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Towards Sustainable and Tasty Food in Europe

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Henri Malosse

President of the European Economic and Social Committee

Food is an essential part of our life, cultural identity and economy. Over the past few years, awareness of the impact of food production and consumption on the environment, through resource use and emissions, has grown and led to numerous civil society actions and government policies on both national and European level. The European Economic and Social Committee promotes good practices regarding the development of sustainable food systems and encourages the exchange of experiences among the different stakeholders. However, further action has to be taken to achieve a more efficient and sustainable food system. Improved cooperation is needed on all levels of the food chain, from farmers to consumers, including businesses and policy makers, to ensure a sustainable future for the next generations. As the President of the European institution which represents the European civil society, I am encouraging their active participation in addressing this growing challenge, alongside the EU institutions.

The Committee is actively taking into consideration the evolution of sustainable food practices, through numerous opinions, and the impact of food production on the economy, environment, producers and consumers, with special concern for the main question of the survival of family farming. In this regard, our committee strongly supports strengthening of local farmers, markets and direct sales from producer to consumer.

The conclusions of the opinions are becoming really tangible as projects are being launched by the Committee and European citizens. Local initiatives have been developed throughout Europe to promote a sustainable food system, such as local food markets; catering healthy and organic food to schools; and community vegetable gardens. These projects support local development and more sustainable production and consumption methods. Thus, with the Committee, alongside the European Commission and large-scale distributors, I have launched a project focusing on food waste. Food losses and food waste have an economic, social, and environmental impact. The project, based on the topic of 'Prevention and reduction of food waste', targets the promotion and facilitation of food donations. The project is set up with local stakeholders, like the Colruyt group. I believe that it is both socially and ethically necessary that more political action be taken to reduce the scale of food waste. Other initiatives are rising throughout Europe. They include the TASTE 2 Seas cluster project, which aims to implement tasty and sustainable food in Europe. TASTE 2 Seas is a great example of territorial cooperation, with participants from the Netherlands, Belgium, France and the UK, and furthermore, of support and collaboration between universities, institutes and businesses.

I am convinced that involving civil society at global, national and local levels is crucial for a successful transition to a sustainable green economy. In addition, the involvement and active participation of the Member states and European institutions is essential for achieving this goal. Only with the commitment of all EU stakeholders from the European institutions to the consumers, including local stakeholders, and the civil society as a whole, can we establish a sustainable food system in Europe for our future generations.

Henri Malosse,
President of the European Economic and Social Committee

Introduction



Why this cluster?

Any cluster that focuses on the food and drink industry is undeniably important. After all, it is the second largest industry in the manufacturing sector in the EU. In fact, it's responsible for 14.5% of all manufacturing turnover. As it stands today, the food and drink industry appears to be in good health with 1.048 billion euro turnover in 2012 (+3,1% compared to 2011¹). But its future is uncertain.

Tomorrow

There are clear challenges ahead. The effects of climate change need to be addressed as well as the effect of our

food system on this climate change. Regional and European population growth needs to be taken into consideration. Environmental issues with energy consumption and waste management cannot be ignored and long-term sustainability is also a major concern. Consumer demands and ever-changing preferences need to be met. Many of these problems have been brushed aside in the past, especially when it appeared as if increases in the availability of food resources would outstrip consumption. Now however, the focus has brought the right to healthy, secure and sufficient food to the forefront of global issues as the theme for

the Universal Exposition in Milan in 2015. The message is clear: if it is to maintain or even improve its situation, the food and drink industry will have to respond to these challenges. And there has never been a better time to do so.

Questions

In developed countries, the population has become dependent on technology and industry for food and water. Few people are still able to grow and prepare their food. This has resulted in extra demands on the food and drink industry. It also highlights the need

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for increased productivity and consequently, a reduction in the amount of waste generated. Any response to these issues must put sustainability first. But does this mean making the most of natural resources? Or developing more innovative processes? Is it possible to do both at once? The simple truth is that this cannot happen without taking the financial situation of the food and drink industry into account. As 99 % of the companies in the industry in Europe² are SMEs, there is little likelihood of their being able to commit to new technology unless there are well-defined financial benefits to be gained. The global economy and logistic possibilities also demand a cross-border approach and solution that is adhered to by every company with an interest in a certain region. By involving the entire 2 Seas area, the TASTE 2 Seas project has a greater chance of having long-term effects in response to issues such as

over-fishing and farming, making the most of agrarian opportunities and improving the farming processes for specific products that are abundant in the area. But it is important to ask whether it is possible to create a solution that incorporates all social, ecological and economical needs? And if so, who is responsible for defining it? Because they will also be tasked with encouraging products and services to enter into new markets. All while taking consumers into account. It's no simple proposition. But it is exactly what the food and drink industry has on its plate.

Research and development

The answer to the questions and issues will require extensive research and development as well as more effective communication with consumers. And

this is exactly what various projects within the Interreg IVA 2 Seas Programme have committed themselves to. Due to the strong connections between the subjects and topics investigated, real added value can be generated by bringing the results together and sharing them across the stakeholders in the various projects. This is the role of the TASTE 2 Seas cluster.

Looking further afield

The results are of interest to others in the industry. Thanks to TASTE 2 Seas, knowledge centres, businesses and governments from across the 2 Seas area all have the opportunity, not just to benefit from the research, but to make a contribution as well. This helps to eliminate any gaps in knowledge while optimising the value of the projects involved.

What is TASTE 2 SEAS?



ir. AJM (Toine) Timmermans - Wageningen UR Food and Biobased Research

As a cluster within the Interreg IVA 2 Seas Programme, **TASTE 2 Seas** (Towards Sustainable and Tasty Food in Europe) capitalises on the results of four different projects focusing on food-related topics. The projects Fish and Chips, meCagrO2, 2 Seas Trade and Swap Now all have different goals, but share common themes: taste and sustainability. By encouraging them to collaborate and share information, and in response to the INTERREG IVA 2 Seas Thematic Cluster Initiative, TASTE 2 Seas will add extra value to the individual research results and improve the taste, sustainability and overall experience of food.

The major subjects addressed are:

Process innovation – The development of more sustainable production methods to ensure safety and security for food and nutrition, while also providing fresher, healthier and tastier products.

Support for local economies – Giving consumers access to local produce. This will help ecologically, by reducing the carbon footprint. At the same time, producing locally is important for the creation of a regional brand.

Reduction of food waste – A search for innovative ways to handle food waste and by-products. There are significant environmental benefits to be gained by approaching food waste in a more sensitive manner.

Consumer education and awareness – Raising awareness of food and food-related issues through alternative education models.



ZLTO initiatiefprijs
Saltwater crops

The four projects involved

The TASTE 2 Seas cluster brought together the insights and efforts of four food-and-drink-related projects. Find out everything you need to know about them below.

Fish and Chips

(www.projectfishandchips.eu)

The Fish and Chips project was formed by a network of partners from six food regions bordering the North Sea and the English Channel: Flanders House of Food (BE), RESOC Mid-West-Flanders (BE), Innovatiesteunpunt Boerenbond (BE), Rurant (BE), Plattelandscentrum Meetjesland (BE), Taste South East (UK), Somerset County Council (UK) and ZLTO (NL). The project encouraged the regions to work together in developing new and innovative products and services, or product-market-combinations (PMCs). There were three main activities involved in pursuing this goal:

1. Encouraging innovation in products and PMCs

The Fish and Chips partners developed several new PMCs in each of the regions to help develop a regional branding strategy centred around food. To draw greater attention to these innovations, a series of promotional visits was organised for travel agents and trade journalists.

2. Strengthening entrepreneurs and networks

With the large number of SMEs in the food industry and the Fish and Chips regions, networking and an under-

standing of best practices was vital. They encourage innovation, help cut costs and increase knowledge. Fish and Chips achieved these goals by organising a number of cross-border initiatives; a number of new networks were formed.

3. Opening up the markets

It's not easy for a product to break into a new market. Fish and Chips identified the keys for improved success. They ranged from distribution tips to the role social media can play in developing interest in food products.

meCagrO2

(www.meCagrO2.com)

The meCagrO2 project was a multinational research cluster consisting of four academic institutions: Icam (FR), the ISA Group (FR), KU Leuven (BE) and the University of Exeter (UK). The objective was to help producers of food-related products with issues in research, innovation and business competitiveness. This was achieved by investigating solutions to problems, with a focus on sustainable development and the health and safety of consumers. There were three main aspects investigated:



Tavola stand
2 Seas Trade

2 Seas Trade

(www.2seastrade.eu)

The 2 Seas Trade project (2ST) encouraged and supported SMEs in efforts to expand their markets into different 2 Seas regions. The 2ST partners (Kent County Council (UK), Kent Invicta Chamber of Commerce (UK), BSK-CiC (UK), Locate in Kent (UK), VOKA Chambers of Commerce East Flanders (BE), VOKA Chambers of Commerce West Flanders (BE), The West Flanders Development Agency (POM) (BE), SW Netherlands Chamber of Commerce (NL), and Canterbury City Council (UK)) developed this international/inter-regional trade with a range of activities and resources that make it easier for companies to take the first steps into new trading territory:

- **support, advice and information** to companies on the English, Flemish, Dutch and French markets;
- **workshops and seminars** on various aspects of international trade;
- **individual meetings** with an international trade advisor;
- **mini trade missions** to England, Belgium, the Netherlands and France;
- the use of the 2ST stand at European **trade fairs** to meet potential clients/ and business contacts;
- **B2B matchmaking events;**
- **stand space at a regional product fair** to test which flavours and products would meet the tastes of a new market;
- information presentations about **future market trends** and innovation in production methods.

SWAP Now

(www.swapnow.eu)

SWAP Now (Smart Ways in the Approach to Prevention using New communication strategies on Waste) is a project aimed at reducing household waste by developing an integrated approach. Belgian companies IOK Afvalbeheer and IMOG with their UK counterparts West Sussex and Adur Worthing collaborated in three major activities:

- 1. Developing new initiatives for a targeted policy on waste prevention** – The initiatives involved everything from face-to-face contact to making accessible information available, not just to educate, but to encourage permanent changes in lifestyle and behaviour.
- 2. Digitalising and professionalising communication relating to waste** – Various methods, including a text-messaging campaign, the placement of plasma screens at household waste recycling sites and interactive mobile workshops were used in order to reach and have the greatest possible impact on the various target groups recognised by the initiative.
- 3. Developing management instruments and an extensive volunteer network.** Focusing on everything from general cleanliness to assistance in the composting of household waste, waste-prevention volunteer schemes had already achieved success. Under the SWAP Now project, a more focused and organised approach was established, expanding into other areas which had not previously been investigated.

- 1. Development of innovative solutions for preserving the naturalness of food** – Focus points ranged from natural or healthier preservatives for meat, to research into essential oils as antimicrobial agents. Product quality and food safety were of importance at all times.
- 2. Improvement of food-production processes** – This involves limiting the environmental impact of production processes by implementing a Life Cycle Assessment method, optimising the food-production chain, minimising consumption of water, energy, reducing waste and exploiting the benefits of by-products.
- 3. Improvement of working conditions in the food industry** – The particular focus was the reduction of musculoskeletal disorders. A new methodology for analysis was created and introduced.

This publication



chapter 1



chapter 2



chapter 3

This publication provides readers with the outcomes of the TASTE 2 Seas cluster, tackling the diverse aspects of the food chain, from production, to distribution and consumption.

The three different chapters approach different aspects of the project: in the first chapter, the TASTE 2 Seas partners pursue solutions to the challenges of changing landscapes, sustainable production processes and healthier production.

The second chapter offer the reader insight into new and innovative distribution models for local products as well as industrialised food. These solutions vary in nature depending whether they are intended for implementation in Business to Business or Business to Consumer models, or a combination of both.

The third chapter begins by looking at consumer understanding of the ingredients in food. If we are what we eat, do we know what we are? And is it true cheese is from plants? There are a number of innovative approaches to educating consumers about food and how products are produced. With a section of the population moving towards locally-produced foods, major producers themselves need to examine their own practices and their suitability when it comes to customer expectations of transparency in manufacturing practices. The influence these expectations have is examined in a sensory research case study, demonstrating that social and cultural beliefs can influence the way we experience food.

Last but not least, the conclusions of this publication reflect on the main challenges we will face tomorrow and the best way in which to work together to ensure a sustainable, tasty and healthy future.



CHAPTER 1: Production



The sustainability of the food and drink industry is dependent on how well it is prepared for the future; as time goes by, new challenges will appear or existing issues will become more pronounced. Population growth and diminishing resources are inevitable; they combine with strong competition within the food and drink industry to serve as a driving impetus to develop in new directions. At the same time, there is a definite need to maximise the use of resources and optimise the production processes involved in creating products; it allows companies to reduce costs and/or increase returns on their investments. On this basis and as part of the meCagrO2 and Fish and Chips projects in particular, research has been performed into different aspects of the production processes. These range from developing new technology to streamline production processes, to making better use of natural resources and the opportunities they offer.

1.1 New agrarian opportunities

The farming environment is the starting point of most production processes. With changing circumstances, there is a great deal of benefit to altering production processes. If this is to happen successfully, it has the potential of bringing about better (financial) results. Especially when it aids in differentiating from the competition or producing a niche market.

Salty potatoes

An example of this can be seen in the increasing salinisation of the farmland in Zeeland (Netherlands). Due to the rising sea levels and sinking land, the salt content in certain areas has increased, resulting in ever poorer harvests over the years. With salinity levels expected to escalate even further in the future, these products were becoming increasingly uncompetitive and were not sustainable in the long-term.

As part of the Fish and Chips project, growers union Terra Scala experimented with how high-saline farmland could add potential rather

than eliminating it. One solution was the development of a new type of potato with a distinctively salty taste. Instead of fighting against the natural salinity of the area, the salty potato embraces it. It gives the potato its salty taste, a unique selling point, promising consumers a new and original experience that sets it apart from the competition. This increases the probability of a successful return on the initial investment and increases the potential for long-term sustainability.

Salty vegetables

Also under the Fish and Chips banner, another approach to the salinisation of the land was taken by Heerlijkheid bij Wolphaartsdijk. For many years, they have been growing sea vegetables such as samphire and sea lavender inside the dikes, rather than on the outside of the dikes where they usually grow. Despite a number of stops and starts, the project became a success. It demonstrates the potential benefits of taking a different approach to farming land, and serves in upholding the view being taken by TASTE 2 Seas that fresh,

healthy and tasty foods are vital to the long-term sustainability of the food and drink industry.

A recognisable brand

The company also had the idea of developing Zeeuws Zout (Zeelandic Salt), aimed at the hotel, restaurant and catering industries, as well as consumers, particularly tourists. The first tests have had positive results. Due to a lack of experience, the income is not optimal, but it offers perspective and serves in encouraging a long-term view to sustainability rather than short-term thinking. Also linked to the long-term approach, the development of these salty products assists in creating a local brand or identity. This is extremely important in gaining a foothold in a niche market and drawing attention to the products for being unique, original and at the same time, attractive to consumers.

Supply and demand

Market demand will inevitably decide the fate of the salty products. However, market demand does not necessarily



reflect the availability of a product. If resources are limited, it becomes increasingly difficult for demand to be met. As a result, competition increases and long-term sustainability is jeopardised. This may be because food sources are exhausted or because a company is no longer able to sustain itself with its share of the market. This exemplifies the importance of optimising production processes to make full use of source materials. The product itself will determine how production can be adapted and optimised to meet consumer demand.

Farming fish on land

The need to fight against over-fishing and ensure the long-term survival of the natural sole population has seen authorities place limitations on catch sizes for North Sea sole. While other TASTE 2 Seas initiatives discussed later in this publication (see 3.3: Mr Goodfish) encourage education and consumption of alternative species of fish as a means of responding to and accommodating low fish populations, in the case of sole the Fish and Chips project investigated the possibility of using the high-salinity land in Zeeland to create 'sea farms' for the mass cultivation of sole and other sea foods. It removed the pressure on the natural fish populations and allowed market demand to be met. Although it turned the usual process of fishing in open water on its head, the sea farm concept demonstrates the versatility of natural land resources and how they can be optimised to ensure long-term sustainability of both a market segment and a specific food source.

CONCLUSION



Over-fishing of North Sea sole will affect every region within the 2 Seas area. While farming fish on land may not solve the problem facing businesses previously involved in fishing sole, it does respond to market demand. Furthermore, it demonstrates the importance of thinking ahead and sends a clear message to the entire food and drink industry about embracing sustainable practices and the benefits of research.

While the high salinity influencing the arability of land are perhaps only likely to be experienced in the Zeelandic region of the 2 Seas area, the approaches taken to maximise the potential of the area are relevant to the entire food and drink industry. They show the importance of thinking outside the box; other agrarian areas may be suffering from completely different problems, but as demonstrated here, solutions may be found to ensure better use of resources and improved sustainability. In this case, the solutions also underline the potential in the production of new tastes, such as the salty potato; fresh, healthy produce, such as the sea vegetables; and the development of a local brand, as can be seen in the salty produce from the region.

1.2 Towards more sustainable production

Land is not the only resource that needs to be optimised to achieve long-term sustainability. In a market where the environmental impact of a product affects the way consumers perceive a product (see 3.2: It's not only taste that matters), it is vital that the potential of all materials and processes used to produce food products are exploited to the full. This also enables the companies active in the food and drink industry to maximise the returns on their investments. The use of heat and water, as well as the amount of waste produced, needs to be reduced to ensure long-term sustainability. While it appears the food and drink industry is open to this concept, financial aspects and potential for disaster dissuade many companies from investing in the possibilities. In Europe, 99 % of companies in the food and drink industry are SMEs, meaning financial investments made to research potential improvements or introduce new technology need to be recuperated as quickly as possible. Failure to do so brings the viability of a company into question. Furthermore, it reflects negatively on the proposed solution, dissuading other companies from pursuing the possibilities.



Cheap + accessible = popular

The reluctance to invest financially in various solutions can be seen by examining the techniques that are and are not adopted within the food and drink industry. Attempts are made to extract added-value from organic by-products from production. However, focus has typically settled on low-added-value techniques, where the organic by-products are used for energy production, or as compost, fertilisers or enhancements in animal feed. Well-known, easy to apply and control, they are effectively cost-free. Unfortunately, they do not realise the full potential offered by the by-products; bio-active compounds such as lipids, phytochemicals, anti-oxidants, pharmaceuticals, flavours, fragrances and pigments are effectively being treated as waste. Which means the industry is effectively throwing away money; these compounds are of high value in a variety of other sectors. The existing techniques for high-added-value uses typically require higher temperatures, long processing paths, and frequent use of organic solvents, none of which are going to help environmental concerns and all of which have costs attached. Researchers have reasoned that if cheaper, simpler techniques were developed, with benefits that clearly outweighed the demands, there would be greater inclination for companies in the food and drink industry to implement them as widely as they do the cheap, easy, low-added-value techniques. The biggest difference and possible motivation, is that here, as well as the benefits for the environment, there are considerable profits to be made.

The hidden value of kitchen and industrial waste

With this in mind, the meCagrO2 project focused on developing environmentally-friendly processes to deliver high-value compounds in quantities suitable for sale to and use by the food, cosmetic and pharmaceutical industries. In keeping with

the overall goals of improving long-term sustainability and minimising environmental impact, they aimed to create processes that had low energy consumption and limited the use and treatment of water.

It was clear that no method for extracting compounds would apply to all waste materials. However, by concentrating on by-products produced in large quantities in the food industry in the 2 Seas area, they increased the likelihood of their research receiving extensive recognition in the industry and of it reversing the reluctance to investigate high-value-added techniques. These same factors meant the research would also have greater impact on the sustainability of the food and drink industry. The decision was made to focus on potato peel, which has the potential to render phenolic compounds, and by-products from chicken-processing, which offer protein hydrolysates.

Potato peel, chicken and technology



Pressurized solvent extractor

In the potato peel project, meCagrO2 brought two universities together to find a solution: L'Institut catholique d'arts et métiers in France (ICAM) and Katholieke Universiteit Leuven in Belgium (KUL). ICAM developed a process using a low-energy, eco-friendly extraction method based on a water-ethanol mixture was developed as an alternative to the usual process using organic solvents. While the new method allowed the extraction of phenolic compounds, they were not concentrated or pure enough to be of any economic benefit. However, the extraction technique was then combined with eco-friendly membrane technology being

investigated at KUL to produce viable results. Membrane filtration was also used to separate hydrolysates from by-products of chicken processing; it was even able to separate the hydrolysates further into their main constituents, opening up additional financial opportunities. The results demonstrate the potential offered by research into high-value-added valorisation techniques, inevitably serving as encouragement for further research. They also demonstrate the potential offered by cross-border collaborations and the involvement of specialised partners, such as the universities, in the pursuit of better practices.

Spend less! Save money with rainwater

While the potato peel and chicken by-product projects focus on added-value processes to produce new sources of income, long-term sustainability also means the financial and environmental costs of production processes need to be reduced. On both a financial and environmental level, energy and water consumption have posed a challenge for quite some time. Regular mains water is typically used in production processes; there are effectively no health, sanitation or ecological reasons why rainwater would not serve as a suitable alternative. And why not use rainwater? On the one hand, it hardly seems practical to allow a natural resource to run down the drains while drawing on a potentially non-sustainable resource like mains water. On the other hand, the initial costs

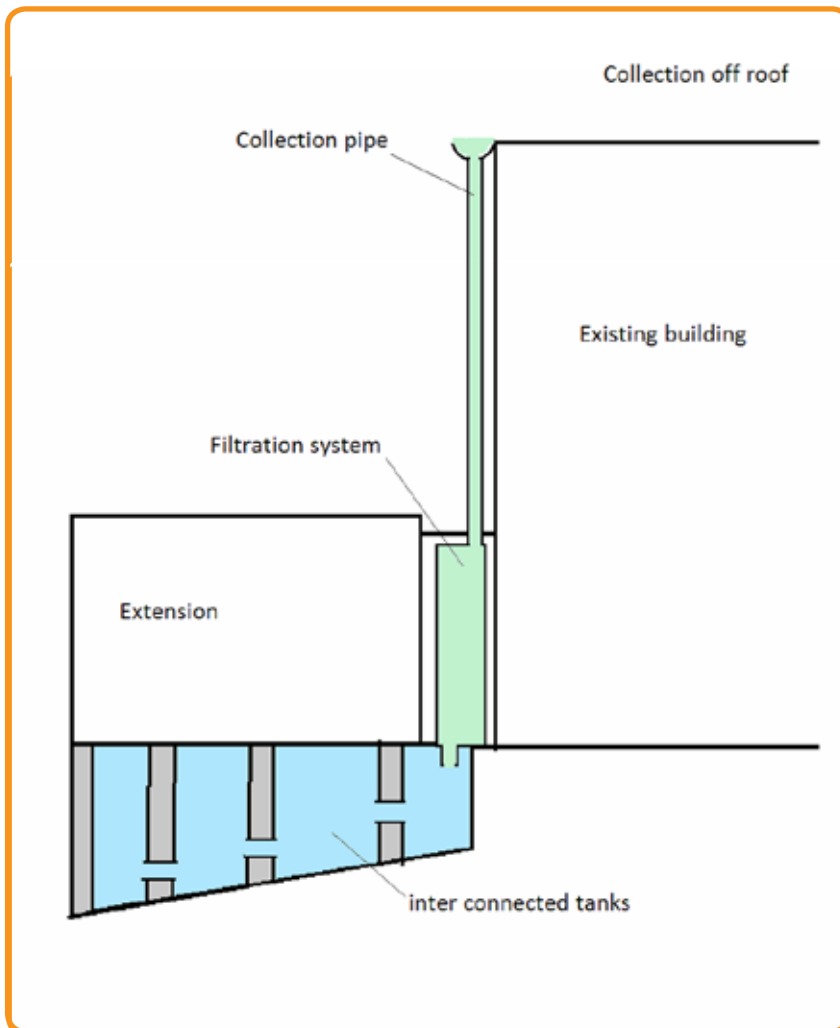


Reverse osmosis

involved in establishing rainwater collection, storage and delivery systems need to be recuperated, in effect, from the savings made on water bills.

As part of the meCagrO2 project, ICAM designed a new system for implementation at the site of a food manufacturer. Due to the physical

limitations of the site, only a small-scale rainwater collection system could be incorporated. Despite this, results demonstrate considerable reductions in the use of (mains) water consumption. On a financial front, the results have been inconclusive up to this point. However, they have been encouraging enough to open the door to further testing on a larger scale.



Rainwater project at University of Exeter

hot waste water to warm yet-to-be-heated water. The heat exchangers that pass these two streams of water by each other offer financial as well as environmental benefits by reducing energy consumption. There is one simple problem: they aren't especially efficient.

As part of the meCagrO2 project, researchers and designers worked to improve this level of efficiency. A novel heat exchanger based on the application of 3D-printing technology was designed and prototyped. It features a complex heat-transferring surface structure to increase the heat transfer rate and hence reduce heat loss. The new design allows the heat exchanger to be manufactured as a single unit, eliminating leakage between heat transfer layers and therefore nullifying the risk of food contamination. Despite these improvements and the benefits they offer the sustainability of the food and drink industry, researchers believe the heat exchanger they have created is still not optimal. There are other factors, such as the regularity of water flow and the type of material used to construct the heat exchangers. They believe adjustments may result in even better efficiency and work further to increase sustainability.

When success is hot and cold

While this demonstrates the benefits of investment in more complex areas of research, it also discourages businesses from adopting the technology for fear it may soon be superseded. It is vital that legislators are made aware of the advancements and respond to the need for more sustainable practices by creating legislation that sets

Efficiency

Another way in which the food and drink industry can adapt production methods to increase sustainability is to maximise the use of non-organic by-products. Heating, for example, is a major part of production, with the financial and environmental costs associated with the heating of water exasperated by the way in which water is used in production processes. Food safety requirements stipulate that when hot water is contaminated by foodstuffs or chemicals, it needs to be disposed of. If processes could be adapted to minimise this contamination, it would greatly assist in decreasing the use of

water and increasing sustainability. Unfortunately, the solution would differ from one production line to the next and depend on the role the hot water plays in the production process; whether it is used for cooking, cleaning, heating, etc. While this advocates the rainwater collection concept for certain processes, use of rainwater does not solve the problem of lost heat.

Heat recovery technology

Existing technology intended to respond to the lost heat issue is widely used throughout the food and drink industry, using the residual heat of

minimum standards of sustainability for processes; this may ensure that rather than waiting for an optimal heat exchanger, businesses will need to ensure they update every so often to meet legislative demands. Of course, legislators will obviously need to consider financial viability in making their decisions, but with developments in simulation software, it appears they may have assistance in this area.

A crystal ball for sustainability: simulation software

The reluctance of individual companies to invest in sustainable practices or new technology typically stems from a desire to be certain technology will prove its benefits and offer financial returns on the initial investment. The problem is that once this has been proven, any and every company can take advantage of the technology. Although it will actually increase sustainability, it will do nothing to give any company an advantage over the competition. As detailed earlier, investments can also prove to be counter-productive if technology continues to advance after an investment is made.

But what if a company could be sure of a return on investment without first having to speculate? Under the meCagrO2 project, simulation software has been developed that uses data from production lines to create a model with realistic results. Adjustments to the data make it possible to test various scenarios. Imagine knowing the effects of a planned production-line modification in advance; it would virtually eliminate all risk. With a few more tweaks of the program, it would be possible to

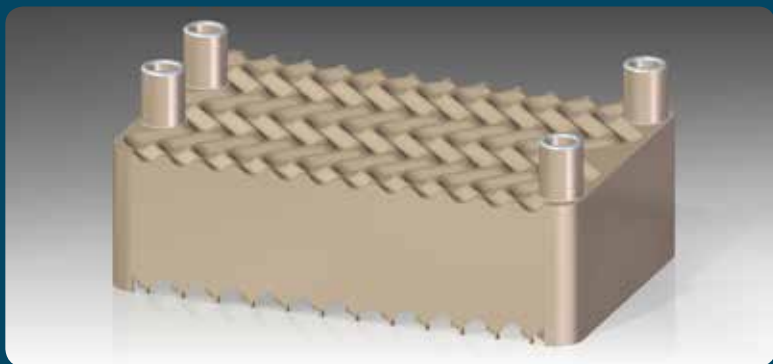
test a number of different scenarios to ascertain how production could be adjusted for optimal results. This software offers considerable benefits to the food and drink industry not just because it reduces risk, but because it encourages companies to invest in the new research possibilities that are key to long-term sustainability and preparing for the future.

Life cycle assessment

While the simulation software is able to demonstrate solutions for financial optimisation, it is also important that the food and drink industry takes environmental factors into consideration. As Life Cycle Assessment (LCA) has become a popular means of examining the

overall ecological impact of a product, researchers have questioned whether it could be used to ascertain the impact of a process (see also 3.2 Clean Processes). It is unlikely a company will replace an installation that is still performing well for an alternative which will provide the same results, even if the process is more environmentally-friendly manner. But when they are deciding on possible new installations or upgrades, LCA will allow companies to incorporate the ecological benefits of different production processes into their decisions. Furthermore, it may help in highlighting other areas in the production process that will benefit from research in the future and aid in developing healthier production methods on the whole.

CONCLUSION



Heat exchanger

The various projects demonstrate the benefits of and encourage the food and drink industry to pursue changes in their production processes. And this is done by responding to the specific needs of the companies within the industry; the projects all investigate low-cost possibilities or demonstrate how companies can recoup initial financial outlay, a major factor which has worked against evolution or development of new processes in the past. While the importance of dialogues that extend outside the industry to knowledge centres has also been demonstrated, the major focus is on improving sustainability. and as such, preparing for the future.

1.3 Towards healthier production

It is commonly accepted that certain foods, such as fruit and vegetables, are nutritious and healthy. But is there adequate awareness of the influence production methods have on produce of this sort? Research has been conducted into the potentially negative effects of certain production processes and, in particular, the various chemicals used. The findings have inevitably encouraged legislative bodies to ban or limit the use and concentrations of certain chemicals to ensure healthier food-production techniques and to prevent any negative effects on human health.

Unfinished, unclear, uncertain

Unfortunately, fresh produce is subject to contamination by insects and bacteria, fungi and viruses. Although methods vary depending on the type of plant and the insect or pathogen, the most common and effective treatments are chemical-based. The potential negative health effects have rightfully brought them to the attention of legislators. This is the case with sodium hypochlorite, a chemical used in certain treatments. While legislators approved specific concentrations for the chemical treatment of pathogens in fruits and vegetables for the period from 2006 to 2014, there has not yet been any indication for the future. While this indicates the need for clear communication between the legislative bodies and the food and drink industry, it also stresses the importance of researching alternatives to the use of chemicals in a timely manner.

Alternative treatments

A few of the alternatives and preventive methods that have been developed, such as seed certification, irrigation and fertilisation management, are known to

minimise the health concerns raised by chemical treatments. However, they have not been successfully adopted by the industry. The overall effectiveness of these methods is reduced by an inability to address contamination that occurs at the time of harvest or during storage. Damage or wounds allow pathogens to enter, infect and ruin produce. And if they are consumed? They adversely affect health. While the results are clearly not what may have been desired, it is important that they are still made known to industry stakeholders, as has been made possible by the collaborations within the TASTE 2 Seas project.

Essential oils

Also to report are the more promising fields of study. One of these is the use of essential oils. As plant extracts, essential oils have natural antimicrobial and antifungal properties, without the health concerns of chemical treatments. Examining the effects of different essential oils on a particular pathogen, researchers developed a mixture which has proven to be highly effective in initial laboratory tests. At present, the results are not definitive, but they have substantiated further testing. The method needs to prove its stability outside the experimental environment. But even if it does prove successful, it does not mean a viable alternative to chemical treatments has been found. The essential-oil method needs to be proven financially viable. Only then is it likely to be widely adopted by companies within the industry.



Meat preservatives



Colour measurement of dry fermented sausages

Fruit and vegetables are not the only foods that need to undergo processes to ensure adequate preservation. Recipes for meat products have included sodium nitrite for quite some time; however this additive has been linked to the development of carcinogenic N-nitrosamines. As part of the meCagrO2 project, the effects of omitting sodium nitrite were investigated.

When sodium nitrite is not used to preserve meat products, there are changes in the colour; the chemical gives meat its specific redness. While it may be healthier to omit the chemical, there are fears it may be difficult to convince consumers to accept meat that may not fit in with their preconceived perception of what fresh, healthy meat products should look like. Zinc protoporphyrin IX, a naturally occurring pigment, has been extensively tested, with results demonstrating its potential as an alternative colouring agent. While this is not likely to affect sustainability, it does have the potential to influence competition and to offer consumers attractive meat products that are much healthier.

Up in smoke

Of course, for thousands of years before sodium nitrite use became widespread, meat and fish underwent smoking to ensure they were still fit for consumption at a later date. In recent times, production processes have evolved in such a way that the preservation function is secondary. Nowadays, the unique sensory properties of smoke have become more important; commercialised smoked food products range from potato chips and sauces to meat and fishes. As was the case with the sodium nitrite, some chemical constituents present



Innovative smoking technology: mackerel case

in smoke have been identified as potential carcinogens. As a result, regulations require that levels of polycyclic aromatic hydrocarbons (PAH) are kept below predetermined concentrations.

Liquid smoke condensates

With a strong market for smoked products, and increasingly stringent health, environmental and processing criteria coming into play, alternative production techniques are being demanded. As part of the meCagrO2 project, food technologists, chemical analysts, sensory experts and the food and drink industry worked together to research the potential of applying liquid smoke condensates. The researchers mainly focused on the application of atomisation to regenerate smoke condensates into real smoke with the desired aroma properties, but without introducing the health-damaging PAH carcinogens present when traditional smoking techniques are used. However, the various condensates examined have demonstrated different characteristics and functionalities. Using aroma and sensory analyses, it is possible to examine which condensate is most appropriate for a particular product or a particular taste, to use this knowledge to create unique and tasty food products.

New tastes and new opportunities

While this research was initially aimed at ensuring the sustainability of smoked products by developing healthier production techniques, it inevitably identified potential new tastes and therefore future opportunities within the industry. While it underlines the importance of open-mindedness and experimentation, the development of new smoke flavours and products is not an isolated incident. As the case study below illustrates, experimentation has the potential to open unexpected new opportunities.



CASE STUDY: Fudge Kitchen

Adapting for International Markets: A recipe for Success

In 2012, the Kent-based company Fudge Kitchen was offered a space on the 2 Seas Trade stand at Tavola 2012, along with eight other food and drink companies. Tavola is a major international food and drink fair with a real emphasis on quality and artisan products. The timing of the fair was perfect as Fudge Kitchen had launched a new range of products in 2011, with export markets in mind. The event was a great success for the company. Entering new export markets was a challenging process but Fudge Kitchen proved that with a lot of hard work and determination and, most importantly a great range of products, a UK manufacturer of high-end confectionary products could have a big impact internationally.

Product adaptation:

Overseas success for Fudge Kitchen required a lot of development work. An initial problem faced by the company was that a key ingredient in fudge, whipping cream, has a very short shelf-life and generally needs to be consumed within a week. This would make it impossible to supply the company's main products wholesale or to ship goods overseas.

Extending the lifetime of the product would therefore be a crucial step in reaching new markets as the original recipe simply was not suitable. After one year, the company had a product with a three-week shelf-life but this was still not enough for export markets. Further experimentation with alternative ingredients was necessary and after another year, the company had produced a range of fudge products using butter rather than whipping cream, leading to a substantially extended shelf life that would be perfect for selling internationally. This was not as easy as it sounds, as the company needed to adapt the recipes at the same time as maintaining the quality of the products which were positioned against high-end chocolates in the market place.

The product adaptation process also led to the accidental invention of two new products along the way: drinking fudge and fudge sauce which are now also part of the company's overseas offer.

Presentation was another key factor so new packaging was developed alongside the new product range which successfully presents the products as premium quality confectionary products.

Secondly, 'fudge' was generally not known in many mainland European countries; there was no word for fudge in Flemish or Dutch. Rather than seeing this as a barrier, Fudge Kitchen started to promote the product as 'premium British confectionary' which immediately opened up a range of new opportunities.

CONCLUSION

Practices such as smoking and the use of certain chemicals are not sustainable. The industry should not look at them as exceptional circumstances that call for innovation; the industry should be developing new options and investigating new opportunities at all times, not just the eleventh hour. Of course, this is hampered by the financial investment required.

A lax approach has inevitably encouraged by the failure of legislators and the food and drink industry to adequately follow-up on legislative decisions. One such case saw legislation on the use of a specific chemical for a set period, with no further indication of what would happen following this period. The food and drink industry is already reluctant to commit to investigating sustainable practices (as discussed in 1.2 Towards sustainable practices).

As demonstrated by 2 Seas Trade with the Fudge Kitchen case study, investment in new processes and production methods offers potential, not just by bringing a product to new markets, but also in improving understanding of the potential of an existing product and the ways in which it can be further developed to create new tastes and products.

1.4 Chapter Conclusion

The food and drink industry needs to prepare for the future by improving the sustainability of the practices involved in bringing products to market. A number of different possibilities have been highlighted:

- optimising the potential offered by land, by overcoming or even embracing apparent issues that make it difficult to maintain traditional farming techniques;
- the need to invest in new processes and technology, but also to ensure these processes are financially viable for the companies expected to invest in them;
- thinking ahead and adapting to market expectations to produce new products or new techniques to ensure the availability of products that have a high level of market demand.

At the same time, the importance of communication outside the food and drink industry has also been highlighted:

- direct involvement with knowledge centres has allowed a more focused approach to sustainable practices that better respond to the needs of the industry;
- communication with legislators needs to be improved to ensure there is no uncertainty about the future of certain practices, allowing better preparation for the future, and to investigate the possibilities of setting minimum standards as a means of encouraging improvement in the industry in the face of ever-improving technology.



CHAPTER 2: Distribution



Business competition and long-term sustainability are no longer based on the performance of single companies, but on the efficiency and functioning of the entire supply chain. This is especially so in the food and drink industry. The perishable quality of fresh produce, the high levels of competition and limited financial resources make it vital that every element of the supply network is optimised. Production methods and practices play a major role in ensuring fresh produce reaches the market while at its peak, providing the best consumer experience. If they do not deliver the ultimate in freshness and taste, producers will fail to meet basic expectations and inevitably disappoint consumers. The high level of competition in the industry leaves no room for let-downs of this sort, meaning the food and drink industry needs to examine how potential improvements can be made.

2.1 Producers: How to get local food to market in time, in good condition and at a good price

Producers need to be sure they are able to meet market expectations. Every step, from promptly harvesting and cleaning produce to ensuring it is appropriately packaged and delivered, needs to be accomplished in the short term. Only under these circumstances can produce be displayed while in its prime. Factors such as cost and carbon emissions need to be taken into account in establishing a supply chain that promotes long-term sustainability.

New markets

Producers and traders need to be aware of what market expectations are when they attempt to enter new, international markets. The 2 Seas Trade project encouraged businesses to investigate opportunities offered outside their home markets with a number of cross-border events. This enabled businesses to examine the cultures and dietary trends in different countries in the 2 Seas area, as well as to gauge the viability of their products in these markets in light of market expectations. They drew up a list of specific factors that needed to be taken into consideration:

- ensuring they can handle increased production capacity for export orders;
- making sure additional costs such as transportation and exchange rate fluctuations are taken into account to protect profits;
- checking product labelling meets the requirements of the target market;

- meeting customer expectations for the branding and presentation of products;
- allowing potential buyers or consumers to taste and test the products to check which flavours or products work best in the target market;
- developing specific flavours or versions of products better suited for a specific international market.

The weakest link

Even if the producer is able to fulfil these conditions, it is vital they have support from a strong supply chain. After all, a chain is only as strong as its weakest link. Producers need to be confident they have optimised their supply chains, but unfortunately, there are numerous factors involved, making them extremely complex, especially when they involve international or cross-border logistics. Although certain changes may appear to offer benefits for long-term sustainability, it is extremely difficult for producers to take every possible factor into account. This results in constant



doubt and a reluctance to change processes that seem to be working, despite the greater benefits offered by the long-term sustainability promised by alternatives. As an SME in the food and drink industry, would you feel comfortable investing in a new market if you weren't sure it would be viable but did know it could ruin you financially?

New methods

New methods have been developed by the meCagrO2 project to overcome these doubts. The first of these allows food companies to identify the best supply chain configuration for them. It takes strategic needs into account based on food sustainability for the future. There is also a method designed to find the optimal operational solution within a specific supply chain already in existence, based on improving the sustainability of the whole chain to the highest standards possible. While these methods require a great deal of relevant data, for the most part, this is the same data as companies need to take into consideration when they themselves attempt to determine the validity of alternatives in their supply chains. As more data becomes

available, the method encourages companies to make changes where appropriate, ensuring long-term sustainability and encouraging improvement and evolution of supply-chain practices.

Stock and lock

At the same time, new systems need to be investigated to simplify the supply chain. Already in use in some parts of the world, the 'lock-box' scheme involves a series of metal lockers of various sizes. Powered by standard domestic electricity supplies, these lock boxes are even available with temperature control. Once a delivery is made, retailers or the companies that will process the delivered materials are notified by text message; they do not need to be on hand to receive the delivery. They are also provided with a numeric code to unlock the box. The benefit of this system is it removes some of the challenges generally related to logistics; deliveries can be made at any time of day or night, potentially reducing time spent in traffic for deliveries made outside peak hours, while farmers, fishers and growers who are actually sending the deliveries are also able to operate at a more relaxed pace rather than being forced to rush to meet stricter deadlines. Once again, the major problem identified with the initiative is cost: priced at €15,000, the lock boxes need to prove effective with minimal maintenance costs to be financially viable.

CONCLUSION



Waitrose Click and Collect lockers

Meeting consumer expectations is a priority; any venture into a new market is doomed to failure if it does not offer consumers something they are happy to invest in. The Trade 2 Seas project identified the factors businesses need to take into account when attempting to enter a new international market. Introducing a food product to a new market:

- assists in increasing the long-term sustainability of the food and drink industry and encourages competition;
- this, in turn, also assists in encouraging development of new tastes.

meCagrO2 developed a method to encourage producers to optimise their supply chains, allowing them to:

- improve their own processes, reduce waste and operate more efficiently;
- examine the possibilities of entering new markets;
- better meet customer expectations.

A party to this is the 'lock-box' delivery innovation. For retailers and production facilities, it promises a simpler and more effective supply chain where there are softer deadlines and more freedom for suppliers and the retailers themselves.

2.2 Distribution: opportunities and best practices

Although it is important to encourage their businesses to grow to ensure long-term sustainability, many producers are reluctant to invest in opportunities for further expansion. In particular, producers of agricultural and horticultural products are choosing to use short supply chains; they sell in individual farm shops that are often relatively isolated. There are considerable advantages to this approach; food is fresher, tastes better and is potentially cheaper for consumers, while the environmental impact is reduced. It does however, limit the financial opportunities for producers; they are reliant on small markets that offer no guarantees for long-term sustainability. At the same time, these producers are generally not against the idea of supplementing their income by expanding into larger regional or local markets. In addition to offering financial benefits and the potential for developing a local brand, this expansion offers better long-term sustainability. Nonetheless, the complexities involved in developing an extended supply chain suitable for serving a larger customer base often minimise or even negate the benefits.

Distribution is complex

While reaching a larger customer base may give rise to more sales, producers also have to factor in the time and financial costs; there is considerable administration work involved, arranging the initial pricing, finding customers, accepting and processing orders, as well as managing the logistics, including the return of any reusable packaging, and of course, payment. The 2 Seas Trade project identified other issues present when serving a foreign market, such as increased production capacity, additional costs and product labelling. Whether domestic or international, transportation used to ship goods is bad for the environment and, with specific trips to individual customers, it produces a great deal of waste. As the majority of the businesses in the food and drink industry are SMEs, the demands of the distribution process are simply too great.

Simplified

In response to this situation, the Fish and Chips project has identified, developed and/or trialled a number of initiatives such as Pick, Drive & Deliver, Farmdrop and bpost by Appointment. From the producer perspective, the distribution process is simplified enormously in the three programmes. All three follow a fairly similar method where producers have a deadline to enter prices, products and available volumes on an online distribution platform. The same system even allows them to draw attention to new products.

Consumers are given a period of time to place their orders. These are then sent to producers, who are given approximately 24 hours to pack and prepare. Orders are packed per customer, ready for transport and delivery. The order is then picked up, delivered, and a few days later, an invoice is sent out. As



Regional products
"100% West-Vlaams"

standard boxes are used for packing, there is no need for the immediate return of specific packaging. The producer simply needs to make sure there are sufficient boxes to supply the next round of deliveries. Of course, any orders the producer places will also be delivered in these standard boxes, helping to ensure boxes are available without the need for them to be specially delivered. While it potentially places greater demands on processing capacity, producers have the option of setting limits in the system to ensure they can meet demand. The methods reduce administrative work and costs and enable producers to reach larger networks, all important for sustainability in the long term. The simplified system appears to meet all necessary demands, as long as supply chains are kept short. It could also be used in collaboration with the 'locked box' method (see 2.1 'Stock and lock').

CONCLUSION

The simplicity of the method, from the perspective of the producer, belies the complex nature of the distribution network. Logistical processes for multiple producers within a specific area are bundled together. Furthermore, every run incorporates pickup and delivery, reducing the amount of travel required and therefore, the environmental impact, while significantly improving sustainability, lowering risk and food wastage to virtually nothing, also vital for long-term sustainability (see 3.4 Taste don't waste). The complexity of the method is not pressed upon individual producers; by offering them a simplified version, with lower costs as a result of the grouped pick-up and delivery methods, producers are encouraged to expand their customer base without having to invest significant amounts of time or money. This increases their financial benefits and the long-term sustainability of their businesses, as well as the food and drink industry as a whole. At the same time, this solution helps to promote local produce and therefore, develop a local brand.

2.3 Consumer: How far does your food travel?

Locally-produced food offers considerable advantages. It is fresher, tastes better, and is of higher quality when it hits the plate. Local food is good for health, the local economy and the environment. When it is purchased, it supports farmers and producers in the region, improving sustainability and supporting other regional businesses. Furthermore, when food is locally produced, it does not need to travel as far, reducing pollution related to transport. It is therefore extremely important that consumers are encouraged to seek out local products. And yet, despite this, consumers are often relatively unaware of where their food originates.

Developing a local brand

It is important that consumers are encouraged to recognise and actively look for a local brand. While this may traditionally have relied heavily on advertising, in the age of social media and digital technology, new methods are open to consumers. For example, in the UK, the county of Kent has developed the 'Kent Food App' to inform users about local food and drink suppliers and growers, as well as the range of products directly associated with the region. The app directs users to outlets where local produce can be purchased. Furthermore, the app relies on users to link to it and recommend it, increasing awareness and distribution. It is a cheaper means of attracting attention than more traditional advertising techniques, plus it encourages users to feel personally invested in and proud of the local brand.

Transparency

As well as a local brand, it is possible to encourage consumers to consider the origins of their food by promoting awareness of the production processes involved. Admittedly, some consumers will sacrifice an understanding of their food for the convenience of online grocery shopping. But this is not for everyone.

While it is not part of any Interreg programme, Talents de Ferme is an excellent example of the consumer desire for better information about their food. Open in a number of locations around France, Talents de Ferme are basically shopping centres where producers of fruit, vegetables, meat, dairy products, etc. have come together to provide consumers with fresh, locally produced food in complete transparency. They work on the basis that there is no one better to give advice on products than the people who actually produce them. As such, the producers are always present to answer questions and give their opinions or helpful hints. This not only develops transparency, but enables suppliers to establish a relationship with clients, overcoming the problems typically associated with small supply chains; by combining producers of all major food products, Talents de Ferme is still able to meet consumer expectations and develop a brand for consumers

CONCLUSION

While there appears to be a desire for better information and transparency when it comes to food, the means by which this is made available also needs to be taken into consideration. What works in one region may not work in another. At the same time, local producers need to look at this trend as an opportunity to establish a local brand and develop client loyalty.

to rally behind. This safeguards long-term sustainability, ensures quality products that are tastier and, of course, it develops local identity.

While Talents de Ferme has proven to be successful in France, it is important to question whether it would meet the same success in other markets. In the UK, the Kent app has proven successful, but would a face-to-face version be equally well received? And what about the Netherlands, Belgium and different regions in France? Are there differences in shopping habits? Are variations in diets and/or cultures great enough to make the initiative less viable? While looking for answers to these questions, it is also important to consider how the base concept could be adapted to meet these markets or overcome any differences. The elements of the concept that do actually translate to a different market need to be identified.

The story behind the product

An alternative method of developing transparency and encouraging consumers to opt for local produce has been investigated by Agrimarkt, a Fish and Chips initiative. Like Kent, they have created an app focused on providing transparency. It features a built-in scanner allowing consumers to scan product bar codes of products compatible with the app. These products are identified by in-store signage. Information is then shown about which farm or producer a product comes from, the methods used

to produce the product and how the producer can be contacted. Providing consumers with this information in an easily digested form gives them insight into the product and the region from which it comes. It also ensures a connection between consumers and producers while making it easier to compare products to find the better choice and encouraging producers to commit to long-term sustainability in order to remain competitive.

2.4 Chapter Conclusion

Meeting consumer expectations has encouraged producers to optimise their supply chains. This has resulted in:

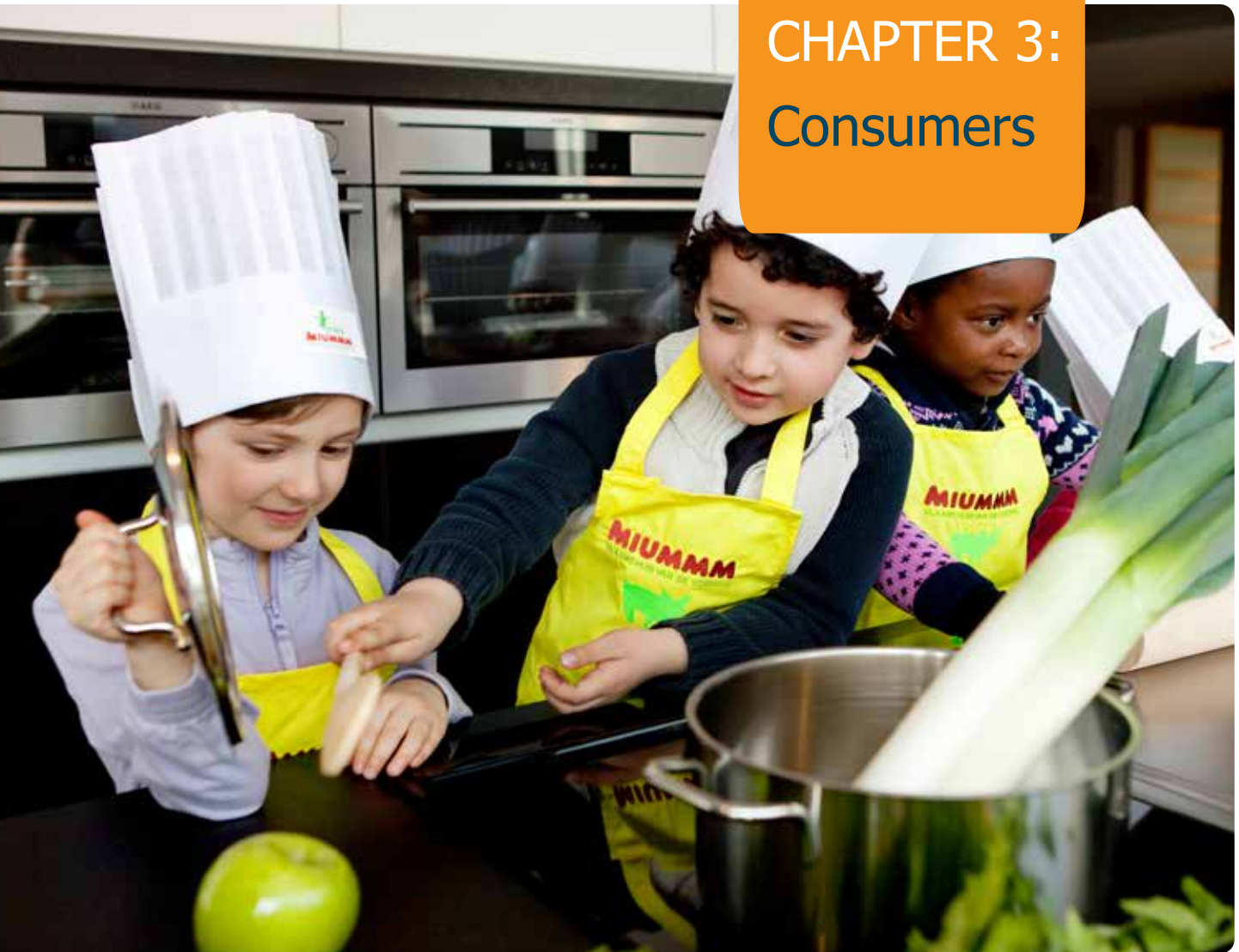
- a clear set of requirements a producer needs to fulfil to successfully enter a new market;
- a method for examining how a supply chain can be improved;
- 'lock box' delivery points, which allow deliveries to be made at any time of day or night, simplifying the supply chain.

It is also clear that consumers desire greater transparency when it comes to their food. A number of responses to this desire also serve in developing a local brand:

- The Kent food app, which specifies food from Kent;
- Talents de Ferme, a shopping centre where producers sell their fresh produce themselves, remaining on-hand to answer customer questions and provide advice;
- initiatives such as Pick, Drive and Deliver, bpost by Appointment and Farmdrop, all of which provide delivery of produce direct to the customer based on orders received through a computer interface.

An initiative which works in one market, culture or country will not necessarily work in another, or may only work with modifications to make them suitable for the market and consumer expectations. While this may appear to be a negative aspect, it actually encourages optimisation of a method prior to its implementation.

CHAPTER 3: Consumers



The role consumers play in the sustainability of the food and drink industry needs to be examined. The current lack of understanding surrounding the lifecycle of food must be improved in order to see consumers make more educated choices with regard to the foods they purchase. Local foods that are in season taste better and do not need to be transported as far, but consumers are often unsure of the origins of their foods. Knowing which seasons are best for fishing certain fish would promote wiser choices and reduce pressure on species that are already over-exploited. Furthermore, better planning and purchasing practices would lead to reductions in wasted food and consequently, the energy, water, packaging and emissions used in or resulting from its production. Finally, by overcoming a lack of understanding about composting, egg shells and banana peels could be put to good use rather than rotting away in landfill.

3.1 You are what you eat

The size and complexity of the supply system, together with a complex regulatory framework, have often prevented consumers from developing a clear understanding of what is involved in the production processes required to bring food and drink products to market. There has been little indication of what certain processes involve; various chemical additives or ingredients may be labelled with codes or numbers without any further explanation, and in some cases, fraudulent substitutions have been made in order to reduce costs and increase profits. This has resulted in a breakdown in the trust consumers have towards the food and drink industry. At the same time, projects such as Talents de Ferme, Farmdrop and Agrimarkt have provided consumers with an alternative: local and regional foods.

Highlighting transparency

Major food retailers are attempting to restore the trust by promising major changes. However, it's the consumers who appear to be defining the agenda in this instance. They have demonstrated a desire for more transparency and better traceability, rejecting longer supply chains in favour of local and regional food supplies. The benefits of regional foods are not lost on consumers; they often provide proven provenance, they taste better, and tend to be healthier. Most of all, for consumers, they represent a more trustworthy and reliable food source. This adds to the sustainability of the local food and drink industry and the establishment of a local or regional brand; food from a specific area is able to be marketed based on its freshness and reliability.



Miummm - Flanders House of Food Taste Academy

Better practices

The ability of the local industry to meet the demands of a larger market has been questioned. It is important that major retailers and local producers avoid past errors when pursuing larger markets. Foods produced using questionable practices are able to tarnish a region; beef from the UK was banned for sale to markets in the European Union for more than ten years after herbivorous cattle were fed the remains of other cattle to enhance growth. It was only with the breakout of human disease – and death – that these production practices were highlighted. More recently, the UK retailers have suffered after the discovery of horse meat in beef products. Both these scandals are demonstrative of the practices consumers have come to be wary of and which producers and retailers need to avoid if they wish to re-establish trusting relationships with consumers.

A lesson learnt

Thus far, it does appear as if the lesson has been learnt. The move towards regional food has been restricted by insufficiencies in the supply chain. However, certain questionable practices adopted in the past have been rejected in favour of new innovations. The difficulties local producers and growers have experienced in meeting the sudden increase in demand have resulted in innovative distribution models, such as Farmdrop and the 'lock-box' scheme (see 2.1: How to get local food to market in time). These methods also aid in reducing wasted food and ensuring food is available to consumers while it is at its freshest.

CONCLUSION

Failure to meet the customer desire for transparency, combined with the complexity and lack of clarity in the way in which the food and drink industry presents the processes food undergoes, has resulted in consumers displaying a preference for fresher, local produce, which is tastier and inevitably supports the local economy, but may have a negative effect by discouraging innovation and market expansion.

The vague processes and fraudulent practices undertaken in certain markets has led to a fracture in the relationship between consumers and major retailers; consumers no longer trust them, further encouraging the trend to shop for local produce with a shorter and more transparent supply chain. It is up to major retailers to learn their lesson and win back the trust of their customers. At present, there is a move towards locally produced foods. In other words, the major retailers are making efforts to give consumers what they want.

3.2 It's not only taste that matters

There are a variety of factors involved in determining consumer behaviour when it comes to food and drink. Producers respond to consumer demand for healthy and nutritious foods; packaging and advertising laud the benefits of their products and their ingredients in attempts to see consumers commit to them. At the same time, foods are developed to respond to consumer taste preferences, discounts and price reductions are constantly on display, and various brands strive to be associated with a standard of quality, a certain taste or of course, a particular image. At present, with the high level of public concern regarding environmental factors, and increased awareness that the food and drink industry has an impact on the environment, producers need to re-examine the images they are presenting.

Clean processes

A number of food producers have committed to new, more environmentally-friendly processes known as 'clean processes'. In general, they reduce energy use, CO2 emissions, water consumption and waste. In doing so, they also drop production costs. As such, it is difficult to determine the reasons behind these decisions. A producer may implement a clean process for one part of production, but then use a process that is cheap, but extremely bad for the environment, for another step. As long as this is the case, environmental concerns will not be receiving the attention they require.



Production line

Power to the people

However, a recent study conducted as part of the TASTE 2 Seas project has produced results demonstrating the importance of environmental friendliness on consumer choices. In the experiment, consumers were given a number of slices of bread. Unknown to them, the bread was the same in every instance, but labelled differently using an easily-recognisable scale demonstrating the environmental sustainability of the production methods. Labels suggesting practices with high sustainability were preferred to the bread labelled as being produced with low-sustainability practices. This preference has raised the question of whether food packaging should recognise the use of clean processing practices as an industry standard.



Nautic Show Paris

Competition

The consumer-perceived importance of clean processes stands to be tied in with the high level of competition in the food and drink industry. In order to maintain an edge, food companies will need to keep up with preferences for clean processes and sustainable production methods. With other projects such as the Agrimarkt app and Talents de Ferme (see 2.3 Consumer: How far does your food travel?), informing consumers about the environmental impact and production methods of foods, it is important that producers focus on improving sustainability in order to maintain the image of their brands and to meet consumer expectations. Introducing descriptions of the environmental impact of a product on its packaging will not only meet this need, but also help to re-establish a trusting relationship between consumers and producers.



Agrimarkt app

CONCLUSION

Research into consumer desires has indicated that consumer choices and enjoyment of a product are influenced by the ecological processes used to produce it. This is not just of major importance in terms of consumer attitudes towards the environment. This gives producers the opportunity to set their products apart by implementing 'clean processes' and due to the competitive nature of the food and drink industry, it inevitably encourages further innovation to make existing processes ever more environmentally friendly.

3.3 Cheese is from plants

Do we know where our food comes from?

Education is due to play a major role in safeguarding sustainability in the food and drink sector. By giving consumers an understanding of the origins of food products, it is possible to encourage them to make choices that promote long-term sustainability. A number of projects have been established to develop this education. They are not only aimed at children and teenagers, but also at adults who are already active in the food sector.

Fishing for the future

The European initiative Mr. Goodfish was launched in 2010 by World Ocean Network to bridge information gaps threatening sustainability in the fishing sector. Rather than compulsively warning about the effects of over-fishing, it takes a positive approach, promoting alternatives using lists of which fish species are in season, the minimum size suitable for catching and what defines healthy stock (see also 1.1: New agrarian opportunities). The focus on minimum size catches and in-season species cannot be limited to just one company, region or country. It is vital that initiatives such as the TASTE 2 Seas project, and even cross-border legislation, is implemented and enforced to ensure a uniform approach to sustainable fishing. For this reason, the Mr. Goodfish website (www.mrgoodfish.com) is available in a multitude of languages.

The initiative is aimed at every active member in the supply chain, from fishermen and fishmongers to restaurants, school canteens and consumer groups, ensuring uniform awareness, acceptance and preference for sustainable practices and fish. The positive approach is taken furthered in



Miummm - Flanders House of Food



Fishmonger in Boulogne

the way information is presented: instead of classrooms, it uses school canteens and cooking lessons. This encourages students to perceive the information not as lessons, but as part of daily life. By doing so, it raises awareness of the issues and actively encourages responsible behaviour and lifestyle changes. The simple, easy-to-understand information is designed to be spread to a larger audience by means of personal and professional networks, resulting in a greater impact at minimal cost and with minimal resources. Educational materials and activities developed by marine educators are available not just for teachers, but for everyone via the Mr. Goodfish website (www.mrgoodfish.com) and are present at educational institutions such as aquariums, zoos, science and natural history museums.

Food origins

The concept of learning about food and the origins of food products outside the classroom environment is further supported by educational farm visits. They allow children to see, do and feel for themselves rather than rely on traditional educational mechanisms. Actively engaging



Mr Goodfish programme at Nausicaa

the Taste Academy works to broaden knowledge about food in general, as well as the role played by the agrofood sector. By doing so, it encourages interest in the sector and the potential it offers, working to enhance its long-term sustainability.

with plants and animals encourages an understanding of the origins of food while raising questions about how food is processed. The goals of the farm visit can be achieved or reinforced with educational materials and collaborative planning between the class teacher and representatives from the farm (or in other words, the education and agrofood sectors). Furthermore, interaction with the farm is able to encourage children to take an interest in and develop familiarity with the agrofood sector.

it does not mean taking the traditional classroom approach. Instead, educational entertainment is used to familiarise the younger attendees with food and its origins in the agrofood sector. For example, board games are used to demonstrate how potatoes become chips (yes, the correct answer is potatoes), quizzes encourage students to learn about healthy eating and interactive computer programs allow them to investigate how corn is turned into cornflakes.

For the elder group, diverse professional opportunities in the agrofood sector are highlighted by testimonials, educational workshops and company visits, as well as development of a better understanding of how a product is sourced and produced.

What's in a chip?

Nonetheless, there are still concerns about how well children understand the origins of food; their uncertainty about the primary ingredient of chips, or the occasional statement that cheese comes from plants, are treated as scandalous. These concerns are met head-on by the Fish and Chips project. One of their initiatives is the Miummm Vlaams Huis van de Voeding (Miummm Flanders House of Food). It is aimed at educating children of ages four to ten and an older group aged from ten to eighteen. But once again,

Tastes good

Last but not least, as part of the Fish and Chips project, Miummm created the Taste Academy, an initiative designed to enable students to physically prepare and taste food. The focus is on seasonal and local produce. Like the other activities,

CONCLUSION

Education is important for farmers, fishers, growers and other producers who need to be made aware of sustainable practices, as well as others who play a part in putting food on the plate, from retailers and restaurants to consumers themselves. This cannot be limited to specific regions; initiatives such as Mr. Goodfish reflect this by taking a multinational approach.

Other initiatives such as the Miummm Flanders House of Food, the Taste Academy and interactive farm visits are aimed at using positive education practices to bring about lifestyle changes. The goal is that bringing education outside the classroom will make it more interesting and make a greater impact on.

3.4 Taste, don't waste

Lifestyle changes are more important now than ever before. The amount of food wasted every year now exceeds the billion-tonne mark. And this does not refer to egg shells and apple cores. It is more than one billion tonnes of once-edible food that has been thrown out. Vegetables that have been allowed to rot, food left on the plate due to oversized servings, produce restaurants and caterers have not been able to use, and every type of foodstuff, from fruit to fish, that has been harvested, but deemed unsuitable for sale because of size, shape, taste or low market prices. Aside from this, the energy, water, packaging and money spent in producing, transporting and preparing it for sale is also wasted. Finally, when it is thrown out, wasted food needs further transport before it takes up landfill space, putting even more pressure on the environment.

Previous attempts

Previous attempts have been made but are not sufficiently effective to respond to the demands of the current situation. Under the TASTE 2 Seas banner, the SWAP Now project was developed to enable waste reduction to be approached on a different scale. From various countries in the 2 Seas area, a number of different groups already active in waste reduction were able to examine the different processes and initiatives and discuss the possibilities and ramifications of establishing the same initiatives in the different countries. They also investigated different ways in which to change behavioural patterns to permanently reduce waste. As a result, a number of novel approaches to reducing waste have been developed and compiled.



Food waste

A different approach

A number of different barriers to successful communication about sustainability have highlighted reasons why there has been reluctance to commit to waste reduction, particularly at the household level. It appears that many people are under the impression they themselves are unable to make any difference, or that sustainable living is going to be more expensive for them. Targeting these myths is clearly a necessity, but at the same time, the traditional approach of government communication and letters to householders has proven inadequate. For this reason, SWAP Now developed a more energetic and up-to-date approach. Targeting specific groups, such as young families, low-income groups, students, and others, the new approach avoids specifying the problems with food waste. Instead, it encourages a change in lifestyle through positive actions. These include self-assessments where participants record what they are throwing away, encouraging consumers to use reusable shopping bags, and the development of household composting practices. All these initiatives are supported with information sheets, websites and mobile apps detailing simple steps for smarter shopping, stocking and storage of food, as well as tips on recycling and composting.

A multi-channel approach

The supporting information is insufficient in promoting awareness of or commitment to the new approaches; from research performed as part of the



Compost mobile: education on food losses

SWAP Now project, it has become clear that most people are not likely to go in search of information on sustainable living practices. For this reason, SWAP Now has implemented a multi-channel approach, incorporating television, radio, brochures, newspapers, posters and other promotional material, as well as face-to-face communication and personal conversations. The information is being split up in an effort to encourage multiple viewings. At the same time, care has been taken to avoid excessive communication.

Voluntary support

SWAP Now has also recognised a number of other initiatives designed to assist, encourage and support, as well as draw attention to sustainable practices. These include the Imog Compostmeesters (Compost Masters) programme in which volunteers provide assistance with and commit themselves to composting, energy reduction and cleanliness, or adopt

recycling points. There are future plans to develop the programmes to include general waste prevention, food waste, reuse of garden waste, etc. The great benefit of the volunteer programme is that the message is spread by like-minded peers, increasing the level of acceptance and support for the projects.

The Egg Lab

Another successful project has been the Chickendale Egg Lab. This allows subscribers to buy a chicken for a minimal price, with a view to feeding it organic waste; chickens consume as much as 150 g of organic material a day. Under the right conditions, the chicken will then produce eggs for the owner. Every year, approximately 3,000 to 5,000 chickens are purchased as part of the project. This not only reduces waste, but also raises awareness of just how simple – and rewarding – various sustainability practices can be.

CONCLUSION

The SWAP Now project has benefited greatly from its cross-border nature. It has allowed the organisations involved to share their different approaches to waste reduction, many of which are highly original initiatives and all of which work towards increasing sustainability while reducing environmental impact. It is worth noting that a few of the organisations involved in the SWAP Now project were previously involved in similar projects with participants from other countries outside the 2 Seas area. This highlights the importance of the 2 Seas Programme in the further dissemination of information and ideas across borders.

Information sharing has been highlighted as a major consideration in fighting food waste. Posters, digital materials and face-to-face interventions are preferred to the more traditional governmental letter. They are supplemented by initiatives that encourage lifestyle changes rather than teaching basic facts. This positive approach has been recognised by SWAP Now as being better tuned to modern practices in pursuing information.

3.5 Chapter conclusion

- This chapter has identified a desire for transparency and sustainable production practices, which fit in with a need for improved education. Different groups have been highlighted: farmers, fishers, growers;
- restaurants;
- retailers;
- consumers –
 - o ages four to ten;
 - o ages ten to eighteen;
 - o and other consumers.

Initiatives incorporating alternative educational approaches focus on

- the origins of various foods;
- seasonal variations and availability of certain natural resources;
- sustainable consumption practices;
- and reduction of wasted food.

Of course, many of these initiatives are most likely to be effective if incorporated not just at a local or regional level, but one with a larger focus such as the 2 Seas area, or an even greater area.

Research has also identified consumer preference for foods produced from sustainable practices and with 'clean processes'. By representing the ecological footprint of a product on packaging – and therefore catering to consumer desire – it would be possible to encourage producers to commit to and actively investigate more ecological practices in order to appeal to a customer base.



Sensory research

CONCLUSION



The outcomes of the various projects within the TASTE 2 Seas cluster demonstrate that there are several possibilities already lying within reach. At the same time, many of the solutions are not yet definitive. Further research to hone and improve the options already presented will further encourage the food and drink industry to make changes – and not just in the 2 Seas area. By working together to solve the same issues of sustainability, resource availability and competition, the projects have identified solutions suitable for the area as a whole and, potentially, further afield.

The benefits of collaboration

This demonstrates the benefits of collaborative work. Specific countries or projects have not made their contributions in search of recognition; the driving forces behind the project are considerably more environmental in nature: long-term sustainability, the optimisation of existing resources and the reduction of waste. By involving businesses, knowledge centres and institutional stakeholders such as governmental bodies, a more global view of the limitations, the possibilities and the available options has been developed. This has also improved the ability of all the partners to address related issues and questions, and perhaps most importantly, it has given them the network connections required for a proactive approach in the instances when problems arise that are outside their direct area of expertise.

A consolidated approach

Any consolidated approach to sustainability in the food and drink industry must take commercial performance and consumer preferences into account. In recent times, consumers have shown interest in the processes used to prepare food products, as well as their environmental and health impacts. This appears to be the impetus behind a clear move towards short-supply lines and farm-fresh local produce. And in recognising this, the time is ripe to make a concerted effort to educate consumers on where their food comes from, highlighting the importance of sustainable farming, fishing and food processing methods. By taking a proactive multi-channel approach reflective of modern technology and lifestyles, the opportunity to reach the various target groups is increased. Focusing as much on education as on lifestyle change encourages long-term change with the potential to make an undeniable and noticeable difference. The only question it raises is how long this difference will be sufficient.



The path to long-term sustainability

The population is continuing to grow. For the 2 Seas area, the high density of the population will only place greater demands on the food and drink industry, meaning resources will once again be exploited in full, technology will struggle to perform to the standards required of it and the environment will be at risk once again. It is vital that what has been learnt in the course of these projects is not lost. Areas of research that have not been fully examined but that have been recognised need to be explored now, as the population continues to grow, rather than when the situation is more critical and pressure from external competition is even greater. At the same time, the collaborations and links between the various partners need to be maintained with future projects. Doing so ensures a clear understanding of threats, possibilities and needs which will inevitably come into realisation, disappear or change as time goes by. In other words, the TASTE 2 Seas project provides a much-needed start in setting the food and drink industry on the path towards long-term sustainability. It does not provide any definitive solutions. But it does show that a constant and focused approach to continual improvement will.



“For many years, Europe has been building a food production and consumption system based on efficiency and keeping costs down. Following the Second World War, this model made sense; food was about nutrition and feeding the population. In the late 1960’s and 1970’s however, people started to realise that regarding food as a cheap commodity could have some potentially devastating effects on the environment and people’s health. As economic circumstances improved, these issues became less important but today, they are more prominent and pressing than ever. We will not only need to radically change the way we consume and produce food, but also reconsider our relationship with food if we want to ensure that there is enough food to meet future demand.

Industrialisation has meant that the value of food has not been fully appreciated. We have also lost touch with the central role food plays in our lives and society. While an efficient production system may have played a key role in feeding Europe in recent decades, the system needs to take into account a range of current and future issues. A system that doesn’t value food sees is very damaging, not only to farmers and producers who don’t receive a fair price, but to consumers who end up with food not produced for its quality, but for profit.

Slow Food has been advocating local food systems and the cultural value of food since it was established in 1989. It has always stressed the importance of quality. In some ways, ‘quality’ can sometimes be seen as elitist, and something for the very wealthy. There is, however, a new generation of young people rising up and demanding high quality, fair and sustainably produced food. This is not because they have too much money to spend, but because they understand that eating well is important, sometimes more so than having the latest smartphone.

We have to be realistic about what sustainable food production and consumption should look like in the context of a global population growth. It is clear that enough food will have to be produced to feed the population but the ‘one size fits all’ approach will not continue to be viable. We need to start building not a single new ‘food system’, but a number of sustainable, diverse and resilient food systems. Local food systems can provide more than just nutrition, they can create communities, protect the environment, and add value to landscapes.

I hope this publication inspires you about what the future of food might hold as it highlights a range of potential solutions and innovations that together, could lead to high quality, tasty, and sustainably produced food being available for all.

Joris Lohman
Chairman Slow Food Youth Network International.



"As a cooperative project, 'Towards sustainable and tasty food in Europe' is to be lauded for its aspirations and its accomplishments. The many ideas, themes and evidence of shared best practices contained in this publication are testimony to a food and drink sector filled with innovation, energy and imagination. The pressures upon our global food system are already immense; global population increases, environmental degradation, soil loss, water shortage, climate change, disease and food fraud create challenges and opportunities. However, it would be reasonable to say that, if we as a species are to double our food production by 2050, from a diminishing base of natural resources but in a sustainable fashion, the small holder, small producer and independent farmer will be key to our joint success. This project and its conclusions provide valuable signposts for our long and difficult journey ahead and I applaud all those involved."

Shane Holland
Director, Slow Food UK and
Chairperson, Slow Food London.

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2 Mers Seas Zeeën

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