Boost the dairy industry
by new technologies and methods

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Danish Dairy & Food Industry
worldwide
28
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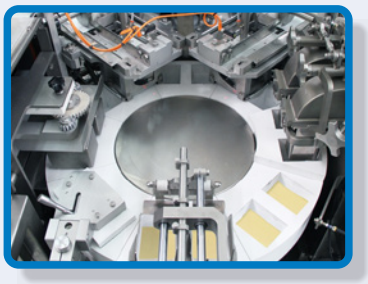

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worldwide

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Boost the dairy industry

by new technologies and methods

Dear reader,

Welcome to the 28th edition of Danish Dairy & Food Industry ... Worldwide with contributions from many large and small companies from the Danish dairy and food industry. This magazine focuses upon a very central theme for all dairy companies: How to boost the efficiency by new technologies and methods.

The industry is characterized by fierce competition, and it is therefore crucial to optimize in all contexts, both in terms of equipment, raw materials and utilities. We have chosen a general perspective – but also a focus on some of the technologies with most development and potential.

The magazine contains a contribution from Jakob Ellemann-Jensen, Minister for Environment and Food in Denmark, and he emphasizes the importance of new sustainable technologies, which places Danish dairy industry in the lead.

Arla – the Danish/International based dairy giant has been asked to point out the most important, technological progresses recently. Three leaders point at new whey products and infant formula due to advanced separation technology. Furthermore, digitization – also with small mobile units - provides new opportunities for the whole supply chain and for the understanding of consumer behaviour. Finally Arla is very focused on new technologies optimizing water management and the production effluents.

A general review of Danish dairy industry and the main developments is given by Danish Dairy Board. And a group of experts share their ideas of the most significant technological and strategic trends in six selected areas.

Finally the producers introduce their companies and their products – all of them representing a very strong and proud Danish industry, which is market lead in several fields.

We hope you will enjoy the many contributions and that your horizon of dairy technology will expand.

Anne-Sofi Christiansen
Chief Editor

Lars Winther
Editor

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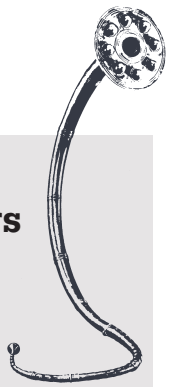

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Vacant Position

Professor in Dairy Product Technology

The Department of Food Science, Faculty of Science, University of Copenhagen invites applications for a position as Professor in the area of "Dairy Product Technology". The position is available from 1 October 2019.

The Professor will be a part of the Section for Ingredients and Dairy Technology, and is interested in conducting and developing basic and applied inter-disciplinary research of high international standard in the field of dairy chemistry and technology.

The research within the Department has the mission to contribute with new solutions for society and industry in order to support sustainable food production, food security and safety as well as production of high quality food promoting human health and wellbeing. The Department is an international workplace with English as primary working language.

The research should preferably cover some of the following areas within dairy chemistry and technology:

- Dairy chemistry including colloidal aspects
- Technology and manufacture of dairy products
- Functional properties of dairy components and dairy derived ingredients
- Interactions between ingredients and milk components
- Milk components as ingredients

Qualifications are expected within the following areas:

- Good project management and leadership skills of research projects involving collaboration between academia and industry
- Experience with international collaborations
- Ability to develop collaborative research project ideas
- Capacity to build up an independent research group with a clear vision
- Success in obtaining research grants
- Documented scientific impact and outreach of conducted research
- Successful track record in industry collaboration

Applicants are required to have a relevant Ph.D. degree and university level teaching experience, documented teaching competencies. Formal pedagogical training or supervision equivalent to the University of Copenhagen's teacher training program for assistant professors is required.

Further information on the Department can be found at http://www.food.ku.dk/english. Inquiries about the position can be made to Head of Department, Anna Haldrup (+45 9356 5698, anna.haldrup@food.ku.dk) or Head of Section, Mogens Larsen Andersen (+45 3533 3262, mola@food.ku.dk).

The University wishes our staff to reflect the diversity of society and thus welcomes applications from all qualified candidates regardless of personal background.

Terms of employment

The position is covered by the Memorandum on Job Structure for Academic Staff.

Terms of appointment and payment according to the agreement between the Ministry of Finance and The Danish Confederation of Professional Associations on Academics in the State.

Commencing salary is currently up to DKK 615.415 including annual supplement (+ pension up to DKK 105.235)

Negotiation for salary supplement is possible.

The application including all attachments must be in English.

Please include

- Curriculum vitae including information about external funding
- Diplomas (Master and PhD degree or equivalent)
- Research plan – description of current and future research plans
- Description of visions for teaching and documentation of teaching experience and qualifications according to university guidelines
- Complete publication list
- Separate reprints of 5 particularly relevant papers

The deadline for applications is 9 June 2019.

After the expiry of the deadline for applications, the authorized recruitment manager selects applicants for assessment on the advice of the Interview Committee.

Interviews/trial lectures will be held on 18 November 2019.

Please refer to the following no. in future communication in this case: 211-0030/19-2K.

Use the following link to apply for the position: https://employment.ku.dk/professor

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Today's innovation in the Danish dairy industry secures **tomorrow's food supply**

By Jakob Ellemann-Jensen, Minister for Environment and Food, Denmark

In Denmark the food industry is a global frontrunner when it comes to gastronomy and food safety. Similarly the dairy industry is globally recognized for high quality, reliability, and excellent food safety.

Part of the reason is the use of technologies that allows optimizing production and the development of new products. Here Denmark combines the Danish tradition for high-quality food production and continuous investments in innovation.

As Minister for Environment and Food of Denmark, I encourage this development and ingenuity in the dairy industry. The industry continues to build on the strong tradition for high quality and investments in innovation and many companies abroad can surely learn from the Danish dairy industry, if they wish to strengthen their business by innovation, high quality, and safety.

Role models for the use of sustainable technology

Danish food manufacturing companies are role models for their use of sustainable technology in some of the world's most sophisticated and hygienic processing plants. Some companies produce ingredients or technology that limits food waste, improving food quality and high safety standards. Others develop analytical tools for monitoring microbiological and chemical substances in food.

New technologies introduced in the dairy industry are e.g. digitalization, high-tech milk testing solutions, membrane filtration, new cultures, water savings, powder technologies etc. Also leading Danish researchers will explore and deliver new ways of using milk and whey to meet the growing world population's needs.

All in all, the Danish food cluster is known for its timely solutions when faced with new challenges to the food supply and consumer trends.

Innovation is the key to the future dairy industry

Efforts will be made from the Danish government to support the development and facilitate companies in gaining knowledge and the right tools to make it easier to relate new activities in the dairy production to food safety risks. E.g. the Danish Veterinary and Food Administration will establish an interactive universe with risk-based, secure, and scientifically based information and guidance, so especially small and medium-sized dairies are not prevented from innovating and growing optimally.

A circular approach is needed in the production

To match the production conditions of the future it is also important to adapt to a circular approach and adjust the dairy production, so that "waste" is considered a new resource. Fortunately, the Danish dairy industry, governmental authorities, research institutions and non-governmental organizations have a long tradition of working together to develop, test and bring new solutions and products on the market, supported by regulatory frameworks that promote and enhance collaboration and innovation – and with impressive results.

Sometimes this collaboration is part of public-private partnerships. E.g. a number of innovative and pioneering projects, such as "The Waterless Dairy", "The Water-efficient Dairy" and "DRIP Partnership - Water-efficient Industrial" to get the dairy industry to implement water-efficient measures in food production without compromising food safety. These projects facilitate the creation of forward-looking, sustainable, and food safety assuring solutions.

Jakob Ellemann-Jensen

Join the journey

There is no doubt that today's innovation in the Danish dairy industry creates the sustainable business opportunities that will secure tomorrow's food supply. We will enjoy the ride and we will also welcome foreign companies and authorities who wish to join us on our continuous journey. ■

Arla leads the way with new methods

The world is changing rapidly, and Arla is on the beat when it comes to technological and strategic adjustments throughout the supply chain - from farmer to consumer. Here are three examples of how Arla shows the way with new methods.

The secrets of breast milk

Arla Foods Ingredients (AFI) was originally 'born' to make use of the dairy surplus of whey. Today AFI is a global business and Arla's most profitable unit through the production of high value products.

- Our aim is to explore all components of milk and whey and combine them to improve the nutritional or functional value of products, says Niels Østergaard, Vice President R&D, Arla Foods Ingredients. He highlights two main segments: pediatric nutrition and medical nutrition, where AFI has reached great achievements – due to close symbiosis between innovation and technology.

Niels Østergaard, Vice President R&D, Arla Foods Ingredients.

As an example, he mentions that AFI is leading in supplying MFGM (milk fat globule membrane), which is important for the cognitive development in infants. AFI is also the leading supplier of Osteopontin, a protein found in human breast milk, where research indicates that it can improve the immune system. And currently, AFI has great expectations for a research project that is being conducted in collaboration with leading universities and the company Evolve BioSystems in California, which has developed a probiotic for mixing with breast milk. AFI has invested in the company and hopes to present a product that can restore a natural intestinal flora in infants.

This exemplifies that AFI not only research the composition in whey and bovine milk, but is equally concerned with understanding the complexity of human milk. The purpose is to produce ingredients for infant formula that resemble breast milk as much as possible. But also because the breast milk contains all the substances we need - not just as a babies, but also later in life. For example, a substance in milk that is important for the infant's brain development may be used in dementia treatment etc.

- The entire chemical understanding is very important. This knowledge combined with especially separation technology — we are experts in separating the proteins from one another — is essential. Process technology is the foundation of our company, and we are very heavy on the technology side, Niels Østergaard emphasises.

Digitization on the shop floor

Eva Maria Galltringer, Head of Strategy and Design, Supply Chain, which is responsible for the digitization strategy in the production, tells about a new system that gathers all production data on the mobile phone.

- The world is changing faster than ever before and consumers' wishes and needs are changing at the same rate not least because of digitalisation. This means that Arla also must change, in order to remain competitive. That is why we increase digitization and data collection, she explains.

On the production side, digitization is about both automating processes and using robots, and then it is about Big Data - which means, collecting, storing, analysing, processing and interpreting huge amounts of data that relate to the entire supply chain.

A current digitization achievement is SAP PM Movilizer - a mobile plant maintenance solution.

- After many years in Arla with the maintenance system SAP PM (computer based), the users in our dairies were asking for a mobile PM (smart phone based) solution so they could have all the data together with them when they were out in the production areas, Eva Maria Gattringer explains.

- This solution is a great example of how working with data does not always need to be complex if you design the right solution. We all use smartphones in our private lives - thus training employees in use of mobile apps is faster, easier and more intuitive than with computer-based software systems. This leaves our mainatenance managers to do what they do best, namely maintaining our machines, instead of sitting in front of computers.

Eva Maria Galltringer, Head of Strategy and Design, Supply Chain.

The mobile system is implemented in 19 sites in Denmark and Sweden and further roll outs are planned.

Water management for the company – and for the planet

Sami Naffakh, Executive Vice President, Supply Chain.

- Arla is a global dairy company that prides itself on its efforts when it comes to social and environmental responsibility. This includes our approach to water management.

- Arla is driven by both cost savings, reputational issues and a fundamental desire to contribute to a better planet. At the end of the day, the result is the same. Water is saved, and that's what really matters, says Sami Naffakh, Executive Vice President, Supply Chain, who among others are responsible for Arla's water management strategy.

He explains that Arla is relentlessly optimising water management and reducing effluents at its production sites.

- Since 2005, we have consistently succeeded in reducing our water consumption – measured in m3 of water per m3 of milk intake – by more than three per cent year on year. In practical terms, between 2005 and 2017, we have reduced our absolute water consumption by five percent from 20.7 Mm3 to 19.8 Mm3. During the same time period, our milk intake has increased by 30 percent.

- We achieved this by gaining a detailed understanding of where and how we are using water, by continuously optimising our processes and by maximising the reuse of water, he says and adds:

- We do, however, still use a significant amount of water and we can definitely do more. That is why our plan is to invest futher in sustainability measures over the coming years, he says.

Recent and future achievements in Dairy business

Six experts share their ideas of the most significant technological and strategic trends in the dairy sector and predict what the next achievements will be in relation to a more rational dairy operation.

Membrane filtration

Better and cheaper membrane filtration

Niels Osterland, director and owner of MMS Nordic, who has more than 40 years of experience in the application of membrane filtration, notes that the technology anticipates great growth. Not least because a growing world population requires food to be produced in a more efficient way, and with different separation technologies, one can improve the utilization of raw materials and residues:

- In this development, the dairy industry has been at the forefront, especially in the manufacturing of ingredients. The technology has been refined, so that the membranes today can separate almost identical molecules.

- The quality of membrane filtration will continue to increase, but at the same time we see smaller modules being brought on the market, which are cheaper and use much less power.

- The membrane filtration market is generally growing — also in the field of sugar and plant exctracts industry, says Niels Osterland.

Niels Osterland

Peter Schouw Andersen

Powder technology/whey protein.

The treasure trove is far from empty

- The utilization of whey proteins has undergone explosive development. What was previously used in animal feed is now an essential part of infant formulas. But the scientific treasure trove of whey is far from empty, says Peter Schouw Andersen, director, Application Science and Technology, Arla Foods Ingredients.

The separate components of the whey have specific advantages for different consumers, such as children with particular nutritional needs or unique functional properties that make it possible to create new high protein food products.

CGMP (Casein Glycomacropeptide) is a great example of how to extract a single component from the whey used by a specific patient group - in this case PKU patients (Folling disease), which structurally changes the way they are treated.

Another topical example is Osteopontin, an important part of an infant's immune system and thus the protein can contribute to infant formula getting closer to the completely unique breast milk.

New cultures/fermentation

Sustainability within Innovation

Søren Herskind, Vice President Chr. Hansen, emphasizes sustainability as the crucial driving force in general and for the bioscience company Chr. Hansen — recently named the most sustainable company in the world.

He points to specific areas where Chr. Hansen's know-how currently play a part:

- First, there is still room for traditional dairy products in 'the new world', but new taste, flavors and functionalities will be added. We believe that a more diversified offering raises the bar for innovations.

- Within the production of cheese, the dairies are increasingly working with high solid milk, which influence the fermentation process.

- Bioprotection, which is a natural way to inhibit spoilage and protect against harmful contamination in food, is also a big deal.

- Future-wise, we will also see more 'free from' products. New enzymes will help utilize the milk nutrients for new products within the health area. Last but not least, we focus on the properties of bacteria and their functional options, so they can be used especially within convenience and food service, says Søren Herskind.

Søren Herskind

Lars Houborg

Efficient cleaning / CIP

Cleaning and production will be integrated

- As dairy plants grow larger, and the demands on performance increase, it is important that cleaning is efficient, fast and uses the least possible resources, says Lars Houborg, Regional R&D / application manager, Ecolab. He mentions the company's newest concept that meets these requirements by reducing CIP cycle times and extending the life of membranes.

- We have used many resources finding the ingredients that works best without leaving residues. This plays a major role in relation to food safety and in relation to reuse of water. And also to meet the consumers for demand pure and natural products.

Ecolab works intensively with food safety and has as the first provider of hygiene solutions, made factories certify according to the food standard ISO 2000.

Lars Houborg foresees a more holistic approach, where cleaning and production will be further integrated as intelligent software will control when and how often to clean.

Water conservation

Water scarcity is top of the agenda

To professor Torkil Jønch Clausen, International Water Adviser, the overall global challenge is water scarcity.

With growing population, climate change and increased competition for scarce resources, we all have to act – so does the dairy business, which is a large consumer of water.

The agriculture sector worldwide uses 67 pct. of the withdrawals. With current levels of water use efficiency and productivity demand may exceeds supply by 40 pct. in 2030. I 2050 the number will increase to 55 pct. The real problem is, that the resources are not there.

- We must produce more food with less water and confront the wastewater challenge with focus on circular water use, he says and sees growth as both a friend and a foe. It creates pressure on the one hand, and possibilities to find solutions on the other hand.

He points at the 2030 Agenda: '17 SDGs for people-planet-prosperity-peace-partnership' and welcomes that many companies implement this in their strategies. He also calls for governance and the need to identify practical, innovative and collaborative solutions to address water scarcity.

Torkil Jønch Clausen

Kristina Åstrand

Digitization - Big data - Optimal monitoring

Digitalization makes it possible to meet facing demands

Kristina Åstrand, Director - Quality and Digital Transformation, Tetra Pak:

- Todays dairy manufacturers are squeezed in between raw material scarcity, sustainability challenges, increased requirements on profitability in operations and a consumer demand on personalized products. Digitalization of the Dairy value chain and related ECO System is a way to be able to meet many of the challenges. Data, Analytics and Artificial Intelligence combined with digital technologies will make it possible to face sustainability issues in an optimized way and get the most out of your operations. And a with a digitalized ECO System, there will be partnership opportunities across the extended value chain, making it possible to meet the demanding consumer needs.

- Dairy being a late adopter of digitalization is now in the fortunate situation where other industries have secured the availability of digital technologies and an increased data processing power and dairy manufacturers now have an opportunity to quite quickly transfer this to the Dairy Value chain as well.

Danish Dairy Technology with impressive results

New technology has given Danish dairy industry several competitive advantages

By Jørgen Hald Christensen, CEO at Danish Dairy Board.

Manufacturing dairy products and dairy production is based on a long historical tradition of good craftmanship. The skills and the senses of the dairymen (and women) have ben decisive for a good result. However, with the same skills the dairymen (and women) have always been searching for smarter and more efficient ways in manufacturing, and consequently technologies and machinery have been developed It is a development that started with the simple wooden churns many years ago and it is a development that is still running today.

Ultrafiltration – a Danish speciality

There are many examples on how a brilliant combination of skills, knowledge and technology have been turned into a competitive advantage for the dairy industry, and the Danish dairies particularly. Think about the use of ultrafiltration techniques in the manufacturing of Feta cheese / White cheeses. Today the use of filtration techniques is a widespread and normal technology within many corners of the dairy industry – but at that time it was really a breakthrough technology. Many other examples can be found.

New products – better environment

It is also the result of technology development, that today milk is not only milk. Milk is something that can be split into pieces and the different components can be modified and used in many different connections – in other foodstuffs, in medicine, cosmetics, pharmaceuticals etc. Different technologies have also resulted in a considerable reduction of the environmental impact of the industry. Today side streams can be re-used to a considerable degree, and we will probably within a few years see dairies working in almost closed systems. Technologies have also eased the daily work of the dairy men (and women). Automatization and robots have today taken over many of the physical demanding tasks that previously had to be done by human muscle power.

Jørgen Hald Christensen

Safety and consumer preferences

Finally, the in – line supervision through sensors and IT systems have again raised the level of food safety and quality to a higher level.

However, technologies have always to be seen in relation to the acceptance by the consumers. Techniques involving f. ex. genetic modification are examples of which so far have not been accepted by consumers. So, there are limits to the use of technologies but as was mentioned in the beginning it is the combination of dairy skills and technologies that has lifted the dairy industry to the level it has to day. And I believe that this development will continue.

Danish Dairies

– 68 plants all over the country

Arla Foods and the rest. That is the impression many people have of Danish dairy industry. With 90 percent of the milkintake – 25 plants in Denmark - and with activities world wide in all dairy categories, Arla obviously is the mainactor. But Denmark also has several medium sized daries – and a huge underwood of small dairies, icecream producers and specialists in cheese powder etc.

	COMPANY/MILKINTAKE	Products	Markets
Arla Foods (5.000 mio. kg in Denmark)	Akafa	Milk powder	Global
	Arinco	Milk powder, infant formula	Global
	Arla Foods Ingredients Group P/S	Powder, ingrediens	Global
	Arla Innovation Centre	Innovation	-
	Birkum Ost	Cheese	Global
	Bislev Mejeri	Cheese	Global
	Branderup Mejeri	Cheese	Global
	Christiansfeld Mejericenter	Liquid milk	Denmark
	Cocio Chokolademælk	Flavoured milk	Global
	Danmark Protein	Protein powder	Global
	Esbjerg Mejeri	UHT Milk	Global
	Gjesing Mejeri	Cheese	Global
	Hobro Mejericenter	Liquid milk	Denmark
	HOCO	Milk powder	Global
	Holstebro Mejeri	Cheese, butter	Global
	Høgelund Mejeri	Cheese	Global
	Korsvej Mejeri	Cheese	Global
	Kruså Mejeri	Cheese	Global
	Lillebælt Mejeri	Cheese	Global
	Nr. Vium Mejeri	Cheese	Global
	Rødkærsbro Mejeri	Cheese	Global
	Slagelse Mejeri	Liquid milk	Denmark
	Taulov Mejeri	Cheese	Global
	Tistrup Mejeri	Cheese	Global
	Troldhede Mejeri	Cheese	Global
	50-200 MIO. KG.		
	Bornholms Andelsmejeri	Cheese, liquid milk	Denmark+export
	Mammen Mejerierne	Cheese	Denmark+export
	Them Mejeri	Cheese	Denmark+export
	Thise Mejeri	Cheese, liquid milk, butter	Denmark+export
	Nørager Mejeri	Cheese	Denmark+export
	0-50 MIO. KG		
	Asaa Andelsmejeri	Cheese	Denmark
	Barrit Mejeri	Cheese	Denmark, Japan
	Grøndal Mejeri v/Uhrenholt A/S	Cheese	Export
	Gundestrup Mejeri og Bryghus	Cheese	Denmark
	Ingstrup Mejeri	Cheese	Denmark
	Jernved Mejeri	Cheese	Denmark
	Løgismose Meyers A/S	Cheese, liquid milk	Denmark
	MBM, Meginfelag Búnaðarmanna (Faroe Islands)	Cheese, liquid milk, butter	Faroe Islands
	NATURMÆLK	Liquid milk, cheese, butter	Denmark
	Nørup Mejeri	Cheese, butter	Denmark+export
	Tebstrup Gedeosteri	Goat cheese	Denmark

	Products	Markets
SMALL DAIRIES (0-5 EMPLOYEES) / FARM DAIRIES		
Brandbjerg Gårdmejeri	Cheese	Local
Elmegaard Mejeri	Cheese	Local
Enghavegård Osteri	Cheese	Local
Gedsted Mejeri A/S	Cheese	Local
Humlebæk Mikro Mejeri	Various	Local
Hårbølle Mejeri og Osteri	Cheese	Local
La Treccia	Cheese	Local
Lindved Mejeri v/BT Ost	Various	Local
Ostebørsens Gårdmejeri	Various	Local
Sondrup Gårdmejeri, Øko Ged & Grønt	Cheese	Local
Sønderhaven Gårdmejeri	Cheese	Denmark
Ullerslev Mejeri I/S	Cheese, packaging	-
ICECREAM		
Aabybro Mejeri	Icecream, butter	Denmark
Hansens Flødeis ApS	Icecream	Denmark
Mejerigaarden A/S	Icecream	Denmark
Skee Ismejeri ApS	Icecream	Denmark
Svaneke Ismejeri ApS	Icecream	Denmark
Vebbestrup Flødeis	Icecream	Denmark
SPECIALPRODUCTS/SALESCOMPANIES		
Lactosan A/S	Cheesepowder	Export
Kerry Ingredients	Cheesepowder	Export
Kirkeby Cheese Export A/S	Salescompany	Export
Fayrefield Foods A/S	Cheeseprocessing	Export
Kirkeby & Thrane	Cheese	Denmark
Mille Food A/S	Infant formula	China
Vest Mælk ApS	Raw milk to dairies	Denmark/Germany
Sømælk	Raw milk to dairies	Denmark/Germany
Rørbæk	Raw milk to dairies	Denmark/Germany

Protein Standardization and Concentration of Milk

Protein standardization and concentration by ultra- and microfiltration, the natural way of adding value to your dairy products.

By
Gary Schoeller, Product Manager – Tetra Pak Filtration Solutions

Protein standardization and concentration of milk is done by using two types of membrane systems: ultrafiltration and microfiltration. These two types of membrane systems standardize the protein in milk and milk products. Ultrafiltration is used to standardize the total protein and microfiltration is used to standardize the casein.

Cheese production

The standardization of the protein using ultrafiltration or microfiltration evens out the seasonal variation of the protein content and creates a more stable cheese making process.

The membrane systems can standardize raw or pasteurized whole or skim milk.

Both membrane systems lead to many advantages to the cheese making process. Some of these advantages include:

- stable ingredient control of the cheese making process
- improved utilization of the cheese vats
- repeatable process parameters day-to-day
- uniform high-quality cheese
- same cheese volume from each vat
- reduced rennet consumption
- reduced operational costs
- increase in cheese making capacity
- increased yield of cheese per mass of milk

These advantages give more control of the production process with less quality variations in the final product due to stable process parameters and standardized protein levels. Incorporated with these types of membrane systems in this process is typically the use of NIR technology to optimize the overall membrane system process.

Concentration of milk protein in powder production

Ultrafiltration of skim milk produces different milk protein concentrates (MPC) and milk protein isolate (MPI) products with polymeric spiral membranes. These products have a higher value than the original milk as they are concentrated protein products.

The ultrafiltration membrane system fractionates the milk stream into a protein rich stream, retentate, and a protein free stream – the permeate.

Microfiltration of skim milk produces casein concentrate with polymeric spiral membranes or ceramic membranes depending on the specific application.

The microfiltration membrane system fractionates the milk stream into a casein protein-rich stream, retentate, and a whey protein rich stream – the permeate.

In these ultrafiltration and microfiltration systems, diafiltration is used to help transport lactose and minerals at higher levels from the ultrafiltration or microfiltration retentate to the permeate side of the membrane. Diafiltration is more efficient when used in the higher concentration areas of the membrane system.

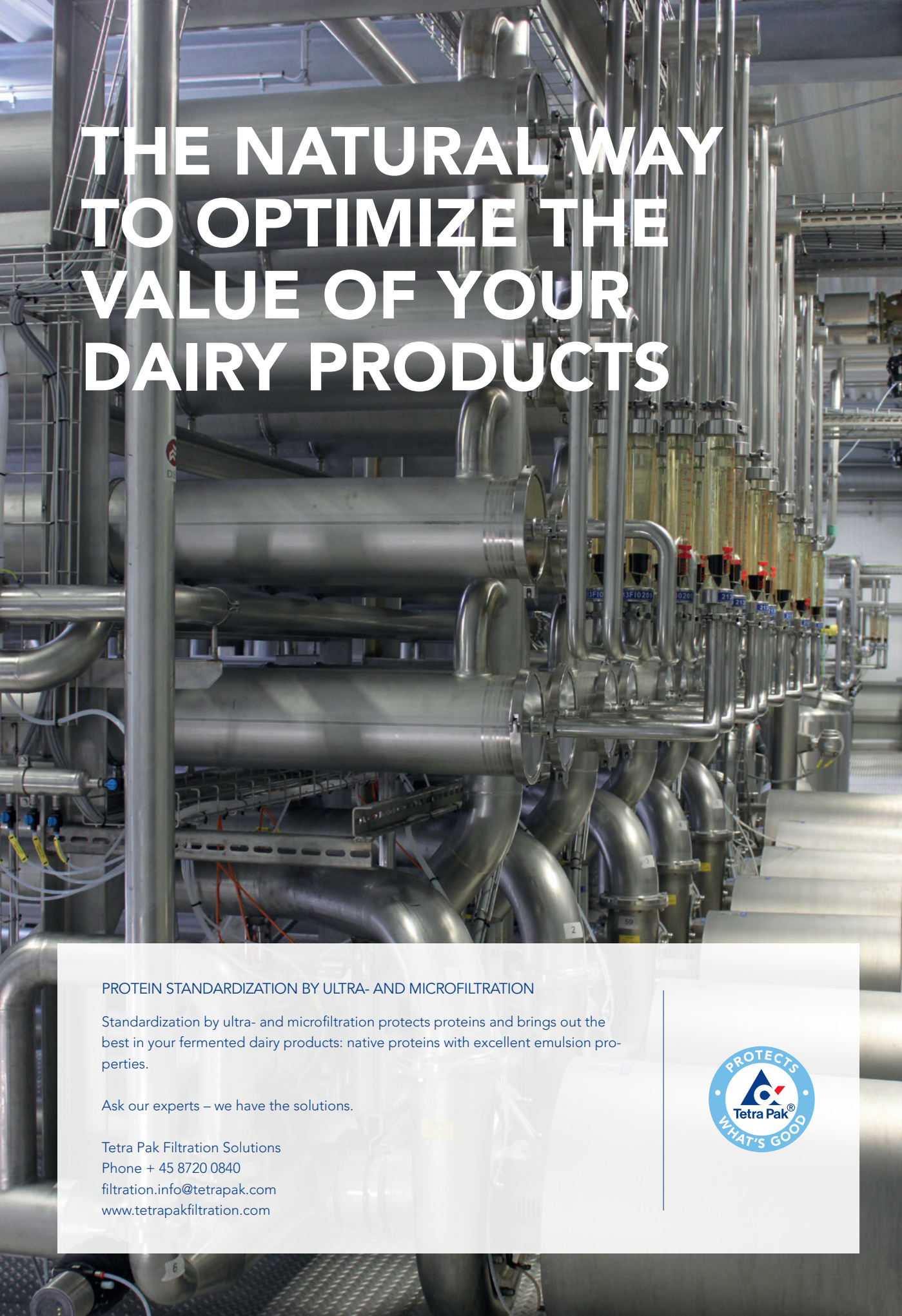
Permeate products from milk concentration and standardization

The permeate products derived from ultrafiltration and microfiltration of milk are also valuable products.

The permeate stream from the ultrafiltration system is primarily lactose and this stream is an ideal product for standardization of milk powders.

The permeate stream from the microfiltration system contains native whey proteins that can be further processed into higher value protein products such as whey protein isolate or other whey protein concentrates. These whey protein products are used in many food drinks and protein-enriched foods.

Additionally, water from these product streams can be polished in RO systems and utilised as process and/or CIP water inhouse and thereby improve the water footprint of the whole dairy production.



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AgroSoft
is ready for the food industry

- We do not do rocket science but we may have invented a smart way to make software, says Jesper Toft, consultant of the optimization program WinOpti from AgroSoft.

AgroSoft has more than 30 years of experience in developing software for the agricultural sector but its optimization program WinOpti has in recent years been top-tuned for the food industry in a broad sense.

- We have a 100 percent operational optimization program for the food industry. We are on the other side of development and trials. The challenge is to get some of the agricultural dust shaken off so that the food industry may recognize us, says M. Sc Agric. Jesper Toft, consultant of WinOpti.

One of the food companies that discovered AgroSoft's program WinOpti almost ten years ago is Arla Foods Ingredients (AFI). And it is, among other things, through close cooperation between the software and ingredient company the program has been adapted to the food industry's special working methods, values and requirements.

Development in collaboration with AFI

The collaboration began in 2009 when WinOpti was introduced to AFI primarily for recipe and ingredient management. It has since been developed to document traceability of ingredients, packaging and auxiliaries down to the last detail and to record water loss over a process - to name just a few of the many functionalities.

- It is a flexible system, quick and easy to use. It is logically structured. The calculations are credible and you can search on virtually all data, says Niels Rauhe, and he adds the advantage that AFI's application center in Argentina also uses WinOpti so you can follow each other's work and have access to the same data.

- Before we introduced WinOpti we searched the market. We tried at least 10 different systems but AgroSoft won, he says.

The first year of the collaboration was used to develop the system for food specifically for AFI - including converting the old IT system to WinOpti.

Since WinOpti's implementation, the program has been developed and expanded several times. Most recently the water loss feature has been added and you can now among other things calculate the nutrient content of a wet product to be dried as for example an infant formula.

According to Jesper Toft WinOpti is the only company on the market with this feature and is a concrete development project for which AFI has a large part of the credit.

- The collaboration takes place in the way that AFI says; we want to work in this or that way, how can we do it? Then some very thorough discussions

Jesper Toft (left) from AgroSoft and Niels Rauhe (Arla Foods Ingredient) work closely together on the development of WinOpti.

take place. I hope it has great value for Arla. It certainly has value for us, Jesper Toft says.

A chocolate box with many options.

WinOpti is - in addition to AFI - used in a couple of other Danish food producers, and Niels Rauhe can only see the benefits of the system becoming widespread in the industry so that the synergies can be exploited.

Even though WinOpti is customized to the needs of AFI right now, new things are constantly happening in the food industry. For example there is currently a great focus on nutritional values and the declarations thereof.

AFI's experimental center started with 20 different nutritional values in its system, but is just about to upgrade to 25, says Niels Rauhe.

- For example wework with more than 100 infant formulas, he adds.

Jesper Toft says that in addition to the regular portfolio WinOpti contains a number of functionalities that have been developed for the feed industry.

For example it applies a handling system for dangerous goods and the possibility to transfer recipes directly to the production computer, the financial system or the web service.

- We have three or four big things that are dormant in the system and can be activated if there is interest and needs, Jesper Toft says and ends:

In principle, it is like a can of mixed chocolates that you can dive into and find what you need.

Lene Mikkelsen Walsh

Facts about AgroSoft

AgroSoft - with address in the town of Tørring in Mid-Jutland, Denmark - has developed software for the agricultural sector for 30 years, including the optimization program WinOpti. In 2015 AgroVision (Deventer, Holland, part of the KIWA group) took over 95 per cent of the shares in the limited company AgroSoft. The remaining 5% is owned by SEGES. AgroSoft is the European market leader in pig production software but also aims to break through in the food industry with the optimization program WinOpti.

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Hygienic mixing
and tank cleaning increases ice cream food safety and quality

Better mixing efficiency and cleanability reduces the risk of contamination in ice cream maturation tanks.

Ice cream manufacturers must adapt production lines to meet consumer demand in a wider range of categories yet keep cleaning cycles to the shortest possible amount of time. Easy-to-clean, hygienic Alfa Laval EnSaFoil agitators, used in combination with high-efficiency Alfa Laval Rotary Jet Head tank cleaning machines, help producers reduce downtime during cleaning-in-place (CIP) while ensuring food safety and quality.

Challenges with seasonal demand

Producing ice cream mix requires a high degree of flexibility and efficiency; process lines must therefore be able to handle a variety of dry and liquid ingredients, adapt to fluctuations in seasonal demand, and create an innovative and varied product portfolio. To meet demand with limited plant capacity, ice cream producers plan ahead, stretching production over the longest possible period of time before the summer peak. To extend shelf life, manufacturers ensure formulation quality by reducing fat and/or sugar content and add functional ingredients that prevent ice crystal formation during storage. Maturation tanks are therefore becoming increasingly important to ensure ice cream quality.

Commercial pasteurization of liquid food products generally takes place immediately prior to packaging to prevent recontamination by microorganisms. Ice cream mix, however, is an exception to this rule. It is kept under slow agitation in a refrigerated maturation tank, typically overnight, for four to 24 hours without any further treatment prior to freezing. This ensures both proper fat crystallization as well as hydration of the functional ingredients, which is essential for the final quality and storage properties of the ice cream.

Food safety first

During the hours-long storage in maturation tanks, the pasteurized ice cream mix is highly sensitive to recontamination. Any residue left in the maturation tank after cleaning can promote the growth of psychrophilic microorganisms such as Listeria monocytogenes.

Upgrade tank cleaning technology for exceptional maturation tank hygiene

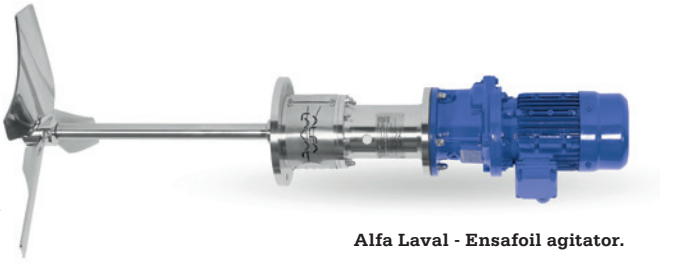
The standard design for ice cream maturation tanks is an insulated cylindrical vessel, equipped with a chilled water jacket and top-mounted agitator. The typical tank size for industrial lines is between two to six cubic metres, although some of the larger tanks can be up to 20 cubic metres in size. Static spray balls are often used to clean these tanks; however, due to the immovable nature of the equipment, it is difficult to flush all of the tank and equipment surfaces with cleaning fluid. Moreover, due to the high fat content, sticky consistency and frequent presence of particles such as chocolate flakes and fruit bits, ice cream mixes are difficult to clean, especially underneath the agitator blades. To ensure thorough cleaning, additional water, cleaning agents and

time are required; this impacts plant output and profitability.

The use of high-impact rotating jet spray devices, such as Alfa Laval Rotary Jet Heads, can reduce cleaning time and improve plant efficiency. Rotating spray devices move in three-dimensional patterns and use impingement as the primary cleaning parameter to remove even the most difficult residues in a fraction of the time required by static spray balls. Rotary jet head technology is so effective that it can reduce your water and chemical consumption by up to 70% compared to the traditional spray ball technology, while reducing cleaning cycle times by more than 50%. An investment in rotating spray devices generally pays for itself in less than 12 months.

Optimizing agitator cleaning

Cleaning the underside of the agitator is the most critical aspect of CIP for maturation tanks, as it is not directly exposed to jet spray from tank top. It is therefore important to use mixers and agitators with open, easy-to-clean designs, such as Alfa Laval agitators with EnSaFoil impellers. These agitators have no overlap between the blades and therefore eliminate shadow areas, or blind spots that are not reached by the cleaning fluid, during CIP. The unique profile of the front end of the impeller blade enables the high-impact jets of the CIP fluid to clean the underside of the blade. What's more, the robust design and slow rotating speed allows an axis length of up to seven metres without requiring any bottom connection. The wide Alfa Laval EnSaFoil impeller blades ensure that even viscous mixes are homogeneously blended, while keeping energy consumption to a minimum. Alfa Laval agitators with EnSaFoil impellers reduce power consumption by more than 30 percent compared to conventional agitators.



Alfa Laval - Ensafoil agitator.

Reducing contamination risks in maturation tanks

Shorter, more efficient cleaning cycles of ice cream maturation tanks are the key to higher capacity and higher yields. Using easy-to-clean Alfa Laval agitators with EnSaFoil impellers with high-efficiency Alfa Laval Rotary Jet Head cleaning systems help reduce cleaning cycle downtime without compromising with product quality or consumer safety.

Alfa Laval

For further information:
Alfa Laval
www.alfalaval.com/dairy

In-line analysis and standardisation

Au2mate – Plant optimisation in the dairy industry by high precision In-line analysis instruments.

Dairy plants are getting more and more complex and at the same time the demands for fully flexible production schedules with rapid recipe changeover in the process equipment are constantly increasing.

New and improved technologies for In-line measurement and analysis of product components in real-time provides new opportunities for optimising on tolerances and production processes.

A good number of process applications taking advantage of the new generation of analysis instruments have been implemented by Au2mate, in Denmark as well as abroad.

The incentives to install a high value add and high precision in-line analysis instrument, would be:

- To achieve an accurate composition in processed milk. (Fat, protein, solids etc.)
- Higher profit with lower tolerances
- Use of raw materials needs to be optimised
- Use of equipment needs to be optimised
- Time saving. No need for post adjustments to achieve required composition.
- Small batches can be produced effectively when standardisation is optimised.

The applications can be split in two different categories. One category can be classified as In-line standardisation, and the other category as Batch standardisation with continuous correction measures.

In-line standardisation

In-line standardisation takes place by controlling flowrates and addition of ingredients (if any) to achieve a specified target on product specific parameters. Please refer to figure 1 for In-line standardisation.

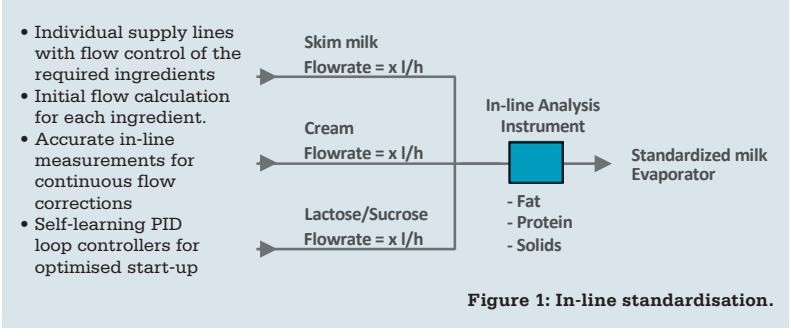


Figure 1: In-line standardisation.

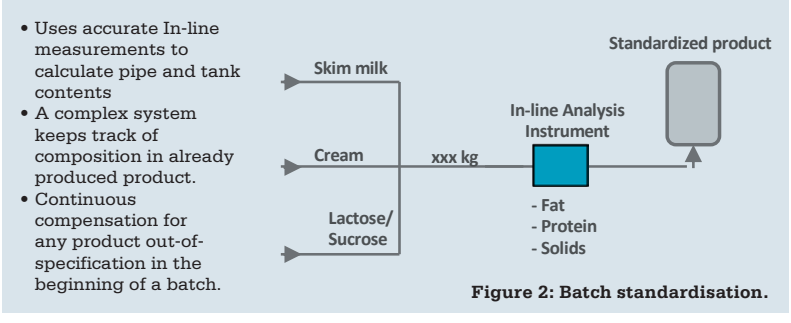


Figure 2: Batch standardisation.

The process can be applied in standardisation of fat, protein and total solids directly from e.g. a pasteuriser or a blending system feeding an evaporator. The control system can be delivered as a stand-alone system interfacing to the existing plant control system via communication signals or integrated in the existing plant control system.

Batch standardisation

In batch standardisation applications, a continuous summation / integration of the product components, e.g. fat, protein and milk solids take place to form a uniquely defined batch. An adjustment of the flow and any addition of ingredients is made to obtain the desired batch specification. Using batch standardisation compensation/correction of out-of-specification product is also possible.
Please refer to figure 2 for batch standardisation.

The process can e.g. be applied for the standardisation of fat, protein and milk solids in a cheese milk tank. The control system can be delivered as a stand-alone system interfacing to the existing plant control system via communication or be seamlessly integrated in the existing plant control system.

Proactive partner

Moving forward, Au2mate strive to be a proactive partner in the continuous optimisation of the dairies. In case more information on In-line analysis applications is required, please do not hesitate to contact us at www.au2mate.dk or by telephone +45 8720 5050.

Au2mate

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Au2mate services the dairy industry from offices in Denmark, Norway, Sweden, Dubai and England.

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Sustainable Chr. Hansen keeps it great!

Chr. Hansen is ranked the most sustainable company in the world, driven by a pioneering position within natural ingredients and bioprotective solutions.

By Anna Hoffmann, Communications Partner, Corporate Communications.

Working for a more sustainable future, Chr. Hansen embraces the benefits of good bacteria and natural ingredients. Respect for nature's scarce resources has always been an integral part of Chr. Hansen's DNA, and they remain dedicated to promoting a wider adoption of natural solutions. Their products are consumed by more than 1 billion people every day – with dairy being one of the main product areas.

- It is with great pride and humility that we receive this acknowledgement, and we believe that this is a result of outstanding engagement among employees and an acknowledgement of the collaborative partnerships that we have with our customers, says Kristian Elsborg, vice president of Global Sales, North Europe.

The era of good bacteria

There is an increased understanding of the power of good bacteria and the impact they can have on some of the major challenges facing the modern world, such as food waste and the overuse of antibiotics and pesticides. Chr. Hansen is uniquely positioned to address these challenges and raise more awareness of what they refer to as 'the era of good bacteria'.

The main ambition of dairy producers is to improve quality to consumers, optimize shelf-life and reduce food waste, without compromising consumer demands for food with fewer artificial ingredients.

- At Chr. Hansen, we use nature's own good bacteria to keep dairy products fresh. We call this bioprotection. Bioprotective food cultures help strengthen the trust consumers have in your brand and your product. As a food manufacturer, you can provide food that keeps up with market trends while supporting a clean label, explains Elsborg.

Dairy bioprotection – naturally fresh for longer

Today, 20 percent of all EU dairy products are wasted, which corresponds to 29 million tons a year. In fact, dairy is the number one food category for which

consumers check the expiration date, and 25 percent will not buy a product that expires within 5 days of purchase. For dairy manufacturers this means reallocation costs, discounts to retailers and retailer-returns.

An independent impact study highlights the positive net savings that dairy manufacturers in the EU receive by reducing food waste, using food cultures from Chr. Hansen. Food cultures with a protective effect help keep dairy products fresh for longer in an all-natural way. This enables dairy manufacturers to reduce costs while increasing their batch volume and frequency. Chr. Hansen calls this culture range FreshQ®.

FreshQ keeps your food great

FreshQ® gives dairy manufacturers a competitive edge without compromising their product label. While it takes time and diligence to build a strong brand, one moment can compromise everything. Word spreads faster than ever and pictures of spoiled food and stories about dangerous food travel far on social media. And if worse comes to worst, product recalls can be catastrophic to a brand and its relationship to retailers.

Bioprotection can contribute to strengthening the trust retailers and consumers have in a specific brand and will enable everyone to benefit more from the products. When the food reaches the consumer, it will be the way the food manufactures intended it to be – each and every time.

FreshQ® not only helps food manufacturers create a great brand experience – it helps them "Keep it great!"

The sustainable journey continues

Chr. Hansen seeks to have a positive impact on global challenges and can document that 82 percent of their revenue contributes to the UN global goals.

CHR. HANSEN

Improving food & health

Through their Nature's no. 1 strategy, they are committed to reducing food waste globally – but there is still a long way to go.

- We have a great responsibility and opportunity to make a positive impact on people and our planet. And this is something we take very seriously, states Elsborg.

Together with their customers, Chr. Hansen works for a better world, and benefitting from the era of the good bacteria, they will continue on their sustainable journey.

Chr. Hansen

FH SCANDINOX A/S
– when project engineering combines new- and used processing equipment

The Danish engineering company, FH Scandinox, is busy working for dairy and food customers all over the world. One of the growing activity fields are installation of CIP systems and pre-manufactured mix-proof valve matrixes

Dairy, ice cream and other food manufacturers are under increasing pressure to provide a constant stream of new and imaginative top-quality products. At the same time, they must comply with heavy demands on sanitary solutions. FH SCANDINOX designs, engineers and supplies complete processing plants, and equipment for treating fresh raw milk or recombined milk into the different process applications and parameters. Expertise covers project management, plant installation, commissioning and after sales service. Dairy processing technology is designed and engineered to meet strict hygiene, food safety and quality standards, while operating efficiently and sustainably.

Efficient organization

- With 55 employees we are still a small actor in the food industry, but this means we have a very efficient and flexible organization, and most important we are very close to our customers. Thanks to our experience and know-how we are a serious and competent partner, who in close co-operation with our customers, develops optimum solutions fully meeting the consumers' stringent requirements, says Torben From, Sales Director at FH SCANDINOX. The company has a broad cooperation with several suppliers of dairy equipment, so the customers can be assured, that the technical level is at top.

CIP and mix-poof valve matrixes

One of the growing activity fields are installation of CIP systems and also pre-manufactured mix-proof valve matrixes for any purpose in the process, which do have high attention.

- Our CIP systems are designed to ensure optimal cleaning. Depending on the customers' requirements, we install central or decentralized systems or a combination of both. We are also able to pre-manufacture complete CIP units in our workshop, says the Sales Director.

- Our mix-proof valve matrixes are the optimal state-of-the-art solution for the liquid media flow in fully-automatic dairy and food processing plants. Manifold flow can thus be realized in a clearly arranged form in a relative small space. Our valve matrixes are individually developed by our engineering team, suitable for the respective processes and to meet the customers exact requirements, says Torben From.

Torben From

FH Scandinox pre-manufacturing a complete CIP plant in the workshop.

Growing in margarine

The dairy industry is a main work area for FH SCANDINOX, but also margarine production is an very important work area. In 2018, the company acquired 75 pct. of the shares in Gerstenberg, who has more than 100 years of know-how in equipment and services within the margarine industry.

- We are convinced that this new initiative will not only be of great benefit to our existing customers on the international market but also make new potential customers enthusiastic. Our common vision is to be the preferred

Second-hand Equipment

With one of Scandinavia's largest stocks of used processing equipment for the dairy and food industries, FH SCANDINOX A/S can supply a wide range of:

- Stainless steel storage and processing tanks
- Homogenizers
- Separators
- Plate heat exchangers
- Butter processing equipment
- Margarine processing equipment
- Packing and filling machines
- Pumps
- Valves, etc.

We can rebuild and meticulously test used processing equipment in our workshop prior to delivery.

supplier to the margarine industry with new technology, and we believe there will be a positive synergy to our dairy activities as well, says Torben From.

Dismantling and used

Another important area is dismantling and sale of used dairy- and food processing equipment.

- We have lot of experience working for the biggest companies in Europe. This includes dismantling of complete plants or smaller production lines, which often is re-installed at a new customer with different upgrades of the involved technology, says Torben From.

Among the customers are Arla Foods, TINE Dairy Norway, MILLS Norway, FOODMARK Sweden, Puratos Belgium, who make use of the FH Scandinox experience in dismantling and selling used equipment.

FH SCANDINOX

About FH SCANDINOX

- 40 years of experience and know-how within sale, engineering, manufacture, erection and running-in of complete processing plants and equipment worldwide.
- 3 divisions in Denmark, 2 placed in Jutland and 1 placed in Copenhagen. Plus subsidiary in Norway and China.
- Engineering department with skilled technicians endeavor, who always provide a satisfactory solution in terms of quality, hygiene, function and economy.
- Own erection department and a workforce of committed and highly experienced and flexible fitters, all experts in stainless steel.
- All field engineers have certificates in stainless steel TIG welding.

Contact: FH Scandinox A/S

Tarm – Head office, Kærhusvej 4, Hoven, 6880 Tarm

Phone: +45 7534 3434. E-mail: fhs@fhscandinox.com

Zero-water dairy plants save vital resources

Rather than simply purify water through RO for cleaning and other non product-contact operations, GEA has extended the processing capability to produce water, that can be used within the product.

Reverse Osmosis plant from GEA.

According to UN-Water, nearly half the world's population is already living in water-scarce areas and, by 2030, up to 700 million people could be displaced by intense water scarcity. Meanwhile the World Health Organization (WHO) says that there are approximately 1.1 billion people in the world who do not have access to clean drinking water. Such statistics are sobering, and it is clearly incumbent upon the industry to limit water use wherever possible.

The rise of the zero-water plant

The agricultural sector accounts for 70% of global water usage, so it is here that the greatest potential savings can be made. In this respect, the dairy industry has done its share with companies worldwide investing heavily in water-saving technology. But now there is a trend that takes the whole process to its ultimate limit. The technology to re-process water, not just for reuse in the factory but for use in product-contact operations, is here. Dairy plants that use no water at all are fast becoming the norm. Large dairy factories that have such zero-water plants have reported huge water savings with water recovery plants having the capacity to provide between 800 m3 and 5,000 m3 of recovered water a day. But the latest technology can do much more than simply recycle water. With the right treatment water can be re-used for product-contact operations and even within the product itself.

GEA purifies water through Reverse Osmosis (RO)

Rather than simply purify water through RO for cleaning and other non product-contact operations, GEA has now extended the processing to produce water, that can be used within the product. This, according to Mark Braun of GEA in Hudson, Wisconsin, requires a totally different approach. Mark explained that there is an additional carbon treatment

About GEA

GEA is one of the worlds largest suppliers for the food processing industry and a wide range of other industries that generated consolidated revenues of approximately EUR 4.6 billion in 2017. The international technology group focuses on process technology, components and sustainable energy solutions for sophisticated production processes in various end-user markets. The group generates around 70 percent of its revenue in the food and beverages sector that enjoys long-term sustainable growth. As of December 31, 2017, the company employed almost 18,000 people worldwide. GEA is a market and technology leader in its business areas. The company is listed on the German MDAX (G1A, WKN 660 200). In addition, GEA's stock is included in the MSCI Global Sustainability Indexes. Further information is available on the Internet at www.gea.com.

process, necessary to remove unwanted odours, UV treatment and both ClO2 (Chlorine Dioxide) and mineral dosing to make the water less aggressive to the plant. But as well as these extra processes, the design of the plant needs to be completely different.

- If the recovered water is to come into contact with the product we have to treat it in a hygienic manner. Our system has a hygienic design with hygienic tanks and piping. In fact we treat the water in the same way that we would treat the finished product, said Mark Braun. Water treated in this way can be purified to meet WHO standards for potable water and therefore be used in a wide variety of operations such as for final flushing, rinsing of cans, cleaning of tanks and pipework, and even as an ingredient in the finished product. This was never required in the past.

Even with this additional processing, there is still some water that cannot be reprocessed to the required standard. This small residue is frequently used in plants for watering gardens or flushing toilets; water that would otherwise have been supplied by the water utilities.

Dairy processors set a good example

It is feasible, from a technology and engineering perspective, that all new dairy plants will be able to derive all their water from the milk they process. As water resources are getting scarce, the dairy industry has been at the forefront of conservation efforts. Since the early 1990s, when the first membrane plants were installed to recover water from evaporator condensate and re-use it, the technology has become a common feature for all new installations. It has also facilitated the installation of large production facilities even in water-stressed areas such as the Western United States. While water re-use initiatives are being applied very successfully in the dairy sector the same technologies could be applied to other sectors of the food industry that require high volumes of water for processing.

We all rely on water and, as the global population increases towards a predicted 9.5 billion people by 2050, its availability continues to diminish for many. In recent years this realization has focused the minds of dairy processors worldwide. Of course, many dairy processing plants are not in countries suffering from water stress, however operators still see the retention of water as good practice and essential to preserve this vital resource for future generations. For those in regions where water is already scarce, the motivation is more acute.

GEA

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www.gea.com

Membrane filtration for Dairy plants.

Jorgensen

– infant formula handling systems in all sizes

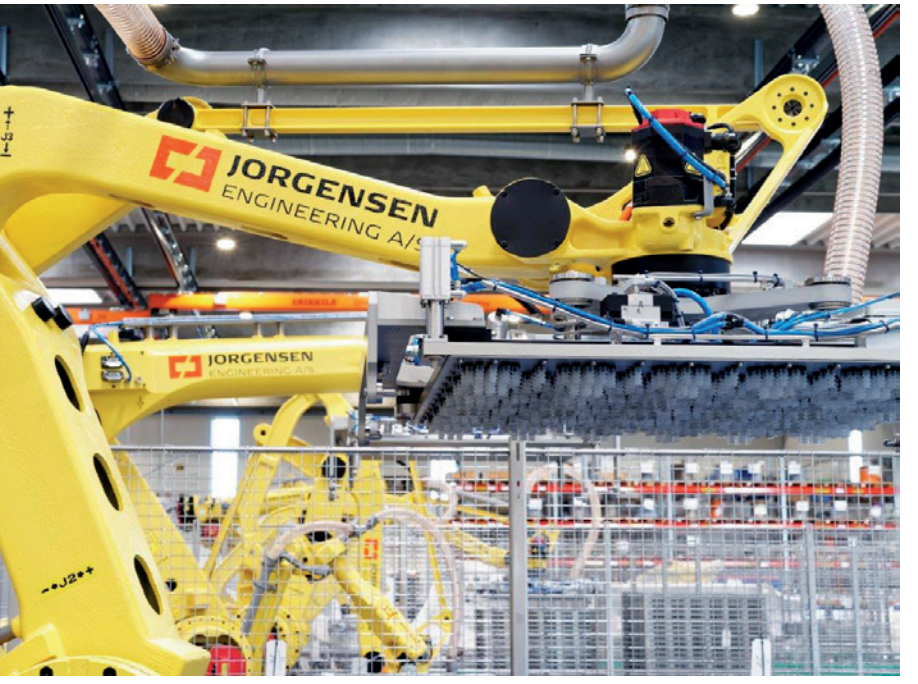
Over the past five years, Jorgensen has delivered 19 packaging lines for infant formula production – all in the highspeed category. A need for higher flexibility among the producers means an enlargement of the Jorgensen program with smaller and cheaper systems, which still will fulfill the highest quality requirements.

The market for infant formula has historically been one of the most lucrative for the dairy industry. Simultaneously, it has been one of the most challenging markets, since the customers and end-consumer segments are the most quality demanding at all – asking for the ultimate product for their children. One of the important processes is the packaging handling, when the milk powder is canned, which is ending up with the consumers. This is where Jorgensen Engineering comes into the picture as one of the world´s leading producers of these lines.

For years, the Danish engineering company has delivered some of the fastest, safest and technically most advanced packaging handling systems. Jorgensen's customer list includes some of the world's largest food and dairy companies as Nestlé, Danone, Arla Foods and FrieslandCampina.

- For the past five years, we have delivered 19 complete packaging handling systems, which has given us a unique and leading, global position, says Jesper Johansen, Marketing Manager at Jorgensen.

- And of course, we are proud, when these companies time after time repurchase and give us very generous evaluations, he says and refers to the latest state-of-the-art project in Holland, where Jorgensen has finished a very successful project for FrieslandCampina.



Jorgensen provides complete solutions – in all sizes.

Growing demand for smaller lines

While the latest and most advanced high-speed lines are operating with close to 350 cans per minute, Jorgensen also experiences new trends among the producers with increasing demand for smaller systems with a higher flexibility. This is mainly due to increasing demands in China with strict control of foreign infant formula recipes.

- Therefore, we provide smaller lines with higher flexibility for other production volumes. These lines, which operate with 20 – 60 cans per minute, are obviously cheaper, although they fulfill the same demands for hygiene, traceability and food security being characteristic for all Jorgensen plants, says Per Vedel Rasmussen, Sales Manager at Jorgensen. He is also very focused on the demands from smaller producers, who operate with niche products in the market. Several of these infant formula producers see the big potential in a growing market.

- One of our strengths in this market is the modular construction, where the customer has the possibility to expand and upgrade the existing plant when demands are changing. This is convenient in a growing market, the sales manager says.

Jorgensen - facts:

- Jorgensen Engineering develops and produces packaging handling systems for the food, pet food, health care and milk powder industries.
- Leader in filling and packaging lines for infant formula.
- Project know-how since 1933.
- SEDEX member and SMETA certified.
- Part of Xano Group with 1000+ employees.

Jorgensen's engineers testing robots in the workshop.

Protecting customers' brands

- Furthermore, another advantage in our lines is – no matter size – the high care zones are in closed and 100 pct. clean environment untouched by human hands. Powder products from a Jorgensen line has the lowest content of oxygen, which the integrated measuring system is continuously documenting. Combined with full traceability by means of datamatrix codes and serialization we are protecting customers' brands the best way, Per Vedel Rasmussen underlines.

One solution – one supplier

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

Lars Winther

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

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

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
- Molecular and Functional Properties of Milk
- 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.
A 6 months dairy internship is part of the program and must 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: https://studies.ku.dk/masters/food-science-and-technology/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

	Block 1	Block 2	Block 3	Block 4
Year 1	Internship		Food Processing	Dairy Processes and Equipment
			Molecular and Functional Properties of Milk	
Year 2	Microbiology of Fermented Food and Beverages	Short Thematic Course in Food Science and Technology	Dairy Product Technology 1	Dairy Product Technology 2
	Food Quality Management and Control *			Dairy Microbiology
Year 3	Thesis			

Compulsory course
Elective course

* The course is not compulsory if you passed it as part of your BSc programme (or if you passed the course Food Legislation and Quality Management).

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International FOOD Contest
- a Mecca for dairy people

International FOOD Contest
1.-3. October in MCH, Herning –
In synergy with hi Tech & Industry Scandinavia

John Jensen.

Danish Dairy Industry has long and strong traditions for exhibition and awarding of dairy products. This is to intensify the awareness of quality among the professionals, who meet several times a year in this context. International FOOD Contest is the biggest of its kind in Scandinavia, and 1,000 – 1,500 products are assessed, awarded and exhibited with the possibility to taste and experience almost all products.

You also find several foreign products in the exhibition, which also shows a special selection of gourmet products and a smaller selection of other food products than dairy. Finally, the exhibition offers several lectures and seminars about different and current dairy topics.

- International FOOD Contest is a unique meeting place for the whole food sector. It is a place, where professionals learn from each other and a great option for product innovation, but also a possibility to recognize the work of colleagues and competitors. And as a part of the hi Tech & Industry Scandinavia (-every second year), you have even more advantages, since the many integrated fairs give synergy opportunities, says John Jensen, Project Leader in MCH and a part of the project team behind IFC.

Tech & Industry Scandinavia
1.-3. okt. 2019 MCH Messecenter Herning
hi-industri.dk

hi Tech & Industry Scandinavia – interdisciplinary inspiration

The hi Tech & Industry Scandinavia of this year is the perfect platform to meet colleagues across different work fields. The expo is held every second year (alternately with FoodTech). In 2017 the fair had more than 700 exhibitors and 21.000 visitors, which make it the biggest industry fair in Scandinavia. Besides of the core with industrial equipment the fair is a bridge builder to the food industry, first of all the dairy industry, which simultaneously run the International FOOD Contest. Like this exhibitors and visitors from the industry world will be inspired by food colleagues – and vice versa.

hi Tech & Industry Scandinavia

The expo is divided in different themes: Automation – tools, welding & production equipment – subsuppliers – logistics. Furthermore there is four thematic expos:

Technomania (2.-3. October) – a future universe of 3386 m2 filled with the latest technology

Wind Energy Denmark (1. October) – this year with a strong focus up on onshore.

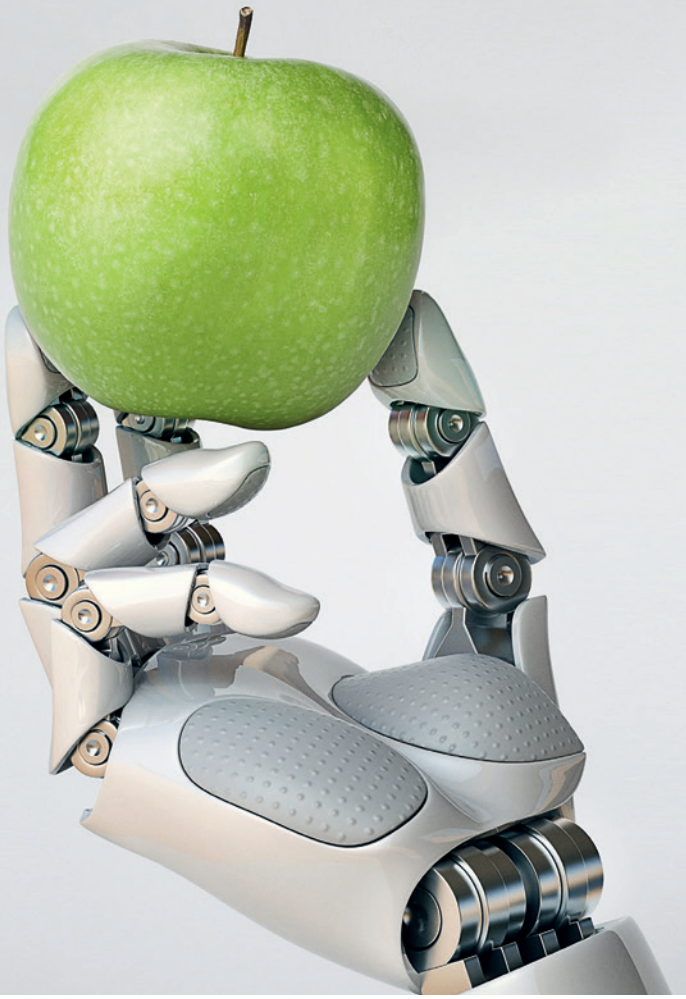
The Smart Company 2019 (1.-3. October) - opportunities and benefits gained by digitalising all parts of a company's processes

International FOOD Contest (1.-3. October) – expo of dairy products and other food products – and suppliers for the food industry.

See more at www.hi-industri.dk

Welcome to the future

29 September – 1 October 2020



FoodTech is Northern Europe's largest food technology expo

At FoodTech 2020, you can experience two major events - the International Food Contest, where 1,800 food products are evaluated and displayed. The second event is the IFC World Congress, which focuses on sustainable use of water in the food industry.

FoodTech gathers the entire industry in one place, with both Danish and International exhibitors. Together we look into the future of the food industry.

Read more at uk.foodtech.dk

FOODTECH

PROCESSING & PACKAGING | 29 SEPT. - 1 OCT. 2020

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MCH

Sustainable Development Goals in Practice

Sustainability is rapidly becoming a mega-trend in the food and beverage industry, and many global companies are incorporating United Nations' Sustainable Development Goals into their corporate strategies. However, only few businesses have the tools to successfully incorporate these goals in their daily operation.

By
Søren Nøhr Bak, Rolf Pedersen & Morten Aae Olander, NIRAS

Not so many years ago sustainability in the Food & Beverage industry was a topic that mainly concerned the CSR departments. Now this has changed. From being a fringe phenomenon, sustainability has grown into a global mega-trend.

Many companies have incorporated selected Sustainable Development Goals (SDGs) in their corporate strategy and communicate their intend to become more sustainable. But most of these companies face difficulties when it comes to implementing their SDG strategy in their processes. Apart from a small percentage, most businesses have not identified the necessary tools to assess their impact against the SDGs and to incorporate the SDG strategies in daily operation.

Why the Sustainable Development Goals?

In 2015 all 193 member states of the United Nations adopted the Sustainable Development Goals to strive for 'peace and prosperity for people and the planet'. The goals are 'an urgent call for action by all countries - developed and developing - in a global partnership'.

NIRAS SDG TOOLS AND METHODS

In NIRAS we have chosen to work with the SDGs in the services we offer. Two tools are typically used to support projects and customers in the work with SDG programs:

NIRAS Capture – is a tool, which is used to follow the development of a project to ensure that the objectives are met. This is a tool, which has been used within the international development segment for many projects.

NIRAS SDG Audit – is a methodology and a tool set with which improvement initiatives are identified and assessed in a customised matter from an economic, resource efficiency and sustainability perspective. All improvements are ranked in terms of their financial impact as well as their SDG impact.

SDGs in a triple bottom line perspective.

They are aimed at ending poverty, improving health and education, reducing inequality, and spurring economic growth, while tackling climate change and environmental destruction.

The SDGs are strongly linked to the "Triple bottom Line" concept of balancing interests in 3 dimensions: Economy, Social and Environment.

The balance means that all dimensions need to be sustainable. So changes relate to social and environmental dimensions and not the economic will not be sustainable.

What does it mean for the Food & Beverage industry?

The SDG work in a company would normally begin by identifying which goals the organization want to improve and have an impact on. While each company has its individual reason for selecting a focus, a clear pattern emerges regarding the SDG focus areas that have been selected by some of the global dairy brands.

The majority of the surveyed dairy companies identified SDGs 2, 3, 5, 6, 7, 8, 12, 13, 15 and 17 as most relevant for their business. However, there is still a difference from having selected corporate goals to having them integrated on an operational level.

How to make the goals operational?

When a company decides to make the SDGs operational, it will have to align development projects and daily operation with the SDGs.

NIRAS has recently been assisting two clients in precisely this sort of SDG transition process:

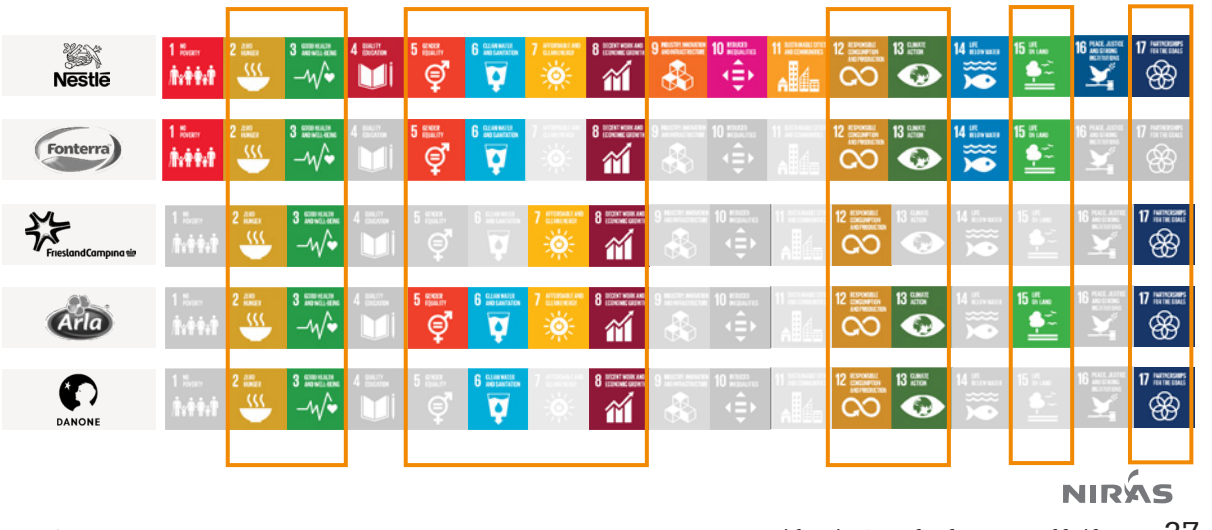
A company evaluated impact by producing with late customisation of products and a more flexible warehouse set-up. By assessing the production set-up, the company was capable of reducing the number of change-overs through the different departments. By having longer product series the loss of product, consumption of detergents, energy and water were reduced. In addition, the productivity of the plant was increased with reduced complexity.

Another company was concerned with the discharge of wastewater to a large recipient and the potential impact of updating their wastewater handling. At the same time, a low cost for water and wastewater treatment had meant that the focus on resource optimisation had been neglected. With a short-time survey it was possible to identify a number of internal initiatives, which will result in savings on product loss, energy and water, but also opportunities to turn considered loss into product. This will reduce the discharge significantly, and thereby also reduce the need for an investment in wastewater handling.

In order to substantiate the assessment of SDGs for projects, NIRAS has developed a tool that will allow for specific identification of sub-goal and the impact generated by a specific project. The tool is freely available through NIRAS. Other advanced project tools and methods that are introduced by NIRAS to address the challenges that most companies confront in relation to implementing SDGs are shown in the textbox.

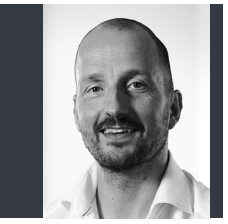
There seems to be little doubt that increased consumer awareness and political change towards sustainability will increasingly influence all industries, including food and beverage. Therefore, implementing SDG strategies can prove crucial to securing the future prosperity of the companies in this sector.

Selected global dairy brands´ SDG focus. Source: Brand websites.



High Precision Filling Machines for the Food Industry

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



By
Lars Henriksen,
Sales Director,
Primodan

Worldwide

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

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

Full servo driven cup, bucket and jar fillers

Primodan strives to be the preferred supplier of flexible filling machines for the dairy industry –our ambition has always been to deliver cost effective and efficient solutions to our clients. Primodan is today able to offer a range of fillers being some of the most flexible in the market – ideal for fast format changeovers from one cup to another or even from a bucket to a cup format.

Our lines utilize servo technology to achieve automatic adjustments of the filling lines.

Flexibility is more than just servo technology

In Primodan we believe in being a flexible partner for our clients – listening to their needs and understanding their business in order to offer the best possible solution.

Today filling lines should not only be able to handle format-changes but also be able to handle numerous product changes during a shift.

For this Primodan has developed various solution depending on the task at hand.

Inline fruit and flavor mixing units

Primodan offers flexible cost effective solution to solve the problem of having fast changeovers between various flavors in yoghurt. At the same time our equipment reduces the product waste known from conventional systems, where fruit is mixed into the product in mixing tanks and from there pumped to the fillers.

In other cases we offer mobile dosing units which easily can be removed from the machine and a new unit can be put in.

New Primodan office in Turkey

In order to ensure the best service for our clients in the MEA region Primodan established an aftersales office in Bursa in Turkey. The office was opened officially from January 2019

Primodan

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

Primodan - When flexibility is your priority

NOW MORE THAN 70 WHITE CHEESE LINES DELIVERED WORLD WIDE

UF (FETA TYPE) WHITE CHEESE PLANTS

Primodan is a world leading Danish Manufacturer of UF (FETA) white cheese filling lines and filling machines for use in highly efficient productions. Our solutions are custom-made with strong focus on hygiene, ergonomics and flexibility.

CUP, JAR, BUCKET- AND BOTTLE FILLING AND SEALING MACHINES

Capacities from 500 - 20.000/hour

www.primodan.dk

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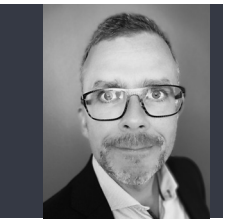
With DairyQuant GO and InSight Pro solutions from Q-Interline you can rest assure that your analytical solution will provide trustworthy results and high value throughout the lifetime of the analyzers

Value through Insight
since more than 20 years



By
Per Sand, BU Manager Nordic, Q-Interline.

Q-Interline has been supplying analytical solutions for the dairy industry since 1996. Experience earned from many projects and close cooperation with leading dairy groups, has resulted in our portfolio of analytical solutions covering the value chain from raw milk to finished products. Our solutions enables the dairies to monitor and control the quality of their production.

Effective implementation

Investing in an analyzer solution is an investment into a long relationship not only comprising an instrument delivery. Our new project concept covers a technical and an organizational project, which secures an efficient installation and implementation and at the same time prepares the organization to own and operate the analyzer solution. The project concept will enable the customer to operate the analyzer concept to its full potential as fast as possible and secure short return on the investment.

High value throughout analyzer lifetime

All DairyQuant and InSight Pro solutions from Q-Interline are ready for automatic instrument control that continuously monitors hardware, application and calibrations. Release resources for important tasks since automatic instrument control will alert you if your attention is required. When utilizing automatic instrument control, you can rest assure that your analytical solution will provide trustworthy results and high value throughout the lifetime of the analyzer.

Contact information:
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Phone: +45 4675 7046
Mail: info@q-interline.com
Web: www.q-interline.com

interline
Value through insight

DairyQuant GO – developed for analysis of key components such as fat, protein, dry matter and lactose in all kinds of liquid dairy products.

InSight Pro

– for online process control

InSight Pro online for analysis of butter.

InSight Pro is a new concept of online analyzers from Q-Interline. InSight Pro will analyze powder, butter and spreads, cheeses and liquid dairy products, for important parameters such as protein, fat and dry matter. In addition to standard parameters, low signal components such as salt can also be analyzed.

Production sites in the dairy industry face constant demands to optimize the production and increase raw material utilization to remain competitive. They must minimize off-spec production and rework while producing within specifications and regulatory limits. InSight Pro delivers important intelligence of the process stability and enables operators and the production management to make solid decisions based on this. We call this value through InSight.

Results of the analysis is presented on a touch screen monitor at the production line where the results are to be used. The results are displayed with the InSight View user interface and ensure that status of the process is continuously provided to the operator.

InSight Pro can be equipped with various cells and probes that are optimized for the dairy products to be analyzed. Up to two measuring points can be connected to the same InSight Pro analyzer, providing greater flexibility and more attractive economy over one-point analyzer systems.

DairyQuant GO

- analysis of all liquid dairy products

DairyQuant GO is the first major innovation for analysis of liquid dairy products in the industry for several decades. It has been developed for analysis of key components such as fat, protein, dry matter and lactose in all kinds of liquid dairy products. DairyQuant GO is used for analysis of WPC and other types of concentrates, ice cream mix, cocoa milk, samples with additives and added sugar and much more as well as standard products such as whey, milk and cream.

Simple sample handling for the laboratory and the process

The unique feature of DairyQuant GO is that the sample is not pumped into the instrument. No liquid at all is pumped into the instrument! Instead, the sample is analyzed using the patented disposable Pivette™. You can analyze a concentrate sample followed by a low-fat milk sample, or any other combination of samples without compromising analytical results. After each analysis, the Pivette™ is disposed, and the DairyQuant GO is ready for the next analysis – without any cleaning, zeroing and waiting time.

Focus your resources on important things, since DairyQuant GO does not require your attention on a daily basis. Traditional systems require annual service, chemical for zero, cleaning and standardization and in general high level of maintenance to operate at optimal performance. This is completely eliminated with DairyQuant GO.

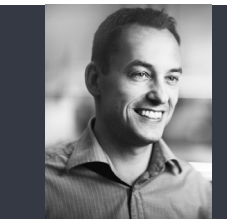
DairyQuant GO is the newest addition to the powerful DairyQuant family of FT-NIR analyzers from Q-Interline. It also comprises DairyQuant solutions for analysis of powders, butter and spreads, cheeses and much more.

Two pressure filter type TFB from EUROWATER. Between the filters is a pre-assembled skid with PLC control cabinet as well as equipment for backwash and UV system.

After production and pre-assembly, the water treatment solution and the documentation was inspected by all relevant parties; manufacturer, customer, installation company, and supervisor.

Water treatment
for a happy dairy customer

How can you tell if a customer is genuinely happy? In 2013 the Molvest dairy company in southwest Russia invested in a water treatment solution from EUROWATER for turning groundwater into high-quality process water. They were so satisfied with it that they recently ordered another solution just like it. The message was clear and simple: "The plant has been working well since we got it, we want an exact copy of the solution you supplied five years ago".



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

What is customer satisfaction? One definition suggests that customer satisfaction is *the fulfilment a customer derives from doing business with a supplier*. In other words, it's simply how happy the customer is with the transaction and the overall experience, before, during and after the purchase.

Applying this definition in real life, the dairy company Molvest must have been very satisfied and happy with the overall experience of their water treatment solution from EUROWATER supplied in 2013. Why? Because a true copy has just been shipped after five years of user experience.

Process water for cheese production

The water treatment solution in 2013 as well as in 2018 consists of the following units:

- Two pressure filters type TFB from EUROWATER with a connecting pipe system in stainless steel, including a skid with equipment for backwash, UV disinfection system type Wedeco Spektron, and PLC control cabinet.
- A frame-mounted distribution unit with four Grundfos CRE pumps and a second UV unit. The skid also includes a PLC control cabinet for both systems.

The water source is groundwater. The water is filtered in the pressure filters for removing iron and manganese. The treated water is then collected in large steel vessels and the pumping unit supplies clean drinking water to the user points, as required. The pumping unit has a capacity of up to 180 m^3/h and the process water is planned to be used for CIP in a new whey powder plant. The UV disinfection systems ensure a constant high protection against bacterial activity.

Project management

In 2013, the first project was delivered to Molvest through Arla. Palle Jellesmark from DairyTech Denmark was employed by Arla as project manager to tie the threads together for the craftsmen, suppliers and authorities involved. DairyTech Denmark is working with consultancy and projecting within the food and dairy industry worldwide. In 2018 for the second project, Molvest contacted DairyTech Denmark directly and the message was clear: "We want a

Inspection of plug-and-play frame-mounted unit with booster pumps and UV disinfection system.

copy of the solution you supplied five years ago". Six weeks after first contact all agreements were signed.

After manufacturing and pre-assembly at the SILHORKO-EUROWATER factory in Stilling, Denmark, a careful inspection was carried out, attended by all relevant parties; manufacturer, customer, installation company and supervisor.

Pure water treatment since 1936

SILHORKO-EUROWATER has more than 80 years of experience within the fields of developing, manufacturing, selling and servicing complete water treatment plants for the food and beverage industry, heat and power plants, waterworks, hospitals and other industries. The main applications are product water, boiler water, process water, cooling water, rinse water and drinking water. The company has more than 410 highly qualified employees at 23 sales and service offices around Europe. For more information, please visit www.eurowater.com

A comprehensive set of installation drawings were prepared, as a convenient way to ensure good communication between a manufacturer and a third party installation company. For the upcoming commissioning and start-up, EUROWATER will send a supervisor to the dairy in Russia to ensure that everything is done by the book. It will be the same technician as in 2013; he knows the equipment, the site, the installation company and the local operators – optimal conditions for success.

Setting the right team

- In 2013, as well as in 2018, the partnership with EUROWATER supplying water treatment plants has fully met the agreed objectives, says Palle Jellesmark, and continues:

- Molvest knows what to expect and also have high demands. Now, to ensure that the overall expectations are fulfilled, all parties involved in the project are committed to doing their very best; a group is only as strong as its weakest member. It is all about setting the right team.

SPX FLOW Infusion UHT plant

Thermal Processing
– Faster, affordable & proven

SPX FLOW has vast experience in UHT-technologies and can tailor solutions to match customers' specific processing and operational goals.

In 1912, the method for direct heating with steam was patented and achieved temperatures of 130 to 140°C, but without commercial aseptic systems progress for this technology was slow. However, this changed in 1953 when milk was packaged aseptically in cans and then in paperboard cartons in 1961. Through its APV brand, SPX FLOW was one of the pioneers of Ultra-High Temperature processing (UHT) development in the 1950s and 1960s, with the first commercial Infusion UHT system supplied by Pasilac / APV in 1963.

Today, thermal processing equipment and technology is one of the cornerstones of SPX FLOW's offerings to the global dairy, food & beverage industry. Some of the key trends in both developed and rapidly growing emerging markets in this industry include:

- Increased productivity
- Increased food safety
- Protection of nutritional values
- Environmentally friendly processing
- Flexible processing technology

SPX FLOW's selection of UHT technologies

The choice of technology is dependent upon factors such as product specification, viscosity and heat sensitivity of product contents e.g. proteins. When it comes to UHT processing of low viscosity products, such as varieties of drinking milk or other plant-based beverages, there are several technologies to choose from including steam infusion, steam injection, plate heat exchangers or tubular systems. SPX FLOW has vast experience in all these technologies and can tailor solutions to match customers' specific processing and operational goals.

SPX FLOW's standard and high heat Infusion systems provide ultra-fast, gentle heating with high efficiency and minimal chemical change to the final product. Indeed, the technic is so gentle it can produce a taste similar to fresh pasteurized milk; read more below under "Natural fresh milk". The unique SPX FLOW Instant Infusion process gives gentle, high temperature pasteurization with efficient spore inactivation and bacteria kill rate. It can be used with high viscosity product lines and can produce less vitamin loss compared with other traditional UHT processes.

Tubular UHT Express

Whether from the standard range or a fully customized solution, SPX FLOW tubular UHT systems are designed to provide excellent quality results, consistency, processing flexibility, superb hygienic performance and cleanability to exceed food safety standards, and optimized energy and utility consumption.

SPX FLOW Tubular UHT Express packages are intended for use with standard UHT milk, chocolate milk, cream and a variety of specialty products. Never before has this quality engineering and expertise been so readily available and affordable. The packages utilize proven designs to give reassurance of system performance and include many of the benefits associated

Summary
Having been a pioneer in UHT processing, SPX FLOW continues to invest in research and development to set new benchmarks and deliver cutting-edge technology to the dairy industry. Its solutions are supported by in-depth understanding of thermal processes, advanced Innovation Centers and world-leading, dedicated dairy and food technologists. These help to test and trial new processes and recipes to create consistently innovative, customer-centric solutions for processing and end product improvements. The systems detailed above address the challenges of higher food safety requirements while offering the potential for more sustainable production, increased profitability and improved quality results, giving vital business advantages in increasingly competitive markets.

with custom SPX FLOW Tubular UHT systems, such as:

- Minimized energy, water and CIP chemical usage
- Reduced fouling, long run times
- Efficient cleaning
- Straightforward maintenance
- Food safety, high kill rates
- Sharp separation of product and water flows

Natural fresh milk

Realizing market trends in terms of long product lifetime, minimal product alterations for freshest tastes and high food safety, SPX FLOW R&D scientists have developed a groundbreaking thermal process known as APV InfusionPlus. This technology combines super high pasteurization at 150-160°C with an incredibly short holding time of 0.09 sec. The process has been proven to deliver an extremely high spore kill rate (B* value of 1.45) with low chemical effect (C* value of 0.04), ensuring a combination of high food safety and fresh milk taste while protecting the nutritional value and other desirable natural product characteristics.

The APV InfusionPlus technology not only enables the dairy industry and consumers to benefit from sterile extended shelf life (ESL) milk with true fresh milk taste, it also has interesting potential in other applications: In the treatment of cheese milk and powder milk it makes the clostridia spores and bacillus spores inactive, resulting in improved cheese and powder quality.

SPX FLOW

For further information:
SPX Flow Technology Danmark A/S
Pasteursvej 1
8600 Silkeborg
Phone: +45 8922 8922

THISE
A PROVINCIAL DANISH DAIRY

The dairy is situated approximately 20 kilometres north of Skive in Denmark. The village is called Thise and consists of approximately 100 houses, a church, a village hall, a school and a grocery shop. And the Dairy.

A slightly modest building with the end wall facing the town's main street. Next to the dairy, also facing the main street, a big cow is gazing; the symbol of the dairy. A large, rusty and charming iron sculpture with a swinging udder. Thise Dairy and Jenny, which is the cow's name, are the perfect couple.

The dairy was originally built in 1887 - and Thise Dairy was founded within the framework of the old buildings in 1988 by 7 organic pioneers and a visionary dairy owner. Since then a minor revolution has taken place within the dairy.

NO DAIRY WITHOUT COWS

300.000 liters organic milk per day - that is how much milk 'Thise's' 11,000 dairy cows produce.

Thise's 5 tank lorries make sure the milk is picked up form the 70 farmers and is driven straight to the dairy. Here the dairymen convert the raw milk into many products in Thise's wide range. After this 7-8 refrigerated lorries make sure that milk, soured products, cheese and butter are sent to shops and wholesalers all over the country every day.

THE DREAM OF:
Sustainable agriculture
with a sustainable dairy
in a sustainable society
to ensure a sustainable world
remains stronger than ever.

Thise
DAIRY WITH PASSION

SPOT ON: DAIRY WITHOUT BORDERS

Dairy without Borders works to reduce poverty through improved income opportunities for disadvantaged dairy smallholders and small dairy production sites in developing countries.

As a non-profit organization we depend on your support:

- Become a member.
- Become a volunteer (at the moment, we have projects in Bolivia, Mongolia and Kenya).
- Become a cooperate member (check our website to see who supports us).
- Follow us on Facebook and LinkedIn: Dairy without Borders
- www.mejerifolkudengraenser.dk

Dairy without Borders in English:

Dairy without Borders

For further information
Tetra Pak Group
Tetra Pak Denmark A/S
Soeren Nymarks Vej 13
DK-8270 Hoejbjerg
Denmark
Phone +45 8939 3939

Digital Technologies
to Boost Efficiency

Tetra Pak uses the latest digital technologies and offers a suite of new services for its customers, focusing on improving the ability to predict machine errors, accelerating response times, and giving the customer faster, direct access to Tetra Pak's global expertise.

These breakthrough digital solutions will boost manufacturers' efficiency, cut costs, ensure food safety, and ultimately drive their business forward.

Tetra Pak's new service solutions for maintenance, issues monitoring and resolution centre around:

- Connected workforce – Empowered with wearable technology, local Tetra Pak service engineers at customer sites are now able to connect directly with global Tetra Pak specialists wherever they are, providing real-time, expert support to customers;
- Advanced analytics – Data from filling lines around the world is collected into a central database from where it can be accessed and analysed by a team of Tetra Pak's global experts. The robust database means that advanced analysis can be used to predict issues and optimise machine performance;
- Connected solutions – All equipment at the customer plant can be connected to the Microsoft Azure cloud system managed by Tetra Pak, enabling machines at different production stages such as processing, filling and distribution to communicate with each other and synchronize. This gives the customer an overview of the plant and offers performance optimisation opportunities for the whole production.

The Tetra Pak Predictive Maintenance Service is one of the best defences against catastrophic failures. By monitoring critical functions in the equipment issues are identified before they lead to breakdowns. Fewer equipment stops mean less production waste, a reduction in unplanned downtime and a healthier business.

More information can be found at: http://www.tetrapak.com/services/maintenance-services

Tetra Pak Group

Experience new packaging **solutions with Trepko**

New and existing customers are offered a possibility of individual demonstrations and machinery testing as well as a number of training courses in 1200 square meters at the 5th Conference and Exhibition in Poland 10th June – 14th June 2019

During the past years TREPKO has grown not only in numbers, but – first of all-in capabilities to utilise its potential. TREPKO's development strategy implies constant quality improvement of the packaging machines, services rendered, as well as acquiring new markets and support the existing ones. We are always with our customers and for our customers. Our activities are customer-driven and focus on the process of mutual understanding and communication. Therefore, in order to be a part of our customer's vision and ideas during creating new products, we have opened the TREPKO Conference and Exhibition Centre in Gniezno, Poland.

THE VENUE

The TREPKO Facility in Gniezno, Poland, represents one of the most modern production plants in the packaging machinery sector and the largest TREPKO subsidiary. In 2011 a new Conference, Exhibition & Training Centre was built to cover more than 1200 square meters in total. The idea of the centre is to offer a possibility of individual demonstrations and machinery testing as well as a number of training courses for our customers. It also serves as one of the world's largest permanent exhibition centres for packaging machines and it will in June 2019 also become a meeting point for all participants of the 5thTREPKO Conference & Exhibition. This will be a very special event as it coincides with the celebration of the 100th anniversary of the plant in Gniezno.

THE IDEA

The 5th Conference and Exhibition of TREPKO Packaging Machines will be held between 10th and 14th June 2019 in Gniezno. The concept behind the 5th TREPKO Conference & Exhibition is to show and present all of the latest solutions from TREPKO in a practical way, i.e. with the use of a real food products at full production speed. Therefore, the demonstrations will be very close to actual production conditions. The idea is to present the technical features of the TREPKO packaging machines but also to inspire our customers to create new food products. The life cycle of

Conference & Exhibition Centre, Gniezno Poland.

4th Conference & Exhibition 2016, Gniezno Poland.

TREPKO Bag in Box Line, 600 Series.

foodstuff has dramatically shortened and this is why a continuous innovation is a must. During the show we are going to demonstrate how easy it is with TREPKO machines. The Conference participants can also take part in individual presentations and consultations. Visiting the production part of the plant is a included in the programme, and has always enjoyed a great interest.

The objective of the Conference is not only to present the broad range of TREPKO's products, but also demonstrate the development that has been effected by TREPKO Group in recent years.

PARTNER COMPANIES

To co-organize the event TREPKO has invited a number of carefully selected and trusted partner companies. As in previous years their presentations are an important contribution to the event. Our goal is to provide our guests with a wide and interesting experience of different technical perspectives.

NEW SOLUTIONS

TREPKO's product-portfolio enables its customers to use TREPKO as a ONE_STOP_SHOP, fulfils their every needs. The TREPKO Group continues to drive that path and recently a number of new packaging solutions has been launched. The show in Gniezno will include practical demonstrations of the following new products from TREPKO.

One of them, a fully automatic TREPKO Bag in Box Line (600 Series) will have its European Premiere. This solution has already attracted huge interest during trade fair in USA last Year.

Moreover, in 2018 TREPKO developed high speed sleeving machine and during our TREPKO Conference you can experience its practical presentation.

On top of that we also decided to extend TREPKO's 800 Series range of the filling - wrapping and closing machines. During the Show in June we will present machine able to wrap and close of the 10kg brick.

Apart from the new solutions, the guests will also experience a practical demonstration of yoghurt filling with a high capacity TREPKO Lane being able to pack more than 25.000 cups per hour, all wrapped with carton and palletised. TREPKO Lane will include 10-lanes In-line Machine for Filling and Closing Preformed Containers (100 Series) integrated with the Pick&Place System (760 Series), Tray Erecting Machine (720 Series) and Palletiser (740 Series).

Bag in Box Line

The TREPKO experience in the packaging machines for fats has paved the way to another innovation of the fully automatic line for packaging blocks in cardboard from 5 kg up to 25 kg (600 series). It is a complete line composed of several devices, each responsible for a specific sequence of the packaging process. The packaging process begins with forming the cardboard, followed by sealing bag bottom crosswise, checking the seal, and perfect adjusting the bag to the cardboard inside. After dosing the product, the process completes with precise closing of both the foil and the cardboard. The new technology of weigh dosing unit allows filling with high precision with no product loss, and vacuum-sealing of the bag extends the product shelf life. It will be possible to see the operation of the block packaging line during the TREPKO Conference this June.

TREPKO's comprehensive offer

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

During the 5th Conference and Exhibition of TREPKO Packaging Machines, in June 2019, you can experience all TREPKO packaging solutions included a how is made trip at TREPKO's production facilities. Join us for the biggest practical packaging Show in 2019.

TREPKO

5th CONFERENCE & EXHIBITION 2019
10th June – 14th June 2019

Search for the core
– a key to energy savings

Viegand & Maagøe delivers new models for energy savings in the dairy industry with concrete results from two Danish cheese plants.

By Fabian Bühler and Brian Elmegaard, Department of Mechanical Engineering, Technical University of Denmark
Peter Kristensen, Energy consultant and Fridolin Müller Holm, Head of industry, Viegand Maagøe A/S

Most dairies worldwide are constructed with steam boilers and steam distribution as the main or only heat utility. Without a waterborne system it can be difficult to exploit excess heat in the process or utilisation of excess heat lead to minor local solutions in the plant. Water-based energy distribution systems further allow the integration of heat pumps. This article outlines an approach to optimisation of the utility system and recovering of excess heat that can provide significant savings in the dairy industry. It further presents the THERMCYC research project, which aims at making low temperature heat utilisation more efficient in the industry.

Why? Challenge the present setup

It is important to obtain a complete overview of all the energy using processes as well as the energy supply of the dairy before any decisions can be taken. A thorough energy mapping is required.

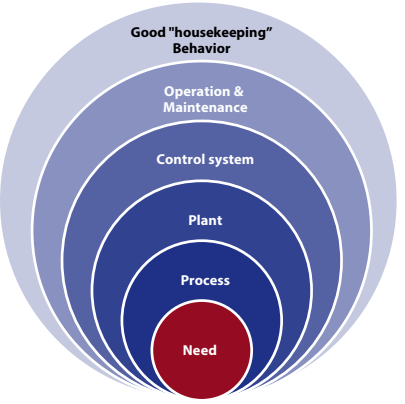


Figure 1. The onion diagram, energy savings by by work out from the actual need for processing the product.

An analysis of the actual need for temperature of the product at each step in the process is the fist step to be taken. It is important not to focus on present equipment but the product to avoid that high temperature requirements from old equipment will blur the results of the analysis.

In the next step the actual temperature demands will be combined with the energy consumptions for all heating and cooling purpose. Figure 2 exemplifies an overview of the temperature needs and associated energy consumptions in a cheese factory. It can be seen that there is no cooling below 4°C and that 95% of the heating is below 90°C.

Process integration and optimising

It must be ensured that the present operation is working as energy efficient as possible before looking at the utility systems. It may be necessary to adjust process parameters or change some equipment design.

With cooling and heating in the same temperature range the potential for

Supply circuit at 90°C – a Viegand Maagøe A/S solution.

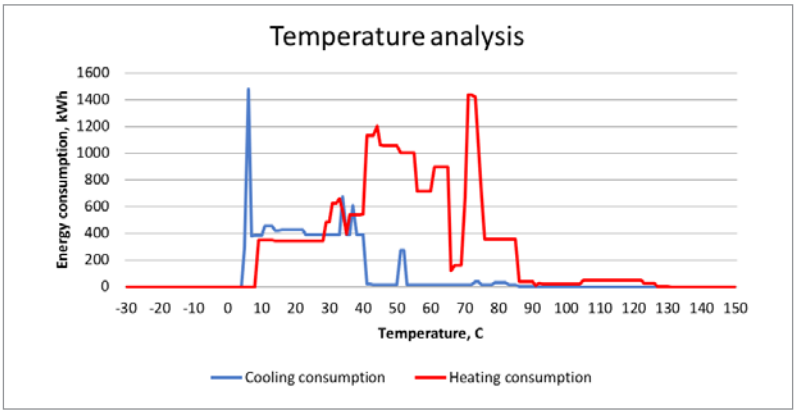


Figure 2. Temperature analysis in a cheese fabrication plant.

THERMCYS partners
Aalborg University
Danish Technological Institute
TUDelft
Technical Univercity of Denmark
Maersk
Alfa Laval
MAN
Danfoss
Arla Foods
Viegand Maagøe

Two cheese plants optimising the energy supply
Viegand Maagøe has successfully generated substantial energy savings by introducing new temperature levels. Two specific cases illustrate two different ways to do it.

Dairy 1
The dairy produces and packs cheeses. The plant was until 2018 only supplied with steam for heating purpose. By introducing a 90°C system it is possible to utilise excess heat from a CHP-plant fuelled by biogas. First established the 90°C system can act as a catalyst for further utilisation of excess heat.

Dairy 2
The dairy produces and packs cheeses. The plant is suppled with icewater and 105°C hot water. A project is ongoing to utilise excess heat from the cooling compressors. The excess heat from the condensers is at the temperature range 25-30°C. With a heat pump installation, it is possible to raise the return temperature in the hot water circuit to the boiler house and providing cooling for the condensers.

further internal process integration must be examined. Often a new water circuit will be needed between the two processes.

Once these measures have been completed, an update of the temperature analysis is necessary as the graph in Figure 2 has changed.

Current research and outlook

By providing the energy closer to the actual required process temperatures, the performance of heat pumps can be increased, and with a lower price ratio between electricity and natural gas new favourable business cases arise. The Danish research project THERMCYC investigates possibilities to increase the performance of heat pumps and expands the use into new process applications.

Membrane Filtration within Dairy Applications

GEA works closely together with our customers through the entire process from design and development to after sales service.

Benefits compared with other methods of separation include: accurate separation of multiple streams; reduced risk of damage especially for heat-sensitive products; no loss of nutritional value or clinical efficacy; reduced energy consumption; reduced waste disposal costs; higher yields; and greater flexibility for new product development.

GEA membrane filtration systems are known in the Dairy industry within the following processes:

- Milk processing
- Cheese processing
- Powder processing
- Whey processing
- Water processing

GEA engineering for a better world

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