



Concretization of a Swedish research strategy from the Swedish Food Federation (*Li*) perspective

A multitude of opportunities and challenges

Vision for 2020

The food industry plays a key role in Sweden's strive to create a sustainable society.

The food industry is a knowledge-driven sector of industry that meets customer- and consumer demands for safe, good, healthy, convenient and reasonably priced food products. The products are made from pure raw materials using environmentally sound processes that consumers have confidence in.

The research strategy of the Swedish Food Federation (Livsmedelsföretagen, *Li*) constitutes an effective tool by which industry is able to attain the set goals and thereby contributes to the strive to achieve economically, socially and environmentally sustainable development of the sector.

Through research and development initiatives undertaken cooperatively by industry, society and academia/researchers in research, successes have included:

- Slowing the development of food-related health problems in the population.
- Increasing the export of high quality and innovative food products.
- Strengthening Swedish research resources that focus on needs-driven research and development in the food sector.



Livsmedelsföretagen

Swedish Food Federation

Background

International development in the area of foods poses increasingly complex questions for food industry actors and heightens the demands on increased flexibility and the ability to change for the entire food production chain. The changes in international policy and economics of recent years, along with the vast increase in the global flow of goods, exposes the food sector to stiffer competition and stricter demands on being able to satisfy new, multifaceted wishes from customers and consumers.

How the food production chain is designed and developed – from farmer's field and fishing waters to the consumer's plate – is of instrumental importance for both the long-range sustainability of the ecosystem and opportunities for food companies to offer attractive and reasonably priced products.

Food and meals continue to play a central role in the interaction between people, and the composition and characteristics of food products have a decisive effect on consumers' health and well-being in the short- and long-term. In all instances, from a simple breakfast at home or quick lunch at the office, to large international banquets, the food and the meal are central. It is difficult to find another industrial sector that has such a profound effect on the everyday lives of all people.

In the presence of increasing global competition, the Swedish food sector is faced with the challenge of producing – and at lower cost – attractive and reasonably priced products using processes that are accepted by the consumer and which fulfill the consumer's well-motivated demands that cultivation, rearing, harvest and refining processes, as well as trade and transport, be carried out in an environmentally sound and ethically responsible manner. This requires extensive development of both new industry-adapted raw materials and effective and resource-efficient production methods along the entire production chain – from land and sea to the dinner table. This cannot be achieved without profound knowledge of everything from the tiniest of life's building blocks and rational production technologies to expansive global logistics, economics and sociopolitical systems.

The food industry

The food industry is Sweden's fourth largest industrial branch measured in revenues and numbers employed. In 2005, it represented 9 percent of the total number of people employed in industry. The food industry is made up of a large number of different corporate structures: from small proprietary companies to complex concerns that operate on the global scale. Along with raw material production and the packing and processing equipment industry, the food industry represents the hub of the

industrial food production system, a system that employs about 250,000 people and affects life all across Sweden. Over the past decade, many food sector companies have gone from using manual craftsmanship to an increased use of advanced industrial process technology in production. Each sub-sector is adapting and developing its activities to ensure high product quality and productivity.

Since Sweden joined the EU in 1995, the productivity in the food industry has increased substantially and its international competitiveness has grown. Food exports have increased from 10 billion, to 35 billion SEK in 2005.

Through an increasing share of private label products, trade in Sweden has created new challenges for the food industry. Two very influential factors are the increasingly international degree of the trade, and the increasing share of private label products made in other countries.

Swedish consumers' confidence in the food production based in Sweden is high. According to a 2006 *Li* attitude survey, 86 percent of the population have high confidence in the food and beverages available in Sweden.

The future of the food industry is closely tied to its ability to develop innovative new products with added value and consistent, high quality. This, in turn, requires a strong increase in food-related consumer research as well as research into other products and processes relevant to the industry, in all links of the food production chain.

Future foods developed through creative cooperation between industry, academia/researchers and society

In all likelihood, the development of foods of the future will be based increasingly on new knowledge in modern biology and research findings that explain people's basic demands and wishes regarding the food they eat.

For the industry to be able to develop products that offer consumers new and exciting sensory experiences, improved health, greater convenience, real environmental value, and uncontested safety, creative collaboration between the industry, academia/researchers and society is required. Maintaining a holistic perspective, from consumption and public health to raw material production and process development, is therefore a central factor. In order to achieve this, the food industry also needs general strengthening of the theoretical knowledge of food industry employees and better access to innovators with leading-edge knowledge in areas of strategic importance.

The food sector's own R&D efforts are almost exclusively focused on product and process development. Other, more fundamental research is increasingly being sourced externally.

Swedish Food Federation Research Strategy

In September 2001, the board of the Swedish Food Federation (*Li*) adopted a strategy paper ("Swedish research strategy from the food industry perspective 2001. A multitude of opportunities and challenges"). The purpose of this document, drawn up by *Li*'s R&D Reference Group, was in part to express *Li*'s views on R&D questions, and in part to form a basis for further concretizing of the research areas prioritized therein.

Four task forces, led by members of the *Li* R&D Reference Group, have worked with concretizing the need for knowledge in the four areas of priority highlighted in the research strategy:

- Consumer knowledge.
- Food products and consumer communications for health and well-being in the short- and long-term.
- Product safety and traceability through the food-production chain.
- Production development, preservation techniques, and packing.

High quality, food-related environment research is necessary in order for the food sector to be able to contribute to a sustainable development of society. The environment and sustainability aspects are included in the four selected areas of research.

This concretizing of the research strategy is primarily oriented to a focus on needs and problem-solving. It is, however, of great importance that the needs-driven research conducted at selected institutions is complemented by researcher-initiated basic research, since this research provides new ideas that can later be further developed in a more goal-oriented form.

The assessments and proposals of the task forces from 2006 are presented in brief below, where the most pressing issues in the four areas are presented as simple questions or statements.

Consumer knowledge

Prioritized issues regarding societal development and the influence of megatrends on the requirements and conditions for Swedish food production include:

- How do consumers motivate/rationalize their choice of food/product/brand?
- What is the psychology behind changed eating habits?
- How does the food production chain identify and respond to new needs/wishes of consumers?
- How can new knowledge be passed on to the consumer?

Food products and consumer communications for health and well-being in the short- and long-term

Prioritized issues include:

- What are the most important diet-related causes of overweight and obesity, and what is the ideal dietary composition for successful prevention and treatment of these problems?
- How are nutrient uptake and health affected by how food is prepared, the number of meals we eat, how quickly we eat, the times of day/night we eat, how we perceive our surroundings (the setting, how the table is laid, etc.) when eating, etc.?

- Which indicators provide information about physiological functions/disease risks, and which are suitable to be used for risk assessment of products containing bioactive ingredients?
- How do consumers perceive different types of health messages on food products, and how detailed/complicated can these messages be?
- The influence of diet/dietary ingredients on physiological functions and/or development of diet-related diseases.
- How can we conduct and assure the quality of scientific studies regarding the positive effects of diet/dietary ingredients on well-being as well as on diet-related diseases?

Product safety and traceability in the food production chain

When it comes to product safety, it is natural to distinguish between four types of contaminants/dangers/risk factors that can affect consumers' health and well-being:

- microbiological (pathogenic microorganisms and viruses, including prions)
- chemical (toxic substances – naturally occurring, process-induced and/or additive)
- allergens
- foreign objects.

The knowledge prioritized is that needed to enable:

- identification of risk factors (analysis/assessment of known risks, prediction of new risks, etc.)
- analysis of contaminants (chemical analysis methods, microbial analysis, detection of allergens)
- prevention and management of risk factors (production methods, quality assurance, tracking, etc.).

Reliable tracking systems are also required to ensure product safety and to be able to guarantee a product's origin and emotional appeal: e.g., tracking systems for organic products, products made from traditional (and not GMO) raw materials, fair trade labelling, labelling of products' geographical origin (e.g., Parma ham), etc.

Production development, preservation techniques and packing

Prioritized issues include:

- Transfer and adaptation of production technology and methods from other branches of industry to the food industry with assurance of sector-specific demands on hygiene, traceability, etc.
- New technologies for production of biological raw materials to achieve more effective production processes and higher product quality.
- New and improved methods and manufacturing processes (including "minimal processing") in order to produce attractive products with the desired shelf-life.
- Process and packing to achieve optimal sensory quality.
- Lean production and flexible new production methods that yield high productivity and proper quality.

Anticipated effects for society and industry

In a 2004 report (“Inspiration for innovation – Fields of technology and knowledge towards 2020”) published within the framework of the Teknisk Framsyn project (Swedish Technology Foresight), sustainable food production is emphasized as one of 11 clusters in need of strengthening for Sweden to be able to exploit its areas of strength. It would be natural to draw up a national strategy program for the food sector, as has already been done in six other industrial sectors: Aero/Space, Automotive, Metallurgy, IT/Telecom, Forestry/Lumber and Pharmaceuticals/Biotech (2005). Such a program would also serve to define and motivate the need for industry-related food research in a logical manner.

A strong initiative – in which the food industry, academia/researchers and society work together – will enable the stimulation and rationalization of the development of new, attractive and reasonably priced food products for the domestic market and for export. These products can lead to both con-

siderable changes in consumption – resulting, among other things, in positive effects on public health – and the establishment of innovative new food companies where food products, packing and equipment that contribute to the creation of a sustainable society are developed, produced and marketed. Sweden’s role as an export country is hereby further strengthened. These efforts are expected to result in considerable economic growth for the coming 10-year period.

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