

STAKEHOLDERS AND ACTIVITIES IN THE AGRI-FOOD SUPPLY CHAIN

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AGRI-FOOD CHAIN

Agri-food chains represent a complex network of inputs and outputs that link farm production inputs to food consumers. They involve a wide range of stakeholders.

At a macro-scale the chain's principal links include agricultural activities, food processing, distribution and consumption. At a micro-scale we can find a number of other players such as feedstock suppliers; agro-chemical manufacturers and suppliers; machinery and equipment manufacturers and suppliers; farmers; produce marketers and sellers; food processors; suppliers of food additives; packaging suppliers; transport companies; food retailers; consumers; and waste processors. Another stakeholder is formed by private and public research centres in the different subsectors of the agri-food sector. It has also to be considered that legal and regulatory requirements exert an influence in every link of the agri-food chain.

In the following table some examples of a generic agri-food supply chain are shown:

Table 1 Principal agri-food chain stakeholders in various sectors

Stage	Agri-food chain link	Dairy Products	Cereal Products	Fruit & Vegetables	Meat Products
Raw material production	Farm suppliers inputs	livestock feed providers; fertilizer, pesticide, veterinary & agro-chemical manufacturers	seed providers; fertilizer, pesticide & agro-chemical manufacturers	seed providers; fertilizer, pesticide & agro-chemical manufacturers	livestock feed providers; fertilizer, pesticides, veterinary & agro-chemical manufacturers
	Farmers	livestock breeding	seed growers	horticultural production	animal husbandry
Processing stages	Food Processors & packagers	dairy product manufacture: milk, yoghurt, ice-cream, powder milk, etc.	grain millers, bakeries, pasta manufacturers, breakfast cereal manufacturers	canned, dehydrated and frozen vegetable based packaged convenience foods manufacturers	abattoirs; butchers; canned, hydrated and frozen packaged meat based convenience foods manufacturers
Post processing stages	Logistic	Transport			
	Retailers	milkmen, super markets, grocery shops	bakeries, supermarkets, grocery shops	supermarkets, fresh fruit & vegetable markets, green grocers, grocery shops	butcheries, supermarkets
	Consumers	single to family households with various age groups lifestyles, cultures, preferences, incomes			

Research Centres and Legal requirements

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Source: "Green purchasing in the field of agri-food" and own modifications

RAW MATERIAL PRODUCTION

Farm suppliers, mainly represented by feedstock and agro-chemical manufacturers and suppliers, have at this moment the task of increasing the information about their products and adopting high quality standards. This is related to consumer concerns regarding the effects of some plant and animal selection and breeding programmes on the animal welfare, environmental sustainability and health keeping.

They are the first step in the food chain and they are the “starters” of the process.

Regarding to **farmers**, they have typically belonged to small-scale independent family operations or are members of a co-operative.

The farm sector structure is changing because of some factors such as the amplification of the European Union or the increasing imports from other countries, resulting in an increase of the competition.

As a consequence, now there is a major output in the raw material production (use of machinery, pesticides, etc.), there is more interest in farmers' training and it has been observed a reduction of agrarian companies (associations, abandonment...). More recently, farming is combined with other activities such marketing of their own products.

Producers associations are considered to benefit from economies of scale through cheaper purchases of inputs and access to modern technologies. Some of the objectives of these associations are:

- To defend and to promote their interests
- To represent the associated members in agreement with bylaws established.
- To organize services of advice, audit, juridical or technical assistance and others suitable for the interests of the partners
- To take part, when the Public Administration requests it, in its institutions and organisms
- To promote co-operative training

Increasingly, EU farmers are feeling pressure from large food processors and retailers who require better agricultural practices in relation to food hygiene and safety, animal welfare, use of agri-chemicals and better management of natural resources.

In most EU countries, over 95 per cent of the agricultural area is farmed using conventional farming methods. However, over the last decade the rate of sustainable farming has grown. This is evidenced by the rapid growth of organic farming. Although organic agriculture still only represents less than two per cent of farmland in Europe, its market share in some countries is becoming significant. Organic farming has to be understood as part of a sustainable farming system and a viable alternative to the more traditional approaches to agriculture.

FOOD PROCESSORS

Some important data regarding the food and drink industry in the European Union are:

- The food and drink industry is the largest manufacturing sector in the EU, with a production of around 626 billion €, accounting for 13% of the total manufacturing sector.
- France, Germany, Italy, the UK and Spain are the leading producers of food and drinks in the EU and represent around 80% of total EU production.
- 4 sectors dominate the EU food industry: beverages, “various products” category (including bakery, chocolate, confectionary products), meat products and dairy products.
- In 2000, 99.3% of the companies in this sector were small and medium sized enterprises with less than 250 employees. As a whole, the food and drink industry counts 257,807 companies, including very small ones.
- Total food and drink products’ exports to third countries in 2002 amounted to 46 billion € with a positive trade balance of 7.6 billion €.
- 7% of the EU production in 2002 was exported to third countries.
- Foodstuffs remain amongst the most important consumption items. Together, food and non-alcoholic beverages in the EU accounted for an average of 12.8% of total household expenditure in 2000.
- The industry buys and adds value to 70% of all EU agricultural produce.

The food and drink industry is dominated by a large number of small and medium sized companies (SMEs). In 2000, 99.3% of EU businesses were SMEs (less than 250 employees). They account for almost half of total EU production and 62% of the employees of the EU food and drink industries. SMEs are of particular importance in southern Member States: in Italy, 80% of the food and drinks industries’ employees work in SMEs, well above the EU average of 62%.

There is an emerging tendency for consolidation amongst processors to deal with the market power of retailers and emerging global competition. Industry concentration gives processors great market power to specify food requirements. Food companies realise that strong brands and market leadership is critical to face the challenge of retailer own label products. Some actual challenges are to get the pursuit of brand loyalty, to increase the market share or price competition.

Table 2: Distribution of EU production, employees and companies according to size (%), 2000

		<i>Micro companies</i> 1 to 9 empl.	<i>Small companies</i> 10 to 49 empl.	<i>Medium companies</i> 50 to 249 empl.	<i>Large companies</i> + 249 empl.
Production	Total ind	5.9	13.5	20.4	60.2
	f & d ind.	7.2	15.6	25.8	51.4
Number of employees	Total ind	13.3	21.3	23.3	42.1
	f & d ind.	18.9	21.2	21.8	38.1
Number of companies	Total ind	78.2	17.3	3.8	0.8
	f & d ind.	81.0	15.3	2.9	0.7

Source: Eurostat, SBS

Launch of new products

The dairy sector leads Europe in terms of innovation, followed by ready made meals, cheeses, frozen products and the soft drinks sectors.

Drivers of innovation vary greatly from one sector to the other. The four innovation drivers generally recognized are pleasure; fitness and well being; health and sustainability and convenience. On a worldwide basis, the notion of pleasure remains the main innovation driver (47,6%) followed by increased convenience (22,3%). But the health and well-being factors are also becoming increasingly important, representing respectively 16,4 and 13,7 % of innovative products. Europe follows the same trend although the proportion of innovative products corresponding to the health and well-being categories is less important than in the United States and in Japan.

Use of new technologies

The spread of Communications Technologies (ICTs) throughout the food and drink industry reflects its structure. Most companies are equipped with basic IT infrastructure, although, for example, more than one third of small enterprises still do not use e-mail.

The use of computers is highly widespread among food industries in all countries. There are more discrepancies between countries as far as the use of Internet and e-mail is concerned. 92 % of Italian companies work with Internet while only 63% of German companies do. The same trend is seen for the use of e-mail. Italian and Spanish companies use e-mail the most while only 59 and 50 % of French and German companies do.

e-commerce

- *The use of a web site:* A web site is a key tool for Business to Consumers e-commerce. The number of food companies who have a web site (Table 3) is in line with the average in the various sectors of the industry. There is however, a certain disparity between small and medium sized companies on the one hand and large companies on the other.
- *Selling and procurement online:* The spread of B to C e-commerce (Table 4) is limited within food and drink industries. However, online procurement is much more common than selling online. 19% of companies purchase goods or services online with much higher figures in Nordic countries.

Table 3: The use of a web site (% of companies)

	All sectors	f&d industries			
		All enterp.	0-49 empl.	50-249 empl.	+250 empl.
Web site	54	45	44	57	73

Source: The European e-business report

Table 4: Selling and procurement online

	DK	D	E	F	I	NL	P	UK	EU8
Selling on line	12	5	11	2	10	9	4	4	7
Online procurement	38	36	12	15	7	23	24	35	19

Source: The European e-business report

TRANSPORT AND LOGISTIC

In the actual globalisation process, as distances become larger, transportation and distribution require more extensive and more developed systems for bringing food to consumers.

Apart from the necessary roads and vehicles, is also important not only a fast way of transport, but also an efficient and continuous supply.

Improper or careless handling of foodstuffs during transportation can lead to damaged cargoes and extensive losses. This inadvertent destruction is often due to incorrect temperatures and humidity settings. An example is the breakdown in temperature control in the chill chain.

It is important to take into account aspects such as:

- standards and regulations for transportation (mainly hygiene and health conditions)
- storage life of the product
- temperature conditions
- humidity and ethylene conditions
- specific heat
- possible chilling injuries to the product
- mixed loads
- ventilation
- sensitivity to foreign odours
- loading and unloading procedures
- important aspects of insurance including information on the necessary procedures in case of transport damage

Looking for “cleaner” and more sustainable ways of transport is becoming an important task in the sector as a result of the recent concerns of the effects on the environmental impact.



RETAILING

Traditionally, food supply and distribution comprised wholesale merchants and retail operators (small shopkeepers, market retailers, street sellers). Nowadays, it is changing to large, vertically integrated distributors and agro-industrial supply networks (which deal especially with animal products) and national or international trading companies.

The main change in the marketing of food products has been retailer's progressive disappearance as the food offer has been increased in the big surfaces. In the European Union the small commercial surface has been disappearing because of the intensified competition in the sector.

The big European surfaces are immersed in an internationalization and globalization process in order to increase the profitability of their operations. The acquisition and consolidation processes, and commercial alliances have been intensified during the last years as a response to the maturity of national markets, emergent business opportunities in Central and East Europe, and the establishment of the Only Market.

Among the reasons that have provoked these changes in the distribution channels it is necessary to emphasize the changes in the social and economic environment and in the structure of the sector, the increase of the offer and the differentiation to adapt to the local demand.

The strong level of concentration of the European markets is reflected in the decrease of the number of distribution groups and the formation of big sales groups. An example of this is shown in the following table.

Table 5 "Evolution of the number of sale points classified for type in Germany"

	Germany								
	1997		1998		1999		2000		Variation 1996-2000
	Number	%	Number	%	Number	%	Number	%	%
Supermarkets									
Hypermarkets	9.596	4,58	9.460	4,57	9.134	4,49	9.230	4,61	-3,95
Discount shops	2.919	1,39	2.225	1,08	2.278	1,12	2.363	1,18	12,68
Domestic posts	13.931	6,66	14.607	7,06	14.974	7,37	14.558	7,27	10,28
Grocer's	39.600	18,92	38.500	18,61	37.152	18,28	35.591	17,78	-12,34
Food specialists shops	143.255	68,44	142.076	68,68	139.690	68,74	138.468	69,16	-4,42
TOTAL	209.301	100,0	203.868	100,0	203.228	100,0	200.210	100,0	-4,84

Source: "La distribución comercial alimentaria en Alemania". Marín, G.

Some challenges of retailers are:

- To assure profitability and continuity of the business
- To assure constant supplies
- To assure high and continuous quality
- To improve in marketing skills
- To increase the perception of food safety
- To know the final consumer to satisfy him better
- To appraise its relationships with key suppliers

CONSUMER

The consumer should be seen as the central element of the food chain and need to be considered in all development phases of new processes and products. It is necessary to take into consideration the consumer viewpoint from the very beginning when developing new food products and processes, in order to meet the consumer demand to the largest extent possible.

For consumers, safety is the most important ingredient of their food. The food scandals in the occidental world have provoked a sensation of insecurity and worry among consumers.

The consumer now demands more information about the systems of production (food safety, environmental impact) and of the composition of the food (origin of the ingredients, quality attributes of the food).

To answer to this demand is required to identify the food and their ingredients, to do quality controls and the corresponding certifications. From all this is necessary to distinguish the importance of the traceability.

It can't be forgotten that in the EU, because of the slow population growth, the growth in food demand is low. Consumers increasingly comprise aged persons with special dietary needs and single person households which prefer processed and convenience foods. Trends also indicate a greater tendency to snack. Such changes to consumer preferences are giving as a result more processed and packaged food products.

It has also to be pointed out the awareness of health and nutritional aspects of food related to cholesterol, calories, food additives, pesticides, organic products, etc. These are causing an increasing number of retailers to cater for health conscious consumers and putting pressure further up the agri-food chain to influence processors and farmers.

RESEARCH

The aims of Research in the agri-Food Supply Chain are:

- to promote technological research and development in the food sector
- to increase quality production
- to improve competitiveness
- to promote modernisation and diversification in the different stakeholders through scientific research and technological development.

It is necessary to maintain close working relationships with the active stakeholders of the food chain and working with other research organisations around the world.

The knowledge and skills developed can then be used by the stakeholders to help ensure the safety and quality of foods, increase the efficiency of production and lead to innovative products and processes.

It occurs that sometimes, researchers and the agents of the food chain work in different directions, which results in a lack of communication and isolation between them. The mutual approximation between research centres and the different agents of the chain is necessary to unify efforts and to look for satisfactory solutions.

ADMINISTRATION: LEGISLATION AND CONTROLS

Until now, controls in food chain have been divided among diverse agents participating in it. Different agents didn't share information and there was no continuity from producer until consumer.

Instead of this, there are different initiatives from the Administration to get integration in the food chain. The main initiative to get this has been the homogenization of legislation and controls.

The objectives pursued by means of food law in the European Union are:

- Protection of human life and health, and protection of consumers' interests, with due regard for the protection of animal health and welfare, plant health and the environment;
- EU-wide free movement of human food and animal feed;
- Consideration of existing or planned international standards.

To develop controls for ensuring the condition of the products through all phases of the supply chain are necessary to protect the products from intentional, as well as unintentional, contamination

An example of this unified law is the European Regulation number 178/2002 about traceability, that came into force on 1st January of 2.005. The main requirements are:

- Introduction of traceability in all the steps of the production, processing and distribution.
- System adoption for the localization of companies that have given any substance destined to be incorporated in a food.
- Adaptation of suitable labels to facilitate the traceability.

The legislation, as driving factor of the industrial application of new technologies and, in minor measure of their development, is constituted as an element that, being an external factor of the food-processing industry and other stakeholders of the supply chain, is a fundamental agent in the relation of this one with their processes.

The legislative frame is constituted as well as a tool that clarifies the actions that food industries and other stakeholders in the food chain can approach, simultaneously that its application supposes a guarantee for the consumer.

Some of the areas in which the legislation is going to have major impact are: additives and ingredients, packaging and labelling of food products, biotechnology, agencies of food safety, limits in residues of fertilizers, pesticides, etc

TRACEABILITY

'Traceability' is the ability to trace and follow a food, feed, foodproducing animal or ingredients, through all stages of production and distribution.

Traceability enables consumers to be provided with targeted and accurate information concerning products.

Traceability should provide a verifiable documentation for an effective food control system and should aim at limiting the discontinuity of the information throughout the food supply chain. In practice the term traceability stands for a system of recordkeeping and documentation by operators that enables tracking of the movement of a product or ingredient through the food chain.

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