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INSTITUTIONAL AND SCIENTIFIC CO-OPERATION, NETWORKING AND CAPACITY BUILDING IN THE FIELD OF FOOD SAFETY AND QUALITY

Hungary and The Netherlands

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Overview

This paper explains the situation in Hungary and The Netherlands regarding scientific co-operation, networking and capacity building in the field of food quality and safety. Specific details are given about institutional co-operation including exchanges between staff and students, collaborative projects in policy and science advancement, institutional and scientific networking projects and capacity building. Within a dynamic and fragile marketplace, with ever changing consumer expectations, the implications and application of a Pan-European approach to further scientific co-operation in food safety and quality are raised by this example.

1. Introduction

Scientific collaboration in the field of food safety and quality within Europe has been well established between Hungary and The Netherlands over the past twenty years. There are several dimensions to this co-operation, which are increasingly important for scientific

research and technological developments and their application to food policy, within the European region and beyond. As enlargement of the European Union progresses and trade between all countries in the region expands to meet the needs of more discerning and critical consumers, food producers (and the scientific and policy makers that they depend upon) are presented with challenges that are increasingly difficult to meet in isolation. Food safety and quality issues are complex and extend beyond national boundaries. Strategies to increase scientific co-operation, networking and capacity building that contribute to harmonised food safety policies, innovation and technological developments provide the foundation for efficient delivery of safe quality food and the effective operation of competitive markets within the European region.

2. Institutional and scientific co-operation

Co-operation in the field of food safety, food quality and agricultural matters has been established and institutionalised between Hungarian and Dutch institutions, in particular with the Wageningen University and Research Centre (WUR). From the eighties onwards four Memoranda of Understanding (MoU) on co-operation have been agreed between Hungarian institutions and Wageningen. One particular example has been the exchange of students, and scientific and lecturing staff, between institutions in both countries.

There has also been extensive collaboration, for example, in the field of integrated and biological pest management, initially between Wageningen and a research institute and the Ministry of Agriculture, followed by agricultural and horticultural universities. A project to place plant protection education on a more progressive footing firstly involved the BSc, later the MSc and finally PhD level. Presently there is ongoing research co-operation between Wageningen and various Hungarian Universities and research institutes in biological and integrated pest control with exchanges of staff and students, as well as a joint research effort.

Another form of co-operation is the project on the tracking and tracing of food-producing animals. The Netherlands is taking a leading role in livestock production technology. WUR has a prominent role in this field[1] particularly in the co-operation and development of an identification and registration system for beef and dairy cattle, and pigs. A Wageningen institute is the main contractor while other Dutch government services and a private enterprise also participate. Overall responsibility lies with a Hungarian national institute. This project aims to strengthen the Hungarian beef cattle and pig chain through operation of an identification and registration (I&R) system according to EU regulations, facilitating co-operation between Dutch and Hungarian governments, NGOs and enterprises. The funding ministry is the Dutch Ministry for Economic Affairs, which deals with this type of pre-accession activity.

Co-operation in food safety and quality also exists between Dutch and Hungarian institutions (Agricultural University, Dept. of Industrial Microbiology, ATO-DLO Agricultural Research Dept., RIKILT, Wageningen and Central Food Research Institute, Budapest etc.). Joint research work covers projects in fermentation technologies, investigation of enzymes, development and application of new analytical and microbiological methods as well as preparatory work on food chain management.

[1]. WUR is heavily involved in the tracking and tracing activities, it provides the Chairperson of the International Working Group on Tracking and Tracing, it is a member of the Groupe d'Identification Electronique des animaux (IdEA), and is involved in ICAR, an institution which serves as a test-house for zoonoses.

In addition, Hungarian researchers and other professionals have attended a variety of specific courses in Wageningen, and visiting experts have worked in various research institutes. Details of participation in courses and involvement in research programmes are given in Appendix 1. Funds for these activities came from the EU's 'Tempus Phare' programme, in which several EU Member States scientific organisations co-operate with those of Central and Eastern European countries.

Within the EU's 'Socrates' and 'Erasmus' programmes funds became available for student exchanges in various disciplines; for instance, in a fish culture project involving 15 students and co-operation on the curricula of the MSc course. Presently exchange programmes exist with seven universities. Plans for 2001/2 and 2002/3 foresee extended exchange periods for students from Hungary to Wageningen and from Wageningen to Hungary, concerning animal nutrition, horticultural and agricultural sciences, farm management, meteorology and water related fields.[2] An interesting further development is the East-West-South co-operation that takes place in a project with Vietnam on fish culture, which is sponsored by the Dutch Ministry for Development Co-operation.

From these experiences of institutional co-operation the following can be concluded:

(i) to establish good co-operation between institutions, the signing of a Memorandum of Understanding is not enough. In the MoU reference to funds available (or that can be raised) needs to be included to enable activities to be undertaken. MoUs without financial contingencies are not viable.

(ii) People undertaking exchanged programmes need to have a good command of a mutually understood language.

Similar types of co-operation have occurred between Wageningen and other Central and Eastern European countries. Some co-opertation has been less intensive, but it has the potential for further development.

It appears that an increasing variety of national, regional or international programmes are becoming available to finance various forms of co-operation: particularly attractive are forms of co-operation that involve institutions from several countries. Various EU programmes have encouraged further co-operation between institutions in an extended number of countries.

Institutional co-operation based on clearly defined MoU offers a positive model for developing and extending scientific knowledge and collaboration. Extension of this type of co-operation to involve institutions and countries on a Pan-European basis offers great potential in the fields of food safety and quality.

3 Pan-European co-operation in policy and science advancement

3.1 The current situation

Effective food safety policy must recognise the inter-linked nature of an increasingly complex food production chain. This requires assessment and monitoring of the risks to consumers' health associated with raw materials, farming practices and food processing activities; effective regulatory action to manage risks; and the establishment and operation of control systems to monitor and enforce the operation of these regulations. Each element forms a part of a cycle. Each part of the cycle must work to the highest possible food safety and quality standards, using

[2]. The work of SCOOP (Scientific Cooperation) should be noted. In this context European Union Member States work together in the field of food safety and quality.

a risk analysis approach, which must be enforced either by consumer demands in the market place or by official control measures.

These facts demand a comprehensive and integrated approach to food quality and safety. For example, EU legislation has to be enforced in an efficient way in the Member States, in line with the principle of Subsidiarity. Responsibility for enforcement above all should remain primarily a national, regional and local responsibility. However, the Internal Market means that these are not exclusively national responsibilities: each Member State has a duty for the food produced on its territory not only for its own citizens but all citizens of the EU and third countries.

3.2 New challenges and partnerships in an extended Europe

Recently, much attention has been paid to food chain management by researchers and business managers alike. In agribusiness for reasons of food-safety, environment, efficiency and technological innovations, partnerships in the supply chain are a widely accepted way of doing business. Based on the experiences of chain management, partnerships are aiming at optimising quality and safety. Networks, moreover, focus on getting access to new distribution channels or making products serving consumer needs. Furthermore, access to each other's knowledge can be a driving force for partnering. Flexibility of partnerships is a prerequisite in these cases.

Participating in network partnerships requires new knowledge, skills and attitudes. It is a challenge for all practitioners to work together to create knowledge, collaboratively, and to transform this knowledge into competitive competencies.

The European Union is preparing for enlargement of the European market with countries in Central and Eastern Europe. A functioning market economy has to exist as well as the capacity to cope with the pressure of competitive market forces within the Union. Many of the transitional economies in Central and Eastern Europe are extending their trading relationships with EU members further. In agribusiness, structural reforms will be necessary for these countries to come into line with developments in existing EU member states.

In an enlarged European market of more than 450 million consumers, the necessity for organisations to focus on their core business and to look for reliable partners will become even more important. Although much experience is already at hand, establishing chain networks comprising partners from Western, Central and Eastern Europe will require much effort. Exchanging knowledge and sharing experiences between representatives of public and private organisations can contribute to making such networks a success.

These tasks can't be implemented in isolation; institutional and scientific co-operation between countries is essential. The Dutch-Hungarian scientific co-operation is contributing to this international effort. From these experiences further projects can be initiated, involving more institutions from an extended Europe. Projects could be submitted to the EC for funding under its Sixth Framework Research Programme. Such co-operation and co-ordination ensure that the resources and management of research are more efficient at regional level, avoiding duplication of effort and enabling gaps to be filled.

The results of these partnership activities have proved that it is useful to deepen and extend this type of co-operation in food safety and quality improvement, since food safety and quality are inherently international. Scientific co-operation networks could be extended throughout the European region to address issues that could benefit from joint action. Policy

issues must be resolved to lay the foundation of harmonised rules and regulations at the regional level.

Existing co-operation concerning exchange of information and personnel between institutions can be extended by:

- generation, collection, processing and dissemination of authoritative information and data on public health, including disease surveillance
- sharing of experience on the evaluation of health
- encouraging more participation of countries in the work of Codex Alimentarius
- helping to establish the food safety policy in the co-operating countries
- enhancing awareness for the need of a precautionary approach within a risk analysis.

Research co-operation could also serve the information needs of decicion-makers for food law development in the European Union, with emphasis on the risk analysis process . It could also serve the need of the consumers by providing them with essential information, in a more user-friendly manner.

Examples of scientific co-operation in research and policy are included in Appendix 2.

Closer co-operation between scientific institutions of co-operating countries could contribute to improved activities and participation in the work of Codex Alimentarius.

These co-operation and partnership activities and their results will help to establish well-founded and harmonised Food Safety Policy in the co-operating countries and encourage the application of a risk analysis and precautionary approach. In this manner safer and better quality food products can be provided for consumers throughout the region.

4. Institutional and scientific networking projects

Food safety has become a major scientific and political issue, mainly due to recent incidents such as BSE, dioxin, mycotoxins and microbial contamination. Furthermore society has been faced with dilemmas related to the introduction of modern biotechnology.

The White Paper on Food Safety (COM (1999) 719 def.) extensively discussed ways to ensure the safety of food products and to restore consumer confidence. An essential element in this process (identified in the White Paper) is the formation of a European Food Authority (EFA). In agreement with this development the Dutch government has established the Dutch Food Authority (NVA). The State Institute for Quality Control of Agricultural products (RIKILT) is part of this new organisation.

To encounter some of the recent problems related to food safety, RIKILT has established two European networks:

- European network on safety assessment of genetically modified food crops (ENTRANSFOOD, www.entransfood.nl)
- European food safety network (EFSN, www.rikilt.dlo.nl/euprojects/efsn).

The most important element in both networks is the establishment of European platforms for communication between all stakeholders. However, the nature of both projects differs considerably.

4.1 European network on safety assessment of genetically modified food crops ENTRANSFOOD, www.entransfood.nl

Co-ordination:	RIKILT (Dr. H.A. Kuiper), Wageningen, The Netherlands
Duration:	1999-2002
Number of Participants:	more than 30 research organisations or universities, industries or consumer organisations from 13 EU member states.
Finance:	European Commission Fifth Framework Programme (FP5)
Contract no.:	QLK1-1999-01182

4.1.1 Scope of ENTRANSFOOD

ENTRANSFOOD brings together experts on genetically modification of food crops from academia, food safety research, transgenic plant production companies/plant growers, regulatory authorities, food retailers and consumer groups. Within ENTRANSFOOD four *Working Groups*[3] have been formed to review and evaluate relevant aspects of safety evaluation, risk management and risk communication regarding genetically modified foods and food ingredients.

- Working Group 1 Safety Testing of Transgenic Foods
- Working Group 2 Detection of Unintended Effects
- Working Group 3 Gene Transfer
- Working Group 4 Traceability and Quality Assurance

Working groups meet regularly to prepare position papers that will be discussed further and integrated into position documents by the *Integrated Discussion Platform*, consisting of members of all the working groups, invited experts from academia, industry, regulatory organisations and consumer groups. Two meetings of the Integrated Discussion Platform will be organised. At the final Workshop conclusions and recommendations will be prepared. Specific issues that ENTRANSFOOD deals with are given in Appendix 3.

The Network co-ordinates research activities with respect to:

- joint work planning
- joint production and characterisation of test materials
- exchange of samples between the projects for specific testing
- common use of test facilities
- exchange of research personnel
- exchange of results
- training of young scientists.

4.1.2 Dissemination

Dissemination of results is important for several reasons: to inform the European biotech-industry, scientific community, regulatory authorities and consumers; to facilitate information exchange between scientists of different research disciplines involved in genetic modification of organisms (GMO) research; to stimulate a discussion between scientists, industry, regulators, consumer groups and consumers.

[3] Members of the Groups are experts from different scientific and socio-economic disciplines and co-ordinators of 4 new Research and Technological Development (RTD) projects funded in the framework of FP5:
1. SAFOTEST (QLRT-1999-00651)
2. GMOCARE (QLRT-1999-00765)
3. GMOBILITY (QLRT-1999-00527)
4. QPCRGMOFOOD (QLRT-1999-01301)

Dissemination methods include use of:
- scientific publications
- popular publications (newspapers, non-scientific magazines, TV)
- press releases
- newsletters
- review and position papers
- flyers
- Internet homepage, including links to related sites.

4.2 European Food Safety Network (EFSN)

Co-ordination:	RIKILT (Dr. H.A. Kuiper and Dr. H.J.P. Marvin), and RIVM (Dr. F.X.R. van Leeuwen), The Netherlands
Duration:	1999 onwards
Number of Participants:	Government-related research organisation, 12 EU member states
Funds:	currently none

4.2.1 Scope of EFSN

EFSN will facilitate the exchange of information and the development of joint activities among its members, concerning:
- general food safety research,
- research and development for control purposes,
- safety assessment procedures for advice and registration purposes
- the whole feed and food chain.

One of the primary goals is the establishment of a database with information on existing expertise and current research activities across Europe, with respect to food safety assessment. The Network intends to strengthen relationships between its members (in present and future EU member countries and other European countries) for their mutual benefit with respect to the identification of emerging risks and their adequate and efficient assessment.

EFSN hopes and expects to receive guidance from the future European Food Authority. It may provide useful supportive functions to this institution, based on scientific excellence and independence.

4.2.2 Membership of EFSN

Membership is open to all governmental-related institutes active in the field of food safety. Provisional criteria for such institutes include having an advisory function to public authorities and publicly funded research programmes.

The provisional list of participants includes:
- RIKILT (co-ordination, the Netherlands)
- Centre for Substances & Risk Assessment RIVM (co-ordination, the Netherlands)
- Graz University of Technology / Institute of Food Chemistry (Austria)
- Cabinet of the Minister of Public Health (Belgium)
- Min. van Volksgezondheid-Algemene Eetwareninspectie (Belgium)
- EU commission: Joint Research Centre (Belgium)
- ISP-Ministry of Health (Belgium)

- Danish Veterinary and Food Administration / Institute of Food Safety and Toxicology (Denmark)
- AFSSA - The French Agency for Food Safety (France)
- INRA-Scientific Directorate for Human Nutrition and Food Safety (France)
- EELA-National Veterinary and Food Research Institute (Finland)
- Bundesinstitut für gesundheitlichen Verbraucherschutz und Veterinärmedizin BGVV (Germany)
- State Laboratory (Ireland)
- TEAGASC- The National Food Centre (Ireland)
- European Commission / DG Joint Research Centre: Institute for Health and Consumer Protection; Food Products and Consumer Goods Unit (Italy)
- Institute Sup. Technology IST (Portugal)
- Institute of Food Research (United kingdom)
- MAFF- Central Science Laboratory (United Kingdom)

The challenges for EFSN in the coming years are to increase the number of members, development of an early warning system using the existing national monitoring databanks and, to establish open communication between all members, in all European countries. EFNS currently seeks contacts with countries in Central and Eastern Europe that are in negotiations with the European Union. Ideally, the network should operate globally.

Projects such as ENTRANSFOOD and EFSN could be extended to permanent platforms for networking and interaction, with the establishment of associated Centres of Excellence. Complex issues such as genetic modification and food safety and quality issues need this type of approach, which support and link directly to policy making. Appropriate funding (such as that proposed within the EC Sixth Framework Programme) needs to be secured.

The experience of operating in large international networks with all actors involved (research organisations, public organisations, consumer representatives, philosophers and industry) has been very positive. Open discussion and transparency has been appreciated, although shortcomings also have to be recognised.

5. Capacity Building and new approaches to education and training

5.1 Changing food markets

The market for food products in Europe has changed drastically in the last two decades: market saturation, demographic changes and consumer attitudes have all contributed. In addition, there is stronger competition in a more unified European market, and liberalisation of the world markets has extended the parameters further.

Consumer demands now play a predominant role in the development of new products and processes, often referred to as *chain reversal*. The way consumers perceive quality has changed: acceptation of a product no longer depends only on the quality of the product but also on the way in which it is produced. There is growing demand for convenience (ready to eat at every time in every place), healthy (functional foods), fresh foods, animal and environmental friendly products, improved sensorial qualities, new and ‘exotic’ products, and above all, safe foods. Consumers also expect a higher level of transparency and traceability in product composition and production.

The demands on food producers are more diverse than ever before. This challenges the European food industry to design and produce safe food products that are tuned to the rapidly changing demands and wishes of individual consumers in an enlarged Europe.

5.2 New technological opportunities

Technological possibilities in food production and processing have increased dramatically offering new opportunities for safe production of existing and new food products. In the past the main aim of new technologies was to achieve higher productivity, cost reduction and process reliability. Given the change towards a consumer-oriented approach, food quality, food safety and environmental demands are becoming determining factors.

Manufacturers actively seek innovative products and process, and technologies that can facilitate those developments. Conventional technologies will be replaced by more advanced ones (such as ultra high-pressure processing, high electric-field pulses, etc.). Thorough risk-assessment is needed before large-scale applications of all new technologies are possible. The development and introduction of advanced process control systems (sensors and robotics for example) will lead to more reliable, safe and/or flexible production lines. Advanced hygienic processing systems will become a prerequisite for future food processes.

5.3 Innovation in the food industry

New products (and or processes) are crucial to successful growth and increased profits for food manufacturers. In particular well-designed innovative products are essential. However, product development is a risky business and has become more complex because of increased consumer demands, and the increased scale of operation of many food companies. A consequence of these developments is that the widely adopted 'trial and error' approach ought to be replaced by more structured approaches based on new insights in innovation management.

Consumer preferences can be translated into technological product requirements throughout the production chain. An emerging concept in that respect is Quality Function Deployment. Advanced modelling techniques to describe product quality in relation to processing conditions are being developed. An important key to success is to bridge, in an innovative way, the gap between consumer demands or wishes and technological possibilities.

The future success of food manufacturers depends on the introduction of structured consumer oriented approaches for new product development meeting consumer demands.

5.4 Education and training

In the development in education and training in Food Science and Technology historically attention was paid mainly to products and commodities. However, it was soon realised that a more general approach based on scientific insights (a disciplinary approach, i.e. chemistry, microbiology, physics and process engineering) would be more fruitful. This approach has brought major advances in the understanding of properties of, and changes in, foods as a result of processing and composition. Food scientists are presently trained to reduce food-related problems to chemical, physical and microbiological problems.

Innovations in the food industry were (and probably still are) mainly based on a *technology push*, meaning that product development is based on an understanding of the food matrix and the technological possibilities. Nowadays, the trend is changing and we are facing a *market pull*, with changing consumer demands, food markets and technologies. Food marketing is no

longer based on supply but on demand. With an abundance of food, consumers are indicating the direction of new developments through changes in purchasing behaviour.

These changes imply that product and process design becomes much more important as consumer demands need to be translated in product properties (chain reversal). Food safety and quality can no longer be reduced to chemical or microbiological problems; rather a broader-based integrated approach is needed.

This is not to say that the disciplinary approach is no longer important, on the contrary, but it is not enough. Disciplinary knowledge needs to be integrated in the design process yet because of the complexity of foods this integration does not come naturally. A new approach is needed with respect to training of food technologists where integration is the key.

The interaction with the market, society and consumer is becoming increasingly important, as illustrated in Figure 1 below.

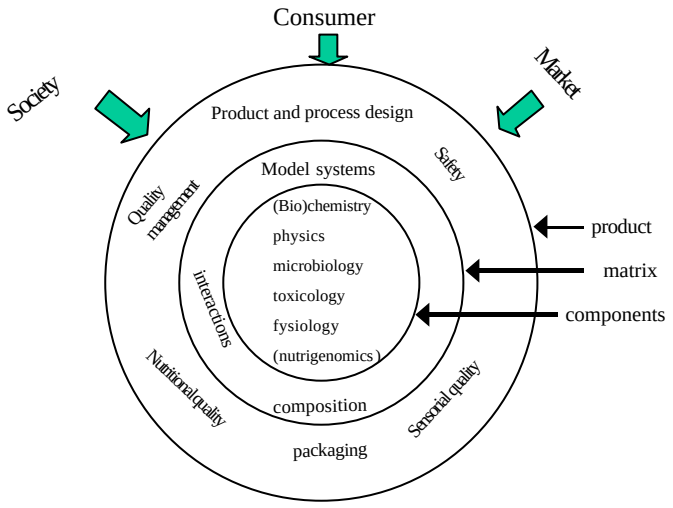

Figure 1: Interaction of societal, consumer and market influences on food product and process design.

Apart from the importance of the integrated design process, it becomes also increasingly important to critically assess the environment of food production. Because of the importance of food safety and quality in general, a so-called techno-managerial approach is needed. This implies that management systems need to take into account the special features of foods: quality managers need to be aware of typical food problems. One such a system is HACCP, now widely employed in food manufacture, but it is anticipated that even more sophisticated techno-managerial systems will be needed in the future. In any case, it is necessary to implant this techno-managerial approach within education and training programmes.

5.5 Capacity building challenges for process and product design

The ability to design food processes and products according to consumer wishes is of the utmost importance to meet the challenges that the European food industry faces.

Competencies needed include the capacities to:
- develop strategic product concepts based on consumer-oriented product development
- develop and use predictive models for food product design
- develop and use tools for structured product development
- develop and use new technologies to produce new products
- analyse and optimise the various elements in the food production chain via the chain reversal concept.

The key aspect is integration, both of conventional food science and technology disciplines and of socio-economic sciences.

5.6 Capacity building challenges for food safety and quality management

The ability to integrate technological and managerial knowledge is very important for food safety and quality design, control, improvement and assurance.

With a particular focus on food safety and quality the quality management skills needed are:
- the ability to apply the techno-managerial approach in food production processes
- the ability to develop and use models for (statistical) quality control
- problem solving skills
- communication skills, with a focus on stakeholders (governments, consumers, NGOs)
- ability to work in multidisciplinary teams
- ability to work in an international context

5.7 Capacity building options

Within in the context of food safety, food quality and trade aspects it is essential to consider all of these from the European perspective, especially with regard policy, risk assessment and scientific integration, for example, as proposed within the European Food Authority.

Further co-operation and capacity building is needed at all stages in the food quality and safety chain between all stakeholders, especially between governments, industries and consumer organisations, in order to reach a better level of European integration.

There are several options to enable and facilitate these objectives:
- organising workshops, seminars and conferences
- development of joint MSc programs focussed on food safety such as the present European MSc course in food sciences (website www.spb.wau.nl/euromscfood/)
- Postgraduate training programs, both for product and process design and safety and quality management
- executive courses/training programs for people working in the food industry
- implementation of distance learning concepts for group work, such as within the 'Global Seminar' (website www.global.cornell.edu/), where Cornell and Wageningen co-operate. Further development of this concept is very promising for future European capacity building.

6. Conclusion

This paper has explained the specific projects in Hungary and The Netherlands contributing to institutional and scientific co-operation, networking and capacity building in food safety and quality.

It is evident that recent developments in food safety and quality require closer Pan-European political and scientific co-operation in order to fulfil ever more demanding consumer expectations, throughout an extended European region.

Multi and bilateral scientific co-operation should be further encouraged in the European region. Financial support will be needed and could be provided by the European Commission, as well as by the national governments to secure the necessary scientific background for the continuous development of food quality and safety.

7. Recommendations

In order to fulfil consumer expectations regarding food safety and quality, for scientific co-operation and research and development, it has been recognised in both political and scientific spheres, that closer co-operation is necessary at the Pan-European level.

7.1 Pan-European networks for scientific and policy collaboration on food safety and quality issues could be established and extended further to ensure the efficient delivery of safe quality food and the effective operation of competitive markets throughout the European region.

7.2 Multilateral and bilateral scientific co-operation needs a secure financial basis to safeguard and promote continuous development and improvement in food quality and safety. Financial support could be sought from the European Commission, as well as national governments and other international organisations.

7.3 Structured consumer oriented approaches should be developed as a basis for success in future safe and good quality food manufacturing processes.

7.4 Capacity building programmes based on innovative approaches in education and food production should be established at all levels, graduate, post graduate, executive or distant learning education.

7.5 Networking on complex food safety and quality issues should be enhanced with the participation of all stakeholders, preferably on a Pan-European basis, with all European countries. Permanent network or discussion platforms and Centres of Excellence could be established. This could be a stepping stone to a global approach.

Appendix 1
Details of Exchange Programme Courses undertaken

Professionals from Hungary participated in the following courses at Wageningen: vegetable production (4), glass house crop production (2), rural extension (5), food processing (5) and protected cultivation (1). Furthermore 55 individuals were involved in various research programmes either in the university or in the research institutes/stations. Five stayed up to one month, 19 from 1-3 months, 22 from 3-6 months, 6 from 6-12 months and 3 for even a longer period. Of these 55, 29 were involved in research in production and/or pest management, 15 in food quality and safety related research and 11 in the other disciples of Wageningen UR such as environment, forestry, economics and agricultural engineering.

Appendix 2
Areas for Scientific Co-operation

Examples of scientific co-operation in research in food safety and quality could include:

- the assessment of quality and safety of food
- surveying and monitoring quality and safety for supply chain management
- development of a network of reference laboratories
- harmonisation of methods of analysis of the main sources of risk to consumer health
- development of new methods (biological, chemical, physical) for determination of hazards (e.g. GMO detection), as well as to determine the bio-availability of food compounds
- development and application of new technologies for ensuring the quality, safety and availability of food
- risk analysis, especially risk assessment and risk communication,
- food safety related to bio-interactions (e.g. allergenicity by GMO).

Appendix 3
Details of the ENTRANSFOOD project

ENTRANSFOOD will focus on the following issues related of genetically modified foods:

- Are current assessment strategies for GMOs adequate to establish their safety with respect to chronic exposure of humans and animals to respectively foods and feed products?
- Are there specific issues related to the nature of the technology applied, which deserve attention with respect to the safety assessment of GMOs, like the use of antibiotic resistance marker genes?
- Are current analytical and toxicological test methods of sufficient specificity and sensitivity to characterise hazards of newly expressed gene products, and to identify potential changes in the composition of GM-food crops as a result of genetic modification (so-called unintended effects?
- How can the safety testing of whole foods been improved and which alternative methods could be developed?
- Which detection methods should be applied to detect genetically modified food crops and food ingredients and which thresholds should be established?
- Are quality control systems based on administrative or other procedures sufficient in order to trace GMO materials throughout the food chain?
- Can supply systems be designed to guarantee “GMO-free” foods?
- How can transparency in risk assessment and risk management be improved, and which are the criteria to develop a strategy for proper risk communication?