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INTERNATIONAL CONFERENCE PERSPECTIVES FOR FOOD 2030

BRUSSELS, 17-18 APRIL 2007



CONFERENCE REPORT

Research FOOD

Anticipating Research Needs for the
Competitiveness of the European Food Industry

2030



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PERSPECTIVES FOR FOOD 2030

PERSPECTIVES FOR FOOD 2030

INTRODUCTION



On 17-18 April 2007 the Directorate-General for Research of the European Commission organised a major Conference on the future research and competitiveness aspects of the European food industry.

The overall purpose of the Conference was to anticipate research needs by 2030 and develop coherent actions in view of the diverse and increasingly important changes that the European food industry will have to face. New challenges induced by globalisation require a good understanding of the triggers of future changes, the inter-relationship between such triggers and their potential impact on major European sectors such as the food industry in order for Europe to remain competitive worldwide and to overcome emerging threats.

Whilst food is the largest manufacturing sector in Europe, it is facing diverse and increasingly important changes related to demographics (ageing, migration), diseases (increased diet-related diseases, cognitive decline, obesity, allergy), lifestyles (occupation, quality of life), sectoral competition (competitive agricultural products) etc.

In addition, consumers' demand for healthy, safe and ethically produced food is increasing, as well as demands for increased environmental protection and sustainability, personalised nutrition and risk reduction for individuals rather than for the whole population.

Against this background, and at the outset of the new Food, Agriculture and Biotechnology Programme of FP7, this conference on Perspectives for Food 2030 provided the opportunity to assess how the food industry and consumer demand may evolve over the next 25 years and to consider what implications this may have for food, agriculture, fisheries and biotechnology research.

The conference brought together major actors from the fields of food technology, retailing, consumer science/behaviour, economists, etc. to gather visions of the future.

PERSPECTIVES FOR FOOD 2030

Programme of the Conference

Charlemagne Conference Centre, Room S4, Brussels

DAY 1

TUESDAY 17 APRIL 2007

9:00
Registration and Welcome Coffee

10:30
Welcome by **Mr José Manuel Silva Rodríguez**
*Director General, European Commission,
Directorate-General for Research*

KEYNOTE SESSION A: TRENDS AND OUTLOOK IN WORLD ECONOMICS, CULTURE AND FOOD

Chair: Dr Christian Patermann
*Director for Biotechnologies, Agriculture and Food,
European Commission,
Directorate-General for Research*

11:00
Outlook on European and
worldwide Economics and Governance
Prof. Pan Yotopoulos
*Professor at the Università degli Studi di Firenze, Italy,
and Professor of Economics, Emeritus, Stanford University, United States*

11:30
Food, Venture capital and Innovation
Mr Esko Aho
*President, Finnish Innovation Fund, Finland
Former Finnish Prime Minister*

12:00
Sociological and cultural predictions
– “A history of the future of Food”
Prof. Warren Belasco
*Professor at Department of American Studies
University of Maryland, United States*

12:30
Discussion

13:00
LUNCH

14:45
A taste of the future: research’s role
in tomorrow’s food development
Mr Janez Potočnik
Commissioner for Science and Research

15:05
Perspectives from the European Parliament
Ms Dagmar Roth-Behrendt
*Member of the Committee on the Environment,
Public Health and Food Safety and Substitute Member of the Committee
on the Internal Market and Consumer Protection*

SESSION B: DRIVERS OF FOOD DEMAND AND MARKET TODAY AND TOMORROW

Chair: Mrs Catherine Geslain-Lanéelle
Executive Director, European Food Safety Authority (EFSA)

15:25
Agriculture and farmers’ situation in 2030
Prof. Andrzej Babuchowski
*Minister-Counsellor, Head of Agricultural Section,
Permanent Representation of Poland to the EU
Former Secretary and Undersecretary of State
and Deputy Minister of Agriculture and Rural Development, Poland*

15:45
Retailer vision in 2030
Mr Xavier Durieu
Secretary General, EuroCommerce, Belgium

16:05
The Food Industry of 2030:
From Food to Well-being
Mr Jean Martin
President, CIAA Confederation of Food and Drink Industries, Belgium

16:25
Impact of food legislation and lead markets
Mr Robert Madelin
*Director General, European Commission,
Directorate-General Health and Consumer Protection, Belgium*

16:45
Retail vision, logistics and supplies in 2030
Dr Gerd Wolfram
*Managing Director, Metro Group Information Technology,
Future Store Initiative, Germany*

17:05
The Food consumer of 2030
Prof. Edda Müller
*Executive Director, Federation of German Consumer Organisations (vzbv),
Germany*

17:25
Discussion

18:00
Cocktail



DAY 2

WEDNESDAY 18 APRIL 2007

SESSION C: NEW TECHNOLOGIES FOR FOOD PRODUCTION

Chair: Mr Michel Coomans

*Head of Unit of Food Industry, European Commission,
Directorate-General for Enterprise and Industry*

9:00
Food, Pleasure, Health and Wellbeing
Prof. Charles Daly
*Alimentary Pharmabiotic Centre and College of Science,
Engineering and Food Science,
University College Cork, Ireland*

9:20
Research, New Technologies and Sustainable Production
Mr Luigi Pio Scordamaglia
*Vice-President of the Italian Food Industries Federations,
Vice- President of INALCA, Italy*

9:40
Future Food Processing
Dr András Sebők
*General Manager, Campden&Chorleywood, Hungary
European Technology Platform Food for Life Board member*

10:00
Concepts for the Food factory of the future
Prof. Thomas Ohlsson
Professor, SIK Swedish Institute for Food & Biotechnology, Sweden

10:20
World perspective: Food Future Flagship in Australia
Dr Bruce Lee
*Director Food Futures Flagship Commonwealth Scientific
and Industrial Research Organisation (CSIRO), Australia*

10:40
Discussion

11:10
COFFEE/TEA BREAK

SESSION D: FUTURE PERCEPTIONS OF FOOD

Chair: Dr Christian Patermann

*Director for Biotechnologies, Agriculture and Food, European Commission,
Directorate-General for Research*

11:30
Fairtrade: Perception and Economic Reality
Mr Ian Bretman
*Deputy Director of the Fairtrade labelling
Organisations (FLO) International,
United Kingdom*

11:50
Risk communication and risk perception
Prof. Ragnar Löfstedt
Director of King's College London, United Kingdom

12:10
Future Perceptions of Food – European Beverage Industry 2030
Dr Mike Knowles
*Director Scientific and Regulatory Affairs,
Coca-Cola European Union Group, Belgium*

12:30
LUNCH

14:20
Multidisciplinary Approach
to Food Research potential for New Technologies
Prof. Remko Boom
*Head of Process Engineering Section,
Wageningen University, The Netherlands*

14:40
Future fish- full chain
fish farm concepts and coming reality
Dr Karl Almås
President, SINTEF Fisheries and Aquaculture, Norway

15:00
Discussion

FINAL REMARKS

Introduced by **Mr José Manuel Silva Rodríguez**
*Director General, European Commission,
Directorate-General for Research*

15:30
Basic needs, complex requirements:
agriculture and food markets in the future
Ms Mariann Fischer Boel
Commissioner for Agriculture and Rural Development

15:50
Way Forward by **Mr José Manuel Silva Rodríguez**
*Director General, European Commission,
Directorate-General for Research*

PERSPECTIVES FOR FOOD 2030

The European food industry is facing huge challenges and is likely to undergo a transformation over the next 20 years. The conference was divided into four sessions, each dealing with different aspects of how the industry needs to shape itself in the coming years. The first session gave an overview of the need for a new and dynamic vision of 2030, taking into account changing demographics, changing consumer tastes, globalisation, developing new markets and the new technologies to be explored and researched.

SESSION A



TRENDS AND OUTLOOK IN WORLD ECONOMICS, CULTURE AND FOOD



THE RISE OF GLOBALISATION

The world's marketplaces are becoming increasingly interdependent - the phenomenon known as globalisation. Globalisation arouses strong feelings; it is seen positively on the whole, but many social and political groups see it as insidious – a new form of domination of the developing world by the rich West. Globalisation relies on institutions, but institution building is difficult for poorer countries and although free trade and free markets can be drivers for growth, they are not a cure-all for developing countries.

Globalisation began in the 1980s, brought about by the technological advances of the 20th century such as ease of transport, communication and transmission of information. But our new style of globalisation is rather different because it involves the international trade in services.

The service trade is very different from the trade in commodities as products aren't bought and sold in the same way. Services happen instantly and involve interactions between the consumer and the provider. They also have different characteristics. With the service trade customisation and trust are important, in other words a company's good reputation will create profits. This kind of decommoditised trade is very different from price-competition based trade. Reputation makes it much easier for a multinational corporation to set up in a developing country as it attracts a clientele partly because of its name but also because of its reputation for being successful. If you have a brand name it's easier to get people to trust you. This aspect of globalisation is much harder for poorer countries because they have to create a reputation from scratch.



Pan Yotopoulos

'There is an increasing divide separating rich and poor countries,' said Professor Pan Yotopoulos from the University of Florence and Emeritus Professor of Economics at Stanford University. 'Both the poor and the rich within a country should benefit as they are consumers of the goods purveyed by globalisation at bargain prices.'

This may be true for the poor in developing countries if their jobs are sustained by an increase in commodity exports in globalised trade, but it is not true for the poor in developed countries if they are the ones who were previously employed in the production business of producing one dollar Chinese blouses when these were produced locally. If the trade for these disappears to a developing country, the people who produced the one dollar blouses lose their jobs and their wage packets. Free trade gains need to be shared more equally between rich and poor countries otherwise there is a risk that the gains



will all be to the benefit of the western world and potential growth in developing countries will be stunted. The world's rich run no risk of losing their jobs to imports nor do they face income constraints. Wealthy people in the developing countries will also profit from cheap commodities of the globalisation trade but mainly they profit from the freedom to import the de-commoditised standards of living of the first world rich. Consuming like a rich country, but producing like a poor one is creating an economic imbalance in the developing world. There is a risk that globalisation will become the epitaph of growth in the developing world, but the increasing divide between the rich and poor within countries, developed or not, may prove even more ominous.

FOOD VENTURE CAPITAL AND INNOVATION

Innovation and research and development are two of the most important ways that the food industry can become more productive and competitive, but Europe is falling behind in this respect. We need to encourage companies to innovate and participate in research and development (R&D).

If the food business wants to flourish it has to commercialise and that is one of the weaknesses of Europe, which has difficulties and challenges in this area. Our performance in R&D is not that good when you look at the percentage of GDP allocated to it. Even in sectors where Europe is leading, such as in science and technology, we are lagging behind. The reason is because traditional funding and financing mechanisms are not operating well with innovative goods and services. New financial methods to fund R&D and innovation are needed. The market is not growing fast enough in Europe to catch up with the US. Using the venture capital sector may provide the help this sector needs to develop and thrive.



Esko Aho

'We have a lack of competitiveness in Europe,' said Esko Aho, President of the Finnish Innovation Fund and former Finnish Prime Minister. 'To improve this situation we have to put more emphasis on R&D and intensify efforts to get European companies and government to invest more money in R&D.' Creating a market for innovative goods and services in Europe is what's needed, but there are still difficulties and fragmentation in the European markets.

How we spend the 16% of GDP allocated for public procurement will have a big effect on competitive markets in Europe. There are a lot of practical methods for creating new markets. Governments need to be encouraged to realise that using these resources innovatively is a positive way of opening up the market for R&D and innovation. We don't have to give up competition requirements, but reasonable compromises between competition requirements and innovative requirements may need to be made.

Buying the cheapest products on the market is not helping the innovation sector. To create comparative advantage for Europe in the service sector, it is necessary to have common European markets. In certain sectors processes have been started to apply new technologies in an efficient way. The forest industries in Europe, for example, relied on the size of production units 10 years ago. They tried to produce as much as possible, which was the key to competitiveness at that time. Now they have transformed themselves and are seeking innovative solutions, such as how to create raw materials, how to create new products. This is what we need to see applied to all areas of the food industry – new methods and new vision.

PERSPECTIVES FOR FOOD 2030



Warren Belasco

THE FUTURE OF FOOD

Food is probably the most important thing in our lives. It's our biggest industry, our greatest export and one of our greatest pleasures. It has a huge effect on our lives, and what we choose to eat may be the single most important cause of disease and death.

Human beings are programmed to fear running out of food. Few things in the world are more frightening. Fear of famine is deeply rooted in our psyches - our bodies still store up fat for the next famine, doom mongers give us nightmare scenarios about the possible food shortages of the future and we are advised to cut down on our food consumption in the western world as the illnesses caused by obesity becomes more and more of a problem.

The environmental movement is also growing in popularity, more and more are seeking greener alternatives to fertilisers and buying more organic food and household products. Subjects such as global warming, chemical pollution of our food, and water and energy shortages are constants topics in the media and politics. Are we justified in worrying about the future and will our grandchildren enjoy anything like the abundance of food that we have today? There is also the perplexing problem of how the world in the future will feed the rapidly growing populations in the developing world.

There are many different ways to analyse the future of food. Some people predict affluence for the future and a continuation of our current abundance, while others see global disaster, food shortages and the destruction of the environment. Others believe that with such things as genetic engineering we can feed more people without experiencing a fall in our own western standards of living and consuming. Those with a more environmental perspective are convinced that only by returning to smaller scale production, growing organic food locally and cutting down on our current over-consumption of food will the earth be able to sustain itself in the face of growing populations and more and more demands for food.

Perhaps we shouldn't get too alarmed – after all, there have been doomsday scenarios for centuries. 'The current debate over whether bioengineering is compatible with agrarian ideals sounds a bit like earlier arguments over hybridisation, tractors and chemical pesticides,' said Warren Belasco, Professor of American Studies at the University of Maryland in the US. In demographer Joel Cohen's book *How Many People Can the Earth Support?* (1995), Cohen found that there were three enduring positions on the question of how we might feed the future: (i) bake a bigger pie; (ii) put fewer forks on the table; (iii) teach everyone better table manners. This three-way debate is continuing today. Some believe the only way to assure good quality and plentiful food in the years to come is through free-market capitalism and biotechnology; some worry about limits to growth and some say that only with a fairer economic system can the poor feed themselves. One thing, however, is clear. There must be open debate about the future of food. 'People's fears and thoughts about such things as bio- and nano- technologies must be acknowledged and respected and scare stories about "Frankenfoods" mustn't be allowed to take precedence over informed debate,' said Warren Belasco.

DISCUSSION SESSION A

At the end of the first session there was a discussion between the speakers and the audience. People who could not be present at the conference were able to participate by webstream. A member of the audience asked the speakers if they thought the cost of energy would go up considering the increase of globalisation. Most speakers believed that what was going to happen in the immediate future was obvious and that we need to talk about alternative sources of energy. 'In the US little has been done about it,'





said Pan Yotopoulos. Our energy bills, whether they are for gasoline or for heating our homes, are going up constantly.’ Warren Belasco agreed that things cannot continue the way they are at present and that energy is the key to so much considering that our current abundance is based on cheap inputs and outputs.

The conference chair, Christian Patermann, then asked Pan Yotopoulos to what extent he would see a market emerging with respect to decommodification services if decommodified services are applied to food properties along the whole food chain. Pan Yotopoulos thought it would depend on changing the eating habits of consumers to appreciate different and good food. He said that it wasn’t very easy to get a patent on agriculture production unless it is tied up with some of the WTO regulations that create pan positional goods that create benefits for a very specific entity but impose costs on the rest of the world in protecting those benefits. Pan Yotopoulos mentioned that ‘The Indians who first discovered the potato don’t have a patent. It is equally difficult to get a patent on the way you cook a food. This is why I was concentrating on what you can do about decommoditising agricultural commodities.’



Christian Patermann

A member of the audience asked Warren Belasco what the influence of food scares, such as the BSE crisis, has been on the perceptions of consumers. Warren Belasco replied that he thought the metaphor of Frankenfoods captured the typical consumer’s attitude and created a mode of thinking that’s been in western minds for a long time – the fear that our technologies can get out of hand. ‘We don’t want to be too nostalgic for the past,’ he said. ‘What’s happened in our day is that we know much more about these things through the mass media than people used to. The 1950s and 1960s pesticide scares were the first backlash against modernist thinking. A lot of technologies are oversold, such as DDT. This also invited a severe backlash when people began to see problems and that’s probably what’s happening with bioengineering and so on. If there’s too much danger, people will turn against it in a violent way.’

A member of the audience asked Esko Aho about his comment on research and development being money to knowledge and innovation being knowledge to money. Which was first in his opinion? Esko Aho said he thought there was something even more important - investment in education as this was the basis of everything. ‘In the case of Finland,’ he said, ‘we were rather poor when starting to invest in R&D, and we did it simultaneously with opening the markets and that is the key of our success story. There was an instant demand for products and services based on these R&D investments, especially the telecom sector. You can’t explain the success story of Finnish telecom services without the combination of R&D and investment along with liberalisation of the telecom market.’ He also made the point that simultaneous operations are needed with everything based on a high level of education and the necessary investments made in education.

An audience member remarked that if we in Europe wish to remain leaders in the world agriculture and food industries we need a different approach to consumers. For example, we need to better inform consumers when we talk about research and development programmes, and in moving away from commodities or agricultural products and services we have to take account of the cultural aspects. Many consumers are very well informed and that in the future WTO will help create greater transparency.

Esko Aho made the point that Finland and Sweden took a risk when they opened their food markets overnight after becoming full members of the EU. The risk was that consumers would give up Swedish or Finnish products, but that did not happen. In Finland, the interest of consumers was higher than ever before. This may be explained by the fact that people are interested in knowing where things are produced. This is something Europe has been doing well and there is a possibility for improvements in this area.

PERSPECTIVES FOR FOOD 2030

PERSPECTIVES FROM THE EUROPEAN COMMISSION A TASTE OF THE FUTURE: RESEARCH'S ROLE IN TOMORROW'S FOOD DEVELOPMENT



Janez Potočnik, European Union Commissioner for Science and Research, gave his views on the future of the European food industry. What does it need to do over the next 23 years to become more competitive and productive and how can it change and develop to meet changing consumer demands?

The food industry probably has the biggest impact on our lives of any organisation in the manufacturing sector. Its turnover in the last two years was over EUR 800 billion and it employs over 4 million people. However, it is mainly made up of small companies – small- and medium-sized enterprises (SMEs). Out of the 283 000 food companies in Europe nearly 99% are SMEs. They employ over 61% of the workforce and produce almost half of the food industry's products. They are crucial to the industry.

Therefore, changes and innovations in the food industry will involve SMEs to a very large extent. The EU, with its Seventh Framework Programme is determined to do more to help SMEs adapt to a changing world and become more productive and competitive. For example, the Programme will increase the funding for SMEs to participate in research projects and training workshops. There are also simplified procedures in place for participating in such schemes.

'EU initiatives such as FP7 have played a central role in doing what Europe needs to do as a whole – pull together, pool resources, eliminate duplication and fight fragmentation,' Janez Potočnik said. But in order to achieve this we need to take a complete view of the food chain. Food influences many areas of our lives, such as the environment, health and the economy. Just as the food industry has looked at its process "from farm to fork" we need to look at its research needs from the beginning to the end of the food cycle. This means that we have to open up to other disciplines by involving converging technologies such as neurosciences, biotechnologies and nanotechnologies. Learning from other disciplines can mean productivity gains and energy savings.

In order to be competitive Europe needs to take advantage of the research opportunities available, such as participating in the regional, national and especially the European programmes which fund research and innovation in the food sector. There are potentially great opportunities available in the knowledge-based bio-economy and this can contribute to economic growth, employment and sustainable development for the future. Research is needed on the impact of biotechnology on Europe's industries. We also have to explore lead markets for eco-efficient bio-based products, investigate incentives for young innovative companies and improve legislation in the area.

'But effort is not just needed from our side,' said Potočnik. 'More investment in research and development needs to come from the private sector, too, and FP7 can help address this issue.' The quality of food, its source, development and future are the business of everyone. This issue is not restricted to private kitchens or supermarkets. It is now an issue for schools, hospitals, laboratories, businesses and politicians. This conference is important because having a vision for the future of our food is not a luxury – it's a necessity.



PERSPECTIVES FROM THE EUROPEAN PARLIAMENT

Dagmar Roth-Behrendt, a member of the Committee on the Environment, Public Health and Food Safety and Substitute Member of the Committee on the Internal Market and Consumer Protection, gave her views on the future of the European food industry. Consumer demands and food producers delivering those demands will be the state of play in 2030. The European Parliament must shape workable legislation and develop a broad debate with consumers on the subject of food. We need to decide where we want to be in 2030. We need to decide what policies we want to have on different areas of the food industry, for example, hospital food, school food and food for elderly people.



Dagmar Roth-Behrendt

In the future the demand will probably be for convenience products made from fresh and healthy food. More people will want to buy environmentally friendly products and there will be much more awareness of how food is produced. These trends are already apparent in our society and will become stronger. The acceptance of GMOs and biotechnology will probably remain small if consumers decide they don't have enough information about these technologies. The demand for functional foods for a healthy lifestyle will probably increase.

Many decisions have to be made on important consumer issues such as safety, animal welfare and new technologies such as GMOs. The European Parliament's first concerns are safety and consumer choice. There are also issues such as using GM feed for animals and the possible health affects on human beings. The EU and EP must also take a strong line on pesticides, said Roth-Behrendt. If products with too high a pesticide rate in them are found on the European markets then the Commission must act. Reliable data must be a top priority to enable safety and full labelling. All this needs research and commitment.



'We need to decide if we want a public debate about meals and society,' said Dagmar Roth-Behrendt. 'Research is only one piece of the picture. Meals have to be seen as a linking and bonding element, but as long as fewer meals are prepared and eaten around the table together at home and as long as children don't know what they are eating or how to prepare it, we will face significant problems in society.'

When we speak about food in 2030 we need to talk about important things such as what science can deliver and what consumers might want and demand, but we also need to talk about how we choose to see food and how we want our children and their children to see it in the coming years.

SESSION B



DRIVERS OF FOOD DEMAND AND MARKET TODAY AND TOMORROW



The next session of the conference looked at how we can better understand what the triggers of change for food production in Europe will be in the next 20 years. Agriculture is the main provider of food, and it has already changed considerably in the last decade to meet consumer expectations in Europe. More recently, it has been required to provide other services than just food production, for example in the environment protection of landscapes. To anticipate future changes in food supply we have to look at agriculture and the role it will play in the future.

The law is an essential of European policy. More than 80% of food law has its origin directly in European law. Looking into the future of food requires consideration of what food law is today, how it is prepared, and what the consequences are on food tomorrow. Will we have better food regulation in 2030? Do we need to invent new tools to face new challenges in 2030 and if so, how will they affect our food tomorrow?

In the last decades retailers have played an increasing role in the food chain, not only as suppliers but with such things as development of own brand products and providing new services to consumers and new technologies such as traceability. What and how we eat today is a result of how we grow and buy food today, and we are eating in a very different way from our parents and grandparents. This has also contributed to the current state of our health. Will this continue or will we be eating completely different food in 2030? And what kind of a say will consumers have in these changes? Are they in fact driving the market?

A GRICULTURE AND THE FARMER'S SITUATION IN 2030



Andrzej Babuchowski

Trying to predict the situation of agriculture in 2030 is a difficult, not to say impossible, endeavour, as using the tools and markets of today to try to make predictions about tomorrow is fraught with difficulties. The world's population is estimated to grow by another two billion and it's assumed that the bulk of increase in livestock production will take place in the developing countries. Figures for food demand in the future suggest that per capita food consumption will grow significantly, meaning that the majority of people will be better fed and undernourishment will decline. But in the developing countries the numbers of undernourished will probably decline only slightly. At present, at the world level, production equals consumption, but this is not true of the developing countries, where demand for food is growing faster than the rates of production. Because of this, many developing countries have turned from being net exporters to becoming net importers of agriculture products.

There have been great costs to the environment by the substantial gains in agricultural production in the past, including deforestation, pollution, loss of habitat and loss of biodiversity. We cannot increase productivity further in the future without further degrading our agricultural resource base.

'The need for further increases in production in the future while conserving the resource base of agriculture and minimising adverse effects on the wider environment, calls for great contributions from agricultural research,' said Professor Andrzej Babuchowski, Head of the Agricultural Section, Permanent Representation of Poland to the EU. Research must



increasingly integrate current advances in the molecular sciences, in biotechnology and in plant pest ecology with a more fundamental understanding of plant and animal production in the context of optimising soil, water and nutrient use. It is important for the future of agricultural production to direct new research efforts to support production growth and improve nutritional characteristics of products, to increase productivity in adverse environments and to minimise adverse effects on the environment.

Modern biotechnology is being spoken of as a possible saviour of food production for the future. Biotechnology is not limited to the much publicised and controversial activity of producing genetically modified organisms (GMOs) but also encompasses activities such as tissue culture, marker assisted selection and the more general area of genomics. Using GM techniques to raise production yields can be cheaper and there is a possibility that it may be the only option for raising productivity considering the difficulties of attempting to do this by using traditional agricultural methods.

This is a controversial area, though, as there is considerable public hostility to GM products. There is also uncertainty about the possible adverse health effects and the coexistence of GM and non GM crops. Another controversial area is the control by a number of large firms of the technologies that farmers will be using to produce these crops and of the future scientific development of such technologies. The food production sector must tread carefully in this area and keep up an informed public debate about the possible positive and negative effects of GMOs in agriculture.

Unless local agriculture is developed and/or other income earning opportunities open up, food and/or income insecurity determined by limited production potential will persist. ‘Willingly or not,’ said Andrzej Babuchowski, ‘farming is going to become a more business oriented activity with a special environmental and social flavour.’ In the EU, it is inevitable that farming will undergo a transition from family-based farm ownership to a professional, knowledge-driven economic activity. If farmers want to be successful they will have to be educated, flexible and entrepreneurial and keep pace with new and innovative technologies.

Farmers are placed in a very difficult situation at present. As the producers of agricultural products they are also expected to be custodians of biodiversity of the environment. But they must be prepared for changing economic, social and environmental conditions using the instruments of modern business and exploiting the achievements of the new technologies.

RETAILER VISION IN 2030



Xavier Durieu

Making predictions about 2030 is difficult because no study exists at the moment to predict consumer patterns for the future. European commerce today consists of six million companies that give work to 30 million people. Food retail is one of the largest sectors in Europe, and most retail companies are SMEs.

Commerce is the link between farmers or manufacturers and the consumer. It is a very competitive sector and commerce has to constantly react to changing consumer demands.

Consumers tell retailers what they want and the retailer has to provide it if he or she wants to remain in business. Retailers have to act as go-betweens between suppliers and consumers and they play an important role in shaping production and consumer patterns.

The role of commerce is to identify the trends that lie behind millions of consumer decisions and act on them. Retailers have to offer products that consumers want and for which they are willing to pay good prices. Issues such as food safety are extremely important in this area as consumers trust their retailers to provide safe products. The

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food scares of the past few years have had a strong effect on consumers and made them keener to know the provenance of their food and how traceable it is. Retailers have responded to this and one response has been the increase of organic products on supermarket shelves. The consumer of today is demanding and expects the retailer to provide high standards in every way.

‘The way people live, work and shop has changed dramatically over the last 50 years and will continue to do so over the next 25 years,’ said Xavier Durieu, Secretary General of EuroCommerce in Belgium. We now have decreasing consumer food expenditure and an increase in spending on leisure and holidays. Self service has become a way of life and less time is spent on cooking. Families are smaller and there are many more single person households and an ageing population, all of which will probably mean an increase in small portions of precooked and packaged food. The development of these ready-made meals will probably intensify. Other examples of how retailers are changing in response to customer requirements are longer opening hours, including Sundays, and in-store technology.

There have been a lot of changes in where we shop too. We have seen a move away from the small specialised shops of yesterday to large hypermarkets where you can buy everything under one roof, including garden equipment and sports equipment. Most of these also offer other services such as ATM machines, financial services such as own brand insurance and travel agencies. Most also offer internet shopping and this will almost certainly be a big area of development in the future. Internet shopping will also give smaller retailers the chance to offer a larger variety of products than they have traditionally been able to. The future successful retailer will be able to take note quickly of new trends and adapt their retail formats to offer excellent services to consumers.

Innovation and product developments are also key elements to offering consumers better and more convenient products with longer shelf lives, new tastes, new packaging and new information.

The development of global trade and agriculture products is important too because this is being driven by consumers who want the same product all year round or who want exotic products. ‘Trade barriers should be reduced for agricultural products to allow developing countries to access new markets,’ said Xavier Durieu. ‘Energy will probably become more scarce and efforts will have to be made to reduce consumption along the supply chain by producing, shipping, storing and distributing products using less energy.’

The growing interest in organic food products has been reflected by retailers as they have responded to this new trend swiftly. Consumers are now asking for more information about their food, about its origins, how environmentally friendly it is and so on. As this movement intensifies in the coming years, partly as a response to much negative publicity about GMOs, the challenge for retailers is to identify the most appropriate tools to meet these changing demands.

THE FOOD INDUSTRY OF 2030: INNOVATION AND THE NEW DRIVING FORCES FOR FOOD



Jean Martin

Population rates are rising, so we will have more consumers in the coming years, which is good news for the food industry, but although people are living longer, life expectancy could be jeopardised by diet-related illnesses. There will be over one billion people over the age of 60 by 2030 and as there is increasing awareness of healthy eating and also of the contribution that sustainable production can make to the environment, they may be healthier and well-informed consumers.

An important point made by Jean Martin, President of CIAA (Confederation of Food and Drink Industries) in Belgium, was that food is a pleasure and must remain a pleasure and we shouldn't lose sight of that by concentrating too much on the scientific and technological aspects. ‘Food must contribute to the well being of consumers, in terms of health and quality of life,’ he said. ‘Where do we want to be in 2030? I would like to see the food industry able to offer a choice, helping to add to life, but also helping quality of life.’

If we want to improve our quality of life then consumer research is the most important activity; trying to anticipate the needs of consumers and knowledge of what they want to buy is very important for future retailer success. Relations to



food are changing - we are going from calories to nutrition, health and variety in food. Structured meals are disappearing and a completely different way of eating is emerging; a very different world from only 30 years ago when sitting down regularly to a family meal was the norm. 'Some people say the art of cooking will disappear,' said Jean Martin. 'I disagree. I think it will be very popular again. Many people now are taking a huge interest in recipe books, so interest is still there. People want safe, tasty and nutritious products, but I hope there will still be things such as plain milk on the shelves in 2030, and not just products with everything added.'

With the right attitude, which involves creative thinking, being willing to innovate and listening to their consumers, retailers can rise to the exciting challenges and opportunities ahead for the food and drink industry. The main goal is to be competitive. The European food and drink industry is a highly innovative one, but improvements need to be made, such as integration of research, a more supportive regulatory framework and more research and development investment. Europe is also not investing enough in research and development, and countries such as Japan are moving ahead. Europe needs to turn the outcome of its research into products it can put on supermarket shelves which consumers will buy.

Decent regulatory policies are needed - ones that are not cumbersome to the food industry, but support research and innovation. Regulation is welcome and necessary in food safety, but it must be supportive of innovation and it must stimulate private investment in research and development. This is probably one of the most important things we in Europe can do along with increasing research and stepping up investment in education. If the food industry can achieve these things then it can create a double success by giving consumers what they want and Europe will be further towards the goal of delivering the Lisbon strategy.

THE IMPACT OF FOOD LEGISLATION AND LEAD MARKETS

The European Commission is changing the way it works. New legislation will be the foundation for the next 20 years and beyond. The Commission is looking at the way it sees its regulatory role in the future and how it interacts with those who are involved with the workings of regulation.

There is an increasing demand from the food industry for more flexibility, the argument being that more flexibility encourages innovation and allows the regulatory environment to keep pace with a market that is ever-changing both in terms of the products offered and the demands of the consumer. Europe needs to consider whether this would be an effective option. The other side of the regulatory coin is that many non-industry stakeholders are concerned about self-regulation, said Robert Madelin, Director General for Health and Consumer Protection of the European Commission.



Robert Madelin

DG SANCO (the Directorate General for Health and Consumer Protection) set up an advertising Round Table at the end of 2005 to debate the issue. The initiative brought together representatives from both industry and consumer organisations to have a constructive debate about how to enhance the credibility of the self-regulatory option. The overall conclusion was that there is evidence to support the usefulness of two core pre-conditions for credible self-regulation: firstly, there must be a sustained openness to dialogue with, and participation of, interested non-business players in the self-regulation process; secondly, there must be adequate monitoring and accountability of self-regulation performance and outcomes.

The report made a valuable contribution to the debate across the EU on the subject of self-regulation. We need to ask the question how law and self-regulation could co-exist in Europe. An important part of this debate is how markets are changing and how they may change in the future without legislation. Companies are starting to adapt to meet the needs of those they supply and this is a positive step.

'All this progress has been made without legislation and in a timeframe significantly quicker than even the simplest regulatory procedure involving the Council and European Parliament would have allowed,' said Robert Madelin. 'I believe this is setting the scene for the way the regulatory environment will look in the future.'

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There are other things to consider if deregulation is to be a new working practice for the future. Governmental organisations need to be more open with consumers. Consumers need to be consulted on important issues such as nanotechnology and biotechnology. Consumer confidence must be built up in these areas of uncertainty. How do we encourage consumers to change their behaviour? We also need to give consideration to the fact that Europe is changing, for example the increasing numbers of immigrants is causing consumer shopping behaviour to change. There is also the ageing population – we need to consider their needs, and to take into account health inequalities and the need to reach the most vulnerable citizens.

Globalisation will become of increasing importance and relevance in the coming years. We must think about exporting our regulatory standards and addressing consumer protection in a global market of the future.

RETAIL VISION, LOGISTICS AND SUPPLIES IN 2030



The food industry is a very competitive sector and constant change and innovation is necessary to stay ahead of competition. It is difficult to predict what consumers will want in 2030, but retailers need to stay ahead of the game by increasing their attraction for the customers, by increasing employee efficiency and by enhancing the complex supply chain processes. Consumers above all want safe, high quality food and the highest priority of the food industry is to provide that.

Stores must find a way of predicting customer demand in the future. Many companies are testing new ideas and innovations for the future store but there are also companies from the food industry testing new ideas with real customers in the stores, but the presentation and shopping will be more convenient' said Dr Gerd Wolfram Managing Director of Metro Group Information Technology.

Supermarkets are bringing very different food to customers today; fresh food stores are selling different fruit and vegetables from different areas and demographics are changing. We are still seeing shopping with services such as counters with fresh meat and cheese and packaged vegetables, but we will probably see innovations such as more convenient and quicker weighing techniques and more information about food. Stores are offering information terminals where the customer can get information on nutritional values, recipes, cooking videos etc. Customers can also check the origin of their products. More customers are doing that and have more confidence in the food they are buying.

'An important technology is the so called radio frequency identification, RFID for short' said Gerd Wolfram. 'We are testing RFID in our supply chain. For instance, this technology enables us to render the goods' entrance much more efficient and significantly increases the transparency of our flow of goods.'

This kind of innovation means that traceability will be much easier in the future when this technology becomes widespread in supermarkets. Product recalls will become much easier and consumers will feel confident that their food is safer. This has a potentially big impact on future food supply because only specifically identified products will need to be recalled from supermarket shelves. Expiry dates will be checked constantly and there will be a higher availability of goods in stores.

In the future RFID will enable several other services to the benefit of the customers. For instance the intelligent check-out. In 10 to 15 years you will just need to drive the trolley through a RFID reading device and all the products inside will be calculated automatically within a second. Queues at check-out will be a thing of the past. Not all of these things will happen immediately, but the retailing industry needs these sorts of visions for the future to keep it dynamic and inspired.



THE FOOD CONSUMER IN 2030



Edda Müller

The traditional approach to nutrition is followed by few families today in the developed world. Many things have changed, including much more regular eating out, take-away food, snacking, longer working hours and the decline of the traditional nuclear family. Knowledge passed down through the family regarding healthy food and how to prepare it has been lost and this knowledge gap is not being sufficiently filled by the public education system. The consequences of these changing food patterns are proving a burden on the health system. Obesity is a growing problem and illnesses such as diabetes, cardiovascular and colon diseases are increasing drastically.

‘When I was a child one of the rules at home was that we had to eat whatever was put on the table,’ said Professor Edda Müller, Executive Director of the Federation of German Consumer Organisations. ‘There were no treats and no special children’s products. We had meals that my mother prepared herself from fresh ingredients, lots of vegetables, fish on Fridays and a roast on Sundays. Snacks were unknown, meals were served at regular times and the whole family ate together.’

But now, the pendulum may be starting to swing back again. The number of consumers who want a diet that is healthy and socially responsible is rapidly increasing. And food retailers are adjusting themselves to these new demands. This new health trend has come as a surprise to the food industry and policy makers. The food industry and the food technology sector are also now starting to solicit the opinions of those people working for consumer protection. A contributing factor to this is no doubt the decision by an increasing number of consumers to look for alternatives to conventional food products.

‘With regard to the future development of a buyer’s market, high levels of competition in the food retail sector will probably create a situation whereby changes in user preferences, even among a small number of shopping trendsetters such as the buyers of organic meat and the shoppers who go to farmers’ markets to buy organic vegetables, will decisively influence the future of the range of food on offer.’

Research regarding the type of consumers retailers will be dealing with in 2030 has identified the following future trends: increasing numbers of older people; more single person households; fewer children; a blurring of the boundaries between work and leisure; bonus schemes by health insurance companies providing motivation for adopting a healthy lifestyle; a willingness by consumers to pay more for food as they become increasingly aware of quality and health. The globalisation of the range of food on offer will also probably evoke a reaction. The sheer quantity of available food products will strengthen the desire for regional and organic products. But there will also be an increase in food consumption outside the home, an increased demand for convenience food, chilled food and functional food.

Research into strategies relating to consumer policy and its instruments should go hand in hand with research into new technologies. More attention needs to be paid to current discussions, particularly in the field of agricultural and consumer policy. For example, regulations on the labelling of genetically modified foods do not contribute to consumers’ freedom of choice if animal products produced using genetically modified animal feed are not labelled. Edda Müller made the point that consumers are becoming increasingly concerned about environmental and animal welfare issues and that there must be a much stronger dialogue between consumers, researchers and policy makers. New technologies should not be applied without first providing reliable information to the consumer and consumers must not feel that their views are thought of as unimportant.

Food scandals have often led to change in the food industry, such as the printing of the method of egg production on egg boxes after salmonella scandals. The decisions of consumers, therefore, are extremely important.

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DISCUSSION SESSION B

In the discussion that followed ‘Drivers of Food Demand and Market Today and Tomorrow’ a member of the audience asked what the speakers thought about the future of traditional food products considering that they are an important part of European culture, even the unhealthy ones. He asked Jean Martin if research should take these products into consideration.

Jean Martin replied that these products will hopefully have a big part to play in the future. ‘We have a unique heritage of food diversity and traditions in Europe,’ he said, adding that healthy eating was a question of balance. He agreed that we should not try to change traditional products through research, as there is a market for every type of food.

There was general agreement that what is important is the quality of the diet and educating people about what they are eating. Speakers hoped that local products will thrive and their consumption by educated consumers will grow. Edda Müller pointed out that one of the most promising developments is regionalising products, which means staying close to traditions and to certain landscapes. ‘Globalisation and huge companies are not in contradiction with regionalisation and they also have the possibility to help farmers go back to certain species of animal that will certainly be more expensive but that are very much related to the region,’ she said.

A member of the audience asked the speakers how we are going to match education to the development of science and technology and the fact that we have 23 years to put the Lisbon strategy into practice. There was agreement from the speakers that many Member States are not doing enough to educate consumers, and that initiatives should be taken at local levels by the media, given that it is a powerful tool for informing and educating.

A member of the audience commented that many of the speakers had talked of food being a pleasure, but asked what would be the implications for research on that?

Jean Martin replied that it is easy for manufacturers to reduce such things as salt and sugar to help promote healthy eating, but then those products often stay on the shelves because consumers won’t buy them. ‘It’s impossible to sell consumers something they don’t like the taste of,’ he said. ‘We need to come up with new products that are tasty.’

The point was also raised that there should be more research on the importance of taste in different cultures, and that in southern Europe people have no problem enjoying food and abundance, but that there is a different attitude in the north. A proposal for research on that topic was put forward.

The Conference Chair, Christian Patermann, said it was interesting that the discussion had included questions on the tradition and pleasure of food. They are not to do with technology and science, he said, but they are nevertheless important. ‘If we look at taste there are very hard topics for research in the future, for example ageing and taste. The sense of taste declines as we age, so when there’s a massive ageing in the population there will be a concomitant deterioration in the ability to taste.’

Christian Patermann also commented on the diversity of European diets and that this was an issue that nobody had mentioned. ‘There’s the Mediterranean diet, the Nordic diet, the Balkan diet, and we know very little on the diets of the ten new Member States,’ he said. ‘When I visited the Ukraine with my delegation recently, we were given very sweet and heavy wine which was what the Orthodox church used in central and western Europe. We wouldn’t drink that here because we have other tastes. They told us that dry wine isn’t their business, and why should it be? That’s the beauty of it. Taking traditional foods of hundreds of years ago with no pesticides and chemicals in them and modernising them is a possible trend for the future.’

The session was summed up by a general affirmation that what is needed is more science, more innovation and more investment and cooperation between public and private research bodies. Christian Patermann also made the point that perhaps we should consider learning from the past. ‘I’ve heard interesting things about the necessity of research to take



into account consumers' attitude to food at an early stage,' he said. 'We have had some optimistic views and we are confident that research will produce the food that we want to eat. But fundamentally the consumer always has the final word. The consumer is not always rational, but he is wise. Food for him means pleasure and I hope this will continue to 2030 and beyond.'

SESSION C



NEW TECHNOLOGIES FOR FOOD PRODUCTION

How will our food be produced in the future? Will functional foods and personalised nutrition become one of our main food choices? Science has a major role to play in the fight against many of the diseases prevalent in European society today, such as diabetes and cardiovascular and intestinal diseases. The genomics revolution may lead to such concepts as personalised nutrition and a much better knowledge of the effect that diet has on our health. Research into biotechnology may also lead to more sustainable food production and foods that are both tasty and healthy.



We need to improve the competitiveness of the European food production industry by encouraging food producers to make technological innovations. Thousands of food producers are SMEs, and many may be reluctant to innovate because of excessive costs and staff problems. But only by keeping up with technological innovation, will Europe be able to compete in tomorrow's highly competitive world markets. At the same time, our traditional food products are a very distinct part of Europe's food heritage, so we need a model of innovation that complements traditional food production methods.

Hand in hand with competitiveness comes sustainability. We need to find a balanced compromise between increasing competitiveness and sustainable development from an economical and environmental point of view. Cutting down on waste, reusing water and recycling are three of the most important ways that the food industry can help the environment in a society that is becoming increasingly conscious of environmental issues.



Charles Daly

FOOD, PLEASURE, HEALTH AND WELL-BEING

For thousands of years, food was a matter of survival, but after a long evolutionary period of more and more efficient and productive farming and manufacturing techniques we have finally arrived – in the developed world anyway – at a period of great affluence and abundance. We are now looking at such things as personalised nutrition, functional foods, an increased interest in organic products and ready-prepared convenience foods. Health and provenance are now top issues for consumers.

Many large food producers, niche markets and SMEs are responding to the new consumer interest in health by removing excessive amounts of salt, sugar and fat from their products.

But in terms of health, however, there are even more significant challenges for the food industry. Serious and life threatening diseases associated with lifestyle in western countries, such as obesity and diabetes, cardiovascular and intestinal diseases, are becoming more and more prevalent and are causing huge expenses to European health services. It is also in the interests of health insurers to encourage healthy eating and exercise. For the food industry, it is a major challenge and a big opportunity.

'We also have to emphasise the major role of science in understanding the issues involved,' said Professor Charles Daly from University College, Cork. 'There are complex scientific challenges we need to look at. What scientific strategies are

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available to us to shape the future of food? We have the chance to use major developments in the life sciences and genomics to help us shape our food industry.'

There is currently a revolution in genomics. The sequencing of the genome of humans, animals, plants and bacteria is a huge technological leap forward with enormous potential for human health and disease. Knowledge of the genomes is helping to uncover unprecedented information about the way our bodies react to food and medicines and this is a huge scientific challenge for the food industry. Producing foods based on an individual's genetic make up will be a development of this in the future.

The Sixth Framework Programme has brought together major scientists in this area and the Seventh Framework Programme will continue this by making research into the new technologies paramount. The scientific community is keen to harness these new techniques, and industry is now taking a significant interest in this area. A number of scientists have made alliances with companies that are active in developing personalised nutrition. Consumers in the future will expect to be able to make choices regarding their food. When they desire to, they will be able to select foods and diets with functionality and wellbeing aspects consistent with their lifestyle.

RESearch, NEW TECHNOLOGIES AND SUSTAINABLE PRODUCTION



With globalisation expanding, improving the competitiveness of the European food industry for the future is vital, and positive changes to face the challenges ahead are needed. The existence of a European processing industry of adequate scale and organisation, which is capable of investing in technology and innovation, is imperative if we want to maintain a European model of a multifunctional and sustainable agriculture.

In the past, European industry has often been seen as antagonistic towards European models of sustainable production, and technological research and innovation, likewise, have been regarded as incompatible with the production of traditional food products. There has been snobbery about traditional production methods of such high quality foods as Parma ham, for example. This attitude needs to change, as only respect for traditional food production methods, coupled with a willingness to innovate and take on board new technologies, will keep the European food industry competitive in world markets in the coming years.

Giving an example of food production methods in Italy, Luigi Pio Scordamaglia, Vice-President of the Italian Food Industries Federations, said: 'In Italy the food industry processes 70% of Italian agricultural production. Over 74% of sales are represented by traditional products. The second place is taken by new classic products, traditional but with greater service content.'

High production costs are a problem in a lot of countries, but innovation is one of the main ways that industry, with the support of public institutions, must develop to overcome. 'Two percent of turnover in the Italian food industry is devoted to food safety, quality control and applied research,' said Luigi Pio Scordamaglia. 'Nearly 24% of Italian companies say they don't devote any money to innovation, 34% innovate substantially, and the rest make improvements.'

So, what sort of changes are we likely to see in the next 20 years? Mainly that consumers will change, there will be an older population and there will be a new nutritional way of life with many more specific nutritional products on the market. It is in the long-term interest of both farmers and processors all over Europe to develop new, more efficient ways of producing food and producing the right food. Production will change and we need to increase plant automation, to ensure safe and ergonomic working conditions. Technological innovation is essential to establish the competitiveness of the products. The European food industry has an increasingly important role and it also has many responsibilities along with the other links in the production chain.



THE FUTURE OF FOOD PROCESSING

No balanced analysis of the food industry can take place without consideration of SMEs and the vital role they play in European food production. SMEs represent a significant part of the food industry, and their ability to innovate, update their technologies and participate in research and development programmes, is extremely important for the future.

Innovations tend to increase with the size of the firm, but the level of qualified personnel is more important for innovation. SMEs usually have limited resources in skilled staff knowledge; therefore their innovations are usually smaller than those of larger companies. There is significantly less help for the SMEs and they need help because one bottleneck in the production cycle could compromise the whole process.

There are many regional differences in Europe with regard to SME structure. In central Europe there is a low proportion of companies that have assigned responsibilities, while north-west Europe has the best figures and the Mediterranean is in the middle.

There are many areas of the food production cycle that need attention and development over the coming years. Things such as better understanding consumer behaviour and adapting existing production methods and approaches, along with exploring the use of techniques from other sectors, improving shelf life, developing training workshops, improving communications techniques, ensuring flexibility in the production process and creating a systematic approach for production lines. But new technologies and positive research results must be implemented by the industry if we want to see increased competitiveness and a lively marketplace.

There are also other innovations that the food industry needs to consider taking on board. For example, new technologies such as biotechnology and nanotechnology, the whole area of tailored food or personalised nutrition, the development of active and intelligent packaging. These are the areas the food industry needs to look at, but some of these areas are problematic. For example, we have a rapidly expanding and sophisticated complex knowledge, but this knowledge is not being matched at many levels by the staff at factory level. 'One of the changes we have seen in the last 20 to 30 years is the decline of specialist factory staff who properly understood the materials and understood when something went wrong,' said Dr Andras Sebők, General Manager of the food research association Campden & Chorleywood in Hungary, and board member of the European Technology Platform - Food for Life. 'Now, this overview has been lost.'

Other challenges for the future are how we can motivate SMEs to invest in the new technologies without specialist staff. The question of help and funding for SMEs is being looked at by the EC's new Seventh Framework Programme for Research, so that is a positive move forward, but equally important is that specialist research and technology providers need to be aware of problems in the industry. Consumer acceptance of new technologies also is an area that it is vital to explore if we want to look ahead in the next 20 years.



Andras Sebők

CONCEPTS FOR THE FACTORY OF THE FUTURE

There are many scenarios for the year 2030. They usually include the acceleration of global warming, the degradation of vegetation, water shortages affecting migration patterns, a fall in the quality of life. Others include energy shortages, big oil producers manipulating prices so that energy gets very expensive, much shorter supply chains because it is too expensive to transport food for long distances. Another might be that the consumer is king, the existence of high quality foods that some consumers can't afford, a much wider division between rich and poor. There will be much stronger competition for land use — a food, feed, fuel and fibre battle. But another could be much more positive: the public is



Thomas Ohlsson

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more aware of the benefits of good food and of inspecting how it is produced. Local production is dramatically growing and the integration of the food chain is very strong.

‘From these scenarios, what are the most important factors?’ said Professor Thomas Ohlsson from SIK, the Swedish Institute for Food & Biotechnology. ‘The scope of the agrifood industry is to take care of the primary products of harvest and slaughter and turn them into food products after cleaning, separation, packaging and storing. Although many of these products could be seen as commodities, we have a decommo-ditisation emerging.’

Decommoditisation in this case means fewer people involved in food production, more automation, process intensification, and many more customer specification products combining a number of unit operations into one, making the process more compact.

Production lines need to run more efficiently if the food industry wants to increase productivity, and they need to operate to top capacity. New technologies of modern processing systems need to be implemented, such as identification of raw materials by imaging analysis. There also needs to be a compromise between sustainable development from an economical and environmental point of view, as well as social responsibility, so all operators in the food production chain can sustain their economies.

We will also see a further development of the food industry to specialisation either as an agro food industry cleaning, separating and preserving the agricultural raw materials from harvesting and slaughter. This will be a highly automated, very rational processing industry. The products this part of the food industry manufactures will be used by what can be called the food assembly industry, operating very close to the consumers.. This is a highly flexible industry which manufactures products to be directly delivered to consumers, with largely varying products demands. Also here automation will be important but also the efficient use of raw materials and other resources will be very important to the success of the assembly industry.

There will be development of the bio-refinery approach to agrifood, noted Ohlsson. ‘Using perfectly good food for fuel as we do today is a real waste of good food.’ Energy also needs to be used much more efficiently, and water reuse and recycling are also important subjects for discussion and development. Factories of the next 20 years will be very different, with many more robots handling food products and much more flexibility towards consumers, who will drive production.



Bruce Lee

A WORLD PERSPECTIVE: THE FOOD FUTURES FLAGSHIP IN AUSTRALIA

One example of an initiative that is trying to transform the agrifood industry is the Food Futures Flagship in Australia, one of the Commonwealth Scientific and Industrial Research Organisation’s research bodies. One of its primary activities is trying to decommo-ditise grains to add product quality. Starches in grains have been looked at and a GM and a non-GM approach have both been used. There are huge potential health benefits from this type of research, as the benefits of low starches in grains is their lower GI (glycemic index). A low GI can help people with type 2 diabetes.

One of Food Futures Flagship’ achievements has been to map all the genes in amylose and amylopectin in wheat grains. RNAi knockout technology has been used to knock out the genes that are responsible for producing amylose and amylopectin. They found that by knocking out one of the branching

enzymes they could create wheat grains that had 75% amylose. They are continuing their studies with GM plans by adding value into oil seed grains. This could be a very important area of research as global fish stocks are being constantly depleted. There is also a huge demand for omega-3 fish oils. These polyunsaturated fatty acids bring many health benefits; it could be a productive area of research to look for alternative sources.

‘We don’t think we will get the backlash with these products that we received with the first product introductions here in Europe, because they have health benefits,’ said Dr Bruce Lee, Director of Food Futures Flagship. ‘We’re also looking at designing foods with low calorific intakes, so we can control food metabolism through active bioactives, but the major



approach we will be taking in the future is looking at controlling and designing foods via a structural approach.’ This type of research is very significant, given the worldwide obesity problem.

Bruce Lee also gave an example of the research that Food Futures Flagship is carrying out with the Australian wine industry, which is facing a major problem with only 40% of normal production because of the drought. A biosensor is being developed that can be applied to the wine industry and then to other sectors of the food industry. ‘Winemakers want to make wine that has a precise flavour and aroma specification,’ he said. At the moment that is largely a subjective measurement, and we are trying to turn that into an objective measurement. So we are using insects for that means and we’ve cloned out a number of the olfactory systems from insects. The idea is that we will be able to incorporate those odour receptors into the front end of an instrument that can quickly measure odour patterns in food and in wines.’

This kind of technology and research is leading the way in future food production and will become increasingly important in the next 20 to 30 years as the need to increase production to cope with swelling food demand intensifies.

DISCUSSION SESSION C

In the discussion on New Technologies for Food Production, a member of the audience asked Luigi Pio Scordamaglia and Charles Daly whether they had any foresight about the apportionment of EU foods in 2030, considering that the greater part of our food sources are located outside of the EU.

Luigi Pio Scordamaglia said that he thought it was very difficult to make forecasts for 2030 between input and European production, but that he wanted to do everything to maintain production. ‘This doesn’t mean we have to protect our markets, but we must explain to the consumer the added value of the producer, and we must understand that also.’ Charles Daly thought the food industry will continue to see a demand for organic and niche products.



A member of the audience asked Andras Sebők about his statements that there will be a lot of investment in new food technology, such as biotechnologies and nanotechnologies, but that there also needs to be more research into what consumers want, and that we need to invest more in making food production environmentally friendly. ‘When you look at consumer behaviour now it seems clear that they are not very interested in new technology,’ she said. ‘What they want is local, fresh, organic and processed foods. When you look at the widespread rejection of GM foods in the European markets and at the fact that the organic sector is the largest growing sector in Europe, I think it’s quite clear what consumers want. You also talked about the environment, but surely local organic sustainable farming is also what’s best for the environment?’

Andras Sebők replied that using the knowledge and techniques of the high-tech sector does not necessarily mean modifying or influencing the food itself, but can help to reassess the current processes. ‘There is a difference between the two’, he said.

It was agreed that the Australian approach is correct, as the Food Futures Flagship is explaining the advantages to the consumer and making information very accessible, so the consumer can choose.

Christian Patermann said he believed that consumers, in fact, are very much interested in technology, but they are mainly interested in price, quality and taste, and they don’t care very much about how these are being achieved. He pointed out one very important thing - that new technologies are not about modifying the food itself, but are attempts at better understanding the structures. ‘With better understanding,’ he said, ‘you might detect from the food the impact that it has on health. That’s very important and we must make that clear to people who are interested.’

It was also pointed out that other continents are moving ahead of Europe in terms of research in these areas, and that Japan, for example, is spending three to four times more than Europe on food research to try to get a better understanding of food via new technologies which might give them an advantage later on.

PERSPECTIVES FOR FOOD 2030

Christian Patermann then asked Bruce Lee to give the conference a little more detail on his concept of a model of de-commoditisation. Bruce Lee replied that Australia is losing value on the crop that it is producing each year. He said a number of factors have caused this, including new countries coming into the international markets and subsidies in other countries. 'We're losing 2% per annum in trading grains,' he told the audience. 'We're able to combat that by about 1.7% by plant breeding and other agronomic practices, so that leaves a gap of about 0.3% per annum, and it's that gap we're trying to address by coming up with niche products that can be sold, that add value both to the farmers and also downstream to the food processing area as well, developing new industries, such as aquafeeds, for example.'

A member of the audience agreed that we need to devote much more attention to research and communication information to the whole chain. He commented that a lot had been said about nutrition and wholesome food at the conference, but enquired what strategy the speakers thought Europe was going to take on cloning. 'This is something that has been done in several countries,' he said, 'but there doesn't seem to have been any real development and we don't seem to have a clear position on whether it should be developed or not.'

Bruce Lee replied that the only way to decide whether it should be developed is if clear benefits can be demonstrated to the consumer. This was why the Food Futures Flagship had chosen omega-3 fish oils, he said.

An audience member asked Charles Daly if he thought we will have the same developments in medicinal technology in 2030, adding that he believed we will never fully understand the functionality of food systems because molecular function is too complex. 'There are principles that we don't understand,' he said, 'but we can learn functionality which we can include in our food. Do you think in 2030 this will play a dominant role?'

Charles Daly replied that we have complexity at a human level in understanding both the human body and associated health and disease issues and we also have the complexities of the food system. He spoke of the accumulating information that within natural food systems there are a range of bioactives that have the potential to contribute very positively to health and that we have to understand the scientific basis as far as we can.



SESSION D



FUTURE PERCEPTIONS OF FOOD

Food is not just food: it's much more than a commodity, it is a service, it is something that has properties, such as traceability, it is something that gives pleasure. There are a lot of different aspects to food, such as economics, health, consumer trends, the environment, sustainable production. We want to know what the future trends are, such as developments in biotechnology and nanotechnology. Can these technologies help to create healthy, tasty and sustainable food in the future? Will they be accepted by consumers and become an established part of the food industry? What about movements such as Fairtrade? Will consumers increasingly want a share in helping to create a fairer world through the products they buy? What about accountability and the effect that food scares and scandals, such as BSE, have on consumers and their shopping habits? How can the food industry win back public trust after the food scares of the past few years? In what way is the food industry in Europe changing and representing different sectors?

THE FOUNDATION FOR A FAIRER SYSTEM?



Ian Bretman

Food is increasingly affordable in EU countries and this has created a very advantageous situation for European consumers and the food industry, but the reverse side of this situation means that the commodities that many people in the developing world rely on are decreasing by huge amounts. Many developing world farmers are earning the same for their products as they were 20 years ago, and that this has a negative effect on our aspirations to promote development.

'There are over three billion people in the world who are living on less than two dollars a day,' said Ian Bretman of the Fairtrade Foundation. 'When you read some of the bibles of globalisation, people say things such as isn't it great that India is no longer an agrarian peasant economy, it's a booming technology hub and so on. But that doesn't actually provide alternative opportunities for a semi-literate rice farmer. It may provide opportunities for his children, but that depends on his being able to send them to school.'

Organisations such as Fairtrade work on the principle that if you want to buy a particular product you pay a sustainable price to the person who produced it. This isn't necessarily a model for the whole of international trade, and many economists criticise companies such as Fairtrade, because they think of them as artificially subsidising farmers.

This is not true, Ian Bretman told the conference, pointing out that the Fairtrade scheme enables people, in a simple way, to give something back to the producer. 'When we tell children in a British school that the amount their family spends on chocolate in a year is the same that a cocoa farmer in West Africa has to feed his family on for a whole year, they see the issue we're asking them to think about and address.'

He also talked of the possibility of companies such as Fairtrade branching out into such things as functional foods, but said there were concerns about how a company with Fairtrade's ideals would engage with products that are more concerned with health and nutrition. Ian Bretman said he was optimistic that consumer support for Fairtrade would remain buoyant, even in tougher economic times. He also talked of other related issues, such as climate change, and said that consumers need to be made aware that there are no easy choices.

There was a discussion of business opportunities for organisations such as Fairtrade, which is providing opportunities for business at present. But how business would react if the company starts to look at sustainable in that don't provide direct business opportunities is another matter. There is also the question of regulation. Fairtrade has been working as a voluntary scheme up until now and although regulation provides more protection for the consumer, it also makes the whole system much more complicated and bureaucratic.

PERSPECTIVES FOR FOOD 2030

Ian Bretman said he hoped that the food industry of the future will be based around a broader set of values and a recognition that food is not just a business, but has an economic dimension, a social dimension, is crucial to health and nutrition and deserves a more holistic approach is necessary.

FOOD RISK COMMUNICATION 2030



Public trust in food regulators and industry is absolutely paramount if we want to understand how the possible risks and benefits of food will be communicated. There have been many food and public health scandals in Europe over the past few years — mad cow disease in the UK, dioxins in Belgian chicken feed, tainted blood in France — and these have left a strong impression in the public's mind, which is that politicians, scientists, doctors and the food industry are not to be trusted. The main aim now is to increase trust and confidence from the public.

Statistics across Europe have shown a continuing falling away of public trust towards politicians and policymakers, and this has led to a change in the making of regulations. The old model of regulation — which was highly elitist and consisted of meetings between heads of industry, politicians, scientists and senior union representatives - was accepted without question for generations, and the public was barely consulted.

Things have changed now. Because of low levels of public trust, a new model of regulation has had to be developed. The new model is based on greater public and stakeholder participation, greater use of precaution, greater social and environmental values and greater transparency. There is also much more accountability of the regulator. Scientists play a less important role in the new model of regulation, because scientific results are more and more under question.

The new model has various problems. For example, what part should science play in regulation? Should we work harder to bring back more public trust in scientists? There is also the fact that most policymakers and regulators don't really like the new model at all, because they don't want to share power. There are also new regulators, such as public watchdogs, the media and academics.

'I think the new model of regulation will stay,' said Professor Ragnar Löfstedt, Director of King's Centre of Risk Management, King's College London, UK, 'because the public and stakeholders won't accept that we go back to an old model. The public remains sceptical about GMOs in the UK and I think public scepticism will grow towards nanotechnology. The public in the US and Europe is ignorant about nanotechnology, and so is the media.'

So, what is likely to happen in the future? We may continue to see regulatory scandals and the aggressive media will remain, but the important thing is that research be carried out in the area of risk perception and communication, to address some of the basic problems of transparency. The new system is here to stay. 'The European Commission should fund risk and science communication training workshops for the small EU Member States,' said Ragnar Löfstedt. 'They should work with social scientists to develop media communication guidelines and support the establishment of a European academy of sciences. We need a strong scientific force in today's post-trust society.'



THE EUROPEAN BEVERAGE INDUSTRY OF THE FUTURE

Although the biggest part of the European beverage market is still dominated by traditional soft drinks, including sparkling and still soft drinks, juice drinks, juices, waters, teas and coffees and so on, the European beverage industry is on the verge of a revolution. We all need water from beverages, in addition to the water we get from our diet, and there is now a real emphasis on health in the industry and a wide range of products on the market that are concentrating on health.

The beverage industry is now seeing an upsurge of new products such as liquid meal replacements, rehydration drinks and sports drinks. There is also a revolution in packaging, with intelligent and interactive packaging being developed, and also such innovations as the bottle can and biodegradable packaging in the form of cups.



Mike Knowles

There is also a new move towards fortifying drinks with calcium or vitamins. Many products of this type have been on the market in the US for several years, and there has been a request by the Commission for many of them to be placed on the market in Europe. There are also multivitamin products such as fortified fruit juice on the market in the US. Calcium is extremely important there, and about 20% of the orange juice there is fortified. In Europe the figures for fortified juice are far lower.

‘There is a huge range of products on the market in Asia,’ said Dr Mike Knowles, Director of Scientific and Regulatory Affairs at Coca-Cola European Union Group. ‘Most of them are Japanese or Chinese, and they don’t go through the same rigour that we have to go through in Europe. Many of them represent an extension of traditional Chinese medicine, which is gaining popularity in the western world. A lot of research is taking place on the bioactive ingredients of common plants and more unusual plants that are traditional in Japan and China, but not so well known here.’

What will be the drivers of innovation in the drinks industry in 2030? We will understand more about how DNA works, there will be a huge advance in microarray screening of products, which will lead to increased computing power to allow almost handheld diagnosis. There’s going to be biotech developing, and more understanding of 20th century diseases through tremendous advances in medical science and biochemistry. Another area that is developing and will continue to do so in the drinks industry is partnerships, mergers and acquisitions with small niche suppliers, special research laboratories and big companies.

‘We will know much more about chronic diseases in the future and will be able to develop appropriate bio-markers,’ said Mike Knowles. ‘We will have to design our science to underpin whatever claim we want to make, be it a disease risk reduction claim or other enhanced function claims. The importance of bio-markers can’t be emphasised enough here. What we would like to see continuing through the Directorate-General for Research is the identification of appropriate bio-markers for different chronic diseases, not only important for the work summarised here but for epidemiology’



Remko Boom

THE POTENTIAL OF CONVERGING TECHNOLOGIES

Technology has a lot to contribute to the issue of food production. There are a lot of challenges in the food business at the moment, such as new food technology and new food processing, the challenge of feeding more mouths, the ageing population and preventive health care, which is vitally important as currently so much money is being drained from health services across Europe, for preventable illnesses such as obesity and other illnesses resulting from diet. There’s also the issue of sustainability, making full use of our raw materials so as not to deplete our agricultural resources too far. We are currently wasting too much energy and we need new technology to help us produce more food while using less fuel and water.

PERSPECTIVES FOR FOOD 2030

‘Luckily for all these challenges, I think there’s a lot of development that can help us with this,’ said Remko Boom, Head of Process Engineering at Wageningen University in The Netherlands. ‘We are talking a lot about genomics, which is giving us a better understanding of the molecular processes going on inside the cell and surrounding the cell when we eat food.’ Also related is the whole revolution in bioinformatics, where we can actually access huge amounts of data and build coherent models for our physiology.

There are other exciting new developments at the moment, such as functional imaging and MRI ultrasound imaging, where we can actually visualise what is happening with the ingredients in our foods during consumption. With all these and more developments we get a better insight into our foods, metabolism and health.

The question though, is what do we do with these new technologies to make the most of them? Remko Boom made the point that the food industry has put a lot of effort into producing products that make the best use of the positive effects found in specific products. The functional foods area is a very important development for the future, and people are choosing these foods because they are developed on both taste and health specifications, whereas foods that are healthy are often not optimised on taste.

New technologies could perhaps be used to create a better concurrence of health and taste. Technologies such as micro-technology and nanotechnology may be of benefit for more sustainable production of food and improving the taste of products in the area of producing ingredients, which can be pure and of better quality and can be produced with much less energy and no chemicals. The best way to do this is by using microsieves which are membranes produced on a silicon wafer.

‘For example,’ said Remko Boom, ‘mayonnaise is a concentrated dispersion of tiny oil droplets in water stabilised with egg yolk. It’s not very good for you if you eat a lot of it because of all the oil, but it tastes nice. If you want to enhance the product to make it healthier you could cut down the oil and add a thickening agent, but then it would be a different product, which is not what we want. So what if we could keep the same amount of droplets for the same consistency, and replaced most of the oil with water? We can’t do that with current technology, but we can with microtechnology. If we can do this then we can go further.’

Using these new technologies could give far more choice and diversity to the consumer, and at the same time the total supply chain could be simpler. This is just one of the technology approaches for the future. The exciting developments in fields such as microtechnologies and nanotechnologies need to be steered in the right direction for more sustainable and very tasty and healthy food.



Karl Almås

THE FUTURE OF FISHING IN EUROPE

Fish production will have to increase over the coming years if we want to continue our present high levels of consumption. The catch of wild fish is flattening out, so fish farming will intensify as the main fish production method.

There are many difficulties with potentially expanding the fish industry. For example, most of this fish will be produced in Asian waters, and will then have to be transported to other markets. There is also a conflict about land and water limitations, and about whether to use land for agricultural or fish production. In Asia there’s little land available for fish production. At present most aquaculture fish are produced from fresh water, but in the future this will probably change. There will probably be an expansion of land-based aquaculture, but this may be limited. What’s really needed is aquaculture expansion in the marine environment.

We have to come up with new ways of sustaining this huge increase in fish production too. Much farmed salmon is being fed fishmeal at the moment, and alternative ways of providing feed must be developed soon. We may have to look at new technologies such as biotechnology in the future to provide enough feed for intensified fish production. Much greater investment is needed if we want to expand aquaculture sufficiently for future demand. With more investment, aquaculture in the open sea can probably be expanded much further. This is already being done in some places; Asia and the US have established a legal basis for offshore aquaculture and there’s a worldwide potential for expanding this.



‘There are important environmental factors too,’ said Dr Karl Almås, President of SINTEF Fisheries and Aquaculture in Norway. ‘If you go into a fish restaurant in southern California today there will be a red list on your table of what fish you should avoid, and a green list of what it’s okay to have. If you look at the production of the more important aquaculture species today, you will find them on the red list. We have to move to the green list.’

Reducing energy costs is an important aspect. We also need to consider the well-being of the fish. ‘Decommoditisation is also happening,’ said Karl Almås. ‘In Norway we have been exporting dried fish for 1000 years, but in the last 10 years the buyers in the market want dried fish prepared more easily for making dishes such as bakalao. So things are changing even in the most conservative products.’

Europe can be part of the new fish farming methods and can contribute to increased production in the future. It is in the lead with new technology for future sustainability and cost-effective production. Europe must take advantage of the new business opportunities for the European food and feed industries and also for the producers. This is an issue of global importance and Europe must take the lead and focus on sustainability if it wants to have a good supply of fish in 2030.

DISCUSSION SESSION D

A conference viewer asked via webstream if the conference speakers thought that consideration must be given to the catering industry, its significance and its role in the future.

Chair Christian Patermann answered that quite a bit of research is already being done on catering, at a European and national level and that it is an important trend to take catering out of the home. Speakers agreed that many new technologies will probably be implemented in catering services first, because there is much more flexibility in the type of products able to be made, and that the investment for such products would be much easier to handle in a catering company than in a private home.



A member of the audience then made the point that although the consumer always makes the final choice he or she can still end up with a totally unbalanced diet. He asked if there was any scientific programme foreseen, that looks specifically at food consumers’ decision-making, using a truly interdisciplinary research approach.

There was agreement from speakers that consumers are already overwhelmed with information, most of it from the media, even if this isn’t always accurate. So, with all this information available why aren’t consumers changing their eating habits, even though there’s more than an adequate food supply to provide a varied balanced diet. More work needs to be carried out on consumer behavior, it was agreed, along with the input of scientists from disciplines such as social sciences and psychology, to help us with this very important area. Christian Patermann said that the European Commission, is preparing for interesting topics on this in its call for proposals in the first two or three calls for the new framework programme, with cognitive sciences in particular playing an increasing role.

An audience member said that preparing food at home is increasingly seen as an unpopular chore and asked what the Commission should do to make preparing food at home more attractive. For example, should it make sure children learn at least basic cooking skills even if their parents are reluctant to teach them, or is this not a policy goal as we are all supposed to be eating functional factory foods in the future?

The Chair replied that the EC did not want to start poking its nose into people’s houses and tell them what to eat and cook. ‘I think that’s something the family must do themselves,’ he said. ‘I would very much welcome stronger home cooking as I benefited very much from that when I was a boy.’

An audience member asked how far we will be with cell cultures in 2030, considering that the demand for meat is steadily growing. There was general agreement that at the present time the efficiency of providing meat substitutes is still extremely low, but that in the next decades there may be significant strides towards it.

PERSPECTIVES FOR FOOD 2030

Mike Knowles mentioned the meat protein called Quorn. 'This is a commercial fermentation product which isn't sold as a meat substitute, and it also has fibre, so it has additional health characteristics over conventional meat protein,' he said. 'I'm not suggesting that it should be substituted for meat but it is an interesting type of material, and there may be other similar substances that are waiting to be discovered. It's an open field.'

An audience member asked Remko Boom about research and the application of converging technologies to food, saying that these require a certain investment. 'As we have heard during the conference, an enormous part of the food industry is represented by SMEs, so how do you think these small companies can be involved in these kinds of activities in the future, because they often don't have access or the capacity to do this?' he said.

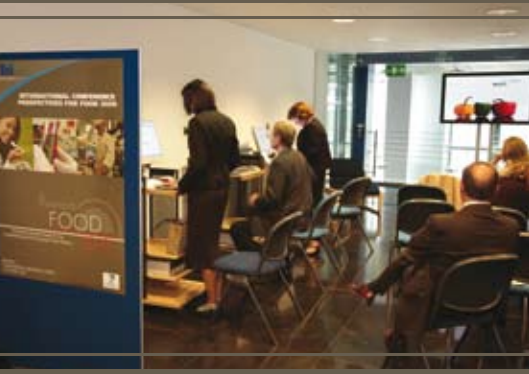
Remko Boom agreed that it is important to incorporate SMEs in the process of this innovation. In principle, they would also have the most to gain, because if they make a successful product they have a niche market for themselves, and that would give them the possibility to become larger. At the moment this type of research is sponsored by a large company together with a number of small SMEs which provide the technology. So the SMEs there seem to have a clear role at the moment. But he did see a lack of possibilities for SMEs in the production of the end product. 'We are trying to engage in the process of innovation there,' he said, 'but it's difficult and I think something could be done to make it easier for SMEs - perhaps opening up research institutes and universities so they can more easily access the knowledge that is available there.'

The Chair made some concluding remarks on this section of the conference, saying that our future perceptions of food are very probably a mirror of the relevant societies, and that this tends to be the case much more in food than in many other areas. 'If this is the case, then we must have to take into account in the future the complexities of the different societies, areas such as governments, areas such as transparencies, consumers, political directives. And notions like wellness and health will have a different meaning than in other areas,' he said. 'We need to develop new tools to cope with the uncertainties and possibilities of tomorrow. We are assessing the markets of the future with the tools of yesterday, and that is something we will have to work on which is not that easy.'

The point was made that we don't know at the present moment whether the current affordability of food today - buying whatever we want from wherever it comes and whenever we want it — will continue. 'When I listen to the many remarks the speakers at this conference have made about increasing demands, increasing uncertainty, increasing prices of the surrounding areas, said the Chair, 'I realise that we will have to watch this closely and the only thing we can make a prediction on is that we will have a rising customised food demand with more customised consumers than before, for example in the areas of ageing, hospital food, children, ethnic minorities and so on.'

A growing trend for customised food will lead to a more specified differentiated demand which will also probably have different price levels, and this might lead to other important trends which are unclear at the moment. One of the most important points during the conference was repeated over and over again: that well educated people working in the food industry will give Europe a chance to get a comparative advantage over other continents in competitive areas.

The Chair's last point was that the future food chain might be a very different food chain to the one we know today. 'I don't know yet how and why, but that is my feeling,' he said. 'It might have a different nature, a different quality, and my feeling on that is backed up by the variety of different views and predictions we have heard, from decommodification to customised consumers, but we have to be aware of this and prepared for it.'



Conclusion

Many topics came under scrutiny in the conference; among them the changing preferences of consumers, the changing role of agriculture, the need for innovation to make food production swifter, more efficient and more cost-effective, the need to support research into new technologies such as nanotechnology and biotechnology, the current low levels of investment in research and development, the role of the SMEs and the role of regulation.

The main conclusion that emerged from the conference is undoubtedly that the European food industry has to change if it wants to remain an important player in our increasingly competitive world markets. These changes must take many different forms. For example, consumer habits and behaviour have changed greatly in the last 20 to 30 years. The way that consumers shopped in the 1960s and 1970s is very different from today. These days consumers are far more concerned with the provenance of a product – whether it has been organically produced, whether the packaging is biodegradable, the issue of animal welfare, and so on. Vegetarianism has been growing in popularity for many years and it looks as if this trend will continue. Consumer interest in buying organic, sustainable and humanely produced food also looks like a trend that will gain momentum over the next 20 years. This has partly been driven by the food scares of the past few years, such as BSE, which have had a strong effect on consumer buying patterns. This is something that the food industry needs to be aware of. Consumers will always be the driving force in the food industry, and manufacturers, farmers and retailers must listen to them and be aware of new food and health trends, and prepared to act on them if they want to flourish and stay competitive over the next 20 years.

Another consumer concern is the environment and sustainability. In the coming years there will be an increasing emphasis on sustainable production and consumers will be asking more questions about how their food is produced and what effect it is having on the environment. The food industry has to be prepared to show it is doing its share in helping to support producers of environmentally friendly food products. Labels such as Fairtrade will also probably multiply as people become more aware of the unfairness of markets that keep developing country food producers on subsistence levels of income, although willingness to pay more to help a developing country producer have a fairer price for his goods, may be dependent on a continuing high level of western affluence.

Away from the environmental issues, consumer preferences are changing in other ways too. The nuclear family, the common pattern up until the 1970s, is changing, and will probably continue to change. Many more people are living alone, we tend to eat out much more frequently than we used to, and takeaway foods are easily available outside the home. All these factors have changed our eating patterns. The amount of money we spend on food to cook at home has declined, while money spent on eating out has increased. Also, in terms of packaging and processing there is a trend towards single portions of prepackaged food.

If we want consumers to have a more positive attitude towards the new technologies, such as biotechnology and nanotechnology, which have the possibility to bring great benefits, we need to make sure they have more knowledge and information instead of media scare stories about “Frankenfoods”, which create backlashes against technologies that are not yet properly understood. Secondly, the food industry must have an ongoing dialogue with consumers so they feel that their fears and concerns are heard, and so there is a high level of trust between the consumer, scientists and the food industry. Public trust in science has declined over the past 30 years, partly due to food scares, and this trust needs to be brought back if we want new scientific technologies to play the positive and productive role in future food production that they may be capable of.

Another very important point raised by the conference was that the role of research and development needs to be much stronger and much more money needs to be invested in this area. High quality and healthy food products can be produced using new technologies, and this is an area that Europe must be willing to fund. New types of functional foods will be developed, and areas such as personalised nutrition and functional foods are likely to be an important part of the future food industry.

Areas of research such as studies of DNA, the mapping of the genome and the knowledge based bio-economy are offering very good opportunities for young scientists and may contribute to economic growth, employment and sustainable development. Deepening knowledge of genomes is helping us to uncover more about the impact that diet can have on health. This type of research may lead to specific functional foods and personalised diets based on a person’s genetic make-up, and this will be a whole new area for the food industry to develop. It could also have an important effect on many types of disease. Furthermore, advances in science and technology may help to reconcile natural resource management and concern for the



environment with more growth and employment. At present, Europe is falling behind in researching new technologies, partly due to lack of funding, and partly to public hostility about the benefits they can potentially bring. One important thing we can do is to make working in the science field more remunerative. Many good scientists are choosing to work in the US because the financial rewards are better. Europe also needs to educate consumers about these new technologies, and the European Commission's Seventh Framework Programme, the world's biggest programme to fund and promote European research and technological development, is a very positive move in this direction.

One of the difficulties with encouraging innovation is that the food and drink industry is mostly made up of SMEs that between them employ nearly four million people. They are a highly significant part of the food industry, and more needs to be done to encourage them to innovate and employ highly skilled and trained staff. SMEs are often reluctant to train staff, make innovations or carry out research and development projects, because of the costs involved. But Europe won't be able to compete in the markets of tomorrow if it doesn't keep up with technology and innovation. SMEs need to be motivated to invest in new technologies and to hire skilled staff or develop staff training programmes. One speaker at the conference talked of the possibility of opening research institutes and universities, to give SMEs access to the knowledge they need to train, innovate and become more productive and competitive. The Seventh Framework Programme is making a positive contribution to this situation by providing SMEs with more funding for research projects.

The European food industry needs to be clever and energetic if it wants to get ahead in the coming challenging years. It needs to learn how to blend technological innovations with traditional food production, be able to satisfy both mass production and niche markets, eliminate waste as far as possible and look for environmentally friendly ways and methods of production as much as possible. The food industry also needs other incentives to reach its goals of being more competitive and innovative. For instance, it needs to find new ways of investing in research and technology. Encouraging private investors to invest in new technologies and creating a simpler regulatory system are the best ways to increase European competitiveness. Many manufacturers complain of the European regulatory system, and heavy legislation placed on manufacturers decreases their motivation to innovate. This is another reason that Europe is lagging behind other parts of the world. Food regulations take much less time to pass in the US than Europe. Perhaps more flexibility in this area in the future will create a more stimulating commercial environment that encourages innovation and competitiveness.

Finally, there was a plea from many speakers in this conference for more education. Better educated consumers can make wiser food choices, and the cornerstone of change and development is a high level of education, both for consumers and the people who work in the food industry.



Final Remarks



Mariann Fischer Boel

Before the conference ended, an overview was given by Mariann Fischer Boel, the EU's Commissioner for Agriculture and Rural Development, and José Manuel Silva Rodríguez, Director General of the European Commission Directorate-General for Research.

Mariann Fischer Boel spoke of the challenge to the food industry right from the top of the food chain. 'Go into any medium-sized supermarket in a prosperous country,' she said, 'and you will see a bewildering range of products. One carton of fruit juice will cost EUR 1.50 and another will cost EUR 3.50. And the fact is that the consumer will often buy the more expensive one. The market for high quality food is a clear reality in the EU.'

She touched on the situation of farmers at the present time and how they must embrace changes, saying that knowledge and new technology were their allies. She also made the point that farmers must produce the things people want to buy if they want to stay in business and be prosperous in the years to come. 'For many years the Common Agricultural Policy (CAP) was based on price support. So when the market wanted less of a given product, the mechanisms of the CAP would come into play to support a falling price, and farmers would carry on producing that same commodity. But this influence is falling dramatically now.'

The point was made that farmers must produce their products in the right way as buyers today are very concerned with the provenance of a product, and they want to know much more about how it arrived in their supermarket. People want to know that as far as possible the process of growing and producing their food was not harmful to the world around them. This is very important, but it represents a considerable challenge for farmers and food producers who are also trying to make money.

Farmers used to use natural methods of maximising yields, Mariann Fischer Boel said, until modern chemicals and pesticides came along, and now we are trying to recover some of the natural production methods that were lost - such as the movement towards organic farming and environmental campaigns. We now have to look at what the latest technology can do for us today. We are making huge gains and can continue to do so by using biotechnology, information technology, nanotechnology and robotics in an integrated way.

'We can now do things that no one would have imagined a few years ago,' said Mariann Fischer Boel. 'For example, in the air a satellite can detect which parts of a field of maize are becoming too yellow, and a robot on the ground can be guided by the satellite to apply fertiliser in just the right place. Using this technology we can make farming both more efficient and more environmentally friendly.'

The Commissioner concluded her speech by saying that the final important new challenge for European farmers is to understand clearly how they fit into the bigger economic picture. The food industry is a complicated business, but so are its economic workings. The agrifood industry must understand that, if it wants not only to stay in business but be prosperous in our emerging global economy.



José Manuel Silva Rodríguez then gave his concluding remarks.

He acknowledged the many contributions throughout the conference to a European vision of food for the future that is dynamic and competitive, as well as innovative, and which will help to create the necessary conditions for future prosperity, saying he believed that Perspectives for Food 2030 will help to stimulate new actions that pave the way for more research investments into the food industry, and at the same time be a call for more collaboration between the food chain actors, in promoting innovation linked to policy and regulation.

‘We have heard from many speakers that the European food sector has high standards for food quality, safety and sustainability,’ he said. ‘We have also identified some weaknesses of the European food sector: a low level of investment in research and development, low productivity, labour intensive production, a technical skills shortage, low levels of qualifications among workers and a drop in employment.’

He made the point that the European food and drinks market is faced with huge challenges today, such as the liberalisation of trade, increased competition from opening markets and the ageing European population. But even so, he said, there are tremendous opportunities in the European food sector.



On the question of policy constraints, José Manuel Silva Rodríguez was sympathetic to the often burdensome legislation in the food sector. However, he said, he believed that legislation can also help in creating lead markets and new opportunities. ‘We have heard positive experiences on new ways forward, such as new ways of investing. It also seems clear from the debate that the success of the European food sector will be closely dependent on innovation. This is where we can differentiate ourselves from global competition. The availability of new technologies, such as GMOs, nanotechnology and biotechnology are all being supported by EU research.’

He also spoke of the massive problems in Europe today because of poor diet, and of the challenges posed by consumer demand for new products that are convenient, healthy, organic and sustainably produced. The DG is supporting the investigation of new dietary strategies, the development of nutrigenomics and systems biology and the study of the interactions between nutrition, physiological and psychological functions. The responses of individuals to food compounds using post-genomic and related technologies aim to explore personalised nutrition, and contribute to the increased markets for target groups with specific needs.

José Manuel Silva Rodríguez concluded that the conference provided very good feedback from industry stakeholders and excellent inspiration from the speakers on identifying necessary future actions in the quest for healthier and safer food, produced in a competitive yet sustainable way. He finally thanked the Commissioners, the audience and the Commission services for their contributions, wishing that the Conference brought a new step in the food chain research.

PERSPECTIVES FOR FOOD 2030

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www.ec.europa.eu/research/conferences/2007/food2030

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www.ec.europa.eu/research

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www.cordis.europa.eu

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The Seventh Framework Programme for research and technological development (FP7) is the European Union's chief instrument for funding research over the period 2007 to 2013.
www.cordis.europa.eu/fp7

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www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/00100-r1.eno.htm

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www.ec.europa.eu/growthandjobs/pdf/COM2005_024_en.pdf

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