

Danish Dairy & Food Industry ... worldwide



Revitalizing Dairy:
Customized Products - Green Technology

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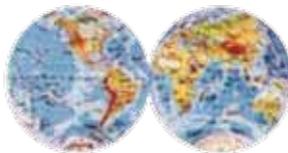
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Denmark - September 2016

Revitalizing Dairy: Customized Products – Green Technology

The topic of this year's edition of the international magazine "Danish Dairy & Food Industry ... worldwide" is "Revitalizing Dairy: Customized Products - Green Technology". Thus, Danish Dairy & Food Industry 2016 includes editorials with various perspectives on how to contribute with green, sustainable ideas and actions to handle the scenario of more milk for more specific consumer groups worldwide.

The Danish Minister for the Environment and Food, Esben Lunde Larsen introduces the magazine, and outlines the Danish dairy/food sectors world-renowned position within new technologies and processes, and not least high-quality, sustainability and food safety.

Further, Arla Foods outlines some of the Groups strategies for developing and marketing revitalized or totally new goods such as organic, lactose-free, high-protein and hand-made dairy products for specific consumer segments in international markets.

However, it is not possible to produce well-known and new improved dairy products if the supplier sector cannot deliver the necessary and constantly energy up-dated green processing equipment, automatization, natural as well as organic ingredients, the greenest packaging, and highly efficient hygiene- and analysis concepts. Thus, the magazine includes editorials from a large number of companies presenting their impressive commitment always to be in front when it comes to inventing new features allowing global dairies to produce innovative foods for the world market.

Excellences in the dairy sector are only possible when based on highly and well-educated students and staffs, and Denmark ranks high within both dairy education and research. Thus, the magazine includes editorials about these topics too.

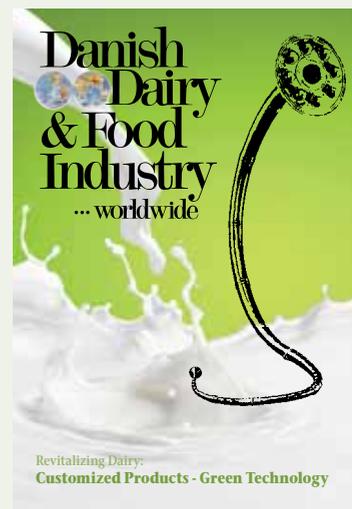
We would also like to draw your attention to the up-coming Nordic Dairy Congress to be held in Copenhagen, Denmark 7-9 June 2017. The Nordic Dairy Congresses has been organized every third year through almost a century. The program of next year's Congress, under the theme "Adding Value", will up-date all participating international dairy professionals with the newest knowledge within dairying in all aspects.

The Danish Dairy Managers Association and the Danish Dairy Science and Technology Association own Danish Dairy & Food Industry ... worldwide. We have published the magazine since 1976, and this issue is the 26th in succession informing you about Danish dairy and food industry.

Danish Dairy & Food Industry ... worldwide is distributed in more than 120 countries in 10.000 copies. Further, the magazine is available at our homepage: www.ddfi.dk. Our experience tells us that about 100.000 dairy and food professionals worldwide study this journal every year. ■

Anne-Sofi Christiansen
Chief Editor

Anna Marie Thøgersen
Editor



The cover shows a lure. This instrument dates from the Danish Bronze Age (about 600 B. C.). It has only been found in Denmark and the former Danish territories. Today it forms part of the Danish Quality sign known as the "Lure-brand", used on dairy products. Background picture by Colourbox.

Circulation: 10.000 copies

Readership: Leading personnel in the dairy and food industry in more than 120 countries as well as employees at Danish embassies and consulate-generals, Government advisers and representatives of marketing councils.

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- MES and ERP integration, OEE
- Upgrading and optimizing
- Professional consultancy
- Training and education, Au2mate Academy
- Standard solutions
- Installation and commissioning
- Service and maintenance

Au2mates's know-how covers every dairy process

Au2mate's know-how covers every dairy process from raw material reception to packaging including high valueadded processes, OEE and MES solutions. Please refer to our web page for further contact information in Denmark, UK, Poland and Dubai.



Au2mate

PROCESS AUTOMATION PARTNER

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QUICK FACTS ABOUT AU2MATE

- Au2mate was founded in Denmark in 2001.
- 82 employees at offices in Denmark, UK, Poland 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.

Denmark wants to enter more new export markets

Danish dairy production and farming have always based their success on the ability to innovate according to market trends, and be the leader when it comes to developing new technologies and processes.

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

Our family farm

As a boy, I had duties every day on our family farm, where I grew up. As a teenager, I occasionally had to help my dad in the cowshed at 5.45 am. Sometimes it would be freezing cold, I risked being kicked by the cattle and it was not always the most interesting work for a teenager. Nevertheless, I would not have wanted it any other way, because it fed my entire family, and my dad and I actually enjoyed our mornings in the milking parlor.

Doors to new markets

Now, as the Danish Minister for Environment and Food, when I think back on the time I spent in my dad's milking parlor, I am proud that now I can help open doors for farmers to new growth markets. This will be through some of the Danish strongholds such as food safety and traceability. These qualities have been developed as a result of decades of strong alliances between Danish businesses, authorities and stakeholder organisations.

This tradition means that now we are helping Kenya, the engine of growth in East Africa, to spread higher quality of butter, and much more. In late May, I visited Kenya with the Danish Agriculture & Food Council and several Danish businesses. The tropical climate in the country makes it difficult to main-

tain a high level of quality and hygiene when milk is being transported from the many small farmers to the dairies. This leads to wastage and lower quality.

Quality, sustainability, food safety

Danish businesses have the solutions to these challenges. In Denmark, we have developed knowledge and raised awareness about quality and hygiene in all parts of the value chain. This means that today we are producing some of the safest and most sustainable food in the world.

However, Danish technology and knowledge not only prevent the local population from having to worry about becoming sick from the food they eat. They also help mitigate pressure on the environment and climate.

Denmark is currently producing some of the most climate-friendly milk in the world. Countries in Africa and in other parts of the world urgently need this technology if the rapid population growth is not to result in massive climatic destruction and migrations of people.

When a consumer in Hamburg or in Beijing sees a packet of Danish butter in the supermarket, there is always a cheaper packet next to it. However, they still buy our butter. They do so because we are not competing on price,



but on quality, sustainability and food safety. This enables us to sell our products at a higher price than our competitors. And, this makes me very proud. ■

OUR VISION

Creating the future of dairy to bring health and inspiration to the world, naturally.



Arla is owned by European dairy farmers. They deliver the high quality milk and we ensure that its natural health benefits and great taste is delivered all over the world.

Together with our farmer owners, we envision a future in which the full potential of dairy is realised. Where natural dairy products outcompete less healthy alternatives. Where the taste of pure dairy is celebrated in homes and professional kitchens around the world. Where food manufacturers turn to high quality dairy-based ingredients to improve their products. It is a future in which safe dairy nutrition is affordable and accessible to everyone.

Our belief in this future of dairy drives us and we all work hard to create it. Tough choices, significant investments and doing things differently will bring health and inspiration to more people across the world – every single day.

Arla Foods amba - www.arla.com

Arla focus on Good Growth

Danish headquartered Arla Foods is no. 7 on the world's Top-10 Dairy-list. In UK, Sweden and Denmark, Arla is the no. 1, and in Germany, the Netherlands and Finland amongst Top-3. In the new corporate strategy: "Good Growth 2020", Arla focus on growing the brands Lurpak, Arla and Castello on existing as well as new markets. Not least to move more milk outside Europe to increase revenue from non-core markets to 20%.

Arla plans to take several path to reach the Good Growth Goals. Some emerging niches are lactose-free and organic dairy products as well as hand-made dairy goods.

By Anna Marie Thøgersen, Editor

Arla Unika®

About 10 years ago, Arla started a Cheese-Revival-Tour rediscovering Old Danish Cheeses. Today, a couple of these successful Unika-cheeses are Krondild and Havgus. Krondild is a dill-flavoured creamy cheese inspired by the Nordic tradition of pickling vegetables with dill for preservation. Havgus (Sea Mist) is a yellow cheese inspired by the marsh-

lands of Denmark with a pure taste and filled with small crispy protein crystals.

During the last decade, Dairywomen and Women have cooperated with celebrity chefs on developing a broader selection of 15-20 dairy products under the Unika-umbrella. The Unika products are available only in special stores and at top-restaurants. However, they are also introduced abroad. In 2013, four

of the Unika cheeses were launched at high-end restaurants in New York, and amongst those were Krondild and Havgus. - The NY-restaurants still have Unika on the menu, tells Arla Global Director of Speciality Cheese, Jens Egelund. He adds that since 2013, Arla has run several Pop-Up-Stores introducing both Castello and Unika in capitals like Amsterdam, Stockholm, London and New York - and with great success. - We are in no rush, nevertheless we want our share of the high-end-markets with the Unika-brand, but it is important to us, that Unika does not lose its original DNA: Creativity, dedication, storytelling, and top-technical knowledge - although the Unika-products are handmade!



Depending on consumer demands, Arla plans successively to reach 1.2 billion litres of organic milk - or almost 10% of the Groups total milk volume in 2020.



Arla continuously develop more lactose-free dairy products and offers a wide range of products under the brand Lactofree®.

More Lactofree®

Almost 70% of the world-population suffer from lactose intolerance, and in several Asian countries, almost all citizens are lactose intolerant. - During recent years, international Groups tried to launch lactose-free dairy products in Asia with limited success. Henrik Frøkjær, Marketing Development Director, Asia tells that Arla's Chinese business partner Mengniu, has already launched a lacto-free range supported by extensive marketing campaigns, however still only gaining a 0,5% market share. In Asia, just 1% of the new

Facts about Arla

- Arla Foods is no. 7 on the Worlds Dairy Top-10.
- Total milk volume 14.2 billion kg.
- Production and packaging facilities in 16 countries.
- Sales offices in 38 countries.
- Main Brands: Arla®, Lurpak® and Castello®.
- Employees around the World 19.000.
- Total turnover 10.3 billion EUR.
- Owned by 12.650 farmers in Denmark, Sweden, Germany, the UK, Belgium, Luxembourg, and The Netherlands.

launches are within Lacto-Free vs 12% in north Europe (Innova Market Insights, 2015). The segment for Lacto-Free is still in its infancy, as Asians consumers does not see the need for nor understand Lacto-Free products, Henrik Frøkjær explains. And, as the Chinese citizens consume relatively little milk per day they choose to overlook the fact that they get a stomachache from the milk rather than buying Lacto-Free products to solve the problem. In Asia, Arla markets lactose-free UHT-milks and Cream Cheese in the Philippines, Singapore and Malaysia, and is ready to roll out more products in more countries when the demand starts growing, stresses Henrik Frøkjær.

The situation is different in the Americas and Europe. During the last five year, the lactose-free milk products achieved double-digit growth rates in these markets. It is no wonder that a global player like Arla continuously develop more lactose-free dairy goods and today offer a wide range of products under the brand Lactofree® including; several cheeses, milk and creams, butter, spreadable, yoghurts and the rocket-flying Icelandic inspired low-fat and high-protein: Skyr. At Arla's main market - multicultural UK, the company last year experienced no less than a 24% sales growth of Lactofree® products.



The creamy cheese “Kronild” is one of Arla Foods 15-20 hand-made Unika Dairy Products. Some of the Unika-cheeses are by now presented at the famous Danish top-chef Klaus Meyers' new Great Northern Food Hall in Grand Central Terminal in New York City.

World's no. 1 in Organic

Arla Foods is by far the no. 1 on the Top-10 global list of organic dairy products! Today's full organic range complements the growing international demands for organic foods. In Denmark and Sweden Arla is big in organic and last year a new group of organic dairy farmers in Germany made it possible to launch Arla® BIO Pasture Milk at the German home market. - Regarding this market, we consider whether to launch new dairy products in organic versions before we market them as conventional. This strategy should provide greater knowledge of Arla products in general, explains Povl Krogsgaard, Vice CEO, Arla Foods.

It is worth mentioning a special success story in this segment; Arla Baby & Me Organic. Since its launch in Denmark in 2012, sales have risen on average by 213% annually! Facebook was the path to these excellent figures, as young mothers are digital and social - and always on the outlook for the very

best and preferably organic foods for their babies. After a single “advertising” on Facebook, inquiries from several hundred Danish mother-groups hit the sale! In just four years, Arla Baby & Me Organic has captured a 14% market share in Denmark.

Arla's recruitment of organic milk continues, as the living standards increases in emerging markets and thus rising demands for organic products. - In China, Arla Baby & Me Organic is growing in popularity, although more expensive than our other high-quality baby-foods, stresses Povl Krogsgaard. The Vice CEO adds that Arla's present share of organic milk is 800 million litres a year - or 6% of all Arla-milk. Depending on consumer demands, Arla plans successively to reach 1.2 billion litres - or almost 10% of the Groups total milk volume in 2020, and before then there will probably be Lactofree versions of organic Arla dairy products - too. ■

Green Awareness at KOLD College

KOLD College is an expert within tailor-made courses for the international dairy and food industries.



By
Hans Skjerning,
Principal, KOLD
College

Global outlook

For decades, international aspects has played a major role at KOLD College's Dairy Training Centre. Numerous courses and contacts worldwide bring inspiration to the College, and additionally demand high standards of flexibility and quality.

Our staff successively participates in international activities, and each year our dairy teachers visit international dairy companies to catch up on new trends and tendencies within dairy production.

Further, we frequently arrange tailor-made courses for DANIDA as well as for international companies and partners. In addition, KOLD has established partnerships with other international dairy schools, as for example Karacabey Vocational School in Turkey and Escuela Superior Integral de Lecheria in Argentina.

International dairy courses

We organize various courses for international dairy people in the following training areas: Basic, Maintenance, Technology, and Laboratory Training. The courses includes subjects within; Milk treatment, production of fermented milk products, special products, cheese, and ice cream as well as quality analysis of milk and dairy products at our laboratories.

Craftsmanship and Green awareness

We train our dairy students in craftsman manufacturing of dairy products. Thus, they get a basic knowledge before entering the industrial production of dairy goods, which in most cases take place in closed processing systems. If wanted, we provide similar hands-on training-courses to foreign participants.

Further, our Dairy Training Centre is equipped with modern technology, which the students learn to operate in the most energy saving way - through training and theoretical teaching. Not least, our staff exercise the students in obtaining a green mind-set as to avoid any product-waste or waste of energy such as water and heat or electrical power turned-on unnecessary. ■



The students obtain hands-on knowledge before the milk enters closed processing systems. (Photos: Ole Friis).



Inside KOLD College Dairy Training Centre.

Facts about KOLD College

- All educations and courses linked by the concept "From Soil to Table"
- Staff 160 employees, of which 90 lecturers with vocational or academic backgrounds
- 1,000 full time equivalent students and course participants
- 6,000 students attend educations or courses each year
- Buildings covering 34,000 square meters

Areas of education at KOLD College:

- Agriculture, horticulture, animal keeper, forestry
- Catering (Chef, Waiter, Catering, Baker, Confectioner)
- Dairy technology (Skilled Dairyman, Dairy Operator)
- Technical gymnasium (3-year pre-university study course)
- In-service tailor made training and courses
- More information on www.koldcollege.dk



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Enter a high-level M.Sc. program that will provide you with a unique in-depth knowledge on dairy products and dairy technology - and become part of a truly international environment.

University of Copenhagen offers a 2-year M.Sc. program in Dairy Science and Technology as part of our Food Science program. Prior to the program, you will have the unrivalled opportunity of 6 months organized industrial internship within the dairy industry in Denmark or elsewhere.

The program focuses on providing in-depth insight into the formulation and production of dairy products, including use of ingredients to achieve the right quality.

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

A 2-year M.Sc. program in Dairy Science and Technology - with Internship and a Global Outlook

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

Year 1	Block 1	Internship	
	Block 2		
	Block 3	Milk Processing	Food Process Equipment
	Block 4	Dairy Processes and Equipment	Elective
Year 2	Block 1	Quality Management and Process Control	Elective
	Block 2	Integrated thematic course for all PST-students	
	Block 3	Dairy Product Technology I	Microbiology of Fermented Food and Beverages
	Block 4	Dairy Product Technology II	Dairy Microbiology
Year 3	Block 1	Thesis (30-45 credits)	
	Block 2		

Compulsory courses and thesis
Elective course



Nordic Dairy Congress: Adding Value

The program for the 44th Nordic Dairy Congress is in the making, and will be held next year in Copenhagen with the CEO of Scandinavia's largest dairy company Arla Foods Amba, Mr. Peder Tuborgh as keynote speaker.

By Isabel Sande Frandsen, Journalist

Adding Value

The Nordic Dairy Congress 2017 will be held in the heart of Copenhagen, Denmark from July 7th to 9th. The theme of the congress is "Adding Value" and is framed as one plenary session divided into two parallel sessions as well as some sections for the participants to dig further into topics of their specific interest. The headings of these sections are: Improving efficiency; all-time high food safety; green solutions and healthy dairy products.

Furthermore, the program will be based on the consumers seen as drivers of the needs of the dairy industry for development, efficiency and renewal. In order to achieve this purpose the Program Committee is planning for a highly

dynamic program with flash talks from PhD-students who will introduce the newest trends within technology and science, combined with some broader discussions. For instance, the plenary session on the first day of the Congress will be discussing how consumer trends add value to the dairy industry, and a panel debate will conclude the conference wrapping up the new knowledge and findings.

State of the Art and network

For the opening session, the Congress will present the prominent speaker, CEO of Arla Foods Amba, Mr. Peder Tuborgh.

Asked why people should participate in the Congress, the president of

the Nordic Dairy Technology Council, Søren Jensen, explains that: - Firstly to be updated on what is new within the dairy sector seen with an international lens and introduced by acknowledged scientists and high ranked specialists from the industry. Secondly, the Congress is an unique venue to share the passion for dairy and a venue for knowledge sharing and networking as well as an opportunity to open up for a global mindset and mobility - not to forget about the reencounters with old dairy friends.

The Nordic Dairy Congresses have been held every second or third year almost a 100 years. The first congress was held in Oslo, Norway in 1920 and the 2017-Congress will be the 44th. ■

Preliminary
program at
page 28



The next Nordic Dairy Congress takes place in Copenhagen, Denmark from 7-9 July 2017. The Congress location will be at Axelborg in the heart of Copenhagen, next to Copenhagen Central Station and to Tivoli. Axelborg is an old and very beautiful building, which hosts the Danish Agriculture and Food Council at its upper floors. For more info about the Nordic Dairy Congress 2017, visit www.nordicdairycongress.com



Together we make the world's best dairy processing equipment

As the world's milk production has increased over the last few decades, GEA has been at the forefront of dairy processing technology. Our expertise in plant design and development has grown with the global demand for pure, healthy food, and by listening to and supporting our customers.

GEA draws its expertise from all corners of the globe to bring together the very best in dairy processing technology, to deliver everything from

individual solutions to entire processing plants. By listening to our customers and responding to their needs, we can ensure that the solutions we develop meet the world's highest production standards.

Ongoing service and support ensures your plant continues to operate with maximum output and minimum downtime, waste and energy consumption, and is why partnering with GEA makes perfect sense.

Au2mate Academy

- A centre for innovation and knowledge about dairy automation

The intensive global competition in the market for dairy products means increase in the demands for better working environment, development and adaptability to new products, minimization of resource consumption, a flexible and highly skilled workforce, quality and traceability as well as individual product specifications. These factors require minimized costs and increased automation.



By
Klaus Dam,
Managing Director,
Au2mate A/S

Competitive advantage

We at Au2mate believe that dairies with production plants that are highly adaptable, flexible, IT integrated, and that have employees holding multidisciplinary skills within dairy technology, process equipment and production IT, have a decisive competitive advantage.

There will be an increase in the need for the process operators to have insight into the dairy's control system. Obviously, this will call for multidisciplinary specialisation.

The entire product flow from cow to consumer will be automated and data integrated. In our constant pursuit to develop fully automated dairy plants, one of the pillars is development of professional skills inside the automation area.

At Au2mate, we see it as a duty to participate in the further development of

competencies and user friendliness of the dairies automation systems subject to best dairy practices in a closely integrated cooperation with the dairies. In combination with modern and future-oriented production IT solutions, we can jointly achieve the competitive advantages that ensure a strong future market position.

Au2mate Academy

Au2mate Academy offers dairies to adapt to the future through focused training in development, operation and maintenance of highly automated dairy plants. Thus, the process operators will achieve just as much knowledge about automation as to the products. Through focused training, the competitive advantages of increased uptime and increased efficiency at the plants are ensured.

Au2mate Academy is an innovation and knowledge centre for dairy automation. We offer specific courses in automation of dairies to our customers, suppliers and business partners.

Academy-courses

The courses are targeted management as well as plant operators and technical

staff. Among other, the courses include: Functionality, reporting, operation, hardware, software, instrumentation, S88/S95. Moreover, we offer customised courses, combined with "on the job" training at the process plant.

Au2mate Academy is equipped with new modern teaching facilities at our address on Frichsvej in Silkeborg, Denmark. There is a classroom and a "live" process plant, in which theory and practice can be trained coherently! Physical structure, selection of components, automation architecture, database, methods and documentation is done from "best practice" in order that the plant and the facilities are as realistic as possible and associate to a commercial plant.

Process plant construction

The Au2mate Academy plant is designed and built according to industry standards, the installations are made in stainless steel. The plant is built in units on mobile platforms, so it is quite simple to expand and upgrade the process plant.

The modular plant consists of a total of 5 units - briefly described in the following; a simulated tanker and milk reception, raw milk storage with 2 tanks and mixer, pasteurizer, final product tanks (2 pcs), a CIP plant with 4 tanks and one line. In addition; energy supply, utilities for hot and cold water and compressed air and electricity.

A detailed sketch of the process plant is seen in Figure 1 "Au2mate Academy Process Plant".

The control system structure of the process plant; the Au2mate Academy

Academy Process Plant

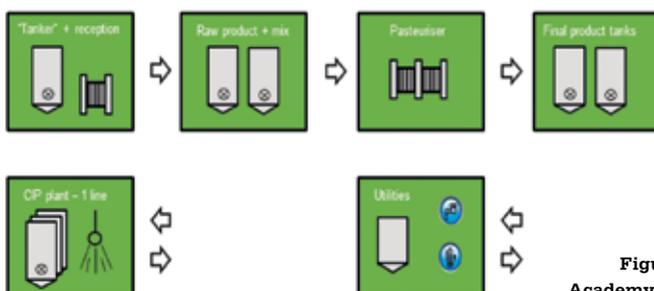


Figure 1: Au2mate Academy Process Plant.



Photo 1: Au2mate Academy - Theoretical review.



Photo 2: Au2mate Academy - Presentation of technical installations.

plant is designed and built according to applied practice in the dairy industry. The control is based on Wonderware Intouch/IAS with virtualised servers, Siemens S7-400 & S7-1500, Allen Bradley CompactLogix PLC's and ABB 800XA DCS system, Siemens ET200S & ET200SP and Allen Bradley Point I/O systems, local operation from Siemens & Allen Bradley HMI panels, communication via ASi, PROFINET & PROFIBUS fieldbus. Furthermore, the control system includes safety equipment and wireless technology.

Au2mate Academy activities

Au2mate Academy was officially opened in January 2016. Some of the activities that have been conducted in Au2mate Academy are listed below.

Course activity: Course held for customers about plant operation, alarms and fault diagnosis, PLC software understanding and conceptual design, SCADA software understanding and conceptual design.

Prototype testing: Execution of prototype project for dairy customer with the purpose to test a new control system platform consisting of PLC software, SCADA software and interface to the customer's MES system.

Development project: Development of a pasteurizer application on a new control system DCS platform. The project includes DCS software, HMI software and interface for plant components.

Cooperation with the School of Engineering - Aarhus University: Development of advanced control. The project

includes theoretical support and practical conceptual design of PLC software, HMI software and interface for plant components.

Development cooperation: Visit from a foreign delegation in cooperation with Danish food organisation. The visit comprised a theoretical review of Au2mate Academy as well as a presentation of the technical installations. Please see below Photo 1 "Au2mate Academy theoretical review" and Photo 2 "Au2mate Academy presentation of technical installations".

More information

In case you are interested in additional information please do not hesitate to contact us by phone +45 8720 5050 or visit our website www.au2mate.dk. Welcome to Au2mate Academy! ■



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More than just milk

Drinking milk can be processed in a variety of ways to reduce transportation costs and create valuable specialist products. In this article, GEA looks at some of the ways in which membrane filtration can be used to separate the individual fractions of the raw product to create much more than just milk.



By
Swami Sundaram,
Product Manager,
Membrane
Filtration, GEA
North America

Whey Concentration

Using reverse osmosis it is possible to concentrate whey, a by-product of the cheese making process. Whey can be concentrated to around 30% total solids both to aid efficient transport and to increase the throughput of fixed evaporator assets.

Carbohydrate reduction

Ultrafiltration is used to reduce the carbohydrate levels in drinking milk for people who are lactose intolerant and for the production of calcium and protein-fortified drinks with reduced carbohydrates. The same process can reduce the lactose content of ice creams for a

smoother mouth feel and less risk of crystallization during long-term storage.

Whey Protein Concentrate (WPC)

Whey Protein Concentrate is now considered to be a vital food ingredient, with applications in food processing and specialist health products. The proteins in whey can be isolated to create specialty products. WPC 35, for example, with a protein on solids level of 35%, has the same level of protein as skim milk but is much lower cost.

Through further concentration of the proteins using ultrafiltration, additional products such as WPC 50, 75 and 80 have become common and perform important functions as food ingredients in infant formula and to replace muscle mass for patients suffering from degenerative muscle wastage (Sarcopenia). Even greater purification produces Whey Protein Isolates WPI 90, a clear product used widely in isotonic beverages consumed by athletes.

Isolating Individual Proteins

Individual proteins, such as lactoferrin that can help guard against bacterial infection and boost the body's immune system, can be isolated from milk or whey using a combination of membrane filtration and chromatography.

Hydrolyzed Whey Proteins

Whey Protein Hydrolysates (WPH) are a family of specialty food ingredients designed primarily for people whose digestive systems are compromised: e.g. premature babies whose stomachs are not fully formed. These people are often unable to effectively digest whey proteins in their raw form. Hydrolyzed whey proteins are created through the addition of enzymes to break down the protein molecules making them easier to digest.

Milk Mineral Recovery

Vital minerals, mainly calcium and phosphorous, can be harvested either directly from whey or, more commonly, from the UF permeate following the concentration



of the whey protein to produce WPC. The minerals recovered from milk in this way are in great demand as a high-quality, natural mineral substitute that benefits from a high bio-availability.

Demineralized Whey Powder and Lactose

Once the whey has been demineralized (de-ashing with some combination of nanofiltration, electrodialysis, and/or ion exchange) it can be used to create a range of Demineralized Whey Powders - D25, D50, D70, D90, etc. - depending on the degree of demineralization. These are used, for example, in the production of infant formula where manufacturers wish to control precisely the composition of minerals in the final product. Further purification of the NF-retentate obtained from the UF-Permeate can create edible or pharmaceutical grade lactose.

Milk Protein Concentrates / Micellar Casein Concentrate

Milk Protein Concentrates (MPC) are

produced by using ultrafiltration to concentrate milk proteins while simultaneously reducing the carbohydrate and soluble mineral content. MPCs form a family of products for different purposes. MPC 40, for example, with 40% protein on solids, is widely used in bakeries and for the making of confectionary. MPC 56, MPC 70, MPC 80 and MPC 85 all have different uses and progressively higher values. MPI 90 is the highest level and termed a Milk Protein Isolate.

Microfiltration can also be used to selectively concentrate casein micelles up to MCC 95 from milk and capturing native serum proteins that are free from bacteria, enzymes and colors. The concentrated casein has the property of being slow to digest, thereby extending satiety.

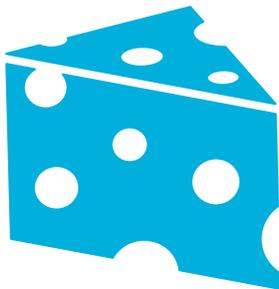
Carbohydrate separation

The carbohydrate fraction, left from the ultrafiltration separation of the milk proteins, is a further milk derivative stream

that has many uses. This carbohydrate-based milk permeate contains soluble calcium and minerals and can be used, for example, to standardize skim milk to give the minimum level of protein on solids required (as an example milk powder standardization). This permeate can also be further processed into pure lactose for pharmaceutical applications or as a component of infant formula.

Water Recovery from Milk Processing

The process of fractionating milk inevitably creates a residual water stream that can be reused within the plant, which - in some cases - can make the plant virtually self-sufficient in water. This reduces the cost of buying water from the local authority, avoids the need for drilling deep wells, virtually eliminates any effluent waste stream into aquifers, and provides high-quality, demineralized water, ideal for reuse within the factory without further treatment. ■



Kold College offers tailor-made courses for the global dairy sector and food industry.

The high standard of Danish dairy and food technology is recognised and appreciated worldwide. Kold College has played an important part in developing and maintaining this excellence. Our international activities focus on the integration of food education and are based on our fundamental concept "from soil to table" .

We houses the only dairy college in Scandinavia: The Dairy Training Centre of Denmark, which specialises in courses in dairy technology • laboratory techniques • maintenance of dairy equipment • environmental engineering • energy saving • quality control management • the operation of dairy plants.

Our mission is to continue the to expand our international courses and contacts. Please contact os for futher information.

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Back to nature with organic spices



These years, trendy foodies go back to nature, and the Danish spice company, Carl J. Nielsen, intercepts this trend for natural and organic grown foods. - Alongside the increasing demands for natural/organic foods, the need for ditto herbs and spices amongst dairy and food producers rise correspondingly. With our new Organic Spice portfolio, we are at the forefront, underlines CEO and third-generation-owner of Carl J. Nielsen, Michael Nielsen.

By Anna Marie Thøgersen, Editor

A chili a day ...

... keeps the doctor away. This slogan meets you when you visit Carl J. Nielsen's homepage - and indeed, hot as well as locally grown milder spices are more popular than ever! - Since 2000, we have experienced a steady growth for spicing up various food products - including dairy goods, stresses Michael Nielsen. He is CEO and third-generation-owner of Carl J. Nielsen, which his grandfather founded in 1923.

The company's herb, spice and ingredient portfolio includes no less than 600 commodities and almost 4000 different prescriptions. In addition, the curry-blends from Carl J. Nielsen is by the company's own recipes.

Roast Spice™

Michael K. Nielsen is always on the outlook for innovating his spice-production, and not long ago he fell into conversation with a chef, who asked him



Michael Nielsen, CEO and third-generation-owner of Carl J. Nielsen.

for roasted spices. Immediately, Michael K. Nielsen transferred this idea to action. A year went on with experiments, and then Carl J. Nielsen launched the very first roasted spices. Amongst the most popular, we find; chili, coriander, curry blends, ginger, paprika, as well as green, white and pink peppers.

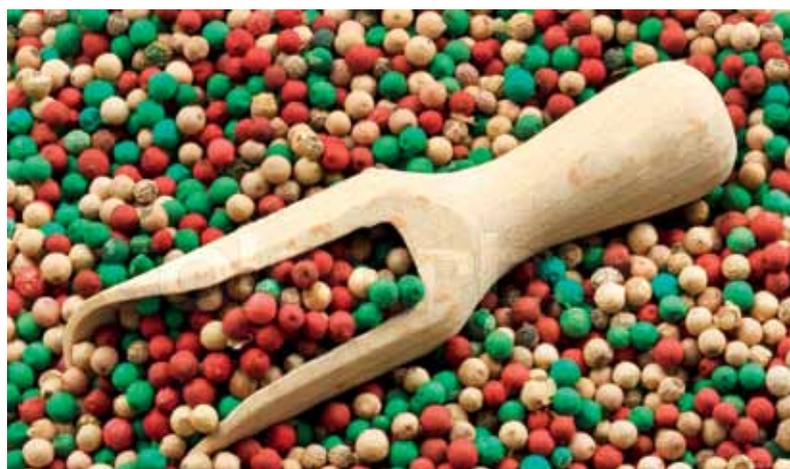
The chef was right. Roasted spices do have more powerful flavour profiles,

and today Carl J. Nielsen successively arrange workshops for customers, and especially charcuterie customers has joined individual workshops for developing special roasted spice-applications for their fine foods. In general, the Carl J. Nielsen hosts workshops at the company's premises, whenever a customer is in need.

Organic Spices

Back in April and after an extensive preparatory work, Carl J. Nielsen achieved the authorization as supplier of organic spices. Even before the approval, the company's food and dairy customers queued-up to order the new Organic Spices. Amongst these customers, we find large Danish cheese producers. Carl J. Nielsen even supplies Arla with spices for a couple of the company's high-profile gourmet Arla Unika cheeses.

The increasing consumer demands for organic foods reflects two main trends, partly globally grown foods without using pesticides, but also the back-to-nature trend with increasing demands for locally grown foods. - We are extremely aware of these trends as spice



Green, white and pink peppers are amongst the most popular in the company's Roast Spice™ selection. (Photo: Colourbox).

Carl J. Nielsen is an authorized supplier of Organic Spices from all over the world as well as e.g. locally grown organic parsley and wild garlic. (Photo: Colourbox).

About Tech Spice®

In 1999, the owner of Carl J. Nielsen, Michael K. Nielsen developed Tech Spice®. The specific technique behind producing spices under this method is a business secret. However, the effective yet gentle Tech Spice® process eliminates all bacteria and spores utmost efficiently in decoration-herbs and -spices without using gas or irradiation.

In general, both Roast Spice™ and Organic Spice are produced under this method.

supplier to the food industry, and our organic range includes both organic chili from the Far East - as well as organic locally grown parsley and wild garlic, Michael K. Nielsen explains. He underlines, that organic spices are seasonal goods, and food customers must pay attention to order products - such as e.g. organic orange - before the growth-season even starts!

Halal is next

For the time being Carl J. Nielsen works on being Halal-certified. In this case, the matter is to make sure and prove that the company's herbs and spice-mixes do not contain any ingredients of animal origin. It might sound a little strange, but also dairies exporting to e.g. The Middle East will be met with demands for a Halal-certification in the near future. Carl J. Nielsen expects to achieve the Halal-certification later this year. ■

About Carl J. Nielsen

- Carl J. Nielsen founded the company in 1923. Today, the third-generation of the family, Michael K. Nielsen runs the company, located centrally in Denmark.
- The staff counts 23 highly educated food-professionals such as chefs, butchers and food technicians.
- All commodities are checked and tested at the company's labs, both at arrival, during production and when leaving the factory as manufactured products.
- Carl J. Nielsen has established a broad range of certified international suppliers of herbs and spices, and more adds on successively.
- Carl J. Nielsen holds accreditation according to all Food Safety ISO-standards and recently by the very strict FSSC-22.000-certification.

CARL J. NIELSEN A/S

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The average EU citizen consumes only about 50% of the recommended daily portion of fibers. ©shutterstock.

Procudan invite dairies to "co-creation" of new ideas for future products.

Co-create new ideas for future business

Current market conditions for dairies are surely known to everybody. Milk has been flooding from the farmers since the 2015 deregulation of the EU milk quota system. Moreover, the wild pace in the previously booming markets of Russia and China among others is slowing down. Historically, the dairy sector witnessed changes and was able to find its way out. On top of today's market conditions, however, dairies face changes in consumer behavior.



By **Morten K. Andreasen**,
Market Director,
Procudan A/S

The overall good news is that, in general, consumers have a positive view on dairy products. Increasing consumer focus on health and wellness still render dairy products of relevance to consumers. It is about energy, nutrition and, even more important, indulgence. However,

consumers are also concerned, insisting on transparency. What is the story behind the product? Is the product free from gluten, lactose and egg? Is it safe to drop the dairy product packaging straight into the bin? All these questions might seem overwhelming. The scary part, nonetheless, is that consumer behavior is changing rapidly.

All this calls for new approaches and novel ways of thinking in the dairy industry. One could ask if this is a job for the dairy, solely? Or, is this an occasion to set up new ways of innovation and continuous product development to secure future business?

How to co-create

Procudan use the term "co-creation". It is about identifying your "business friends" and setting up a confidential team of professionals who have a genuine interest in dairy and knowledge of product and business development. The formalities are simply put away by a secrecy or non-disclosure agreement. And since the business team members are supposed to be future partners, business will derive from the innovation process.

From then on, the field is open for discussing business opportunities for the individual dairy.

Try to picture the dairy together with Procudan gathering a co-creation forum of partners. Moreover, let's pretend the dairy facing challenges like the ones mentioned above. Now, what would be the discussion subjects of the co-creation forum?

Some new ideas...

One topic could be "snacking". The number of times per day for snacking is increasing. Even snacking "on the go" is getting normal. So, how do we develop a "snackable" cheese, tasty and with an on the go packaging? CSK Food Enrichment, Procudan's Dutch partner specialized in dairy cultures, would probably suggest a tasting session over the Flavour Wheel™ adjunct cultures. Browsing into taste and smell, the forum would focus on communication of senses matching consumer profile and behavior. Choosing the perfect combination, CSK would develop a tailor-made culture solution for the dairy.

Another topic could be "health". We know that a growing number of con-

sumers embrace natural and organic foods without E numbers. Dairy Safe™ cultures are suited for consumers who place great emphasis on organic products without E numbers. Dairy Safe™ is a natural preservation for late blowing defects in cheese (caused by *Clostridium Tyrobutyricum*) and can replace E numbers like nitrate or lysozyme in cheese.

The "health" discussions might also address the estimate that the average EU citizen consumes only about 50% of the recommended daily portion of fibers. Cosucra, Procudan's Belgian partner within pea products and inulin would introduce ideas of adding inulin called Fibruline® into milk or drinking yoghurt to the co-creation forum. Adding inulin to milk products strengthens the health profile appealing to the changing demand. Cosucra might also introduce the idea of a "breakfast drink" containing extra minerals, proteins and fibres.

Make it happen!

In this co-creation process, Procudan's role would be about project manage-

ment ensuring implementation of the project goals. All ideas, products and services from various partners could be managed under the "Single Point Sourcing" concept offered by Procudan. The dairy would hand over day-to-day tasks of operation such as securing purchasing, managing logistics, providing online QA documentation and regular project meetings to follow up on performance.

Ideas for free

Depending on internal resources and organizational setup available for product development, co-creation forums are worth considering by the individual dairy. They offer a huge potential of creativity and specific ideas for free. The dairy obtains organized input of technical know-how and documented research on relevant dairy subjects from dedicated partners. When ideas become implementable products, the dairy will have resources and capabilities to run the project and to implement the solutions.

Please visit our website for more information: www.procudan.com. ■



Partners for co-creation



www.procudan.com pro@procudan.com +45 7550 8000

New solution

- unlocks the potential for lactose-free and reduced sugar yogurt

Chr. Hansen's NOLA® Fit is a unique new lactase enzyme, which opens the door to lactose-free, or sugar reduced yogurts - without compromising on taste.



By
Helle Rexen,
Consultant &
Communications
Partner - Corporate
Communications,
Chr. Hansen

With more than half the world's population suffering from lactose intolerance to varying degrees (according to Euromonitor), marketers of yogurt and other fermented milk products have long sought for a cost effective and simple way to reduce lactose.

Chr. Hansen's new NOLA® Fit is that enabler. It is a highly efficient, cost-attractive innovative enzyme solution that allows dairy producers to reduce or remove lactose - or reduce added sugar in yoghurt by at least 1g per 100g of yogurt without impacting the sweetness of the final product.

Works wonders with the right culture

"With NOLA® Fit the door is open for lactose intolerant consumers to enjoy the goodness of yogurt and other fermented milk products. It breaks down

the lactose to glucose and galactose, which additionally results in a naturally sweeter yogurt. It works wonders when applied together with the right yogurt culture," explains Lars Bredmose, Senior Director, Fresh Dairy, Chr. Hansen.

"The enabling trigger of NOLA® Fit lies in the enzyme's high activity at low pH, compared to traditional lactase offerings on the market," he elaborates. "As powerful as this new offering is, it is beneficial to the quality of the final product to combine NOLA® Fit with the right yogurt culture. This is where we offer our long experience in cultures and enzymes application to make simple, efficient and working solutions in the fermented milk space."

Perfect for a rich variety of dairy-based products

NOLA® Fit, which is launched globally, is perfect for various dairy-based products. Apart from the obvious benefits in yogurt, it is particularly suitable for premium lactose free milks, fermented milks and reduced sugar-fermented milk.

High specific activity and low side activities make this enzyme work ef-

Spot on market trends

- Driven by the health and wellness trend many consumers exclude dairy due to the presence of lactose. More and more consumers associate lactose free products with a healthy choice but they will not compromise on taste.
- The lactose free dairy segment is growing rapidly; not least in high end products such as yogurts and desserts, and especially in Europe, North America and Latin America. Furthermore, increases in disposable income in Asia and Africa, where we find the highest level of lactose intolerance, make these regions interesting new markets for innovative dairy producers.
- At the same time, sugar is rapidly becoming the new culprit in consumers' minds. According to a new European study, carried out by the market research company Sensus in Spring 2016, 60% of consumers are monitoring their sugar intake and 25% are actively looking for reduced sugar - but not at the sacrifice of an authentic sweet taste.

Want to visit the world's largest culture plant?

In connection with the Nordic Dairy Congress, which is held in Copenhagen on June 7-9, 2017, Chr. Hansen is pleased to invite congress participants for a tour of our Copenhagen facilities. The plant is the world's largest facility for the production of lactic acid bacteria and has been significantly expanded over the past years. Stay tuned for further info!



NOLA® Fit
Breakfast.

ficiently and free from off flavors associated with other types of enzymes. This is especially crucial for UHT (ultra-heat treated) and ESL (extended shelf life) milk.

The combination of NOLA® Fit's high specificity and low side activities also makes it a perfect match for reducing sugar in shelf stable or fresh flavored milk products. ■

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CHY-MAX® M can make up to 0.5% more cheese out of milk compared to other coagulants. In other words: If producing 20,000 tons of cheese per year you get



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Innovative self-priming pump does double duty for dairies

Are you looking for a self-priming pump that improves energy efficiency and reduces noise levels, as well as meeting the latest hygienic design standards? Using airscrew technology, the Alfa Laval LKH Prime sets a new standard in self-priming pump technology.



By
Allan Bruun, Dairy Industry Manager, Alfa Laval

Based on the Alfa Laval LKH premium range of centrifugal pumps the Alfa Laval LKH Prime is specifically constructed for pumping liquids containing entrained air, making it an excellent choice as a CIP return pump. The Alfa Laval LKH Prime is 60 to 70 percent more energy efficient and operates at noise levels 80 percent below conventional liquid-ring pumps. As all pumps in the LKH family, the Alfa Laval LKH

Prime is EHEDG certified and authorized to carry the 3-A symbol.

Versatile and efficient, the Alfa Laval LKH Prime is therefore of interest to dairy owners and operators who are concerned with:

- Reducing energy consumption
- Improving the work environment
- Reducing installation costs

Reducing energy consumption

The hydraulic efficiency of the Alfa Laval LKH Prime reaches over 50% (Image 1). This means the Alfa Laval LKH Prime offers an added advantage over liquid-ring pumps, which typically reach efficiencies of approximately 30 percent. Its high efficiency is easily attainable

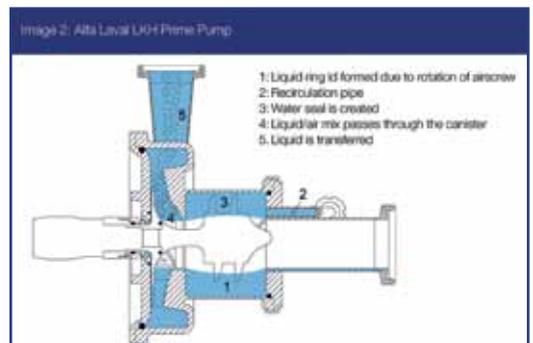
at a wide flow range, which translates into substantial savings no matter the duty point.

Improving the work environment

The Alfa Laval LKH Prime also contributes to a better work environment. It reduces the noise emission level by up to 80 percent compared to conventional liquid-ring pumps. With a noise level of a mere 74dBA, the Alfa Laval LKH Prime efficiently eliminates the need for these protective measures.

Reducing installation costs

While the Alfa Laval LKH Prime is primarily designed for CIP return duties, the hygienic design means it may also



be used to pump dairy products. For instance, the Alfa Laval LKH Prime is a reliable pump for emptying milk tanks. Because of the pump's ability to handle both CIP return liquid and dairy products, it is possible to eliminate the need for a separate liquid-ring pump.

The Alfa Laval LKH Prime combines the gentle product treatment and hygienic design of the LKH range with the liquid-ring principle. In many cases, this can reduce the number of pumps required for an installation from two to just a single pump.

Reducing the installation costs from two liquid-ring pumps to one Alfa Laval LKH Prime pump results in:

- Lower capital investment, one pump instead of two
- Lower piping, cabling and automation costs
- Lower spare parts and service costs

Service is a key element of any Alfa Laval offering and the commonality of spares, including the shaft seal, in the LKH range translates into reduced spare parts inventory and fast maintenance.

Working principle

As the pump starts up, a liquid ring is formed in the pump head canister (Image 2) and the recirculation pipe is filled (2), thereby achieving the initial prime. This liquid ring is formed in the space between the diameter of the inlet pipe, and the outer diameter of the offset canister housing the airscrew. The resultant liquid ring creates a water seal between the airscrew hub and the top of the canister (3).

An air column is created between the airscrew hub and the liquid ring (1). The air column is separated into air pockets by the airscrew and then forced into the impeller's suction stage. Some of the priming liquid re-circulates over the recirculation pipe (2). Air is removed until the content is just a few percent and no pockets are generated. The pump then acts as a traditional centrifugal pump,

transferring the liquid from the suction stage (4) through the discharge (5).

When there is no air present, the canister and recirculation loop have no function and are completely filled with liquid. The liquid passes through the canister into the impeller's suction stage. Here again, the pump acts as a traditional centrifugal pump, transferring the liquid through the discharge at a higher velocity and pressure.

Summary

The Alfa Laval LKH Prime Pump (Image 3) delivers;

- Reduced energy consumption
- Improved working environment
- Reduced installation cost
- And has spare parts commonality with the Alfa Laval LKH pump range making it easy to service ■

About Alfa Laval

Alfa Laval is a leading global provider of specialized products and engineering solutions based on its key technologies of heat transfer, separation and fluid handling. Learn more at www.alfalaval.com

Nordic Dairy Congress

Adding Value

Join the next Nordic Dairy Congress in Copenhagen, Denmark 7-9 June 2017.

The main theme of the Congress is: Adding Value. Otherwise, the program includes e.g. professional visit to Chr. Hansen A/S and opening speech by CEO Peder Tuborgh, Arla Foods.

The plenary sessions focuses on

- Improving efficiency
- All-time high food safety
- Green solutions
- Healthy dairy products

The Congress location will be at Axelborg in the heart of Copenhagen, next to Copenhagen Central Station and to Tivoli. For more info about the Nordic Dairy Congress 2017, visit www.nordicdairycongress.com



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Nordic Dairy Congress: Adding Value

The next Nordic Dairy Congress is held in Copenhagen, Denmark 7-9 June 2017. The organizers invite all international dairy professionals to join the Congress to be updated with the newest knowledge within dairying in all aspects.

Why participate?

The 44th Nordic Dairy Congress will update you within all aspects of adding value to your present knowledge within dairying. One of the keynote speakers are CEO of the Danish-based international Dairy Group, Arla Foods Amba, Mr. Peder Tuborgh.

Further the mission of the Program Committee is to create a program that:

- Has a high professional and scientific level
- Has a broad appeal to the Dairy Industry and is application-oriented

- Is attentive and adds new relevant knowledge and competences
- Provides knowledge, vision and understanding of the dairy industry
- Creates new initiatives in the dairy industry and among the Congress participants
- Provides a framework that enables the participants to share knowledge and network
- Contributes to a global view and mind-set.

Target groups

The target groups of the Congress are the dairy and food industry, the supplier industry, consulting companies as well as universities, dairy schools and research institutions.

The professional level requires that the participants have an academic/technological education or are skilled to these levels.

The main program

7 June 2017 – 13.00 - 18.00 p.m. (individual scheduling)	
Bus service from the Copenhagen Airport Registration and visit at Chr. Hansen A/S plant in Avedøre	
8 June 2017 – 9.30 - 17.00 (registration from 8.30)	
Opening session Main speaker: CEO Peder Tuborgh, Arla Foods Amba	
Plenary session How do consumer trends add value to the dairy industry?	
Session 1 Improving efficiency	Session 2 All-time high food safety
9 June 2017 – 9.30 - 16.30	
Opening speech	
Session 3 Green solutions	Session 4 Healthy dairy products
Panel debate Adding value for growth and development in the dairy industry	
Closing session	

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Improving food & health



Chr. Hansen is Gold Sponsor of the Nordic Dairy Congress.



Visit the world's largest culture plant?

In connection with the Nordic Dairy Congress, which is held in Copenhagen on June 7-9, 2017, Chr. Hansen is pleased to invite congress participants for a tour of our Copenhagen facilities. The plant is the world's largest facility for the production of lactic acid bacteria and has been significantly expanded over the past years.

Stay tuned for further info on:
www.nordicdairycongress.com



Welcome at the ICNIRS Conference in Copenhagen June 2017

The International Conference on Near Infrared Spectroscopy (ICNIRS) is delighted to invite you to participate in the 18th International Conference on Near Infrared Spectroscopy, to be held 11-15 June 2017 in Copenhagen, Denmark.

The conference takes place at the Bella Center Copenhagen, just 5 min drive from Copenhagen airport and 10 min from the city center.

More info on
www.ISNIRS2017.com



Premium goes Prime

Introducing the new standard in self-priming pump technology: the Alfa Laval LKH Prime

The premium Alfa Laval LKH range of centrifugal pumps just gained a new family member, the Alfa Laval LKH Prime. This energy efficient, self-priming pump uses a combination of air-screw technology and advanced design to meet the most stringent requirements of a variety of industries, from food to pharmaceuticals. Designed specifically for Cleaning-in-Place duties, this versatile, reliable prime-performing pump delivers low cost of ownership and increased uptime.



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Primodan a Danish Producer of

Filling Machines for the Dairy Industry

Primodan is a Danish engineer manufacturer of filling-lines with more than 60 years of experience within the dairy and food processing industry. The company domicile is in Vipperød near Copenhagen.



Primodan designed a new full-servo-driven Filling-line with automatic changeovers between cup heights from the panel. The customer is the Danish organic dairy co-operative, Naturmaelk.



By
Frederik Klausen,
Regional Sales
Director, Northern
Europe, Primodan

Filling machine for Naturmaelk

Primodan has recently completed the delivery of yet another filling machine to a customer within the Danish dairy industry. This time, it is a 2-track round-table-filling machine of the type Rot-O-Min, ordered by the organic dairy co-operative, Naturmaelk in Tinglev in the Southern part of Jutland.

Naturmaelk needed a filling machine that was extremely flexible and with an

easy format change, as they fill many different products on the line, and some of them in smaller batches.

- After careful consideration, we chose to buy a Primodan machine, tells Peter Madsen, Operation Manager at Naturmaelk. - Primodan was very good at analyzing what we wanted, and convert it into offering a tailor-made filling-line meeting our needs.

- It was clearly essential to us, that Primodan could explain the advantages and disadvantages of the different machine solutions. Both the solutions offered by Primodan itself but also by the competitors in the market, stresses Peter Madsen and continues.

- Primodan's In-line mixer solution for dosing of fruit/jam mixed into natural yogurt, just above the filling heads, is an excellent solution. Moreover, there is a

minimum of waste by product-change, thus keeping both waste and costs down which is an important parameter to us at the organic Naturmaelk.

The technical solution

The technical solution of the final machine, which is now installed and commissioned at Naturmaelk, includes Pre-dosing for dosing e.g. jam in the bottom before the next layer is filled from the main dosing. Further the filling line includes in-line fruit dosing, cup-lift with built-in CIP manifold, Primoreels foil-system from reel, a Hepa sterile overflow, and much more.

The machine is fully servo-driven which helps to reduce the time spent on both format and product changes.

Customized filling-lines

The Rot-O-Min filling lines are available in different versions - from 1 to 5 rows, and we customize the filling equipment according to the clients' individual needs. After wishes, we can supply the filling line with pre-shaped cups, bottles, glasses, and even small buckets. Further, the Primodan machines are available in countless variations with features such as MAP-technology, UV-treatment, Vision-check, and much more. ■

The Primodan filler-line includes pre-dosing for e.g. strawberry jam in the bottom before filling the next layer of yoghurt from the main dosing. (Photo: Colourbox).





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Prima



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1.500 - 10.000 units/h



Bucket filling machines



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Primodan is a Danish Manufacturer of filling Machines for use in highly efficient productions. More than 60 years of experience making custom made solutions with strong focus on flexibility and hygiene.

www.primodan.dk

Customized products on flexible technology



By
Peter Aalund,
Sales Manager,
GRUNWALD
NORDIC

High-protein trend

GRUNWALD experiences growing demands for filling new customized products such as the high-protein fermented milk products added different ingredients. Firstly, we spotted this trend in the Nordic region, and today we see increasing demands for these dairy products, including quark with different flavors and with added goods such as fruit, chocolate and spices.

Demands for high-protein products increase rapidly, and today we see the trend is moving downwards through Europe and the Baltics. The trend embrace similar products like low-fat cottage cheese with a high content of cheese curds and low fat dressing.

Way to markets

Nowadays, it is not enough to produce first-class products, if you want to reach the final consumer. In order to be successful, imaginative marketing and increasingly costly packaging are necessary. Moreover, these fancy ideas must transform to practice; i.e. they are the elements that catch the consumer's eyes and make the products stand out on the supermarket shelves. The consumer's choice creates the success in retail.

For many years, Grunwald has dealt with successively developing dosing technology so that first-class products stay on the market by means of appealing product presentations.

Developing flexible dosing technology according to market requirements are of significant importance. Apart from pinpoint dosing accuracy, flexibility of



GRUNWALD dosing technology "Swirl".

the dosing technology is the important factor that allows our customers to fill the most varied products in different presentation images on the one and same cup filler.

Filling concepts

In addition to the already known filling technology "put under fruit", further different dosing technologies are possible - on demand - on the rotary-type and linear cup fillers. By combining these filling technologies, particularly designed by Grunwald, the presentation images "multi-layer", "side-by-side", "swirl" and even "topping" can be filled quickly and in a flexible way. This flexibility and the fast changeover-times allow several product-changes on the machine, minimizing product losses and machine downtime. Apart from pinpoint dosing accuracy, flexibility of the dosing technology is the important factor allowing filling the most varied products in different presentation images on the one and same cup filler.

New standards for Ultra Clean Machine

With the new cup filler with a new hygiene tunnel, Grunwald steps-up regarding increased UC level to \geq LOG 4. The

new innovative designed machine is already in production at one of Europe's largest dairies, and we install the second machine later this year.

This new 8-lane inline machine FOODLINER 20.000 UC GRUNWALD is capable of filling various ESL dairy products and for quick and easy format-changeover.

The cups and foils are not - as on traditional machines - sterilized with H₂O₂ but with a new type of double pulsed light high-performance UV(C). In recent years, the UV[®] technology has become a real high flier. The guaranteed sterilization results; \geq log 4 at the cups and \geq 5 log at the foils, was certified by two independent German institutes based on the reference seed *Aspergillus niger* DSM1957. Additionally, the University in Weihenstephan confirms compliance with the EHEDG guidelines for the pre- and after-dosing type GRUNWALD EASYCLEAN.

Essentially, the new overall concept completely re-design the whole hygiene area in an innovative way, this means from the "intelligent" cup-storage to the final interface defined by the customer. Consequently, all drive components, all supply lines and almost all assembly groups are mounted outside the hy-

regarding product-safety and product shelf life.

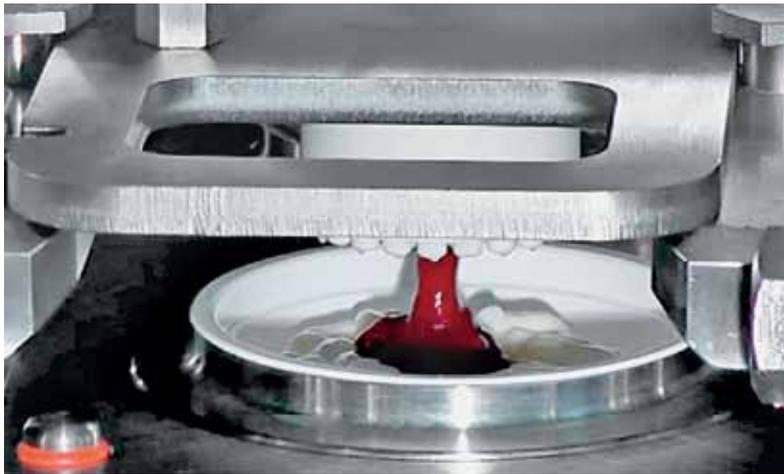
The excellent innovative performance on this cup filling machine becomes clear when the overall concept of this developmental performance and its additional key aspects are taken into consideration.

The new GRUNWALD-FOODLINER 20.000 UC is the ideal packing machine for maximum requirements when equipped with an integrated and flexible tray packer. It is the perfect complement to the modern process technology, which demands versatile, flexible and reliable machine technology with the maximum hygiene standard.

GRUNWALD GMBH

GRUNWALD GMBH is located in South-West Germany and employs more than 160 persons. GRUNWALD has supplied more than 2,000 filling, dosing and packing machines all over the world.

Visit us at FOODTECH 2016 in Denmark - in Hall M at Stand No. 9742. ■



GRUNWALD dosing technology "Topping".

giene-zone and thus outside the tunnel. Thereby, the new concept offers completely safe and secured filling without risk of recontamination from outside.

In addition to the technical innovations and the cleaning concept of the hygiene zone, this machine concept also meets the highest requirements

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Sterilisation of alu-foils.

TREPKO focus on green ideas



By
**Agnieszka Libner, M.Sc MBA, Managing
 Director, TREPKO Poland**
 and **Piotr Lisewski, M.Sc Eng.,
 Development Director, TREPKO Poland**

Sustainable development

On the road to success, TREPKO has always been accompanied by the customers, and - vice versa - the company is proud to have contributed to the accomplishments of our business partners as well. In the context of sustainable development and growing quantity of milk, the requirements of TREPKO's customers within the dairy industry can be synthesized into a few practical areas, such as:

- flexibility of equipment,
- optimisation of media consumption,
- gentle handling of fresh product,
- reduction of spare parts consumption.

Flexible and universal

The growing quantity of milk requires reaching out to different market segments, whose needs differ significantly. More and more consumers decide to support green technologies with their daily purchase decisions. Taking into consideration return on packaging machinery investments, there is a need

for flexible and universal equipment, which is able to handle packaging material innovations both in the moment of purchase and in the future. A perfect example are TREPKO's brick forming and wrapping machines (800 Series) working with both traditional aluminium laminates and eco-friendly mate-

rials based on mineral components, with no compromise about packaging appearance.

Optimization

It goes without saying that implementation of the green technology requires optimisation of media consumption. TREPKO is particularly focused to find different ways to save both energy and other media during exploitation of the packaging machines. It is not only about using energy saving components, but also to prevent from excessive use of other media, such as water during manual and automatic cleaning process. Smart mechanical design



Packaging line including Quick-Wash conveying system.

of parts brings significant savings and keeps cleaning fast and efficient. Recently TREPKO has introduced conveyors based on the concept of quick and easy washing with reduced consumption of water and washing agents. The new design was presented during the 4th TREPKO Conference and Exhibition in Gniezno.

Dedicated solutions

Slow-food and similar green-related trends within the food market imply reduction of preservatives used in dairy processing. The product should be fresh, healthy and natural. In order to extend the availability of such products to a greater number of consumers, the packaging process has to meet a number of requirements. First of all, gentle product handling with no interference into its physical and chemical properties is crucial. For example, the design of the product in-feed and dosing systems has to provide smooth product flow with-

out pressure peaks. Experience and development resources at TREPKO guarantee that the dosing system is always perfectly chosen with consideration of the product vulnerability, and not only the speed. Dedicated solutions for special products are also available on request. The second task is keeping the product fresh and free from contamination. Over the past years, TREPKO has mastered the aseptic packaging process in the cup filling machines. Recent installations represent highly efficient packaging sterilisation reaching high killing rates (up to log 5,9) confirmed by independent institutes. At the same time, the design of the TREPKO aseptic machine guarantees a reduced consumption of peroxide and efficient drying of cups and foils.

Green technology

The idea of green technology includes a new approach to maintenance of the machines. Reduction of waste is one

of the direction. TREPKO has considered it in the new design of tear-and-wear parts. Extended durability of materials, special design and production technology employed in the TREPKO's own factories result in prolonged lifetime of tear-and-wear parts. Thus, the waste resulting from removal of used parts is significantly reduced.

Green technology has become a part of the daily business and daily decisions made by consumers, dairy processing companies and producers of equipment. It is no longer a distant concept, but an idea embedded in the TREPKO's policy, which is always based on close relationship with our customers and business partners. At TREPKO, we believe that only combined, daily efforts will contribute to effective preservation of the environment. ■

Chr. Hansen is Gold Sponsor of the Nordic Dairy Congress 2017.



One billion people can't be wrong

Every day more than one billion people consume a product that contain Chr. Hansen ingredients. Some of those are made at our Copenhagen facility, which is the world's largest facility for the production of lactic acid bacteria. Even so, it has been significantly expanded over the past years and now YOU have the chance to get behind the scenes.

Chr. Hansen is pleased to invite participants from the Nordic Dairy Congress, which is held in Copenhagen on June 7-9, 2017, for a tour of the plant on June 7. Welcome!

Nordic Dairy Congress

Adding Value

Join the next Nordic Dairy Congress in Copenhagen, Denmark 7-9 June 2017.

The main theme of the Congress is Adding Value. Otherwise, the program includes professional visit to Chr. Hansen A/S and opening speech by CEO Peder Tuborgh, Arla Foods.

The plenary sessions focuses on: Improving efficiency, All-time high food safety, Green solutions and Healthy dairy products.

The Congress location will be at Axelborg in the heart of Copenhagen, next to Copenhagen Central Station and to Tivoli. For more info about the Nordic Dairy Congress 2017, visit www.nordicdairy-congress.com



Notice!

The next International Conference on Near Infrared Spectroscopy (ICNIRS) takes place 11-15 June 2017 in Copenhagen, Denmark.

Process safety with the CombiLyz conductivity meter



By
Thomas Hedemark,
Industry Segment
Specialist,
Baumer A/S

The food and beverage industry is faced with continually rising quality standards, increasing cost pressure and strict hygienic regulations. As a result, requirements for processing systems and their efficient cleaning are growing. With an accuracy of 1% and a measuring range of 500 $\mu\text{S}/\text{cm}$ to 1000 mS/cm , together with fast and accurate temperature compensation, the innovative CombiLyz conductivity meter has the ideal technical properties to support CIP safely and cost-effectively.

In order to guarantee food safety, production and filling facilities must be cleaned regularly. This is usually done using an automated CIP process (the cleaning of a process engineering system without dismantling it) and is part of a fully automated production process. In the food industry, the correct settings for a CIP process are very comprehensive, since the final CIP processes can often only be defined after the systems have been set up and meaningful tests have been carried out. There are as many requirements as there are cleaning programs. Some systems are cleaned with water only, while chemical cleaning agents like acidic or caustic solutions are used in others. Some systems recover the water from the last rinsing cycle and use it for the first rins-

ing cycle of the next CIP sequence in order to keep overall running costs low.

Optimum interaction of physical parameters

For all cleaning processes, however, the optimum interaction of different physical parameters is critical. The exact concentration of cleaning agents, while taking into account flow rate, pressure, temperature and time, defines a reproducible process in which the CombiLyz clearly illustrates its superiority.

While the concentration of the acid or alkali is increasing, the conductivity meter controls the specified concentration of the relevant cleaning media. With precise measurements, it ensures no more chemicals are used than necessary. This saves resources and protects the environment. During the phase separation in the CIP return flow, the CombiLyz with its good temperature compensation quickly recognizes different media, even when temperatures fluctuate enormously. This reduces the losses of stored cleaning agents. After one cleaning cycle, the CombiLyz accurately measures the concentration of the remaining chemicals in the rinse water. With this information, the PLC can control the predefined media circuits exactly and reliably using valve nodes. This reduces the risk of food being contaminated by residual chemicals.

Robust hygienic design and user-friendliness

The robust sensing element of the meter is made completely of PEEK. In order to meet the requirements of different installations, it is available in lengths of 37 mm, 60 mm and 83 mm. Its compact design reduces the flow resistance in the line, since the pipe cross-section

is only minimally influenced. Deposits and impurities can be more easily transported out of the system. The hygienically designed sensing element itself can also be cleaned very easily, which is confirmed by the EHEDG certification and conformity with the 3-A standards. Furthermore, its design is exceedingly durable, and is specially made for use in applications with frequent temperature shocks. This guarantees a long service life, reduces unnecessary downtime and thus increases system availability.

Thanks to its very user-friendly operation by touch screen and its modular housing, the CombiLyz is outstanding in its class.

The conductivity meter is available with or without CombiView. This large, illuminated display can be rotated 360° and can thus be read easily from all directions, even from a great distance. It allows different view options, for example, the simultaneous display of conductivity and concentration values as well as fully customizable text (water, alkali or acid etc.). Alarms and configurations can be visualized on the device and can also be transmitted to the higher level controller. With its integrated relay, the conductivity meter can carry out simple control tasks, for example in microbreweries with a low degree of automation, where food safety is of great importance and where valves are to be addressed directly without a process control system. The same applies to retrofitting of systems being upgraded from manually controlled to partly automated processes.

Compact and separate versions

The CombiLyz sensor is available as a compact and as a separate version. The latter is available with cable lengths of 2.5 m, 5 m and 10 m. If required in the application, the display and the sensing element can be installed separately. This offers maximum flexibility for optimum mounting positions.

A wide range of adapters allows hygienic installation in most standard process connections. This makes it the ideal solution for many CIP systems.

Further information: www.baumer.com/CIP ■



The efficient CombiLyz conductivity meter proves its worth through a high level of functionality and hygienic design. It thus meets the highest standards in the food and pharmaceutical industries.

Food safety made by Baumer.

How to ensure food safety while increasing overall equipment effectiveness?
With improved CIP (Clean in place) performance by Baumer. The temperature, pressure, conductivity and level sensors optimize your cleaning processes.

For more information
visit us at
www.baumer.com/CIP



Leading UHT Solutions

The heat treatment of products to provide commercial sterility is required in many processes within the food, beverage and dairy industries. In competitive marketplaces where customers expect more high quality choices, an ultra-high temperature (UHT) system needs to offer flexibility, efficiency and preserve the required characteristics of the final product. This is delivered through expertise in technology along with in-depth understanding of applications and processes.



Infusion UHT plant, type SDH.



By
Gorm Kjaerulff;
Process Category
Manager - UHT &
ESL, Dairy, SPX
FLOW

Through its APV brand, SPX FLOW has provided leading UHT systems for decades. It provides innovative solutions with a range of steam infusion, steam injection and enhanced Tubular UHT systems designed to efficiently produce commercially sterile products while preserving fresh tastes and product qualities.

Choice of technology

The choice of technology is dependent upon factors such as the product specification, viscosity and heat sensitivity. Within the SPX FLOW UHT solution portfolio are many technologies. SPX FLOW *Standard Infusion* systems provide ultra-fast, gentle heating with high efficiency and minimal chemical change to the final product.

The unique process provided by its *Instant Infusion*™ systems gives gentle, high temperature pasteurization with efficient spore inactivation and

Case study: South America

22,000 l/h Infusion UHT ordered as part of a turnkey project in South America.

SPX FLOW has recently put in a bid for a new turnkey dairy in South America. The plant was divided into sub components, with UHT being the first phase of the project. The dairy is currently operating three SPX FLOW infusion UHT lines at one of its other dairies in South America, and it recognized the reliable and efficient performance of our technology.

Solution: SPX FLOW was the first to commercialize the concept of using steam Infusion heating for sterilization of liquid food products. The first-ever commercial Infusion UHT installed in the market was in Lebanon in 1961.

Since then, SPX FLOW has strived to improve and refine the technology to new heights, providing unmatched performance ensuring better milk quality; low product losses during plant start up and flush out, and ease of operation.

Result: The order for the new UHT system was received in the spring 2016. Despite an extremely competitive bidding environment, SPX FLOW managed to close the order for the fourth Infusion UHT line with a capacity of 22,000 l/h.

bacteria kill rate. This system can be used with high viscosity product lines and protects efficiently against vitamin loss as compared to other traditional UHT processes.

The *Pure-Lac*™ and the latest *InfusionPlus*™ UHT processes provide high temperature pasteurization with a short holding time, identical to the taste of fresh, pasteurized milk while providing an extended shelf life.

High Heat Infusion™ systems are also available and offer a very high kill rate with high heat regeneration for plant efficiency.

Comparing technology

SPX FLOW also provides a *Combi-UHT pilot plant*, which offers users the ability to combine and compare four different heat treatment technologies and incorporates tubular and plate indirect heat-

ing technology along with direct steam infusion and steam injection. Users can quickly trial different process parameters and technology to establish desired final product characteristics and plant efficiency before installing full-scale production lines.

Specialized solutions

SPX FLOW engineers highly specialized solutions to meet customer requirements using a complete range of fully automated infusion and injection direct heating UHT systems, which are designed to maximize production capacity with long running times and product flexibility. The design process is supported by the availability of pilot plants and Innovation Centers, where different heat treatment processes can be combined and compared for best results and new product lines rapidly developed. ■



SPX FLOW Innovation Centre, Silkeborg.

About SPX FLOW, Inc.

Based in Charlotte, North Carolina, SPX FLOW, Inc. (NYSE:FLOW) is a leading global supplier of highly engineered flow components, process equipment and turnkey systems, along with the related aftermarket parts. The company serves the food and beverage, power and energy and industrial end-markets with approximately \$2 billion in annual revenue, operations in more than 35 countries, sales in over 150 countries and 8,000 employees.

For more information, including details about the spin-off from SPX Corporation, please visit www.spxflow.com.









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➤ Gerstenberg Schröder
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➤ Waukesha Cherry-Burrell

Optimized dairy production without jeopardizing quality!

Production facilities are always looking for ways to optimize their processes. As the milk market is presently oversupplied and milk prices are at their lowest seen for many years, upgrading production facilities to run continuously with better performance is one way to increase the bottom line.



By
Christine Holt,
Sales Manager,
SiccaDania A/S

24/7 optimized drying process

Standard milk powder plants normally run 20 hours before parts of the plant needs to be CIP'ed for controlling bacteria growth as well as fouling of the heating equipment. A CIP cycle of feed system from feed stop to feed run can

take up to 4 hours, meaning more than 16% downtime on expensive production equipment. Further the shutdown of dryer to water can give irregularities in the powder specifications and thereby an uneven powder quality compared to a continuously powder production with a high degree of powder stability. Additionally the energy loss of running the spray dryer on water without getting any powder is also considerably high.

Based on above, rebuilding of the production facilities to make the spray dryer run 24/7 has lots of advantages and the investment is quite often paid back within a very short time. Each case must be thorough investigated with the

existing plant equipment evaluated and analyzed to understand the implications and necessary equipment/upgrade to be installed.

Necessary assessments

Five process areas must be assessed before a 24/7 upgrade, as described below:

Evaporation capacity: The evaporation capacity of the existing process will often not have sufficient capacity to increase the production with 16% as well as it will not be able to feed the dryer inline due to CIP requirements. There are different solutions to increase evaporation capacity:

- Install an additional evaporator to switch between two evaporators to avoid any bacterial growth.
- Install an evaporator - a so-called "finisher", which can concentrate the product from 36 to end concentration.
- RO plant to concentrate the incoming product before evaporation.
- Buffer system for feed to dryer.

Feed line system: The feed line system must be a double system where the feedline up to the atomizer is CIP'ed every 10 to 12 hours, often in connection with the finisher. If the existing atomizer is a centrifugal one, then there is a possibility to switch from one system to the other with a very short run on water (less than 1/2 hour).

If the dryer already has a nozzle atomizer system, it will most often be possible to add duplex set of nozzles to the system. The air distribution system also needs to be assessed in terms

Facts about SiccaDania A/S



SiccaDania was founded in 2014 by a group of engineers with vast experience from the evaporator and spray dryer industry. SiccaDania focusses on the dairy and food end markets, with headquarter located in Denmark and subsidiaries in China, France and New Zealand with more than 50 employees. SiccaDania's ambition is to become a leader within our field of drying, and give our customers the highest value for money for their investment into new projects.



SiccaDania MVR evaporator.



SiccaDania Milk Powder Plant.

of the additional nozzles, which might affect the airflow.

Overall layout: Existing production area is normally used down to every square meter, and it can therefore be a challenge to re-build and add additional equipment to the facility. However, smart solutions are possible in terms of elevation and platforms for new equipment. Every site needs careful examination to find the most optimal solution.

CIP system: The existing CIP system needs to be able to CIP the new lines and have surplus capacity in case of new evaporators to be installed.

Automation: An update of the existing automation system is required to control the switch overs as automatic as possible to save time and man hours.

Optimized production

Based on above-mentioned assessments, required capital investment for

optimizing the production can be made and thereby the overall business case and return of investment time is visible.

In many cases, making a rebuild can be a fast and lower capital cost alternative to a complete new plant investment, however each case must be investigated individually. ■

Can you keep up when the market changes next?

Not being able to meet market demands is expensive. That is why you need to know how to respond to the ever-changing landscape of the dairy industry. With ALECTIA's dynamic master plan you will get a carefully plotted roadmap to turn your overall strategy into a development plan. With a consistent overview and the ability to simulate "what if"-scenarios, ALECTIA will help you to anticipate future initiatives and always be one step ahead.

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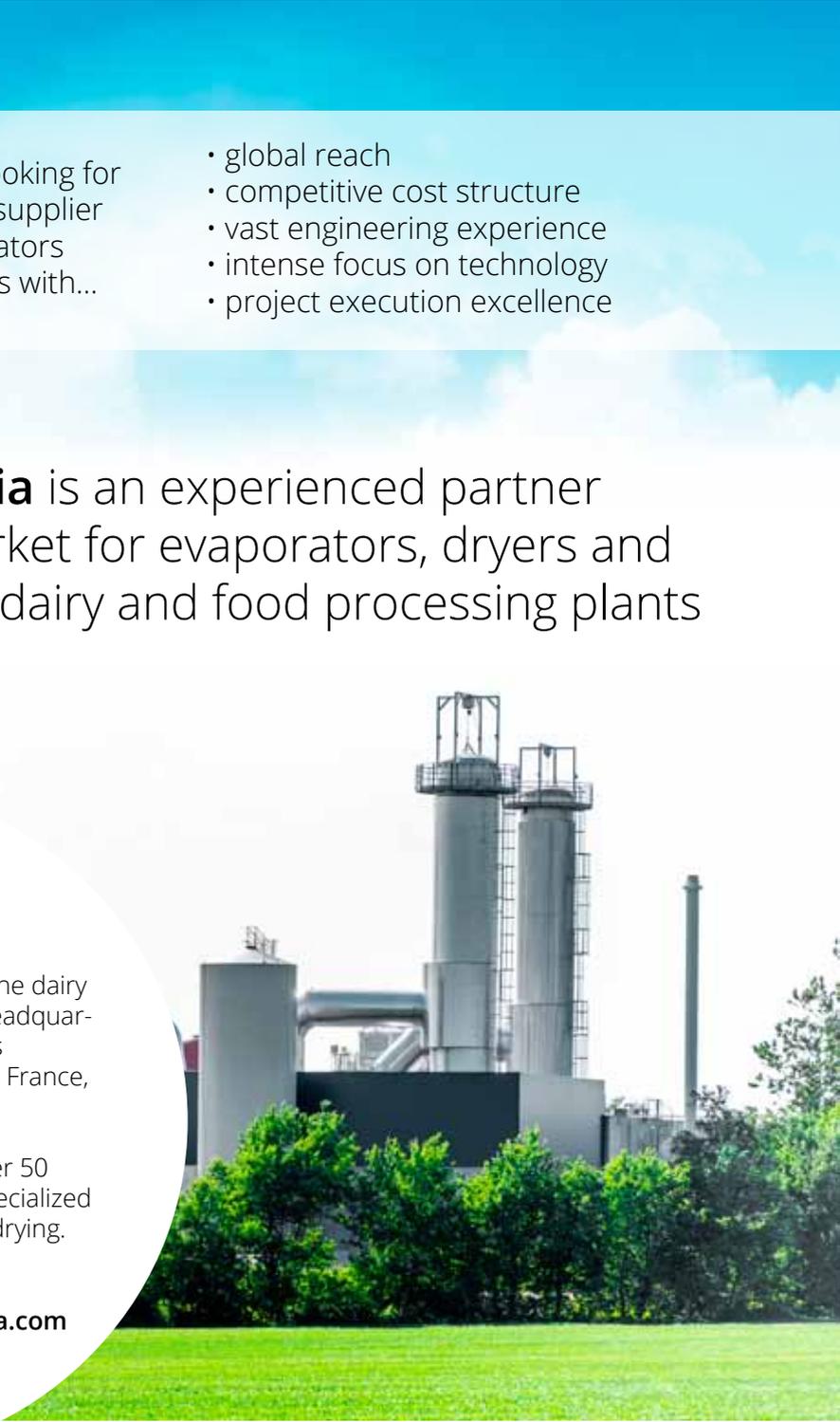
SiccaDania is an experienced partner in the market for evaporators, dryers and complete dairy and food processing plants

ABOUT SICCADANIA

SiccaDania is focused on the dairy and food sectors and is headquartered in Denmark, and has established subsidiaries in France, China and New Zealand.

The company employs over 50 experienced engineers specialized in evaporation and spray drying.

Learn more at siccadania.com



SiccaDania

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The Greenest Pure-Pak carton ever

Featuring renewable polyethylene



By
Inge Brock Sommerlund, Key Account Manager, Region Europe, Elopak Denmark,
inge.sommerlund@elopak.com

The Elopak Future Proofed Packaging Strategy

Elopak intends to be a company with zero net impact on the environment and we are setting very clear targets for our people, our profits and our planet. Elopak is aiming for nothing less than 100%.

Elopak's Sustainability strategy towards 2020 is called Future Proofed Packaging and covers 6 main focus areas, including renewable raw materials and sustainable energy amongst others.

A renewable resource is a natural resource that can be re-grown with the passage of time - such as trees or plants, among others. When grown responsibly, these things are sustainable.

- 100% Recyclable
- 100% Renewable
- 100% Recycling
- 100% carbon neutral

The greenest Pure-Pak carton ever

Elopak's cartons are mostly made of paperboard, made from wood. By ensuring the purchase of 100% wood fibres derived from legal and verified sources, the paperboard is renewable. Elopak's cartons also have a thin layer of plastic (polyethylene, or "PE") that protects the product inside it, and many have a closure too, also made of PE. Like most other plastics, PE is traditionally made of fossil resources that are not renewable.

Elopak aims to replace all fossil-based raw materials with renewable alterna-

tives as part of its ambitious Future Proofed Packaging Strategy. An increased use of renewable PE helps reduce the use of fossil-based materials by replacing them with resources that can be regenerated. Using renewable PE also reduces one of the largest sources of CO₂-emissions in the beverage carton value chain.

The renewable polyethylene is produced in exactly the same way as regular oil-based polyethylene, the only difference is the raw material input. Hence, there are no physical or technical differences between regular PE and the renewable PE. The new renewable cartons are therefore fully compatible with all current filling systems.

"The beverage carton is the environmentally superior packaging choice, consisting of at least 75% renewable paperboard derived from responsibly managed forests. The remaining materials are mostly made of polyethylene, a polymer usually produced from fossil-based raw materials. Renewable PE brings us much closer to our vision of a 100% renewable carton. At the same time, we are further reducing the carbon footprint of the carton; a footprint which was already best in class within beverage packaging", says Kristian Hall, Director Corporate Environment at Elopak.

Renewable PE - 2nd generation

Elopak offers since summer 2014 a range of products featuring renewable PE featuring 2nd generation renewable PE made of renewable feedstock.

Elopak is working in partnership with key customers wanting to boost the environmental merits of their packaging.

The sustainability of the supplied products is ranked very important to many of the Elopak customers and the renewable Pure-Pak carton from 2nd generation renewable PE is a possibility to reach further in the pursue of 100% carbon neutrality.

Renewable plastics are often made from crops; however, in this case the renewable PE is produced from biomass from second generation feedstock. Second generation raw materials are derived from by-products or waste products such as vegetable oils, and hence they are not in competition with human food supply. Furthermore, the renewable PE used by Elopak is locally sourced within Europe.

- Uses resources that can be re-grown
- 20 % reduction of CO₂ emissions
- Increases brand value of products & companies that are environmentally friendly & ethical

Security through certification

The renewable PE used by Elopak is fully certified through the entire value chain by the International Sustainability and Carbon Certification system (ISCC PLUS).

ISCC stands for "International Sustainability and Carbon Certification" and is a world-wide applicable and acknowledged certification system for any kind of bio-based feedstocks and renewables. ISCC PLUS is specific for food and feed products as well as for technical/chemical applications (e.g. bio-plastics) and applications in the bio-energy sector (e.g. solid biomass).

In Elopak's case, ISCC ensures that the entire value chain and all production steps are certified (from collection of the residue to the final product). www.ISCC-system.org ■



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Baby food: new kid on the block in SuperLock®

A Danish entrepreneur is experiencing great success for her organic baby food sold in SuperLock® packaging. Branded Lovemade™, her products are now on shelf in major supermarkets in Sweden under ambient temperatures.



By
Søren Marcussen,
Regional Director,
Region Nordic, RPC
Superfos

Sweden is the main market for Silvia Wulff, a Danish entrepreneur and mother of two, who sells readymade organic baby food. On her team, she has two Danish celebrity chefs, vouching for high-quality ingredients, high-level taste and texture. The baby food sold

under the brand Lovemade™ is locally produced, which is unique in its category, and the range comprises eight varieties with more to come.

The launch of Lovemade™ baby food has been successful. The products are now available in approximate 700 stores in Sweden and both consumers and retailers agree that the products are unique. Silvia Wulff opted for the SuperLock® packaging solution, holding 215 ml with a 95 mm diameter, which she considers to be part of the success. From her own experience, she knows how irritating it can be to feed a baby if the food container is too narrow: “In terms of giving parents an ease-of-use experience the diameter is important. The SuperLock® pot is the right size, making it easy to stir, get a spoon in and the baby food out. Add to this the click-on screw-off lid makes it hassle-free to open and reclose the pot.”



Instead of importing a series of quark all the way from Germany, the Swedish dairy producer Skånemejerier decided to produce and pack the range themselves. In this regard, their choice of packaging fell on the thermoformed SuperLight™ pot from RPC Superfos.

Let's do it ourselves with pots from RPC Superfos

Quark is full of healthy proteins and is very popular among fitness fans and athletes in Sweden. The Swedish dairy producer Skånemejerier offers a large range of quark under the trademark Lindahls Kvark.

The quark comes in 25 different flavours, each with its specific artwork design, and is now on shelf in Sweden in thermoformed SuperLight™ pots from RPC Superfos. They contain 500 g of tasty quark and are decorated with offset print in six colours.

Although the packaging actually changed, the end users have not noticed it at all. Purchaser Thore Bengtsson from Skånemejerier stresses that this was in fact the whole point: “The aim of the entire project was to maintain the same packaging standard as before, with only ourselves noticing the changes. We asked RPC Superfos to deliver the same type of pack as the one we used to import, and we got what we asked for, even within a very tight time schedule. We've had superb cooperation with RPC Superfos who have given us the right product quality, service and support on time and according to plan.”

Suitable for autoclaving

As the SuperLock® pot is made with oxygen barrier labels, it provides for a long shelf life. This means it is possible to get a product placement in retail stores under ambient temperatures - alongside competing products sold in glass. While the market for baby food generally is dominated by glass packaging, Silvia Wulff concludes that this packaging has all the properties she wants for the Lovemade™ products: “Plastic has low weight which is good as it means reduced transportation costs and reduced environmental impact. I also appreciate the fact that SuperLock® is suitable for autoclaving, so we can ensure suitable shelf life and at the same

Plastic has low weight, which means reduced transportation costs and reduced environmental impact. This is just one of the reasons why Lovemade™ baby food is sold in a SuperLock® pot.



time ensure pure and natural products, avoiding the need for additives or preservatives. Also the pot can be re-used at home multiple times, which adds value to our product.”

The pot has excellent clarity

The artwork design of Lovemade™ is appealing and evocative of a happy child universe. The base of the SuperLock® pack is transparent, making it possible to see the content at the moment of the purchase decision. In this way, the packaging communicates authen-

ticity, freshness and a healthy nutritious product.

“Our goal is to sell a product that fully takes baby food to a higher level: organic, high-quality ingredients that are cooked following gourmet recipes, served in a safe and user-friendly pack

of low weight that can be used over and over again at home. There is love in all aspects of Lovemade™,” Silvia Wulff points out.

Silvia Wulff cooperates with the leading supplier of branded consumer goods in the Nordics, Orkla Foods Sweden. ■

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Improved mixing technologies for the process industry

Headquartered in Denmark, Daniatech develops and sells state-of-the-art mixers for the process industry worldwide. The revolutionary new mixer design offers improvements on every important parameter. Especially the new powder transport method and the energy efficiency of the innovative solutions are expected to make a great impact in the industry.



Daniatech LabMaster
test before you invest.



By
Erik Dath Harbo,
Sales Director,
Daniatech

New Powder Transport Method (Patent Pending)

For high capacity powder-handling, the use of vacuum transport is dominant. Powder is sucked by vacuum into the mixer below liquid level. This method has limitations, due to the limited pressure difference between the vacuum in the tank and atmospheric pressure in the environment.

To eliminate this problem Daniatech has developed a system that uses pressurised air for powder transport into the mixer below liquid level. The newly developed method has a range of advantages over the existing vacuum method. Advantages of the new method:

- Reduced risk of blocking due to the innovative powder valve that will be fully CIP-able.
- Positioning of the powder equipment and mixer regardless of the distance between them.
- Controlled amount of air limited to what is required to obtain the necessary powder transport.

- Same size pipe can transport a higher amount of powder.
- Reduced energy consumption.
- Can be retrofitted on existing vacuum-based systems.

Disadvantages of traditional systems:

- Frequent powder-valve blocking due to product backflush into the valve.
- Nearby positioning of powder equipment and mixer (Distance typical max 5-10 m).

- Uncontrolled amount of waste air is sucked through the product from the environment.
- Higher energy consumption to drive the transport.
- Excess air required for the transport.

Daniatech is in the process of obtaining a patent on the improved method of powder transport.

Significantly reduced energy costs (Patent Pending)

Excessive energy costs are a major concern for all companies in the process industry. As a result, energy efficiency is a focus point in the development of new systems and the centre of every Daniatech mixer solution.

A new patent for a Computerized Flow Dynamic (CFD) design of the mixer unit and the tank has resulted in a high-efficiency system that offers a considerable reduction in energy consumption. A Daniatech solution offers the same types of mixing and the same quality,

Company Background

Daniatech is a sister company to Danish based Cabinplant. 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 industry, they are the backbone of Daniatech.

but at a lower cost. An energy reduction of up to 40% compared to typical systems on the market offers yearly savings of up to €12.000 (40 kW load / 5.000 hours of operation).

Reduced maintenance costs and time

No customer has ever expressed approval of the downtime and expensive maintenance costs that are typical of the process industry. To eliminate this problem, the Daniatech mixer unit comes with as few moving parts as possible and easy access for service. With only three spare parts - two gaskets and a double mechanical seal - the unit can be serviced instantly using only a pallet lifter and a wrench.

To change the parts, only a standard pallet lifter with a bracket mounted for

the purpose is required to support the mixer unit. After removing a few bolts, all other parts can be removed by hand. No heavy complicated bearing house and no pulley systems are necessary.

Components used in the construction come from well-known suppliers with a global service organisation. Consequently, wear and tear parts can normally be purchased locally.

Reduced noise level

As a result of the CFD design, the mechanical construction is virtually silent. The hydraulic noise from moving the liquid and from the frequency inverter are the only noises generated from the unit. However, the noise level of the complete unit is down to 73 dB - a reduction of 2-3 times compared to other systems.

Hygienic design

The Daniatech mixer unit is designed according to EHEDG and FDA. The mixer unit is electro polished except for the impeller. The remaining standard components are from major suppliers with a global service organisation. However, in most solutions customer-specific suppliers are also an option.

Test facility

Daniatech offers customers to test their products both in Daniatech's state-of-the-art test facility, but test mixers can also be rented for onsite testing. ■

Join the **evolution...**

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Inside the Jorgensen Engineering state-of-the-art 7,800 m², domicile in Odense, Denmark. Marketing Manager Jesper Johansen (left) and Sales Manager Per Vedel Rasmussen in front of a just-begun construction of an infant formula line.



Jorgensen is in the exclusive league of global leading machine manufacturers to the milk powder industry.

Green solutions for infant formulas

- Our international customers not only require high quality and hygienically designed processing and packaging lines, but also green solutions and a CSR-profile beyond reproach! So tells Jesper Johansen, Marketing Manager at Jorgensen Engineering. The company is a major player within fully automated packaging lines for infant formulas, and Jorgensen Engineering is extremely aware of the high demands for producing and handling milk-based formulas as green and gently as possible.

By Anna Marie Thøgersen, Editor

International player

Last summer Jorgensen Engineering landed a record order of a three-digit DKK-million amount. The order covers two complete lines for milk powder production, and the customer is a major Dutch/Chinese dairy company. Jorgensen has designed and built the entire part of the new factory; this is from where the milk powders are poured into cans and all further packaging handling.

Moreover and recently, Jorgensen landed the most prestigious order ever from one of the world's leading dairy

companies. - This state-of-the-art order places very high demands on technical solutions including robotics and comprehensive documentation of functions and structure of the entire package line, underlines Marketing Manager Jesper Johansen.

For decades, Jorgensen has designed and delivered high-tech packaging lines with integrated robots to highly esteemed food producers like Nestlé, Abbott, Wyeth, Arla, Danone and FrieslandCampina etc. With the two new huge orders, Jorgensen is really mov-

ing up into an exclusive league of global leading machine manufacturers to the milk powder industry.

Green performance

In general, a complete Jorgensen packaging handling system for infant formulas includes: Automatic de-palletizing, jet air cleaning and feeding of empty cans, scoop inserting, filling, check weighing, clinching, end-handling, air evacuation and gas flushing, seaming, labeling, plastic lid over-capping, code reading, wrap-around case packaging,

case coding, palletizing and line control with SCADA .

The Jorgensen-staff design all packaging handling lines the intelligent way with a dynamic flow to increase the overall efficiency. A Dynamic Line Control system monitors the units and automatically adjusts the line speed for smooth operation and maximum line performance. - Our packaging systems are highly automated and complex, and thus we have to maximize the utilization of the line capacity. When projecting a new packaging line, we integrate our Dynamic Line Control providing a far better performance. Thus, focus is on saving both production time - and energy! So informs Jesper Johansen.

Further and in general, Jorgensen Engineering focuses on hygienic designs of the packaging lines making them easier to clean.

Flexible solutions

Moreover, Jorgensen's flexible packaging lines are equipped with picture

monitors, meaning that the dairy operators only have to watch the monitor to know, which products will be next in line. Thus, changeovers require from zero to an absolute minimum of time switching from one to another type of product, packaging, and/or volume. - Our global infant formula producers demand more flexibility on the very same packaging line. These demands could be filling/packing and handling different milk powder products with e.g. differently shaped and colored scoops in different kinds of cans or cartons. Thus, the picture-monitor-features contribute further to saving downtime - and energy, explains Jesper Johansen.

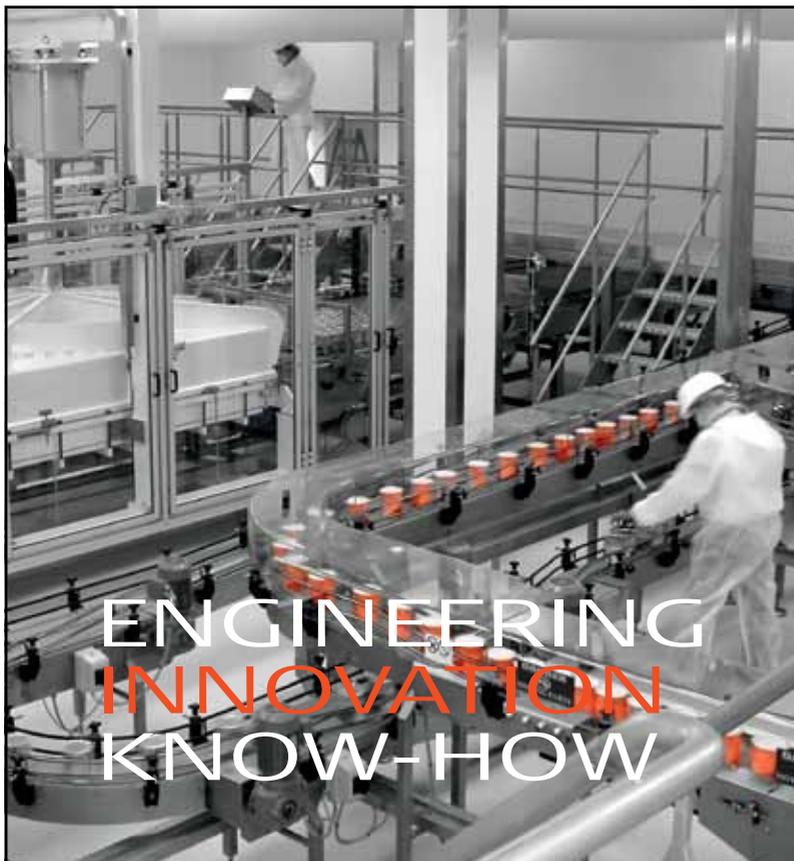
Focusing on CSR

Infant formulas are only the second best when young mothers are unable to breast-feed their babies, thus they put heavy pressure on the producers for the very best baby foods - and the producers' social consciousness. These facts again place high demands on sup-

pliers of productions lines for the infant formulas.

Therefore, at Jorgensen they know that their large global customers must focus on CSR (Corporate Social Responsibility), as consumers worldwide keep a sharp eye on the food producers and their social profiles. Indeed, Jorgensen wants to contribute to an improved CSR-profile, and the company holds accreditation within guidelines defined by international organisations as e.g. SEDEX (Supplier Ethical Data Exchange), the SMETA guidelines (Sedex Members Ethical Trade Audit), and not least an accreditation by SHE (Safety - Health - Environment).

These approvals underline that Jorgensen Engineering operates extremely seriously and holds high ethical behavior in the global supply chain. ■



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Optimization by Novadan

Bornholm's Andelsmejeri: "Our UF-plant is now running at full speed!"

Optimization of the cleaning procedure and newly developed products have made the UF plant at Bornholm's Andelsmejeri run at full speed.



By
Torben Jensen, Key
Account Manager
FOOD, Novadan

Overloaded UF-system

The UF-plant at Bornholm's Andelsmejeri has for a long time been overloaded as the company wants to send as much of the leftover protein in their whey for further processing.

Therefore, the requirements for their whey and the UF-plant that concentrates the whey protein are high.

"When Novadan asked us if we wanted to test some new Ro Dan products we readily agreed.

Novadan focused on optimizing the cleaning, and we hoped the optimization of the cleaning might be able to increase our capacity on the plant



The Novadan-optimized UF-plant at Bornholm's Andelsmejeri.

and thereby help us to expand the production without investing in a new UF-plant." So tells Jim Ingvorsen and Rasmus Sørensen, Bornholm's Andelsmejeri.

Before optimization

Before the cleaning optimization of the UF-system, there was a daily stop in the cleaning procedure in the enzyme phase for 4-6 hours in order to maximize the effect of the enzyme and thereby ensure a really good cleaning. This meant that the night shift had to remember to start the CIP when they came to work. Otherwise, the membrane system would not be ready to start when the produced whey was ready to be concentrated.

Test-phase

It was therefore with great excitement that Bornholm's Andelsmejeri was awaiting the results of the test-phase, where Novadan worked on the optimization of cleaning.

Novadan started the test-phase with the optimized product: Ro Dan 300E. The result was that the period where the system was switched off with the enzyme product, now could be cut away. Thus, Ro Dan 300E has now become an integral part of the cleaning, and time

About Bornholm's Andelsmejeri

The Danish dairy-cooperative, Bornholm's Andelsmejeri is an independent dairy owned by the Bornholm milk farmers. The dairy was founded in 1950 and has since 1970 been the island's only dairy. Daily, the 36 milk suppliers provide milk, which is produced for milk products, butter, fermented products or cheese.

The milk and fermented products is delivered to the local Bornholm retail shops whereas the cheeses are sold both locally and internationally. The world famous Dairy Cooperation produce yellow cheese, hard cheese (Greek style) and blue cheese.

Bornholm's Blue Cheese (Danablu) is famous. The blue cheeses has won numerous awards both nationally and internationally. St. Clemens Food Products is Bornholm's Andelsmejeri's Export Division marketing and selling the famous cheeses all over the world and export about 5.000 tons of cheese annually.

As the only cheese maker, St. Clemens has won "World Cheese Champion" in Wisconsin two times - in 1980 and again in 1998.

savings of a minimum of 4 hours daily have been achieved.

Subsequently, the new acid product for membrane plants Ro Dan 18 was tested, and it has given the plant the final push, so the plant is now always running at extra speed.

Increased revenue opportunities

As Jim Ingvorsen and Rasmus Sørensen from Bornholm's Andelsmejeri explain: "Now we can hardly keep up with producing the whey, the plant is to concentrate." It does not just mean that the production completes quicker than before - but also that it is possible to expand production while processing the produced whey. Therefore, this optimization of the cleaning helps to increase the earning potential without having to invest in new production equipment.

High level of loyalty

Bornholm's Andelsmejeri attaches great importance to a high service level, qual-

**Novadan
Dosing
System.**



ity products and consultancy from their suppliers.

Jim and Rasmus underline: "We greatly appreciate the service we get from Novadan and we have great confidence in their knowledge about e.g. CIP- and membrane cleaning and the professionalism that they put in the implementation of their cleaning procedures and products."

Jim and Rasmus continues: "Novadan has for several years been a

good and stable supplier of cleaning solutions to our company." They explain that Novadan has ensured that the cleaning runs at a high level on the membrane plant ensured that production has been running at a good level, and that membrane renewal not yet has been necessary. The membranes in the membrane system at Bornholm's Andelsmejeri have been running satisfactorily for three years and they show no signs yet of fatigue. ■



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One stop services in raw milk testing

Raw milk testing - local client integration with a global outlook



By
Søren Hansen,
Business Line
Director,
Milk & Serology,
Eurofins

When Eurofins Scientific acquired the Danish Steins Laboratorium in 2006, raw milk testing became an integrated part of the “Eurofins DNA”. Steins was established in 1857 and the competence and dedication contributed by generations is today the core in Eurofins ca-

pabilities in raw milk testing in Denmark, Sweden, Poland, Italy and the US.

Raw milk testing is strategically a focus area for Eurofins. Recently, a separate Business Line has been set up for this activity, ensuring the right attention is in place for the major three business segments.

Eurofins - global leadership in bio-analysis



Eurofins Scientific is a World leader in food, environment and pharmaceutical products testing, as well as one of the global market leaders in agro-science, genomics, discovery pharmacology and central laboratory services. In addition, Eurofins is one of the key emerging players in specialty clinical diagnostic testing in Europe and the USA.

With over 23,000 staff in more than 225 laboratories across 39 countries, Eurofins offers a portfolio of over 130,000 validated analytical methods for evaluating the safety, identity, composition, authenticity, origin, traceability and purity of biological substances and products, as well as for innovative clinical diagnostic. The Group provides its customers with high-quality services, accurate results on time and expert advice by its highly qualified staff.

Through R&D and acquisitions, the Group draws on the latest developments in the field of biotechnology and analytical chemistry to offer its clients unique analytical solutions and the most comprehensive range of testing methods.

As one of the most innovative and quality oriented international players in its industry, Eurofins is ideally positioned to support its clients' increasingly stringent quality and safety standards and the expanding demands of regulatory authorities and healthcare practitioners around the world.

Payment milk testing

This type of testing is mainly performed to provide results that will determine the value of the raw milk. Based on the results from the Laboratory, the dairy companies/milk buyers will pay the farmers (producers). Further, the testing can also be mandated by local regulations as part of a national surveillance program or even regional regulations within the same country. The samples are collected when the milk hauler goes to the farm to collect the milk. The farmers are paid according to the value driven parameters (protein, fat and lactose) and to the quality driven parameters (e.g. somatic cell count, total bacterial count, freezing point depression, spores and inhibitors).

Dairy Herd Improvement testing (DHI testing)

The testing is performed on individual cow samples in order to provide results that can support the farmer in the farm management. Typically, samples are collected 5 to 12 times per year per cow. The farmer is offered value driven parameters (protein, fat and lactose) as well as quality/breeding parameters (somatic cell count, urea and ketosis). Based on the results, the farmer can optimise the mass balance in the milk production and the output (efficiency) of the individual cow. The farmer will

often also use the results to setup cattle breeding plans.

Bovine health testing

Bovine health testing relates mainly to specific testing that can detect sickness (e.g. mastitis, Salmonella, IBR, BVD) within the herd and could also include testing related to breeding (e.g. Bovine pregnancy testing). The results are often used by the farmer in cooperation with a bovine veterinarian. Sometimes the testing can also be mandated by local regulations as a part of national surveillance plan. Mainly, the bovine health testing is performed on individual cow

samples. But also bulk milk is used for quick and cheap surveys.

Calibration standards

An extensive programme in raw milk and processed milk calibration standards is an example to the diversity in our add-on services supporting raw milk testing.

Eurofins' comfort zone

Eurofins' comfort zone is in the matrix between farmers, dairies and organizations related to dairy farms. During the past years, Eurofins has built a significant experience in this field and with

emphasis on impartiality, responsibility and trustworthiness. As a one-stop service supplier Eurofins has continuously and proactively improved quality and efficiency and has enlarged the scope of services significantly, all in very close cooperation with our clients.

We look forward to giving new partners access to the capabilities of the Eurofins raw milk testing, to support them in strengthening their quality and efficiency. We offer local presence and integration supported by a global network! ■



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Is “Disruption” the new buzzword in the dairy industry?

When world market leaders like LEGO, A.P. Møller-Mærsk and the largest bank in Denmark, Danske Bank are jointly founding a company to make them able to be - or learn to be - disruptive, the word “disruption” must be taken seriously. Kodak and other great companies learned it the hard way! However, is “disruption” also an issue to be aware of within an old and somewhat conservative sector as the dairy industry?



By
Ole Bressendorf,
Vice Sales
President,
Alvibra A/S

The dairy and food industries in general, have for years been very active within introducing new green technologies. Moreover, the general trend in customizing all kinds of products and services are an important focus area for many dairy and food equipment manufacturers. However, with all respect far away from being disruptive.

Green technologies - a key world

For Alvibra green technology is not only a focus area, it is a part of the business model. Our patented vibratory drive systems VibraDrive™ and ViFlex™ save you as much as 30-50% of the energy costs compared to traditional vibratory systems.

However, green technology and cost savings are not the only benefits you achieve by using Alvibra’s advanced technologies. In addition, you further obtain an ultra slim design and a flexible and easy adjustment of your capacity.

It might not reach the level of “disrupting technologies”, but topped up

with issues like an “easy-to-clean” and “no-dead-corner” design, an option of retractable CIP-nozzles, and our QuickLock™ sifter ball deck - you will get a lot more than just an ordinary vibratory conveyor or a vibratory sifter. Indeed, our QuickLock™ sifter ball deck is probably the most advanced ball deck in the market. Finally yet importantly, you get the conveyors up to 30+ meters long and still by the means of one motor only. A traditional design would require up to six motors.

Standard and tailor-made options

Our line of standard vibratory conveyors - both tube and rectangular, and the different types of sifters for almost all kinds of powders and granules, will simply give you such a large variety of options, that we feel sure we are able to find the best possible solution for your production - too.

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An Alvibra Sifter on-site.



ers and other vibratory machinery for more information.

About ALVIBRA

Alvibra is a worldwide player and family-owned supplier of vibratory machines and equipment with a long tradition of introducing innovative and patented technologies.

Our focus segments are the dairy, food and ingredient industries, and we regard it an obligation to serve our customer

with high quality products with a supporting and service-minded attitude.

We will be happy also to serve YOU. Send us a request and we will get back to you ASAP.

We do our very best in learning to be disruptive! ■

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Milk: a source of process water

Cow water can be a precious resource. At the Rødkærstro dairy in Denmark, Arla Foods has cooperated closely with Grundfos BioBooster on developing a method for purifying and reusing cow water from mozzarella cheese production. The partnership opens up new and exciting prospects for the development of the waterless dairy.



By
Jonna Mortensen, Arla Foods, and Søren Nøhr Bak, Grundfos BioBooster

Business is booming at the Arla Foods dairy in the town of Rødkærstro, Denmark. The dairy processes the largest volume of collected milk in Denmark and specialises in manufacturing mozzarella cheese. In recent years, production has risen steadily to its current level of 80,000 tons annually. This is in line with the Arla Foods Good Growth strategy, one of the aims of which is to build a global food service position within mozzarella cheese production characterised by high quality and low cost.

A key element of the Good Growth strategy is responsible growth that prioritises safety, society and the environment in a long-term perspective, and

Arla Foods has seen its share of challenges with the production increase at Rødkærstro, where increased mozzarella production results in a greater volume of RO-water from the reverse osmosis (RO) processes. Since the Rødkærstro dairy has also been able to increase the solids content in the whey from 8 to 18%, the amount of RO water has now reached a level where the dairy's own wastewater treatment plant (WWTP) is no longer able to process it all.

The RO water challenge could be solved by discharging to municipal sewer or by extending the existing WWTP, but both of these solutions would be

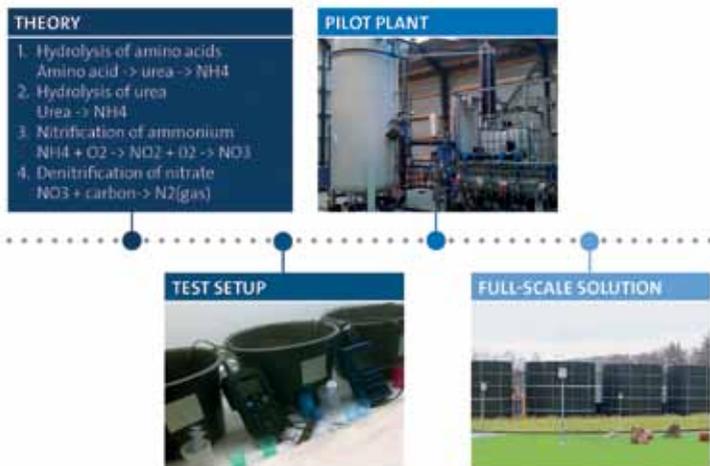
quite costly. Instead, an economical and promising alternate solution has now been devised in close cooperation between Arla Foods and Grundfos BioBooster: a new WWTP that cleans the RO water in a biological membrane reactor. This done so effectively (see table 1 and 2) that the water can be discharged directly into the environment - or be reused as process water at the dairy.

Cooperation on win-win solution

Grundfos had already successfully tested the technology behind the project at the Arla Foods dairy in Vimmerby, Sweden, and a structured research programme was initiated at Rødkærstro. In a matter of months, the solution went from idea via laboratory testing and pilot plants to final implementation as a full-scale solution.

The solution is based on biological treatment of the RO water followed by ultra-filtration through ceramic membrane. This prevents microfilm formation and removes nitrogen, and the water is filtered to remove bacteria and particles. The purified water complies with all requirements on discharged water, and the modular BioBooster plant can easily be scaled up and down to accommodate varying production requirements at the dairy. The WWTP at the Rødkærstro dairy currently handles approximately 450 m³ of RO water daily but is sized to handle 650 m³. This gives Arla Foods ample opportunities for increasing production as needed.

The Grundfos BioBooster solution at the Rødkærstro dairy has gone from theory to practical reality in a very short time



Exciting prospects

In the short term, the Rødkærstro dairy is working on using the treated RO water

Parameter	Reused water Sep-Oct 2015	Tap water limit	Unit
Bacteria count, 37°	35	20	CFU/ml
Bacteria count, 22°	48	200	CFU/ml
E. coli	<1	Not detectable	CFU/100 ml
Coliform bacteria	<1	Not detectable	CFU/100 ml

Table 1: Microbiological measurements and results.

for its cooling plant, and in the longer term, it may be possible to use it for cleaning and CIP processes. The environmental prospects in reusing water from milk are very exciting: Arla Foods and Grundfos estimate that optimal utilisation of the RO water may make it possible to reduce water consumption at the Rødkærø dairy from 1,500 to 1,000 m³ daily. Much of the process water used in mozzarella cheese production quite simply arrives at the dairy as part of the raw material! In addition to the significant financial and practical advantages in using and discharging less

water, the Grundfos solution enables Arla Foods to increase growth in an environmentally responsible manner and in alignment with its company strategy.

Environmental partnership

There is therefore far more to the project than increased production and turnover. Both Arla Foods and Grundfos have clearly defined policies on environmental protection, responsible growth and protection of the world's water resources. The symbiosis between the focused environmental efforts at Arla Foods and the Grundfos investment in

new water technologies is a prime example of what can be achieved when two environmentally conscious companies collaborate. The solution at Rødkærø is a win-win solution for Arla Foods and Grundfos, but it is also very much a win for the environment. It represents a major step on the road towards dairies where the process water arrives with the milk - the waterless dairy. "If the cows produce milk that is 84% water anyway, we might as well save on groundwater and use the water from the milk first", says Jonna Mortensen. ■

Parameter	WWTP outlet Sep-Dec 2015	Limit, discharge water	Unit
Total COD	3.8	75	mg/l
Total Nitrogen	3.4	8	mg/l
Nitrate - N	2.2		mg/l
Ammonium - N	0.03		mg/l
Phosphate - P	0.14		mg/l
Total Phosphorus	0.17	0.3	mg/l
SS (Suspended solids)	<1		mg/l

Table 2: chemical measurements and results.

GRUNDFOS BIOBOOSTER
Next Generation Wastewater Solutions

Arla Foods, Rødkærø

be think innovate

GRUNDFOS

Water saving in Arla Dairy

New water technology from EUROWATER reduces water waste by more than 75% to the benefit of both the dairy's competitiveness and the environment.



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

The dairy is located in Brabrand west of Aarhus and owned by the Danish head-quartered international dairy company Arla Foods. Arla is a responsible food provider focusing on sustainable dairy production. In this context, water consumption plays a major role and water saving was high on the agenda in connection with replacement and modernization of the dairy's water treatment plants. The choice fell on a series of standard water treatment plants from EUROWATER, which all are designed with a view to low water consumption.

Intelligent design of softening unit

The nearby waterworks supplies the dairy with clean drinking water. Dairy production requires clean water in various qualities; drinking water quality is insufficient. The largest volume of water - approximately 90,000 m³ per year - is used for a number of purposes: condenser, cooling water for homogenisator, and heat exchangers for pasteurisation equipment and centrifugal separators. Here, it is important that the water is soft in order to prevent calcium deposits. In other words, softening minimize operational costs and

prolong the life of technical plants and installations.

The solution is a softening plant type STFA comprising two vessels with ion exchange resins. The softening plant has a total treatment capacity of 40 m³/h and is designed with a distributor section that ensures smooth and uniform flow distribution whereby the capacity (the total volume of filter media) is fully utilized. The produced water is collected in a reservoir of 15 m³ from where frequency-controlled pumps distribute the water to the production sites.

When the plant capacity is exhausted, the plant is regenerated with a saturated saline solution known as brine. Costs for water and salt for regeneration constitute a large part of total operating costs. To optimize this process, the plant is equipped with a number of special features that minimize the consumption of water and salt:

- Monitoring of regeneration water quality. When the ion exchangers are cleaned, regeneration stops.
- Reuse of regeneration water from the various regeneration phases to the extent possible.
- Exact plant design enabling the plant to use exactly and only the amount of salt that the plant shall use - regardless of ambient temperature.

Brine for regeneration is produced by a brine maker, i.e. an automatic system for preparation of large quantities of saline solution. The system can handle one ton of salt at a time. The dairy

uses fine salt in big bags. Filling is carried out once a week using an overhead travelling crane in accordance with environmental security standards.

Demineralized water by water-saving RO unit

An annual water volume of approximately 5,000 m³ of the softened water is further treated and used as make-up water for steam boiler, laboratory use, and internal cooling on filling machine. Here, it is important that the water is demineralized, i.e. free of salts. This is accomplished in a reverse osmosis system using membrane technology to produce demineralized water without the use of chemicals. The reverse osmosis system is of the type RO-PLUS, characterized by a particularly high water recovery. In comparison to traditional reverse osmosis systems, the water waste is reduced by 60%. In this case, a large operational saving on water consumption was achieved.

Total water saving

Annually, the water saving totals approximately 5,500 cubic metres. The dairy pays a water price of EUR 4.16 per cubic metre for water and discharge tariff. Thus, the dairy saves approximately EUR 23,000 a year on its water bill. Add to this saving on consumption of salt and energy, which is affected positively by all the modernization measures.



EUROWATER Water Treatment Plants designed for lower water consumption.



EUROWATER insures reliability during transition from old to new water technology.

Pure water treatment since 1936
 EUROWATER has 80 years of experience within the fields of developing, manufacturing, selling and servicing complete water treatment plants for heat and power plants, waterworks, hospitals and industrial companies. The main applications are boiler water, process water, cooling water, rinse water and drinking water. EUROWATER has more than 366 highly qualified employees at 23 sales and service offices around Europe. For more information, please visit www.eurowater.com

Supply reliability

During the whole project implementation, the reliability of supply was also on the agenda. It was a condition that the existing room for technical installations containing the old water treatment plant was to be modernized and contain the new water treatment plant. Dairy production runs 24/7 all year round, so the dairy could not do without water supply during the moderni-

zation period of eight weeks. This challenge was solved by means of a rental unit from EUROWATER. In this case, a softening plant with a reverse osmosis system installed in a 20 feet container, ready for use, was applied. The necessary equipment was already reserved for the task from project start. During the entire project, the water supply has been very reliable. ■

Reliable water treatment – for the food and beverage industry

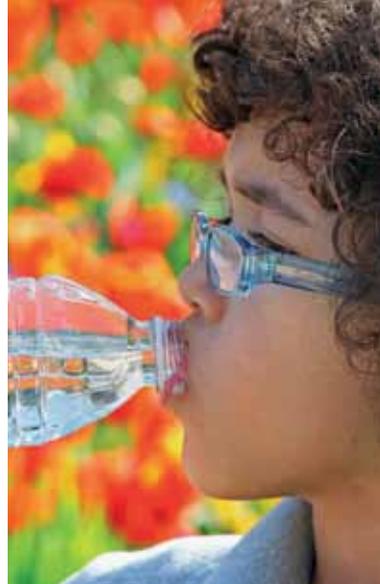
Safety, product quality and running costs are important issues in food and beverage production. EUROWATER has decades of experience in dimensioning, producing, installing and servicing water treatment plants for a demanding industry.

Find your local EUROWATER sales and service office – visit eurowater.com

EUROWATER
 PURE WATER TREATMENT

Thirsty for new, green ways of saving water?

In the light of the severe and escalating worldwide water crisis and increasing focus on water consumption, Tetra Pak Filtration Solutions has spotlighted a number of focus areas, which can reduce the water intake of dairy and food processing facilities considerably. The new opportunities have spurred the opening of a Water Competence Center in Silkeborg Denmark.



In many countries around the world, clean drinking water is extremely scarce.



By
Orla Nissen,
Director,
Large Projects,
DSS - A Tetra Pak
Company

In many countries around the world, clean drinking water is extremely scarce, and this shortage makes it problematic for dairy and food processing plants to consume huge volumes of fresh water. However, implementing various green technologies such as RO concentration of milk and purification of process water will help save water and reduce the need for fresh water intake considerably. With the new Water Competence initiative, Tetra Pak Filtration Solutions wishes to inspire dairy and food processing companies to new, greener ways of thinking. New ideas, which will save water and at the same time secure growth opportunities - despite soaring prices of water and increasing regulatory requirements to water consumption and wastewater discharge, which often stand in the way to growth.

Water Competence Center

The Water Competence Center will be staffed with highly competent specialists in water saving technology and reuse of process water. It will be the hub for collection, systematization and documen-

tation of existing water expertise within Tetra Pak Filtration Solutions, and development of innovative solutions and best practices for optimal utilization of water in the dairy and food industry.

Recovering process water from production and using it for cleaning of production equipment reduces the need for water intake substantially, and some facilities around the world have already implemented 'Zero-Water' solutions. However, one very important aspect of reusing and recycling cleaned process water is food safety, and many countries have strict requirements to process water for reuse. One of the tasks of Water Competence experts is to map local legislation and requirements to recovered process water around the world. Only by having thorough knowledge of such legislation can the Water Competence Center provide professional advice to customers with respect to their particular regulatory framework, always with food safety as the main mission.



The new Water Competence organization will focus on process water and separation technologies in business areas where Tetra Pak is already active, e.g. dairy, cheese, ice cream, beverages, prepared food, and cosmetics. In addition, the organization sets out to further develop and enhance Tetra Pak Filtration Solutions' competencies globally in the production of dairy ingredients as well as membrane filtration processes outside the dairy industry.

Maximized value

Hence, the overall goal of the Water Competence Centre is to create maximum value for customers, delivering sustainable and profitable process solutions, which walk hand in hand with Tetra Pak's promise: 'Protects What's Good'.

Tetra Pak Filtration Solutions is Tetra Pak's centre of excellence for membrane filtration, formed by the merger of DSS Silkeborg, Filtration Engineering, and Tetra Pak Filtration Systems in 2012-13. The office in Silkeborg Denmark counts nearly 90 filtration and separation experts, dedicated to supplying innovative liquid separation solutions. ■

Tetra Pak Filtration Solutions have established a new Water Competence Center, dealing with greener ways of thinking to inspire dairy and food processing companies.

THIRSTY FOR NEW, GREEN WAYS OF SAVING WATER IN YOUR PROCESS PLANT?



GREEN membrane filtration technologies such as concentration and purification save water and reduce the need for fresh water intake in your plant.

Contact our water experts for more information on GREEN technology.

Tetra Pak Filtration Solutions
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Documented quality within the Food Industry

LOGSTOR raises the standard for hygiene and life expectancy of our pipe systems



By
Lars Petersen,
Sales Manager,
LOGSTOR Industry

Demands on quality, environment and hygiene are continuously higher within the Food Industry. For LOGSTOR Industry it is a decisive factor that our solutions meet these demands and at the same time provide our customers value for their investment.

LOGSTOR Industry is the preferred supplier of standard and special pipe systems for the Food Sector. With the customers in focus, LOGSTOR Industry always provides the ideal solution, which ultimately ensures both earnings, quality and the environment.

Clean pipes equals good hygiene

The primary reason for using pre-insulated pipes within the Food Indus-

try was to prevent condensation and to improve hygiene - an optimal insulation has a very crucial role in that equation. The smart and obvious solution is to choose just the right insulation thickness that constantly keeps the air temperature above the dew point temperature, which prevents condensation and dripping from the pipes, and thereby significantly minimizing the bacteria growth.

The pre-insulated pipes are available in white or black polyethylene (HDPE) jacket pipe. The jacket pipes are 100 % waterproof, chemical resistant and tolerate high pressure cleaning, meaning that the pipes are easy to clean, they comply with hygiene standards and they do not provide breeding ground for bacteria. The casing also protects the carrier pipe - no water or moisture can penetrate and damage the insulation or cause corrosion. As a result, the unique insulation properties are preserved throughout the life expectancy of the pipe system, which reflects on the low energy consumption and low operating costs.

Danish Technological Institute has conducted a report which concludes that the surfaces of the outer casing is just as easy to clean as the surfaces of stainless steel - this is a mark of quality.

Maintenance costs or lack thereof

Pipe systems from LOGSTOR Industry are maintenance free. The jacket pipe and insulation combined have a high mechanical strength, making them resistant to the influences of the physical environment. The jacket pipe cannot deform as metal casings, therefore it remains sealed keeping the **best efficiency and insulation performance throughout the life expectancy of the system.** As already stated, LOGSTOR pipes are 100 % waterproof, thus the pipe systems are designed to be rinsed and washed in an effortless and easy manner. The recipe for operation optimization and reduced environmental impact must therefore be that a strong insulation equals clean pipes. This results in a better working environment and lower maintenance costs.

Dairies do not cry over spilled milk - they simply apply pipe systems from LOGSTOR Industry, which ultimately will simplify their working day. The many advantages of our pipe systems are as follows:

- A strong design
- Always a dry and energy efficient insulation
- High energy efficiency and long life expectancy
- Unique condensation insulation that reduces energy losses to an absolute minimum



The reason to use pre-insulated pipes within the Dairy and Food Industries is to prevent condensation and to improve hygiene.

- Plastic (HDPE) jacket pipe, which is: 100% waterproof, hygienic, maintenance free, salt, chemical and impact resistant

High demands on quality and hygiene as well as focus on CO2 emission makes pre-insulated pipe systems from LOGSTOR Industry the perfect choice for the Food Industry. Our pipe systems are maintenance free, easy to clean, have a long life expectancy and low operating costs. The pipe systems from LOGSTOR Industry guarantee at least 30 years reliable service life = **a long-term investment that always pays off.** ■



Global ambitions for the environment and people

LOGSTOR is a global supplier of complete pre-insulated pipe systems with a focus on providing better energy efficiency to our customers. The invention of the technology behind pre-insulated pipe systems made LOGSTOR the leading global supplier and manufacturer of piping systems for the energy industry. *“With optimal solutions between environment, energy and people, LOGSTOR improves conditions for the people in all parts of the world. It is an investment in the future and in the world which we are a part of.”*

Giving you the whole package



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Stand J 7160**

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Exiting Program at FoodTech 2016

FoodTech is Northern Europe's leading trade fair for food technology. In 2014, more than 8,000 highly qualified decision makers visited the fair. The next FoodTech takes place during the days 1-3 November 2016 in MCH Messecenter Herning, Denmark. FoodTech '16 will host several events and activities as e.g. the EHEDG World Congress on Hygienic Engineering and Design.

FOODTECH
Processing & Packaging | 1.-3. november 2016

FoodTech 2016

FoodTech is Northern Europe's leading trade fair for the food industry and its suppliers of process technology, packaging and package solutions, equipment for traceability and analysis as well as ingredients and biotechnology. Furthermore, International FOOD Contest is an integrated dairy and food fair under the auspices of FoodTech. Both fairs take place 1-3 November 2016.

EHEDG World Congress

- In cooperation with our collaborators, we have planned a broad program of activities with high professional levels, tells Project Manager, John Jensen. He stresses, that FoodTech further hosts

the EHEDG World Congress on 2-3 November 2016.

The European Hygienic Engineering & Design Group, one of the leading organizations in the field, bi-annually organizes the EHEDG World Congress on Hygienic Engineering & Design. The event is a summit for all target groups interested in the hygienic engineering of equipment and facilities for the safe production and processing of food and related products.



Activities and events

Amongst other events, FoodTech 2016 will be the place for following activities and events:

- EHEDG World Congress on Hygienic Engineering and Design
- FoodTech Challenge
- International DAIRY Contest
- International FOOD Contest
- Conferences and seminars
- Demonstration of production lines for small and medium-sized companies
- FoodTech Award.

We welcome you all!

Are you interested in visiting FoodTech, participate in EHEDG World Congress, exhibiting at the food technology fair, or do you have any questions at all please feel free to contact FoodTech's Project Manager John Jensen, phone +45 99 26 99 38, jj@mch.dk.

For more information about visiting and participating at FoodTech '16, you can also visit the homepage www.foodtech.dk

Key figures 2014

No. of exhibitors: 284 - from abroad: 31

Exhibition area, gross m²: 36,000

No. of visitors: 8,288 - from abroad: 943



FoodTech also host the International Food-Dairy Contest. Thus, exhibitors and professional visitors can taste Danish food products and dairy goods from more than 15 different countries, in which Arla Foods and other Danish dairies are active.

As an exhibitor at FoodTech 2016, you have an ideal opportunity to meet current and potential customers face-to-face in an inspiring and professional atmosphere. Visit www.foodtech.dk for more information. (Photo Tony Brøchner/MCH).



FOODTECH

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Meet more than 8,000 decision makers at FoodTech '16 - Northern Europe's largest trade fair for food technology

Do as more than 240 of your colleagues have already done.
Book stand and be part of the first round of stand allocation.

Contact us and learn more about how you can display and present your products.

FOODTECH '16 IS ALSO:

- International DAIRY and FOOD Contest
- FoodTech Product News & Award. Star dust and extra exposure of your products
- FoodLab. Special sector presenting the latest within lab-equipment
- Network, knowledge sharing, new relations and business opportunities

Almost every other visitor at FoodTech '14 found a new supplier



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Hosting EHEDG World Congress 2-3 November 2016



Documented quality within the Food Industry

We raise the standard for hygiene and life expectancy of our pipe systems

High demands on quality and hygiene as well as focus on CO² emission makes pre-insulated pipe systems from LOGSTOR the perfect choice for the Food Industry.

Our 100 % waterproof polyethylene jacket pipe is chemical resistant and tolerates high pressure cleaning, meaning that the jacket pipes are easy to clean and comply with hygiene standards. Our pipe systems are designed to be maintenance free and to have reduced energy consumption, a long life expectancy and low operating costs.

LOGSTOR is the preferred supplier of pipe systems for the Food Industry and gives you value for your investment:

- Simple and efficient cleaning
- Maintenance free pipe systems
- High quality and long life expectancy
- Reduction of operating costs

A cleaning test with proven effect conducted by The Danish Institute of Technology

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