inc

SPX® FLOW has a long history in serving the Food & Beverage industries with innovative, efficient and reliable solutions that are designed to help manufacturers gain and maintain a competitive edge today and into the future. Its program of continuous research and development helps ensure its precisely engineered solutions meet the challenges faced with changing consumer demands and market pressures.

Focus on four keymarkets

At this year's exhibition, SPX FLOW will focus on four key market and process areas within the Food & Beverage sector: Dairy Powder Nutrition, Dairy & Beverage Nutrition, Dairy & Vegetable Fats and Processed Foods. Using best-in-class technologies, customers will learn about how SPX FLOW solutions can drive efficiency, reduce operational costs and optimize the use of valuable resources while helping them create fresh and exciting new products that will tantalize their consumers. Products and solutions to be highlighted include Anhydro's® evaporation and drying technology specifically designed to protect nutritional value of Infant Formula. This innovative approach to powder drying offers many additional benefits including higher yield of lactose

powder and best in class non–caking permeate powder and functional whey protein powders, as well as technologies to produce other high value protein powder from both animal and vegetable raw materials. The display of technology will be supported by taste samples for customers to try, incorporating bakery foods produced using the Gerstenberg Schröder® bakery range of solutions and dairy products processed using APV membrane technology. Virtual reality displays will further be used to present other key process equipment, such as plate heat exchangers.

New pumps – new standards

WCB UTS pumps use a special non-galling alloy that enables tight clearances inside the pump without risk of seizing. This provides excellent performance and reliability even in applications with low inlet pressure. Based on 60 years of experience in the design and manufacture of PD pump technology, the new Universal 3 Series PD pumps set a new standard in sanitary performance and, using a robust front-loading seal design, are designed to increased process uptime. The APV Cavitator is an innovative mixing and dispersion technology which harnesses forces from the collapse of controlled cavitation bubbles to provide superior mixing results for even the most difficult solutions and heating of liquids without scale build-up. The Seital® bacterial clarifier is quick and easy to install. Its design and highly effective process control offers users exceptional performance and, with high dynamic stability of mechanical parts, excellent process availability.

Mixing and blending solutions

SPX FLOW offers an exceptional range of proven components, systems and services for the Food & Beverage industry. Our booth will include SPX FLOW's comprehensive mixing and blending products, mix-proof valves, pumps, homogenizers, heat exchangers and separators. Informative animations will also be displayed to help explain product concepts to increase customer understanding of some of the solutions that will help them deliver sustainable production today and into the future. The booth will further include the display of several different automation solution options including SPX FLOW Integrator and a wide range of 3rd party systems to meet varying plant needs. Additionally, informal presentations on the critical area of IT/OT control system security will be made throughout the event as well as a deep into the industry leading automation solutions offered by SPX FLOW, which embrace legislative solutions and engage the IIOT technologies now available.

Service and aftermarket solutions

The comprehensive range of aftermarket services provided by SPX FLOW will also be a key feature of the stand. Complementing both pro-active and reactive strategies, our solutions to customers' maintenance needs will be showcased throughout the show.

We will be introducing a number of newly developed maintenance kits and selection tools to make sure choosing the right parts to secure asset performance is now easier than ever before.

Moreover, customers will be able to see live demonstrations of the innovative, highly advanced and non-intrusive SPX Magnerscan 2 (on-site crack detection) integrity testing technology. Magnerscan 2 enables eco-friendly inspections of spray dryers without the use of gases and liquids. Taking only a short time to complete, this solution can be incorporated into scheduled maintenance routines and have the potential to substantially reduce the risk of product contamination whilst lowering overall production costs

SPX FLOW solutions focus on maximising the use of resources for cost effective production and environmentally friendly processing as well as supporting process and food safety. Experts will be on hand throughout Anuga FoodTec 2018 at stand E010 F029, Hall 10.2 ■

APV Cavitator

More information

For more information on SPX FLOW, please visit www.spxflow.com.

New Tetra Pak mixer delivers better mixing and lower energy consumption

The Tetra Pak® High Shear Mixer R370-1000D is a patented mixing solution, which is revolutionizing the mixing process for huge potential improvements in cost savings and product quality. The innovative new design moves the mixing head and high viscosity pumping device outside of the traditional mixing tank – and it replaces the mixing tank with a dedicated deaeration unit.

By Søren Steffensen, Commercial Product Manager

Mixing is often the first in a long line of processes and it greatly influences product quality and production costs in food production. If not done properly, unwanted air in the product and inefficient mixing negatively influences the downstream processing. It increases costs, shortens shelf-life and compromises food safety and quality.

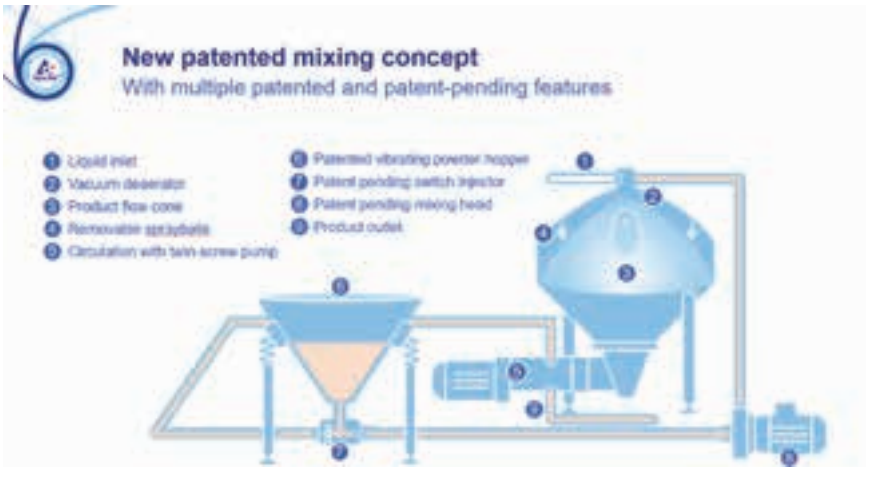
To solve some of these key issues, the new generation high shear mixer is designed with both the mixing head and the high viscosity pumping device placed separately outside of the traditional mixing tank. Each of these devices have been optimized to obtain the highest mixing and pumping efficiency. In addition, Tetra Pak have replaced the traditional mixing tank with a dedicated deaeration unit. Also, all of these components are designed to be independently controlled to give the greatest possible flexibility and control over the mixing process. This in turn enables producers to achieve superior emulsification, powder dissolving and deaeration performance and run high viscous products in a continuous or recirculation setup.

Superior emulsification, powder dissolving and deaeration performance

The new solution enables better emulsification performance – reducing energy consumption, ensuring quality and giving food producers better utilization of ingredients. The very high shear – up to 100,000 reciprocal seconds, in a five-stage mixing process – means we have the unique ability to deliver down to one micron fat droplet size. This is very difficult, if not impossible, to achieve with other mixing solutions. The size of the droplet influences the taste and mouthfeel of the products and increases their stability. The smaller the droplets, the more stable the product is, meaning less high pressure homogenization downstream is needed. Food producers can actually reduce homogenization pressure.

All this reduces the energy consumption significantly. And the improved powder dissolving performance also enables better utilization of ingredients, such as stabilizers, allowing to use less of these ingredients in the recipes. Thus, energy savings and ingredient savings combine to reduce the total cost of ownership for the whole solution.

Furthermore, the new setup prevents unwanted air incorporation and removes air effectively to ensure high product quality and an improved downstream process. It may even allow to eliminate additional downstream deaeration for even greater savings on equipment and energy costs. Improved powder introduction, thanks to the new powder hopper design, prevents excessive amounts of air entering product with the powder ingredients. And a flexible setup lets you place the powder



Tetra Pak Processing
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Customer Management Manager
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Or for headoffice:
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handling where you want it without risking increased air incorporation.

Run higher viscosities and higher dry matter content

In large scale production, recirculation is more cost-effective than batch processing but normally there are constraints when it comes to high viscosity products. High product viscosity often makes recirculation mixing difficult. The new setup handles viscosities of up to 2,000 cP, where most typical recirculation solutions cannot go above 200 cP. This enables food producers to produce high viscosity products such as ketchup and dairy desserts much more efficiently. The new setup also enables to mix products with higher dry matter content – up to 80%. This opens up for huge savings in infant formula production for example, where having higher dry matter content means much lower costs for evaporation later on.

Thinking outside the tank to revolutionize mixing

The special patent-pending mixing head design allows very narrow tolerances and very high speeds in the rotating device. This provides high mixing intensity with ultra-high levels of turbulence and shear rate. The design also secures that no product passes the device without being subjected to this high intensity mixing region multiple times. In comparison, in traditional rotor stator systems most product often bypasses the high intensity region and passes through the mixing head only once. In the new Tetra Pak High Shear Mixer R370-1000D, the product is forced to go through the high intensity region at five stages. And since it is placed completely outside of any tank, it causes no turbulence or vortex that could incorporate unwanted air into the product.

The high viscosity pumping device is also placed outside the tank and is also separately controlled. Its unique design makes it able to pump both high and low viscous products without risking cavitation – despite being located just downstream of the deaeration unit where the suction pressure is very low, i.e. down to 0.15 bar. Unlike typical centrifugal pumps, which would lose pumping ability at this low pressure, the twin-screw pump continues to work efficiently and also treats products very gently.

A dedicated deaeration unit with a specially designed inlet distribution nozzle and a large interior cone inside a vacuum tank now replaces what once was the mixing tank. The geometrical design of the inlet nozzle ensures that the product is calmly and evenly led onto the conical structure and distributed over it in a very thin layer. This allows any air bubbles to rise quickly to the surface and be removed, while ensuring that the product surface flows smoothly and calmly without turbulence or splashing.

All in all, this patented new mixing solution prevents air in the process and products and offers a very flexible mixing for a wide range of ingredients and viscosities. And it achieves this while also ensuring great efficiency to keep total cost of ownership and carbon footprint as low as possible. ■

Waste heat with huge potential

The dairy industry can achieve profitable reductions of energy through systematic approach and waste heat recovery.

By
Fabian Bühler and Brian Elmegaard, Department of Mechanical Engineering, Technical University of Denmark
Fridolin Müller Holm, Head of industry, Viegand Maagøe A/S
Poul Erik Madsen, Energy Consultant, Arla Foods

A systematic approach for analyzing the energy use in dairy factories is the key to obtain the maximum of possible energy and economic savings, while taking advantage of the latest technological developments.

An analysis made within the research project THERMCYC for the utilization of industrial excess heat in Denmark showed that there are large opportunities to reduce energy use by smart integration. It was found that in Denmark the excess heat from the food industry alone is equal to the heating demand of around 150,000 households.

Focus on the dairy industry

The dairy industry was early in the research project identified as a promising sector, where the new developments could be integrated and lead to a considerable reduction in energy use. It was found, that in Denmark the dairy factories are responsible for one quarter of the waste heat from the food industry. In particular drying, evaporation and refrigeration processes cause these large amounts of waste heat.

Systematic approach for successful integration

The work with opportunities to minimize the amount of excess heat and thereby saving money has to be approached with a strict bottom-up analysis. It is important to obtain a complete overview of all the energy using processes as well as the energy supply of the dairy factory, before decisions for optimizations are taken. This will avoid wrong prioritization of projects and bad investments.

The first step is an energy mapping, where the energy need for all processes with heating and cooling demands and utility systems are systematically analyzed. With the energy mapping in place it is then possible to assess the state of energy efficiency, from which suggestions for improvements can be made.

The optimization should be done by the following steps:

- Optimizing the energy need by challenging process parameters and equipment design
- Internal process integration
- Optimizing energy distribution systems
- External production process integration
- Optimizing utility systems
- External heat recovery

The consultant company Viegand Maagøe who is participating in the THERMCYC project has with success assisted a broad variety of Danish and international companies in working with this systematic optimization method.

Heat pump technology with cost-effective integration

The temperature of the waste heat will often be below the required process temperature. In these cases, heat pumps can be used to lift the temperature of the waste heat to higher temperatures. New developments made within the

Heatpump reduced Arlas gasconsumption with 30 pct.

Several examples from Denmark confirm that it is both technically and economically feasible to utilize waste heat. As an example, Arla Foods has been working systematically with energy optimisation, based on the principles described in this article. This means that Arla Foods has made a complete mapping of energy on all sites. From the energy maps it became clear that there was potential for utilizing waste heat both internally and externally. The internal waste heat could be utilised both directly and by the use of a heat pump.

The heat pump can act as a cooling and heating device covering the cooling demand at 2 °C and at the same time covering the heating demand at 85 °C. Cases from Arla Foods show that by making this integration the consumption of natural gas could be reduced by more than 30 %. These potentials would not have been fully exploited if Arla Food had not worked systematically with the energy optimisation.

THERMCYC project show, that the performance of the heat pump can be increased with up to 40 %. Higher temperatures will make the utilization of heat pumps an interesting option for drying, pasteurization and sterilization processes in the dairy industry.

CO_2 neutral utility system and export of heat

After the processes have been improved, the utility system should be optimized, and cost-efficient and environmental alternatives should be assessed. Increased efficiencies of heat pumps, meaning less electric energy required to increase the temperature, make it interesting to replace existing utilities, e.g. natural gas fired boilers. If the electricity is generated from renewable sources, the CO2 emissions can be considerably reduced. There is also the opportunity to produce process heat and cold water in the same heat pump, to further increase the degree of utilization (external process integration).

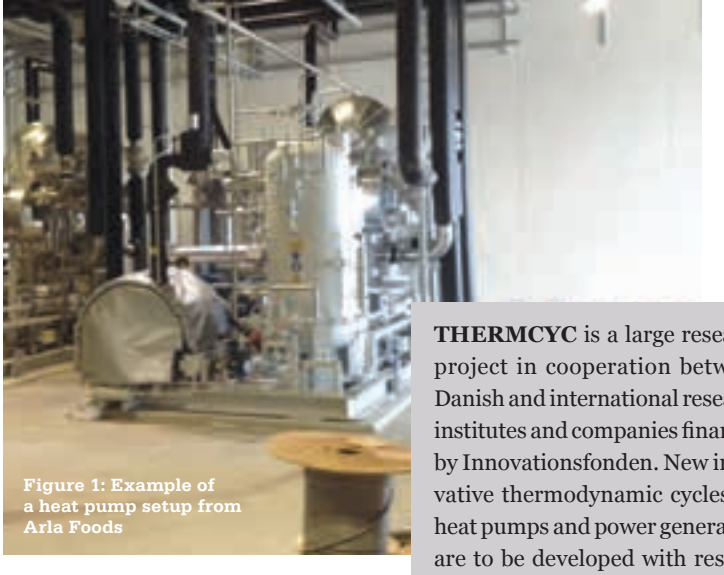

Figure 1: Example of a heat pump setup from Arla Foods

At the end the remaining excess heat, e.g. drying air or condensate, should be utilized outside of the factory (external heat recovery). This can, for instance, be other industrial sites with heating demands or district heating networks. Studies, made within the THERMCYC project showed that there is a large potential of exporting waste heat. Excess heat from a milk powder factory could supply up to 4.000 households with district heat. ■

THERMCYC is a large research project in cooperation between Danish and international research institutes and companies financed by Innovationsfonden. New innovative thermodynamic cycles for heat pumps and power generation are to be developed with respect to excess heat in Denmark. The projects partners are the Department of Mechanical Engineering and Chemical Engineering at the Technical University of Denmark, Aalborg University, Danish Technological Institute, Viegand Maagøe, AP Møller Mærsk, Danfoss, Arla Foods, Alfa Laval, Technische Universität München, Delft University of Technology and MAN Diesel & Turbo.

These companies are working towards a more sustainable future through research and innovation

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The Thermcyc is funded by Innovationsfonden

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70-year experience
in customer-driven innovations

TREPKO delivers full packaging lines with different types of unit packaging and a great variety of end-of-line solutions with technical support included. Among our latest releases are an integrated system for product mixing and filling and a double indexing feature in rotary machines and further development of aseptic machines.

By
Piotr Lisewski, Msc Eng,
Development Director, TREPKO Poland
Agnieszka Libner, Msc MBA,
Managing Director, TREPKO Poland

For more than 70 years TREPKO has had a very special approach in implementation packaging innovations for our customers'. Common for our activity is that it is driven from the needs of the consumer and in a process of mutual understanding and communication. The result can be a new product, new packaging or a new process.

TREPKO's activity concentrates on two innovation types: process innovation and product innovation, which are closely connected, meaning that our process innovations lead to product innovations. Very often, new market possibilities has been mulitplied thanks to an investment in TREPKO equipment – flexibility.

Dry Filler

Recently, a number of interesting new solutions that illustrate TREPKO's innovation policy have been introduced.

A new system for mixed product filling

Thanks to a new dosing system, rapid flavours change is made possible. Small machines in respect of a footprint dimension is prepared for fast short batches, which give possibility to prepared for huge variety of flavours with minimum of product, water and media loses.

Smart product delivery installation is based on two dosing systems, one for white mass and the other for e.g. different flavours of fruit with separated CIP system. While one of the piston pumps is designed for volumetric dosing of fruit, the second one is designed for white mass and mixture dosing. The measured flavour is injected into the pipe coming from the main hopper. White mass and fruit is delivered through the mixer by the main dosing system into containers. A dynamic mixer mixing two components together. The speed of the dynamic mixer is adjustable from the HMI touch-screen panel, by this design a perfect mixing result is guaranteed.

The dynamic mixer and the fruit pump is integrated in the filling machine and those are both CIP-cleanable.

The dosing volume of the flavour is automatically adjusted from HMI touch-screen , and it is also integrated with white-mass doser. These settings are a part of each recipe.

For flavour change the automatic CIP manifold and the main dosing pump is activated, thereby is it possible to flush the dynamic mixer and the dosing cylinders, at the same time keeping the white mass in the main hopper. It is optimising a water and CIP agents consumption. Aditionally there is a huge reduction of fruit and white mass waste, with a guaranteed reduction of the changeover time.

Double-indexing rotary and in-line machines

Another perfect example of customer-driven innovation is represented by a number of delivered filling machines with a double-indexing feature. Thanks to this feature different product + packaging combinations are being filled at the same time. Such solutions are based on a modern driving technology, reliable mechanical design of the dosing system as well as perfect control solutions.

Using two different packaging types on the same machine, and at the same time, does not limit other machine functions, such as additional dry fillers. These types of machines are very popular both in the rotary and in-line versions.

Ultra-Clean and Aseptic solutions

The consumer requirements of the product safety keep growing, and a failure to meet them can be very expensive for a dairy producer. TREPKO is ready to share this responsibility and therefore pays special attention in furthering improvement of the hygienic features of the filling machines. Both rotary and in-line machines are delivered today in the Ultra-Clean standard with packaging sterilisation. At the same time, TREPKO's dedicated team can offfer in-line aseptic machines with a proven sterilisation efficiency, which has been certified by an independent laboratory with the killing rate level of log 5,9.

Double Index Rotary Filler

TREPKO's premises

These are very few examples of the TREPKO's innovation potential. During the past years TREPKO has grown not only in numbers, but – first of all – in capabilities. Today we are ready to deliver full packaging lines, including both different types of unit packaging and a great variety of end-of-line solutions. All of this is available from the TREPKO's own premises with technical support included. Thanks to these possibilites TREPKO is prepared not only to deliver packaging machines, but assist in implementation of the boldest customer-driven innovations. ■

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4 Days to learn what cheese is, how is it manufactured and how to manage the processing and the quality of products.

6 trainings planned in 2018

January I Hard cheese technologies - Advanced training courses

March I Soft Cheese technologies - Advanced training courses

September I Cheese technology - Basic knowledge

October I Dairy technology - Basic knowledge

November I Processed cheeses - Advanced training courses

November I Pasta filata cheeses - Advanced training courses

More details on our website : www.anfopeil-enil.fr

Distance learning plan

To prepare or to complete your training in a French dairy school :
E-learning is a distance learning technique allowing you to follow courses on the Internet. With Webalim, we furthermore offer individualised follow-up.Webalim offers quality online courses designed by teachers from the ENILs.

Food Biochemistry

Food microbiology

Dairy processing and technology

Cheese processing and technology

Hygiene

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