makustele

ENGLISH
2011

ANNUAL PUBLICATION
OF THE FINNISH
FOOD DEVELOPMENT
CLUSTER PROGRAMME

GROWTH
BY NETWORKING

FOOD SAFETY EXPERTS
WANTED
IN CHINA

WEIGHT MANAGEMENT
CHALLENGES
SCIENTIST

ORGANIC FOOD
GOES
GLOBAL

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OSKE FOOD DEVELOPMENT CLUSTER PROGRAMME

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Photo: Jussi Koivunen | Photos on the cover: iStockphoto, Mikko Rantahakala, Plugi

TOWARDS SUCCESS STORIES BY COOPERATION

Jukka Lähteenkorva
Programme Director

In 2010, when halfway through, the Centre of Expertise Programme (OSKE) (2007–2013) underwent an evaluation. The evaluation was a success story for Finland's Food Development Competence Cluster: our cluster was found to be the best of all the cluster programs. So, we have been doing things right. I am particularly happy that our cluster received such good feedback from the Finnish food companies. It is for them that we exist.

Food Development Competence Cluster is now putting more and more energy into its international activities. We have set several targets, from which I'd like to single out our activities in the Baltic Sea area and in China. We see one of our key tasks being to help SMEs commercialise their products within the Baltic Sea area. I feel strongly that we should continue this work together so that, in the near future, SMEs can come to feel of this area as their home market. We can't do this alone; we do need good cooperation from the other BSR countries. I warmly welcome all interested organizations to plan and work together with us to achieve this goal.

Our work in China already started in 2009 when we began cooperating with the Shanghai FDA to develop common food safety activities. From this grew the association Food Safety Management Finland, the main goal of which is to commercialize the highest quality Finnish food safety expertise. We have a lot more to do, but I can feel that we are heading in the right direction. Working together with the Shanghai FDA, FinNode, several ministries and, of course, with many excellent companies has shown us just what good cooperation can lead to.

Looking to the future is important for us. One key area is the building of tools that food processing companies can use within their planning processes. This can mean several things, like following trends, developing innovative processes and methods for monitoring weak market signals, and so on. I think that this is one area in which we can internationalise our cooperation. That is why I again warmly welcome all interested organizations to contact us, to start planning our cooperation. It will be a benefit to all of us.

THE FINNISH FOOD DEVELOPMENT CLUSTER

Our vision is to become the most significant developer of the Finnish food industry, whose cooperation in research, development, and with the business world will create growth, internationalisation and new business throughout the entire industry.

THERE ARE THREE STRATEGIC FOCUS AREAS OF THE FOOD DEVELOPMENT COMPETENCE CLUSTER:
1. Foods, technologies and services that uphold and promote health and that meet the customers' requirements;
2. Food safety and responsibility throughout the food production chain;
3. New concepts, new business operations and cooperation between different areas of expertise.

The Food Development Competence Cluster is one of thirteen clusters within the Centre of Expertise Programme (OSKE), coordinated by the Ministry of Employment and the Economy. The objectives of OSKE (2007–2013) are
- Internationalisation
- Increasing the growth rates of competence-intensive companies
- Utilising competence within larger scales of activities.

THE BENEFITS OF THE ENTIRE CLUSTER

The Food Development Cluster Programme finances its operations from both national and regional funding. The services are available free of charge to food industry businesses, including companies that produce food and companies that provide services to the food industry.
Our services include:
- Offering a helping hand with running successful projects;
- Conveying research information;
- Supporting internationalisation;
- Boosting growth;
- Providing innovation and specialist help.

Contact us to benefit from our expertise.
For our contact information, please see page 25.

Photo: Jussi Koivunen

OFFERING A HELPING HAND WITH RUNNING SUCCESSFUL PROJECTS P. 5–7

THE EXPERTS within each of the Centres of Expertise offer practical and tangible support for the preparation of publicly funded projects.

In practice, the Centres of Expertise…
- offer assistance in finding out about funding options
- offer support for project and development planning
- help look for the right partners
- act as project specialists
- prepare, implement and coordinate projects.

PRIMARY PROJECTS

PRIMARY PROJECT 2011: RESPONSIBILITY

For 2011, the Primary Project for the Food Development Competence Cluster is 'responsibility'. The KiVa project – "Responsibility as a means of providing competitive advantage to SMEs in the food industry" – is currently being prepared. The aim of this project is to develop responsible methods of operation within businesses and, through these, help them to succeed in the consumer marketplace. Another impetus behind the project is that such visible responsibility will present many oppourtunities for improving the public profile of the food industry as a whole.

One of the project's objectives is to increase responsibility amongst small and medium-sized businesses in the food industry by developing well-designed practices that are environmentally, financially and socially responsible. The KiVa project emphasises the significance of the right kind of communication: with responsible communication, the company can create products and services distinguishable from those of their competitors.

In other words, responsibility is a means of creating a competitive advantage and building a positive image for the business. Consumers are increasingly interested in responsibility, and businesses in the food industry should rise up to meet this challenge.

For further details, please contact Salme Haapala (p. 25).

PRIMARY PROJECT 2010: ORGANIC FOOD

The Primary Project 'Organic food' concentrates on the strengths of organically produced Finnish food products, focussing on Finnish organic grain, oats in particular. Finland is a significant producer of organic oats, and there are plenty of scientific studies that demonstrate the health-benefits of oats, such as the effect of oat beta-glucan on blood cholesterol, the suitability of oats as part of the diet for most patients suffering from celiac disease, and the beneficial fatty acid composition of oats.

According to the companies involved in the project, an important part of their successful internationalisation has been the development of the Finnish organic food supply chain as a whole, from production all the way to the consumer. In the production of organic oat products, one challenge is presented by the poor baking qualities of organic oats. Another is the way that they behave during certain manufacturing processes. This development project aims to solve these technical processing issues in relation to the product's development. This project also helps companies reach new market areas. As one example, the organic product market in Great Britain was evaluated in a preparatory survey conducted by Finpro. In addition to Great Britain, the Nordic countries and Germany are seen to be particularly promising areas for the export of organic oat products.

For further details, please contact Erkki Vasara (p. 25).

PRIMARY PROJECT 2009: LINGONBERRY

The Primary Project for Lingonberry, "Creating new business activities within the berry industry through an integrated, export-orientated marketing strategy", received funding from the "Added Value for International Food Markets" programme run by the Finnish Funding Agency for Technology and Innovation (Tekes). Ten companies in the berry industry are participating in this ongoing project.

Competition in international markets is often tough, and the required marketing investments can be significant. Gaining international visibility is challenging, particularly for SMEs. To tackle this problem, a project to establish an international marketing strategy for the berry industry was created, in a cooperative venture between small, medium and large-scale Finnish enterprises. By joining forces, the businesses will comprise a cluster large enough to gain significant international visibility. The long-term goal of the project is to increase the extent to which the berries are processed by the Finnish berry industry and so prepare the way for new business operations.

Lingonberry has been selected as the main focus of the project because of its novelty factor in the international market, its ease of harvesting, the availability of sufficient volumes, its Nordic image and the berry's potential health benefits. As outputs of the R&D and strategic operations being carried out by the cooperative venture, the project aims to add value to both the lingonberry and to lingonberry products. In the future, the operative models developed and the experiences gained in the lingonberry project may be used in developing the business potential of other berries.

For further details, please contact Marja-Leena Laitinen (p. 25).

THE 2011 PRIMARY PROJECT OF THE FOOD DEVELOPMENT COMPETENCE CLUSTER:

RESPONSIBILITY
AS A COMPETITIVE ADVANTAGE

Text: Anne Rintamäki

Photo: iStockphoto

Consumers today are increasingly interested in the origin of products and in how responsibly the company that has produced their product operates. Today, purchase decisions are not purely based on images; consumers are looking for concrete facts to support their decision making. Products that can be seen to have come from companies that operate responsibly have a clear competitive advantage in today's competitive marketplace.

What does responsibility mean in the business world? Globally, responsibility is often referred to as Corporate Social Responsibility (CSR); in Finland, we often talk of businesses' social responsibility or of responsible business activities. The emphasis may change, but it is always a question of conducting one's business in a way that takes into account social, financial and ecological responsibility in the operations and during the development of the company.

Complying with legal requirements is not enough: a responsible company does more than that and genuinely takes responsibility. 'Greenwashing', the deceptive use of a few individual environmentally friendly acts to falsely promote the company's overall environmental friendliness, does not constitute responsibility.

PEOPLE, THE ENVIRONMENT, AND THE ECONOMY

This trinity leads companies to pay attention to environmental issues, to wellbeing and to sustainable economical development. The company should also benefit financially from its responsible operations: efficient energy and environmentally sustainable solutions lead to savings, happy staff are more productive, and communicating the company's responsible operational methods to the public improves and extends the company's good reputation.

In Finland the number of such consumers is steadily increasing. During October 2010, a survey commissioned by the Helsingin Sanomat newspaper and conducted by TNS Gallup examined the effect of responsibility on consumer choices. Nearly 60 per cent of the respondents indicated that businesses' ethical and responsible operational behaviours affected their purchase decisions either 'significantly' or 'to some extent'. In a similar survey in 2007, only 35 per cent of respondents shared this view.

SPREAD THE WORD: "RESPONSIBILITY"

When consumers' and the whole world's requirements are changing, corporate communication must also change. The right kind of communication helps to build the desired brand and image, and to even give reasons for the high price of a product. If consumers have no emotional attachment to a brand then they will choose the cheapest option. Therefore, companies should tell the public about their responsible commercial operations, especially now that many other companies are already acting responsibly.

One example of gaining a competitive advantage via responsibility is seen in B2B business. In this market, the brand must be convincing and the partner desirable. This is somewhere that responsibility creates a competitive advantage: goods produced in an environmentally responsible manner enhance the good reputation of the goods' retailers. By choosing a responsible product, consumers can act in accordance with their values and "buy a good conscience".

LEVERAGE FROM THE KIVA PROJECT

For 2011, the Primary Project for the Food Development Competence Cluster is 'responsibility'. Responsibility will become an increasingly important factor in the food sector. Corporate responsibility and ethical behaviour are particularly important in the food industry because the industry is so people-oriented and because its effects are all pervasive. In other words, the need and the demand exist for responsible business activities.

There are several components of the responsible production of food. An extensive, interactive interest-group survey, conducted in 2009 by MTT Agrifood Research Finland, discovered seven dimensions comprising responsibility in the food production chain: the environment, product safety, nutrition, local production, wellbeing at work, financial responsibility and animal wellbeing.

The KiVa project, "Responsibility as a means of providing competitive advantage to SMEs in the food industry", run by the Food Development Competence Cluster, wants to play a part in building responsible operating methods for companies and, in this way, promoting their success in the consumer marketplace. The objective of this project is to create for each of the participating companies a package of the necessary activities and tools to develop their 'responsibility programme'.

The KiVa project is currently in its start-up phase. Consumers' ideas on responsibility in the food industry have been mapped, and now the next step is to integrate the needs and wishes of companies in relation to the project's content. The project is being run by Foodwest, with **Salme Haapala** and **Jouko Kirjavainen** being the people to contact.

COOPERATION IS STRENGTH

Alongside the KiVa project, a larger project dealing with responsibility is also underway, a cooperative effort amongst the Competence Clusters themselves. This project aims to combine the extensive responsibility expertise currently held within each cluster into one integrated whole, an integrated whole that can then serve all the companies participating in the project. The main objective of this project is to increase the responsibility-related competencies of the companies in such a way that these increases lead directly to enhancements in their competitive advantage.

Once the expertise, project management skills and the financial competencies of the different clusters have been successfully combined, the project will then be able to offer companies a wide range of highly versatile development tools. Through the Centres of Expertise run by the Competence Clusters, the latest research results and findings can be conveyed to the project's participants.

The fundamental idea is that this responsibility project will offer companies solutions that are tangible, naturally connected to their businesses and that can be easily integrated into both their everyday routines and into their future plans for their company.

The planning stages of this responsibility project have already begun. The project is being managed by a working group consisting of representatives from the various Competence Clusters, led by **Anna Hillgrén** from the University of Turku's Functional Foods Forum. ■

NEW BUSINESS OPERATIONS FROM RESEARCH P. 8–13

FINNISH RESEARCH INSTITUTIONS, universities, businesses and universities of applied sciences all conduct extensive research and product development within the food industry. These experts have the latest information about activities and developments in the industry, and they can offer their expert assistance when it comes to transforming research results into new innovations.

In addition, the experts within the Food Development Competence Cluster will help you to apply what has been learnt from research to the needs of your business. We also conduct surveys on potential market risks in Finland and abroad, among other topics. For more information, please just contact us.

Day Care Centre Manager Jussi Ohvo (on the left), nutritionist Maarit Ketola, Adjunct Professor Mari Sandell, and kindergarten teacher Satu Pohjankukka from Turku encourage the children to get to know their food.

TESTING, TRYING AND PLAYING WITH FOOD

Text: Aleksi Rajamäki And Mari Sandell, Turun yliopisto | Photos: Hanna Oksanen

Last year, the Sapere method, designed to activate all of a child's senses, was tried and tested on a large scale in day-care centres in Central Finland and in Turku in the "Exploring food through all senses" project.

Sapere is a food and nutrition learning method that supports the wellbeing of children and their families, while promoting the development of healthy eating habits.

The method, originally developed for French school children, is also used to strengthen children's naturally positive approach to food and eating. One of its objectives is to bring up children to taste food open-mindedly.

ACTIVATING THE SENSES WHILE EXPERIMENTING

In the Sapere method, children are introduced to foods through their senses. Various sessions have been run at day-care centres, during which the children experience the world of food by testing, playing and trying.

In these sessions, children are supplied with positive experiences to do with food. At the same time they are encouraged to appreciate other things that are connected to food and eating. The children can participate in a discussion about the different stages of food production, or about the origin of food.

Katariina Reponen tastes an apple in a very practical experimenting session.

Kindergarten teacher Satu Pohjankukka supervises the experimenting sessions in which children can get to know food by using each of their senses.

Kindergarten teacher **Satu Pohjankukka** has directed many practical activities that exercise the senses of the children at the Heinikonkatu day-care centre, in Turku.

"Kids love to examine the shape and consistency of different fruits and vegetables. Cauliflowers seem to be particularly interesting. We have baked together and visited grocery stores together. Children are motivated by doing things together," Pohjankukka says.

An instructional menu, based on the Sapere method, has been developed and tested in Turku and Jyväskylä. This process has then helped the existing cooperation between the catering services and early childhood education to grow even stronger.

In practice, the early childhood education staff first study the menu and then select foods suitable for the next experimenting session. For instance, when there is grated carrots on the menu, children can examine a whole carrot with a microscope and talk about their experiences. The children may get to chop the carrots themselves. This way, a perfectly normal side dish of grated carrots can offer many interesting experiences for the children, while enhancing the pleasure of eating at the same time.

SAPERE ENCOURAGES SELF-EXPRESSION

According to Day Care Centre Manager **Jussi Ohvo** from the Asemanseutu Day Care Unit in Turku, Sapere is a very child-oriented way of doing things.

"Children can take their time in getting to know the food. They are not ordered to eat, and they can taste the food on their own terms. Children accept new flavours and dishes more readily when the approach to eating is positive. The method also enhances the naturally insightful understanding and verbal expression of the children."

In practice, children may experience food very differently to adults. Experience shows that, for instance, a tomato may feel rough and tomato seeds exciting to a child, whereas for adults, a tomato is... just a tomato.

Cooperation between the home and the day-care centre, the "pedagogical partnership", has reinforced the children's interest in and awareness of food. The objective of those taking part in the projects was to discover, in detail, to what extent the day-care centres deploying the Sapere method have succeeded in developing the children's expressive skills to do with food in every-day family life.

AN ACCLAIMED PROJECT

The project was granted a weight-management award at the end of November, in recognition of its work promoting healthy eating habits in children. The annual weight-management award is granted by *Suomen Lihavuustutkijat ry*, the Finnish Association for the Study of Obesity.

The project, funded as part of a programme promoting Finnish food culture, is trying to have the Sapere method eventually taken up in all early childhood education.

This year, the project will expand to Tampere, Joensuu, Uusikaupunki, and Kouvola, each with the support of the Ministry of Social Affairs and Health. In addition to these national projects, the positive experiences from last year have inspired many other Finnish municipalities to start developing food education for children in their day-care centres on their own. ■

WHAT IS THE "EXPLORING FOOD THROUGH ALL SENSES" PROJECT?

- The project is administered by the Central Finland Health Care District, and it is a part of a Finnish Food Culture development programme run by the Finnish Government.
- The objective of the programme is to spread the Sapere method to all the early childhood education institutions in Central Finland (Jyväskylä, Laukaa, Keuruu, Äänekoski, Hankasalmi, Viitasaari and Pihtipudas) and Turku.
- The Central Finland Health Care District is responsible for the project in Central Finland. Participating in the project are the University of Jyväskylä, JAMK University of Applied Sciences, the early childhood education operations in each municipality, in addition to the catering service Kylän Kattaus.
- In Turku, the University of Turku is running the project. Also taking part are the Cluster of Food Development, the early childhood education services of the City of Turku, and the catering service Katerinki.
- For more information, please visit http://www.peda.net/veraja/projekti/saperemenetelma.

Photo: iStockphoto

WEIGHT MANAGEMENT CHALLENGES SCIENTISTS

Research institutions examine consumer needs and product selection prospects

Text: Marja-Leena Laitinen and Janiika Vilkuna

Consumers focus more and more on the healthiness of their food and strive to improve their health by making conscious food choices. However, the number of overweight people is increasing.

This issue is being tackled with the project "Consumers on the weight management market" that aims to achieve a deep understanding of everyday weight management habits. The aim is to describe and analyse consumer behaviour related to weight management and the choices that consumers make in everyday life, as well as the experiences that consumers have on particular products.

"We are trying to increase understanding on how food companies could help consumers with their weight management practices, e.g. through product and marketing solutions", says Project Leader, Professor **Teuvo Kantanen** from the Department of Business, University of Eastern Finland (UEF).

There is also an interest in how consumers could be supported and advised in their everyday choices into healthier direction.

"Everyday choices and routines play a key role in keeping up with a healthier diet and in long-term weight management", Kantanen adds.

VARIOUS FACTORS BEHIND CHOICES

The experiences of individual consumers, everyday routines, and the significance of marketing and messages presented to consumers must all be considered when examining consumer behaviour. Specialists from six research organisations are taking part in this research in order to get an extensive database on weight management information.

"We highlight daily routines and factors that affect weight management", says Dr. **Anja Lapveteläinen**, Senior Scientist at the Food and Health Research Centre, UEF. The relationships between consumer choices, product properties and the purchasing environments where the choices are made are also studied.

"Part of the research was conducted in authentic shopping situations. That way we can draw conclusions on how the product properties vary in shops and how purchasing environment enables consumers' choices targeted for weight management. This also provides us information about the possible problems that consumers face when trying to make healthy choices", Lapveteläinen says.

FOCUSING ON WILLINGNESS TO CHANGE

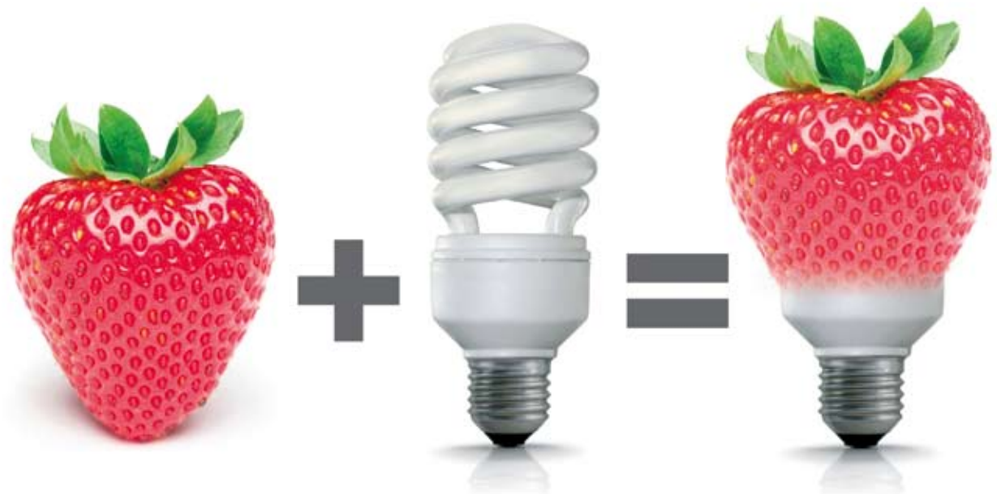
The behavioural analysis was used in this project to understand the choices and change of habits that consumers make.

"The general discussion related to weight management often seems to revolve around products. With behavioural analysis, we like to delve into the individual factors related to weight, especially those that motivate individuals in their weight management process. We will also examine the impact of psychological flexibility on weight management", says Professor **Raimo Lappalainen** from the Department of Psychology, University of Jyväskylä.

The final aim is to find new approaches to understand consumers' weight management needs, and to translate them into practical business solutions that will benefit both business and consumers. ■

BACKGROUND:

- The interdisciplinary project brings together researchers, experts and companies in a new way. The project is funded by the Finnish Funding Agency for Technology and Innovation (Tekes). The project is coordinated by the University of Eastern Finland's (Kuopio Campus) Department of Business and by the ETTK (Food and Health Research Centre) Department of Clinical Nutrition.
- Other organisations taking part in the project are the University of Jyväskylä, the Finland Futures Research Centre from the University of Turku, the University of Vaasa/EPA-NET, the National Consumer Research Centre, and the Savonia University of Applied Sciences.
- The participating companies are Atria, Fazer Leipomot, Hartwall, HK-ruokatalo, Saarioinen, Sinebrychoff, Vaasan and Valio. They all deliver high levels of business expertise and a commercial approach to the project. The project got started from the initiative of companies that were particularly interested in research results related to consumer behaviour and products targeted at weight management.
- The long-term cooperation between research institutions, businesses and the Centres of Expertise contributes a great deal to the project. In 2008 several project ideas, prepared in cooperation with the Kuopio Region Centre of Expertise, the University of Eastern Finland (at the time 'the University of Kuopio') and the Savonia University of Applied Sciences were presented to the Finnish Innovation Fund 'Sitra' and to the Finnish Food and Drinks Industries' Federation ETL. Later these projects were combined together with two other proposals into this extensive business-driven project.



COMMERCIALISATION TRAINING FOR RESEARCHERS

Text: Johanna Jaskari-Halonen

What commercialisation opportunities do research in the food industry create? What does commercialisation mean, really? Then, how is it implemented, step by step? Fourteen food researchers presented these questions during a series of commercialisation trainings run during the autumn. A pilot project had showed that researchers were very interested in developing commercialisation competence amongst businesses. In the future, this course will become a regular part of research education.

Participants from the University of Helsinki, MTT Agrifood Research Finland, VTT Technical Research Centre of Finland, as well as from other education and research institutions attended the Tiedosta tuotteeksi ("From Information into Product") course, organised by the Food Development Centre of Expertise Programme (OSKE) in partnership with the Viikki Food Centre. The course provided researchers with the practical tools that they need to commercialise their research processes, to create cooperative relationships with financial backers, industries and commerce.

During the five day course, the main focuses were recognising potential research targets, assessing the commercialisation potential of an idea, the stages of developing an idea, selecting a method of commercialisation, the requirements of product development, and perspectives on utilising innovations as a competitive advantage during commercialisation. The speakers let the participants observe these processes from the point of view of business, the points of view held by different research institutions, as well as the point of view of academic commercialisation work. In return, the researchers could share their ideas with business representatives, particularly during the two days of the course that were organised in the Inex Partners Oy's and Fazer Leipomot Oy' facilities.

The course showed that there is a great deal of interest in, and need for, the development of commercialisation expertise. In addition, the requirements for proper competence when it came to the commercialisation process in the food industry, were discussed in detail, including the competencies will have to be emphasised in the future. To support commercialisation process, many different areas need to be understood, including how insights into consumers' expectations can be used as its starting point, customer-oriented product development, and the different phases of the commercialisation process, to mention just a few. Building a brand and value chain thinking are areas that could be discussed further.

There is a clear need for a course like this in the future. Researchers' commercialisation training will lead to more cooperation between the research and business sectors, and will increase the flow of new technologies and skills into business and industry from the research sector. Ideally, such commercialisation courses could be made a regular part of researchers' education. Such commercialisation training would also be useful for students about to finish the basic studies parts of their master's programme in the sciences, as the course would both support their career prospects and promote entrepreneurship among these students.

EXAMPLES OF THE COURSES' CONTENT

The opening speech at the course talked about the challenges presented during the commercialisation process, as **Hannu Pellinen**, Director of Grocery Goods Purchasing at Inex Partners shared his insight into the competition in the grocery shop sector: only a few per cent of the products launched every year are still in the shop's selection even 3–4 months later.

Fazer Leipomot, Valio, and the Foundation for Finnish Inventions, among others, provided some good examples of how commercialisation can be successfully carried out. Product Development Director **Heli Anttila** from Fazer Leipomot showed how the interfaces between mega trends, constantly changing consumer needs and product development are managed quickly and efficiently in the bakery business. **Matti Harju**, Vice President of Technology at Valio, shared an interesting example of the chain of innovation that lead to lactose-free milk. The examples given by the companies all showed how industrial product development processes are been organised, and, even at this early stage, gave the participants some new tools to use when planning business-oriented projects.

The course provided some pretty comprehensive information on patenting, including examples of how the process is managed, and the services offered by patenting offices, with some practical examples as illustrations. Interesting cases included the patenting of the Yosa snack products, presented by Professor **Hannu Salovaara**, as well as a presentation by VTT's Executive Vice President, **Tapio Koivu**, about the management of the IPR portfolio in the challenging multinational environment.

Kaisa Kautto-Koivula, Managing Director at Mind Gardenia Oy, offered many ideas for the future in her speech, as well as having a lot of encouragement for innovative work, finding one's creativity, and developing these special areas. She also contemplated the kinds of consumer needs that the global food market will have to address in the future.

In addition, the course focussed on the funding of commercialisation and entrepreneurship as a pathway to commercialisation, discussing the road from researcher to entrepreneur, how to establish a business, and how to acquire funding for its operations from, for instance, Finnvera or from private investors.

Technology expert **Pirjo Hakanpää** from the Satakunta Centre for Economic Development, Transport and the Environment talked about the funding services available through Centres for Economic Development, Transport and the Environment, as well discussing the TULI programme (*Tutkimuksesta liiketoimintaa*, "From Research to Business") (2008–2013), by Tekes, which aims to create new business operations from technology transfers. This programme provides funding for the commercialisation of research-oriented ideas and innovations, as well support for the reports that are always required when examining the commercialisation potential of any such innovative ideas. ■

INTERNATIONALISATION P. 14–19

THE CENTRE OF EXPERTISE PROGRAMME OSKE brings together businesses groups, builds contacts with regulators and institutions, transfers research information and promotes commercialisation. OSKE also helps in finding and contacting potential partners, it participates in Finnish and international fairs and it organises seminars, workshops and networking events.

Sometimes, finding events at which it is appropriate for new companies to make an appearance can be challenging, particularly in the international market. The experts in the Centre of Expertise Programme have all the most up to date information on the most effective forums for networking.

HEALTH INGREDIENTS JAPAN

The Centre of Expertise Programme for Food Development in cooperation with the internationalisation expert Viexpo is currently gathering a group of companies to take part in the Health Ingredients fair, to be held in Tokyo, 5–7 October 2011. As in the previous years, the focus of the fair is on berry processors and natural products, but this time operators from the grain industry, such as the processors of oats and rye, are also invited. The visitors to the fair are usually interested in natural products and functional foods that increase our wellbeing and positively affect our biological systems. One interesting product segment is cosmetics that contain natural products.

The Finnish companies that have previously visited the fair have been very happy with the number of contacts that they have made. Small and medium-sized enterprises may apply for funding from the Ministry of Employment and the Economy. If this is of interest to your company, please contact Salme Haapala (please see page 25).

Health Ingredients Japan
The Biggest and Most Advanced Exhibition & Conference of Health Ingredients in Asia !

WORLD CLASS KNOWHOW FROM FINLAND

For a long time, Finland has been well-known from the top quality expertise in food safety area. The reason for this is not an accident, but it is due to a long time deep cooperation between producers, researchers and authorities. We have successfully built a chain both transparent and traceable. That's why Finnish consumers can for example enjoy excellent tasting and salmonella free chicken meat and eggs. Several new companies have started operating in the food safety sector during past few years to produce services for food producers.

Many of the producers of food safety products and services are rather small companies, except packing material producers which are mainly large. Small producers often have problems in getting their products well-known particularly in international markets, even though the products and services are unique and advanced. Food Safety Management Finland association (FSMF) has been established to combine the expertise of Finnish food safety and to help the companies in their international activities.

FSMF started its work in June 2010 when the concept was introduced to Chinese authorities and food producers in Shanghai World Expo. The introduction was successful. We have started to plan several projects in deep cooperation with Chinese experts after introduction in Shanghai.

China is very important target and partner for FSMF companies, but of course not the only one. I am sure that there are several other countries where Finnish expertise and cooperation in food safety can be used. We are very willing to start discussions in this area. Feel free to contact us for further information.

Text: Jukka Lähteenkorva

Photo: Mikko Rantahakala

Finnish food safety was successfully introduced to the Chinese at Shanghai World Expo 2010.

PUSHING **FINNISH FOOD** BUSINESSES OUT INTO THE WORLD

Text: Esko Pihkala | Photo: Jussi Koivunen

The statistics clearly show that Finnish food businesses are too shy when it comes to exporting. One of the tools for getting rid of this excessive modesty is the internationalisation programme for small and medium-sized enterprises in the food industry that aims to promote the growth of food exports by giving an expanding number of small and medium-sized businesses some basic internationalisation skills.

The statistics of the Finnish Food and Drinks Industries' Federation, ETL, show all one needs to know about the situation: in 2009, the value of food imported into Finland was approximately EUR 3.2 billion, while the exported food came to only EUR 1.2 billion.

Finland is now wishing, quite rightly, to do something about this situation, and the *Elintarvikealan pk-yritysten kansainvälistymisohjelma* – internationalisation programme for SMEs in the food industry, funded by the European Social Fund, is defiantly a step in the right direction. The programme began in February 2010 and is led by the South-West Finland Centre of Expertise's Functional Food Forum (FFF).

Project Manager **Saila Mattila** says that ten SMEs from throughout Finland and development managers from the Food Development Cluster's different centres of expertise take part in the programme. Some of the companies had already had some export experience, while other had not. One of the companies actually started export operations during the training.

"We still have two training periods left, during which we will focus in more detail on the market areas of the most interest to the participants. At the end of the training in October we will organise a fact-finding trip to Germany. Meetings with buyers will be organised for each business, and we will participate in the Anuga 2011 food fair in Cologne," Mattila says.

FINNISH PRODUCTS HAVE GREAT POTENTIAL

One of the companies participating in the training is Marjajaloste Meritalo Oy, located in Perniö, Salo, and owned by **Olavi Lindstedt** and his wife **Susanna Lindstedt**. Meritalo produces conserves and juices from Finnish ingredients, and the annual turnover of the company is slightly over one million Euros. Today, the company has three employees in addition to the Lindstedts.

Now the Lindstedts wish to expand into the export market. According to Olavi Lindstedt, the internationalisation training has been very helpful to Meritalo's future prospects. As just one example, he mentions the presentations on the structure of the target market.

"I had no idea that I could find the contact information of all supermarket chains in Hamburg, or of all the wholesale dealers in St. Petersburg, in a single database maintained by the Turku School of Economics," Lindstedt says.

According to Mattila, Germany and the rest of the Baltic region – St. Petersburg in particular – is the market area that most Finnish entrepreneurs are interested in.

The interest is mutual. In St. Petersburg, Finnish food has such a good reputation that Russian chain stores have hired consultants to scout for the best Finnish products to be sold in Russia. Thanks to a substantial stream of Russian tourists coming to Finland, the Russians have come to know Finnish foods and food products, and they like them.

In other words, both the products and the demand for the products exist. However, the Finnish food industry mainly consists of SMEs, and as these tend to have a high threshold when it comes to expanding abroad, they need all the support they can get from the network.

In addition to the FFF, the implementation of the internationalisation programme for SMEs in the food industry is also being carried out by Foodwest Oy, Viikki Food Centre, Agropolis Oy and the Turku School of Economics. ■

Kuva: Esko Pihkala

Olavi Lindstedt, Marjajaloste Meritalo Oy

Euroopan unioni
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2007–2013

XIE MINQIANG, DIRECTOR OF SHFDA:

"FOOD SAFETY IN CHINA IS BEING DEVELOPED IN COOPERATION WITH FINNISH EXPERTS"

Text: Pasi Kivelä and Zhang Qi, China Operation Center | Photos: Pasi Kivelä and Mikko Rantahakala

China has one of the largest and fastest growing food and food safety markets in the world. In its policy definitions, the Government of China wishes to significantly increase international cooperation in regards to improving food safety. In relation to this, Finland's high levels of expertise have been noted in China.

Dr. Xie Minqiang, Director of the *Shanghai Food and Drug Administration* (ShFDA), was interviewed by Makustele in November 2010. ShFDA is responsible for, among other things, the supervision all food, medicine, cosmetics and health-care in the Shanghai region.

THE DEVELOPMENT OF FOOD SAFETY IN CHINA IS AT A CRITICAL STAGE

"The work on food safety in China has now progressed to a critical phase," said Dr. Xie.

"The Government of China has solved the problems with the food supply chain, in general, but several risks related to food safety still remain. These problems are clearly visible, and solving them has become a priority at the Government level. Shanghai plays a crucial role here; the solutions developed in the Shanghai region will be duplicated in other parts of in China."

According to Dr. Xie, the development of food safety in Shanghai is now much more systematic than previously, so that today the food supply chain can be supervised better than ever before.

"However, it is possible that China may yet have to face some serious food safety issues. In this respect China is still a developing country, and making the food safety system watertight throughout the food supply chain requires passing through several developmental phases."

In the future, one of the aims will be to invest in proactive, preventive approaches to the handling of food safety problems. In its five year plan, the municipal administration of Shanghai wishes to improve its supervision of the food industry, focussing on improving technical abilities, improving supervision methods and increasing international cooperation.

SHFDA TRUSTS FINNISH EXPERTISE

Dr. Xie noted that cooperation with the Finns and their investments in food safety in China had made a very positive impression on ShFDA.

"ShFDA works very closely with Finnish experts. The Finnish innovations in science and technology are internationally significant, and they have duly been noticed in China. We have to learn from the Finnish expertise and their experiences in solving food safety issues. A good foundation for our future is our long-term cooperation with Finnish experts."

In spring 2009, a Chinese delegation, led by Dr. Xie travelled to Finland and visited its Competence Clusters of Food Development and Health and Well-being, the Finnish Food Safety Authority Evira, and the Finnish Ministry of Agriculture and Forestry.

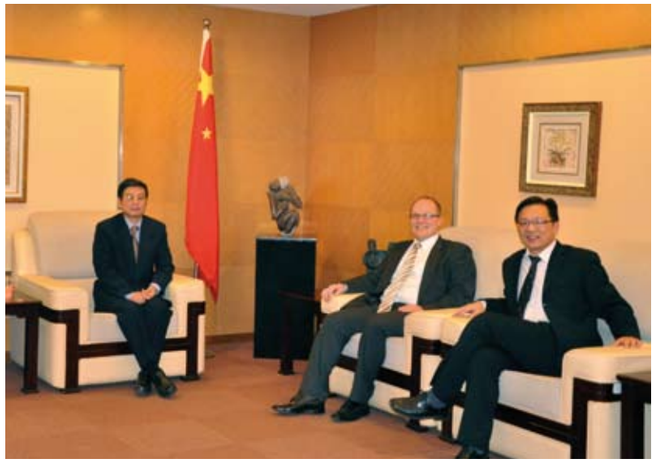
"**Jukka Lähteenkorva** from the Food Development Competence Cluster of the Centre of Expertise Programme has had an active role in opening up the Chinese market, as well as in the associated negotiations. This cooperation has also sparked discussions in the political sector, and as a result significant investments have been made related to improving food safety in China. For instance, already three extensive food safety joint ventures have got underway."

COOPERATING WITH AUTHORITY IN A SIGNIFICANT ROLE

One significant initiative in food safety was the general agreement between China and Finland organised by the Food Development Competence Cluster, part of the Centre of Expertise Programme. **Tuula Honkanen-Buzalski**, Director of the Research Department at Evira, and Xie Minjiang, the director of ShFDA, signed the general agreement between Evira and ShFDA during the visit of the Finnish delegation in November 2009.

"Visits and discussions have given new insight into the Finnish and Chinese food industries, their current situation, the challenges they are facing, as well as their regulations related to the supervision of food safety. In Finland, both the legal framework and the practical implementations of food safety supervision are of the highest level. So, in this area, Finnish businesses and the Chinese authorities exchanged technical know-how. A good example of this is the expertise that the Finns have built up to do with laboratory measurements and the supervision of substances that stimulate animal growth, as well as the development of quality controls of in this area. In Finland, the food industry has already done plenty of work to tackle these issues," Dr Xie said.

The Expo 2010 Shanghai China helped develop China's connections around the world, as international trade, cooperation and exchange of information increased. Food safety at the Expo was ensured through an international evaluation. From Finland **Jaana Husu-Kallio**, the Director General of Evira, took part in the evaluations which got underway during November 2010. The visit of the Finnish Minister of Agriculture and Forestry **Sirkka-Liisa Anttila** to the Expo 2010 and to the Nordic Food Safety Forum Shanghai 2010 during August 2010 also gave strong support to the food safety evaluation project. What made this evaluation particularly special was the fact that the final report of the evaluation project will be used to help plan and guide the food safety measures implemented at future large-scale international mass-participation events.



Zhang Qi and Pasi Kivelä, the two directors of the China Operation Center, met with Dr. Xie Minqiang, the director of the Shanghai Food and Drug Administration. Director Xie talked about the future prospects for food safety in China, as well as about the existing cooperation between Finland and China.

Dr. Xie Minqiang was the keynote speaker at the June 2010 Sharing Health–Food Safety event the Expo 2010 Shanghai China, organised by the Food Development Competence Cluster from the Centre of Expertise Programme.

FOOD SAFETY MANAGEMENT FINLAND AT THE EXPO 2010 SHANGHAI CHINA

Dr. Xie was the keynote speaker at the June 2010 Sharing Health – Food Safety event, organised for Expo 2010 Shanghai China by the Food Development Competence Cluster from the Centre of Expertise Programme. A Finnish Food Safety Management Finland (FSMF) concept was launched by Chinese authorities and business executives at the event, which was held in the Finnish pavilion Kirnu. Dr. Xie was the director of all food safety at the world's fair. The task was especially challenging, due to both the large number of visitors and because of the demanding climate. More that this, the Expo 2010 Shanghai China was one of the largest mass events ever organised. The Finnish pavilion Kirnu alone was visited by more people than the population of Finland.

The FSMF presentation at the fair immediately stirred visitors' interest in Finnish expertise. Development projects involving liquid feeding solutions, traceability, and food safety training and education programs are all currently in progress, to select just a few.

In November 2010, the University of Helsinki and the Shanghai Ocean University began negotiations looking at starting a food safety education programme in Shanghai.

"Though still at the early stages, exchanging information between universities forms a good basis for extensive educational cooperation. The education programme will be implemented in phases. The number of students in China is simply vast in comparison to Finland, which itself presents another set of challenges for the project. With efficient cooperation the education programme can be realised, and results will certainly be achieved. In 2011 we will strengthen our exchange of academic information and expertise, and promote the food safety courses being offered by the University of Helsinki as being suitable for use in China," Dr. Xie says.

INCREASING COOPERATION

"The year 2011 will bring many new and interesting challenges. Cooperation with Finnish experts will be intensified further. The items on our agenda include increasing educational cooperation, developing our abattoir laboratory tests further and introducing new technologies. One important issue to be developed for the future is improving the traceability of food throughout its production chain, and we will see significant investments being made in this over the coming years."

Opening the Chinese market to Finnish businesses is a sign of the good results that have come from the strong cooperation between the different operators. The investments of, for instance, the Centre of Expertise Programme, Evira, FinNode and the Consulate General of Finland in the opening of the Chinese market have led directly to increased exports between the two countries. Several companies have benefited from the official cooperation and networking now in place between China and Finland. In China, such networking and cooperation between authorities is crucial when starting any business operation. Trust must be earned, and a long-term cooperation requires effort by both sides.

Now, Finnish companies are being presented with great opportunities to expand their export operations into China. The China Operation Center founded in Shanghai in November 2010, in cooperation with the Finnish Centre of Expertise Programme, plays a key role in implementing food safety projects. Finnish authorities such as Evira, FinNode, the Finnish Funding Agency for Technology and Innovation (Tekes), the Technical Research Centre of Finland (VTT), universities and R&D organisations, as well as other organisations in the sector such as FSMF, can all expand their business operations through the networks that have been created between the two countries. For just one example, there is already a huge demand for high-tech products, and we can look forward to further significant growth on top of that. ■

FINNISH SUPERFOODS NEED TO BE SOLD TO THE WORLD

Text: Aira Kuvaja | Photo: Virgino

Kankaisten Öljykasvit Ltd, a participant in the Primary Project for organic food, manufactures Virgino rapeseed oil and the organic Luomu Virgino rapeseed oil. Exporting has begun, and the Finnish cold-pressed rapeseed oil has been seen at a number of international fairs.

SCIENTIFICALLY PROVEN HEALTH BENEFITS

From the start, research and product development have been at the core of Virgino rapeseed oils' development. Research has focused, in particular, on the health benefits of the cold-pressed rapeseed oil. Studies commissioned by the company have led to greater awareness of rapeseed oil's health benefits, which, in turn, have created a competitive advantage for the entire industry in comparison to the imported olive oils, for example.

"A balanced diet includes a sufficient amount of healthy fats that protect the heart, lower the blood's cholesterol level and have beneficial effects on the brain. Our entire body, from the cells up, needs fatty acids. We must guarantee a supply of Omega-3 and Omega-6 fatty acids through nutrition, as our bodies cannot produce these. Virgino contains these vital fatty acids, and in the correct ratio. The rich supply of Omega-3 fatty acids is particularly important, because there normally isn't enough of it in the Western diet," says **Perttu Korolainen**, Managing Director of Kankaisten Öljykasvit.

The latest research conducted by a team led by Chief Physician **Ari Palomäki** discovered that Virgino reduced the level of oxidised LDL, which is the most harmful type of cholesterol, by 16 per cent during the six week study period. The study was published in the internationally acclaimed scientific publication *Lipids in Health and Disease*.

"We have noticed that active cooperation between research institutions can lead to new information about products we had thought that we already knew about. Health effects must be scientifically proven if they are to be used in the marketing of a product," Korolainen says.

RESPONSIBLY AND SAVING THE ENVIRONMENT

The Virgino manufacturing plant is located in Turenki, and Virgino supplies work for both turnip rape growers, and for workers in its factory. All the raw materials are produced in the fields of its Finnish contract farmers, and each batch of turnip rape is test-pressed before being accepted into production. The organic Luomu Virgino is produced from organically produced turnip rape, while the Virgino rapeseed oil is made from turnip rape grown under the so-called "integrated production" system. Integrated production utilises natural production resources, such as the water and nutrient reserves of the soil, the natural enemies of vermin and crop rotation, all of which, in turn, reduce the need for artificial fertilisers and pesticides.

The turnip rape used as the raw material for Virgino is mainly produced in the nearby areas, before being delivered, conveniently and efficiently, by centralised distributors. This way, the energy consumed in the transport and handling of the raw materials stays as low as possible. The pressing plant is partially heated using the production waste, and the electricity used is bought from a wind farm.

"We don't use chemicals or high temperatures in our production, so we can reduce our emissions. The pressing of the rapeseed oil does not create any waste because the pressed rapeseed can be utilised as protein-rich feed for animals. The oil is packed in PET bottles which, when considering the entire life cycle of the package, are the most environmentally friendly solution. Virgino's carbon footprint is very small," Korolainen adds.

"The environment has been considered throughout the production chain, including in the farming, the storing and the cleaning the turnip rape. The effects of transport, cleaning, maintenance and the total energy consumption have all been taken into account."

RAPESEED OIL STIRS GLOBAL INTEREST

The health benefits and other advantageous characteristics of rapeseed oil also interest consumers outside of Finland. Virgino is a member of the Organic Food Finland export group for organic products.

Last year, Finland exhibited in the Nordic stand of BioFach, the largest organic fair in Europe, held in Germany. Delicacies made from the best Nordic raw materials were served in the organic restaurant, and top chef **Kim Palhus** and his team used the organic Luomu Virgino rapeseed oil for all of the dishes served in their buffet.

"In the future, we will invest even more in the export of cold-pressed rapeseed oil. Finnish superfoods need to be sold to the world," Korolainen explains.

When it comes to export, the Northern location of Finland is an advantage in the production of organic rapeseed oil, as the climate enables more environmentally friendly growing methods; many of the bothersome diseases and pests common in Southern Europe cannot survive the Finnish winter. ■

The dozens of cameras installed in the ceiling of the Restaurant of the Future record the journey of each customer and their tray towards the cashier.

THE RESTAURANT OF THE FUTURE INVESTIGATES CONSUMER CHOICE

Text: Salme Haapala | Photo: Restaurant van de Toekomst, Wageningen

The research centre at the Dutch Wageningen University runs a large number of research programmes that lead to new understandings of consumers' eating and drinking behaviours. It then assists businesses take advantage of these findings. A versatile research restaurant, Restaurant van de Toekomst, the "Restaurant of the Future", is part of the research centre. One indication of the scale of the overall project is that the initial budget for the research centre was three million euros.

The Restaurant of the Future is a test platform, a physical environment for the research project, run by researchers, a restaurant entrepreneur, furniture and equipment manufacturers, and by the other project partners. The restaurant provides the perfect setting for both scientific and business-driven research. The unit consists of a lunch restaurant and its functions as well as sensory consumer research laboratory. In both of these two facilities the research centre engages in groundbreaking, innovative operations, routines and studies from which extensive new data and knowledge of the behaviours related to food are obtained.

BEING TESTED

A group of Finnish decision-makers and product developers from the food industry visited this unique restaurant in the spring of 2010. While the restaurant is just one part of the research operations, a huge number of researchers, students and companies participate in its operation. Eating at the restaurant exposes the incidental patron to many tests and studies that may go completely unnoticed. At the same time, the visitor can be imperceptibly manipulated.

When a customer, that is research subject, first enters the restaurant, it appears to them as any old lunch cafeteria. But appearances can be deceiving. For example, all of the equipment in the food service area can be moved and its arrangement changed as necessary. This way, scientists can examine how placing warm dishes at the start of the buffet selection line – instead of the salads, or vice-versa – will affect the contents and the composition of meal that customers select.

The dozens of cameras installed in the ceiling of the restaurant record the journey of each customer and their tray towards the cashier. At the cashier, the diners previously registered in the restaurant system are given advice on how to make healthier food choices in the future. The information is based on the nutritional information of the food items that they have chosen for their meal. These could be versions of products still in development, or products that are already on the market.

SCIENTIFICALLY VALID INFORMATION

The arrangement of the furniture in the restaurant is adjusted according to the needs of the research. The lighting and the sound profile in the restaurant can be changed to observe how these affect consumer behaviour.

The site offers facilities for scientific research, in addition to consumer research. The research facilities feature a number of items of innovative equipment, some of which have had to be custom built for the University – similar equipment has simply not existed before. The object of a study could be, for example, to find out, while chewing food, the number of times that each eating customer – each research subject – moves their jaws before they swallow. The results from such studies can then be applied to looking at the suitability of food that may appear on menus being offered to senior citizens, for instance.

One device dispenses drinks, say milk, via a closed tube so that the research subject will register the taste and smell without ever having seen the actual product. This helps to eliminate the effect of the visual experience from the sensory evaluations that people make via their other senses. In the sensory consumer research lab, different taste components can be tested separately, delivering deep understanding of the thoughts behind certain taste evaluation results.

During the group's visit, a study on replacing alcohol with other chemical substances was being conducted in the laboratory. The idea was that the research subjects would think that they had tasted a product containing alcohol, when in fact the product was alcohol-free. Another interesting study examined the eating behaviour of small children. The study aimed to discover whether the initial foods given to a child would affect the child's later preferences in terms of fat or salt containing foods.

PLENTY MORE TO STUDY

The Wageningen research centre is a clear demonstration that each scientific result can only be delivered after a massive amount of information processing by students and researchers. In addition to food scientists, the study utilizes psychologists who both analyse the results and think about ways to investigate various further questions.

This project at Wageningen has so far produced a great number of reports, available to anyone who is interested. To learn more about the research results, all one has to do is contact the contact person shown on the website and then get to work. The project really makes you wonder at how little we still know about our eating behaviour, and how much more there is to learn. ■

Visit the Restaurant of the Future's website at www.restaurantvandetoekomst.wur.nl.

BOOSTING GROWTH P. 20–24

FOR MANY ENTREPRENEURS a very clear goal is the growth of their company. However, growth does not just happen by itself; it requires a wide range of changes and developments. Luckily, entrepreneurs do not have to manage all of this by themselves: the Food Development Competence Cluster makes available expert help for businesses, particularly for those in the food industry. The high levels of competence and expertise that these experts bring with them will definitely help your company to move forward.

INNOBOOSTER
–BOOSTERTEAM FOR GROWTH AND COMMERCIALISATION

Text: Johanna Jaskari-Halonen

Using the InnoBooster service, food industry businesses can now support their growth with new, innovative solutions, solutions built from the highest levels of industry expertise. A company could, for instance, begin developing a new business area, or find out industry-proven ways to increase the sales of their currently available products. InnoBooster brings an entirely new perspective to applying to food industry businesses the research and commercialisation information already available from various scientific and business experts.

With InnoBooster, companies are given a BoosterTEAM: three to five top experts from various fields, each with expertise in commercialising products and a hard-won understanding of customers and the challenges to growth. Each company's BoosterTEAM is selected from fields such as food sciences, behavioural sciences or design – depending on the business. Representatives of the retail sector, or even consumers, may also be invited onto a BoosterTEAM. This cooperation of experts from different fields within the team creates a perfect platform on which to create bold and significant solutions. Resulting from InnoBooster can be a growth programme, a funding application to acquire funds to implement a growth programme, or even long-term commitments of support from top-level industry experts, all customised for the business.

The InnoBooster programme can be undertaken by individual businesses or by a group of businesses facing similar challenges. Building a business network is an important tool for achieving growth targets, particularly when the business aims to penetrate the international market. InnoBooster supports the building of genuinely productive business networks, networks that share a strong common goal and strive to create more value for the businesses and end clients in the network.

The implementation of InnoBooster has been made as quick and easy as possible for companies, as the regional development organisations are there to help from the very start. What's more, each business can apply for public funding to implement their programme.

InnoBooster has been developed by the Viikki Food Centre and by the Food Development Cluster of the Centre of Expertise Programme, and it was commissioned by the Satakunta Centre for Economic Development, Transport and the Environment. It has been designed for use by the "Sapuska – Added Value for International Food Markets programme" that is run by the Finnish Funding Agency for Technology and Innovation (Tekes). ■

ORGANIC OATS
MANAGING THE PROCESS EXPERTISE AND PRODUCT DEVELOPMENT

Text: Annaleena Ylinen | Photo: Helsingin Mylly

The Primary Project 'Organic Food' focuses on product development and process expertise related to organic oats. **Miska Kuusela**, Managing Director of Helsinki Mills Ltd, answered our questions about organic oats. Helsinki Mills Ltd is the largest processor of Finnish organic grain, and has been involved in planning the Primary Project for organic food.

Why should we export products made from Finnish organic oats?
"One reason is the high quality of Finnish oats – technically speaking, but also subjectively, as an image. Finnish oats are valued and wanted. It does not mean, however, that they would be worth substantially more than oats from elsewhere, but it is a competitive edge nevertheless.

Another reason is the reputation of oats as a health food and the resulting increase in demand. The health effects of oats have been proven, and the knowledge of this has spread quickly. In this respect, oats are significantly different to rye or wheat; rye is very healthy too, but not too many people know or appreciate this outside Finland."

Why should we then export specifically organic oat products?
"In the export destinations, being organic is a definite bonus for a product. A normal oat product would be OK as it is, but when it is labelled organic, it becomes even more persuasive and attractive. Organic oat products compete directly with normal oat products. All export clients would rather pick the organic version. If the organic version is not available, the normal variety will do, but because there is much greater production of non-organic than organic oats in the world, competition is also much tougher, and signing a particular deal becomes less and less likely. However, the price differential can't be too great or else interest in the organic produce starts to wane."

Why export products made from processed organic oats, rather than just organic oats?
"The more the product is processed and the brand is developed, the better its foothold in the market. In addition, a larger share of the value chain will be produced by Finnish labour. When exporting grain in bulk, the only competitive edge is the price, and only the production value will remain in Finland. International buyers of raw grain will simply disappear if organic oats can be bought for a lower price from elsewhere.

But if a company's or country's foothold in a market is good, especially if the producer and processor are close to each other, then it is possible to develop long-term cooperation. This year, Helsinki Mills Ltd will offer long-term growing contracts for organic oats which, in the long run, will significantly improve the opportunities for planning amongst business operations, for both the producer and the processor."

What particular areas of the Finnish organic oat supply chain do you currently think should be developed?
"Volume and perseverance. The production volumes of organic oats are simply too low, which decreases our ability to meet the product demands present in the market. These windows of opportunity are often open for only a short time, and we have to be able to react before the opportunity is gone. The demand for oat products should not be taken for granted: nobody will buy organic oats for any price, or wait for product if the supply does not meet demand. If the price is wrong or the product is unavailable, the consumers will lose interest. This spring and summer this risk will be particularly predominant. The fluctuation in the price and supply of grain make the long-term planning of business operations very difficult for all the parties involved – but through cooperation, we could build operations that could be planned further ahead than just the next harvest season."

What benefits does this Primary Project for organic oats offer to Finnish companies?
"The weakness of the oat is its poor baking and processing qualities, compared to other grains. This narrows down its applications, and as a result, its total consumption. If these issues can be solved, and the solutions patented, Finland's position as an 'oat country' will be greatly developed.

For instance, oat kernel flour is not used much at the moment, which is why much of it ends up as animal feed. Increasing the possibilities for using oatmeal in food would significantly increase the value of oat, as an even larger part of the grain would end up in saleable products. Today, only half of the weight of the raw grain ends up in a saleable food product; with rye, more than 90 per cent is used." ■

Want to know more about the organic oat project? Please contact Erkki Vasara (page 25).

NUMCORE AND KUAVA
BOOST INDUSTRIAL PROCESSES

Text: Anne Rintamäki

The Kuopio-based Numcore Oy provides sensors and measuring software that enable real-time monitoring of changes in pipelines and containers. Kuava Oy uses modelling and technical computation to produce analyses and virtual models of processes, and offers software solutions for analysing such data.

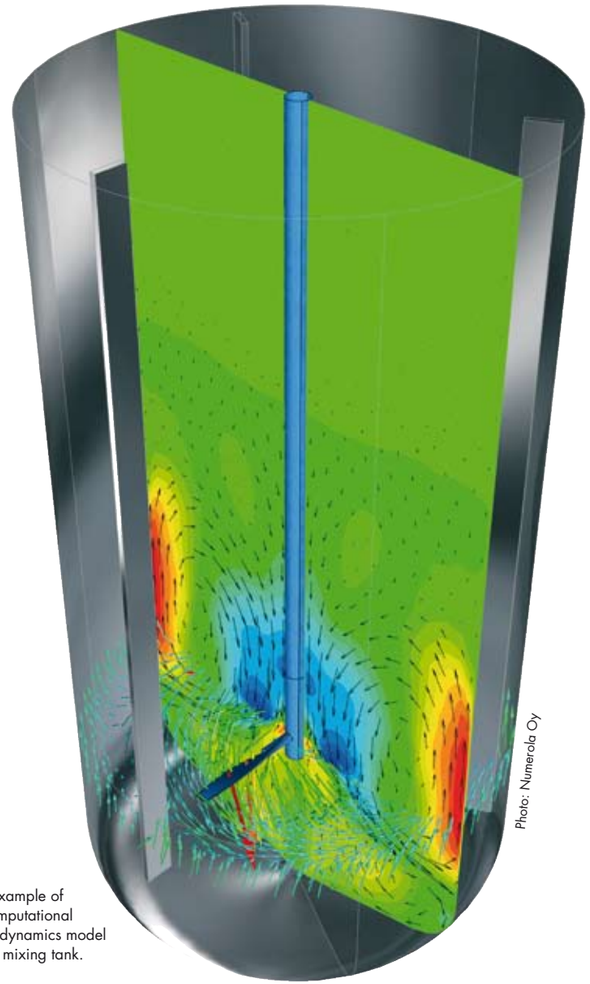


Photo: Numerola Oy

An example of a computational fluid dynamics model for a mixing tank.

What is measuring technology like this used for? According to **Jukka Hakola,** Vice President, Sales and Marketing at Numcore, real-time measurement is very useful.

"When the right type of measurement information is collected in an industrial application, many processes can be optimised which, in turn, can create significant savings."

"At the same time, we can also improve food safety, as the sensors can detect foreign objects during the process, such as pieces of glass, metal, plastic or bone.

Another very useful attribute is the real-time process information that sensors supply, which leads to the solving of processing problems much quicker and more efficiently.

"Human process operators often make adjustments based on their gut feelings, but measurements made by sensors provide solid data that can, and should, be used in the management of the process," Hakola explains.

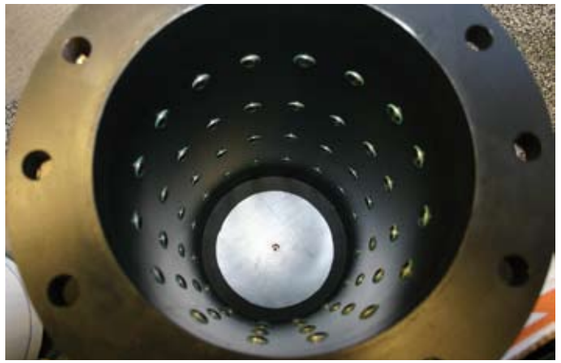
BOOSTING THE PROCESSES

Matti Malinen, Managing Director at Kuava, says that they also aim to help companies make their products and processes more precise, efficient and environmentally friendly.

"With physical and chemical modelling, we can for instance test various process options virtually before moving a certain process into production. This is an efficient way to weed out unnecessary investments and ineffective solutions.

"With modelling, we can even adjust existing processes to make them as efficient as possible. This will create, for instance, energy savings or help to resolve problem areas," Malinen says.

Photo: Anne Rintamäki



The Numcore measurement system uses various sensors to measure the required steps of a process. In a flow-through sensor, dozens of electrodes have been installed on the surface of a steel pipe.

Photo: Anne Rintamäki

Jukka Hakola, Vice President, Sales and Marketing, says that Numcore already focuses on the international market, and is currently building a network of agents.

Photo: Kuava Oy

"Research is important, but you also have to know how to commercialise its results and bring them over into the business world," Matti Malinen, Managing Director of Kuava notes.

Both Kuava and Numcore systems are well suited for use in the food industry. The Kuava solutions are ideal for simulating drying, freezing, chilling and mixing processes, among others.

"Our measuring systems are typically used in processes that contain phases related to mixing or separation surfaces, such as extraction, filtering, mixing and separating," Hakola says.

"Making cheese is a good example of a process in which the homogeneity of the cheese curd can be improved with measurements."

NEW TECHNOLOGY

The Numcore measurement system uses various sensors to measure the required steps of a process. In a flow-through sensor, dozens of electrodes have been installed on the surface of a steel pipe. The data collected by these electrodes can be transmitted directly, both as a signal to an automated system and as a 3D image to a computer in the control room.

Larger pipes and tanks are measured with probe-type sensors, in which the electrodes are installed on the surface of a glass fibre probe.

Kuava has clients in the forest industry, electronics and machinery, environmental technology and the medical technology fields.

One interesting application is ultrasound surgery, in which cancer tissue is burned through the use of ultrasound. With the help of modelling, the use of this technology can be optimised by monitoring the progress and temperature of the ultrasound waves in the tissues.

"A core principle in our operations is that the numerical data from the processes must be suitable for analysis," says Malinen.

"For this purpose, we have developed the Datain software that provides exact information about the operation of the equipment and the processes, through visualisation and producing process models."

In addition, Datain combines the results of process measurements and separate laboratory analyses with observations made by the operator.

"Modelling is a great tool for training employees as well; with the virtual training simulator, their understanding of the process and process control is improved without interfering in the actual production by holding organized training sessions," Malinen says.

ROOTS IN THE UNIVERSITY

The roots of both Kuava and Numcore run deep within the University of Eastern Finland. Numcore was established by an Inverse Problems group of researchers that had started to examine measurement systems during the 1990s. **Marko Vauhkonen** and **Jari Kaipio**, among others, participated in the operations of the group, supported by the Academy of Finland.

"Numcore was established in 2007, and after the productisation work, actual sales operations started in 2010," Hakola says.

"Funding from the Finnish Funding Agency for Technology and Innovation (Tekes) has helped us significantly. Last year we were admitted to the second round of the Tekes NIY programme for young, innovative and growing businesses, which increased our resources remarkably."

Kuava, too, was established in 2007, and its three shareholders Matti Malinen, **Tomi Huttunen** and **Antti Vanne** have all worked at the Department of Physics at the University of Kuopio. The fourth owner is the Jyväskylä-based company Numerola Ltd which works in the field of computational technology.

"I wanted to be an entrepreneur because I wanted to offer both my expertise and the possibilities provided by computational technology to businesses. Research is important, but you also have to know how to commercialise its results and bring them over into the business world," Malinen notes.

OUT INTO THE WORLD

Hakola says that Numcore already focuses on the international market, and is currently building a network of agents. Korea and Japan, among others, have shown interest in the measuring systems.

The right partners play a crucial role in internationalisation. The Kuopio Region Centre of Expertise, part of the national Food Development programme and coordinated by Kuopio Innovation, has helped both Numcore and Kuava to find the best contacts and to make successful entries into the market.

"Today, personal contacts are essential for reaching clients; simply exhibiting at fairs is not enough," Hakola says.

Kuava's internationalisation is also supported by Numerola, whose clientele can be now offered a collection of extremely versatile service solutions.

"Process modelling and measurements are still new to many industries, which is why companies must also change their ways of thinking. For instance, cheese has been made without these systems for 2,000 years, but this does not mean that modelling and measurements could not make cheese production more efficient, save costs, and improve the quality of the cheese," Hakola and Malinen conclude. ■

MULTIDISCIPLINARY **PILOT** PROJECTS

IN SEARCH OF INTELLIGENT APPLICATIONS

Suomen elinkeinokalatalouden toimintaohjelma 2007–2013

Text: Anna Hillgrén and Saila Mattila

How could printed intelligence help a fish product along its journey from the producer to the consumer's table? The ÄLYKALA project – "Ensuring the cold chain of fish as a part of the industry's quality control system" – has looked for answers to this question. The project's basic idea was born from the results of a cooperative effort between the Centre of Expertise Programmes of Food Development and Forest Industry Future.

"Temperature management" was selected as the research topic as the efficiency of the cold chain has a particular effect on the quality of the fish that ends up on the consumers' dinner tables. The project looked into how well the cold chain for fish operates, from the producer's facilities to the shops, from the shop's display to the consumer's kitchen. In addition, the project examined the consumers' opinion on the temperature indicators attached to the product's packaging. The results were then used to look at the need for intelligent solutions in the management of the cold chain. The project showed that intelligent solutions could be useful in maintaining the quality of consumer products and in assisting with the logistics of moving products from the producer to the shop. However, these two applications would require separate intelligent solutions.

So, what did the businesses think about the project?

▶ THE RETAIL SECTOR

Marju Erävaara, a packaging specialist at Ruokakesko Oy

"The ÄLYKALA project gave us research information about how consumers feel about different types of temperature indicators, how well the cold chain works from the perspective of the consumer, and how well the cold chain model operates between industry and the wholesale trade.

Intelligent packages can help to reduce unnecessary losses in fresh products, which, in turn, would also decrease our carbon footprint. These indicators need just a bit more product development so that they will show the right information at the right time."

▶ THE FOOD INDUSTRY

Tarja Aro, Product Development Manager, Felix Abba Oy Ab

"Three herring deliveries from Felix Abba were included in the monitoring process, each equipped with temperature loggers. I was involved in the temperature monitoring project at Felix Abba. We organised specialised training for our warehouse staff to update their knowledge on cold chain logistics.

Our company initially wanted to participate in the project because we were interested in our consumers' behaviour, and we wanted to see how much the temperature inside a jar of herring rises in the consumer's fridge and on the consumer's table. Our presumption was that the herring jars would not be kept within their recommended temperature range, and the study confirmed that we were right. That the study was performed in the summer was extremely important because summer generally poses a great challenge for the maintenance of the cold chain for fish. I hope that the publicity about the study reminded consumers of the importance of the cold chain in preserving the quality of their fish products.

In the future, packaging technology will be one of the most essential areas for development. However, the larger scale commercialisation of any related innovations will take time. Before a temperature indicator can be added to a herring product, for example, we have to think carefully about the type of information that we want to supply to our consumers. Should the consumers be guided to use the correct storing temperatures through the use of reversible indicators, or do we want to map the entire cold chain using irreversible indicators or time-temperature indicators?"

▶ THE PRINTING INDUSTRY

Juhani Korppi, Development Manager from Auraprint Oy

"We provided to the project the perspective of the printing industry. Our task was to discover how different printing methods could be used to produce indicators that display changes in temperature, and how these could be attached to the products or to the products' packages. These indicators had to be as inexpensive as possible, which meant that the production method had to be as efficient as possible. Our solution was an added colour, printed at the same time as the rest of the packaging, or attaching a sticker to the package when packing the product. This added colour then changes reversibly, which means that it changes according to the current temperature, so it does not provide information about the actual cold chain as such."

"During the project, Auraprint Oy studied the availability of suitable indicators and colours. Through this and through other special projects, we have been able to increase our range of competencies. We are now knowledgeable about a number of special issues, those related to the management of the cold chain in particular."

"The ÄLYKALA project clearly demonstrated the two sides of the issue. One side involved the chain from production to packing, transport, storage and finally to the store. In this domain, large amounts of goods are processed, and the indicators can be more expensive as they can be used repeatedly.

However, it is a completely different matter what the consumer does between the purchase of the product and bringing the product to their table. The consumer should also check that their fridge is at the correct temperature, which means that the indicators must be cheap and preferably of a reversible colour type. This way, the consumers can assess the quality of their cold chain themselves; they can see where the problem is if, say, their tummy starts to hurt." ■

The ÄLYKALA project was run by the Functional Foods Forum of the University of Turku in cooperation with the Southwest Finland Centre of Expertise, the Technical Research Centre of Finland (VTT), Ruokakesko Oy, Ab Chipsters Food Oy, Felix Abba Oy Ab, Auraprint Oy and Turku Science Park Oy. The monitoring of the logistics was undertaken by NetFoodlab Oy, and the project was funded by the European Fisheries Fund (EFF).

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CONTACT US IN CASE YOU WANT TO BENEFIT FROM THE CLUSTER!

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