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Y ESTUDIOS SOCIALES



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**Federación
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INITIAL ANALYSIS

EUROMEAT

PHASE 1

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INTRODUCTION

This research is a first step in the Leonardo da Vinci – Reference Material Project “EUROMEAT – QUALIFICATIONS TRANSPARENCY IN THE MEAT INDUSTRY IN THE EUROPEAN UNION”. This project has the following goals:

- To establish how professions and competences are modified by changes in the meat industry, related to issues such as food safety, quality and environmental impact control, changes in consumption and in commercialisation channels, etc.
- To open a debate on tools to facilitate the transparency and recognition of qualifications in the sector, in the framework of the general EU policy in this field.
- To design a proposal for a model or models of certificate of competences in this sector, valid at European level.

This research, then, is framed in the first goal, by establishing which are the changes that the meat industry faces, and how these influence professions and competences. This second issue will be the object of a deeper research, in the following step of the project.

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The meat industry has come up against a series of factors that will lead to changes in organisation, production methods and, therefore in workers’ qualifications. Many of these change factors are well-known because they are related to production quality and food safety. This is particularly the case after a number of years marked by food crises that have led to serious problems in selling meat products, and recurrent crises in meat consumption.

This study therefore aims to offer a perspective of the meat industry sector in the general setting of the meat chain “from farm to table”, i.e. with reference to livestock production, sale and consumption of meat. This sectorial analysis will focus in general on the European Union, and in particular on the four countries that are participating in the project (Germany, France, Italy and Spain), which, as it will be seen, are highly representative of this industry.

Alongside this perspective of the more recent evolution and current situation in this industry, the factors behind the changes will also be analysed. Not only will the development of quality control systems and food safety be discussed, but consideration will also be given to elements such as the control of environmental impact, evolution of domestic and international markets, and the incorporation of new technologies in production processes. The consequences of these changes on workers’ qualifications in this sector will also be analysed.

To conclude, we will identify the most relevant professions in the meat industry, considering two factors:

- The presence of these professions in all labour throughout the sector.
- The impact that these change factors have on these professionals’ functions and tasks.

THE MEAT SECTOR IN THE EU

An analysis should be made of the meat industry situation in the European Union within a context that ranges from livestock production (at the start of the “chain” that represents the industry which is the object of this study), to the sale and consumption of meat products (at the very end of the chain). The meat industry analysis should also be considered within the food industry that envelops the former.

Therefore, this study has been divided into three sections:

- Study of livestock production
- Study of the meat industry
- Study of meat product trade and consumption.

Since the study is focused on four countries (Germany, France, Italy and Spain), information will refer to data on the EU in general and on these four countries in particular.

For greater clarity, a table with the principal statistical data from the information detailed below is annexed at the end of this section. ¹

1. LIVESTOCK PRODUCT

1.1. General situation

Total livestock production in the European Union can be divided into the following sub-sectors, in order of importance: pig, cattle and sheep. This order applies to livestock numbers (i.e. number of heads of cattle) and also to meat for consumption or transformation (expressed in tonnes of carcass). In terms of carcass weight, production volume in the EU is as follows:

- Pig, production of 17.8 million tonnes in 2003.
- Cattle, production of 7.4 million tonnes in 2003.
- Sheep, production of 950,000 tonnes in 2003

As will be seen below, pig and cattle production are the principal ones, way ahead of any others (this study does not include smaller meat production such as poultry, goat or horse meat for human consumption).

When both parameters (livestock numbers and carcass production) are taken into account, the four countries on which the study is focused (Germany, France, Italy and Spain) are the principal producers. Data provided by *Eurostat* reveal the following:

- In order of importance, Germany, Spain, France and Italy account for 49.1% of pig livestock numbers and 63.8 % of pork carcass production.
- In order of importance, France, Germany, Italy and Spain account for 52.4% of cattle livestock numbers in the EU, and 63.7% of cattle carcasses.
- In order of importance, Germany, Spain, France and Italy account for 55.4% of sheep livestock numbers. The order varies in the case of sheep

¹ The quantitative data in this chapter are taken from statistics provided by Eurostat, the Statistical Office of the European Community.



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carcass production: Spain, France, Italy and Germany share 49.4% of the total.

Data refer to 2003, except for sheep and goat livestock numbers that are taken from 2001 data.

1.2. Production trends

Carcass weight data are considered rather than the increase in livestock numbers, because the former reflects production evolution more clearly. Information on the three productions under consideration is given below (pig, cattle and sheep).

Pig

There is a slight upward trend (15.6 million tonnes in 1995 to 17.8 million in 2003). Per country, this trend is seen in all four countries, and more notably in Spain (increasing from 2.2 to 3.2 million tonnes in this period).

Cattle

There is a slight downward trend in cattle production in Europe (from 7.97 million tonnes in 1995 to 7.36 million tonnes in 2003). This slight fall is registered in Germany, France and Italy, while in Spain, which has the lowest production figures of these four countries, there has been a marked increase (of about 40%).

Sheep

As mentioned earlier, sheep production is much lower than the other two meat productions. In addition, a downward trend has been noted in the European Union (from 1.1 million tonnes in 2005 to 0.95 in 2003). This fall has occurred in all four countries, except for Germany, where production has increased from 210.000 to 360.000 tonnes.

2. MEAT INDUSTRY

In order to study the weight of the meat industry in the EU and also in the four countries in question, an analysis was made of the food industry in general in these three countries (NACE 15), and then data for the meat industry itself (NACE 151) were considered, dividing the latter, in turn, into three sub-categories:

- Production and preservation of meat (NACE 1511).
- Production and preservation of poultrymeat (NACE 1512).
- Meat and poultry products (NACE 1513).

This study therefore focused on NACE 151 activities (i.e. NACE 1511, 1512 and 1513). Data on number of companies, turnover and number of employees were considered.

2.1. Distribution of companies

- Using data referring to 2001, there is a total of almost 282,000 companies in the food sector (NACE 15) in the European Union. In order of importance, Germany, France, Italy and Spain account for 72.9% of the total.

Comentario [EMG1]: Nota del traductor: ¿no debería ser "cuatro" en lugar de "tres"?



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- With regard to the meat sector (NACE 151), there are 47,400 companies (i.e., 16.8% of the food industry total). 73.3% is located, in order of importance in Germany, France, Spain and Italy.

2.2. Turnover

- Using 2001 figures, the food industry in the EU (NACE 15) has a total turnover of about 785,000 million euros. In order of importance, Germany, France, Italy and Spain account for 59.4% of this figure.
- With regard to the meat sector (NACE 151), the total turnover in the EU is 161,000 million euros (according to 2001 data). It therefore accounts for 20.5% of the food industry total. In order of importance, France, Germany, Italy and Spain account for 59.2% of this figure in 2001.

2.3. Employment

- Using data referring to 1999, the food industry sector (NACE 15) has almost 4.4 million workers. In order of importance, Germany, France, Italy and Spain account for 50.8% of labour.
- Although there are no data available for total labour in the EU in the meat industry sector (NACE 151) for 1999, we can analyse data for the year 2001. Using these figures, 22.3% of food industry workers are in the meat industry sub-sector. In order of importance, Germany, France, Spain and Italy account for 52.6% of labour in this sub-sector.

2.4. Trends in the meat industry (NACE 151)

Data referring to the meat industry (NACE 151) in the EU and also in the four countries in question were considered.

Data for the European Union

A downward trend was observed in all indicators:

- Although no comparative data are available for the number of companies in the EU, in view of the representative share of our four countries (accounting for 73.3% of the total), a downward trend is noted in number of companies.
- National figures are available with regard to turnover as in the above case, but here an upward trend is noted.
- Still using representative national figures, an upward trend has been noted with regard to number of workers.

These data are broken down per country below.

Data for the four countries

The situation varies from one country to another. Data on each country are given in terms of their ranking for number of workers and number of companies, which coincide:

- In Germany a downward trend is noted in all three variables, although some recovery is observed from 1999 to 2003.
- In France there is an upward trend in the number of workers and turnover, but a falling number of companies. Data from 1997 to 2001 was analysed.
- In Spain, the number of workers, number of companies and turnover increased during the period 1995-2003.



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- Finally, in Italy, the number of workers, number of companies and turnover increased during the period 1995-2003.

2.5. Some data on sub-sectors.

Distribution of sectors

The meat industry sector is divided into three sub-sectors:

- Production and preservation of meat (NACE 1511).
- Production and preservation of poultrymeat (NACE 1512).
- Meat and poultry products (NACE 1513).

Although there are no data available for the EU, the fact that, as mentioned earlier, labour, companies and turnover are largely concentrated in the four countries under study, gives a fairly clear view of each of these sub-sectors for Europe as a whole. Data referring to 2001 are used.

- With regard to labour, percentages of a total of 513,296 workers are as follows:
 - Production and preservation of meat (NACE 1511): 22.3%.
 - Production and preservation of poultrymeat (NACE 1512): 13.6%.
 - Meat and poultry products (NACE 1513): 64.1%.
- With regard to number of companies, percentages of a total of 34,768 are as follows:
 - Production and preservation of meat (NACE 1511): 13.9%.
 - Production and preservation of poultrymeat (NACE 1512): 2.8%.
 - Meat and poultry products (NACE 1513): 83.3%.
- Finally total turnover stands at 95,440 million €, distributed as follows:
 - Production and preservation of meat (NACE 1511): 37%.
 - Production and preservation of poultrymeat (NACE 1512): 14.6%.
 - Meat and poultry products (NACE 1513): 48.4%.

Trends per sub-sector

Trends in the three sub-sectors are as follows for the period 1999-2001:

- NACE 1511 – Production and preservation of meat. This industry shows an upward trend when all the variables are considered for the whole set of countries.
- NACE 1512 – Production and preservation of poultrymeat. There is also an upward trend in the number of workers and turnover, but there is a slight fall in the number of companies.
- NACE 1513 – Meat and poultry products. In the meat transformation sector, however, there is a clear downward trend with regard to number of workers and number of companies alike, although the turnover has been maintained overall.

3. TRADING AND CONSUMPTION

In order to increase our understanding of the relevance of the meat industry in the EU, it is worth gaining an overall view of the evolution of meat trading, and of consumption data. The idea is to offer basic information on the last link in the chain that we are studying in the first part of this analysis, that runs from "the farm to the table".

3.1. Trading of meat products

With regard to food sales, including meat products, figures available show that there is a general upward trend in turnover (in member States, not the EU as a whole, between 1999 and 2003).

This situation also applies to the four countries under study, although different growth rates are observed, with notable growth in the case of France and in particular Spain; less in Italy, and a levelling off in Germany.

More specifically, with reference to the sale of meat products, the general trend observed in the EU is a slight increase in turnover. With regard to the four participant countries, there is some levelling off with even a slight fall (Italy and Germany) and moderate growth in other cases (France and Spain).

3.2. Meat consumption

With regard to meat consumption, the only reliable data available refers to the participant countries, and therefore information will only refer to these countries.

The distribution of meat consumption per type, in thousands of tonnes is given below, using 2003 figures:

- Total meat consumption: 25.5 million tonnes.
- Pork consumption: 11.7 million tonnes.
- Beef consumption: 4.8 million tonnes.
- Poultry consumption: 3.9 million tonnes.
- Sheep and goat meat consumption: 0.67 million tonnes.

For the period 1999-2003, and with regard to meat consumption in general, there is a slight upward trend in Germany, Spain and Italy, while in France there is a gradual fall in meat consumption.

Pork is clearly the type of meat that is consumed most, followed by beef and poultry (which were very evenly positioned throughout the whole period, but showed marked differences in 2003), and much further down the scale are sheep and goat meat.

The trend for each meat type is as follows:

- In pork consumption, there is a slight downward trend in Germany, a slight upward trend in Spain and Italy, and an almost unvarying level of consumption in France.
- In poultry consumption, there is an upward trend in Spain, a clear downward trend in France and a stable consumption in Italy.
- In beef consumption, there is a clear downward trend in Germany, and very little change either way in the other three countries.



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- Finally, in sheep and goat meat consumption, which holds the smallest share of all, there is a downward trend in Germany, Italy and France, and a very slight upward trend in Spain.

4. SUMMARY OF DATA

Livestock production

Livestock production (in millions of tonnes of carcass) in the EU and accumulated total for DE/FR/IT/ES, for 2003			Trends per production (from 1995 to 2003)					
	EU (totals)	DE/FR/IT/ES		EU	DE	FR	IT	ES
Pig	17.8	63.8%	Pig	Upward	Upward	Upward	Upward	Upward
Cattle	7.4	63.7%	Cattle	Downward	Downward	Downward	Downward	Upward
Sheep	0.95	49.4%	Sheep	Downward	Upward	Downward	Downward	Downward

Food industry (NACE 15) and meat industry (NACE 151)

2001	Number of companies		Turnover (millions €)		Workers (thousands)	
	EU (totals)	DE/FR/IT/ES	EU (totals)	DE/FR/IT/ES	EU (totals)	DE/FR/IT/ES
Food industry	282.000	72.9%	785.000	59.4%	4.386	50.8%
Meat industry	47.400	73.3%	161.000	59.2%	976	52.6%

Trend					
	EU	DE	FR	ES	IT
No. of companies	Downward	Downward	Downward	Upward	Upward
Turnover	Upward	Downward	Upward	Upward	Upward
No. of workers	Upward	Downward	Upward	Upward	Upward

Meat industry sub-sectors (data for DE/FR/IT/ES, 2001)

Meat industry (NACE 151)	Production and preservation of meat (NACE 1511) Production and preservation of poultrymeat (NACE 1512) Meat and poultry products NACE 1513)			
	NACE 151	% NACE 1511	% NACE 1512	% NACE 1513
No. of companies	34,768	13.9%	2.8%	83.3%
Turnover	95,400 mill €	37%	14.6%	48.4%



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No. of workers	513,269	22.3%	13.6%	64.1%
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Trend			
	NACE 1511	NACE 1512	NACE 1513
No. of companies	Upward	Downward	Downward
Turnover	Upward	Upward	Stable
No. of workers	Upward	Upward	Downward

CONSUMPTION (DATA FOR DE/FR/IT/ES,)

Consumption (Mill tonnes, 2003)		DE	FR	IT	ES
Total	25.5	Upward	Downward	Upward	Upward
Pig	11.7	Downward	Stable	Upward	Upward
Cattle	4.8	Downward	Stable	Stable	Stable
Poultry	3.9	Downward	Downward	Stable	Upward
Goat and sheep	0.67	Downward	Downward	Downward	Upward

PRODUCTION PROCESS

This section describes the production procedure in the meat industry in a highly schematic way. The specific production procedure discussed here is one that takes place in an industrial cattle slaughterhouse.² The aim is not to offer a valid definition for all production processes in this industry, but to explain the general phases entailed in order to understand the following sections, which will refer to changes that affect this production process, and later, the impact of these changes on the functions and tasks undertaken by the professional workers in this industry.

1. CONDITIONS PRIOR TO SLAUGHTER

Slaughterhouses lay down the conditions for purchasing live animals for slaughter from suppliers. The aim of these conditions is to meet the requirements provided by the corresponding health authorities and to ensure certain circumstances that will guarantee suitability for slaughter.

Before being slaughtered, the animals are inspected in order to assess their condition. Then they are washed.

2. FROM SLAUGHTER TO CARCASS CHILLING

The following steps are involved in the production process of meat as a raw material:

- ***Insensibility and stunning.*** Slaughter is usually performed using techniques and instruments that avoid unnecessary suffering to the animal, such as a stunner gun or bolt pistol.
- ***Bleeding.*** When the animal is dead, it is then bled completely by sticking and draining the blood. Blood is handled with all necessary precautions, especially if it is to be used to make products for consumption.
- ***Dehiding.*** When the dead animal has been hung on a moving chain, the hide is then removed in order to open up the carcass.
- ***Evisceration.*** After dehiding and opening the carcass, the viscera are immediately removed in order to avoid carcass contamination.
- ***Carcass splitting and washing.*** After evisceration, the carcass is split open and checked by a veterinary inspector and then washed with high pressure water.
- ***Post mortem veterinary inspection.*** During the dehiding and evisceration stages all possible focal points of contamination are analysed.
- ***Carcass classification and identification.*** Carcasses are classified according to sex, age and carcass weight. They are also marked for subsequent identification.

² The information here was taken from the website of an industry that presents these characteristics. We believe that it is representative of the industry in general because it covers the whole process, from slaughter to meat product production.



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- *Final washing of carcass and chilling.* After classification, the carcasses are washed and then chilled.

3. MEAT PRODUCT PROCESSING

As a raw material, meat can undergo various elaboration processes. Some of these processes are given below, although the list is not an exhaustive definition of all processes.

- *Preparation of meat trimmings and pieces.* This involves preparation of meat pieces for subsequent processing or consumption as fresh meat, and preparation of meat trimmings for meat products such as sausages.
- *Sausage processing, etc..* The meat trimmings are used to make sausages and similar products.
- *Meat preparations.* Different techniques from sausage processing techniques are used here, to make meat-derived products such as ham, etc. Techniques include drying, smoking, boiling, curing, etc.
- *Meat product packing.* This involves packing pieces of fresh or processed meat, and packing, labelling, weight control, etc.
- *Storage of fresh, processed and packed products.*



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PROFESSIONAL PROFILES IN THE MEAT INDUSTRY

This section offers a very brief summary of basic information on jobs in the meat industry.

1. CLASSIFICATION OF PROFESSIONS

Three sub-sectors are described in this section, and each sub-sector refers in turn to a series of areas that cover the different professions.

- **Livestock slaughter and meat preservation. Specific areas: Production and Quality.**
- **Manufacture of meat products. Specific areas: Production and Quality.**
- **Wholesale meat marketing. Specific areas as above.**
- **There is also a series of areas and professions that are common to the three sub-sectors: Maintenance, Administration, Commercialisation, Prevention.**

It should be remembered that one company may deal with all three activities (slaughter and preservation, manufacture, and commercialisation), or just one.

The following tables illustrate each sub-sector with reference to the areas under consideration, and the corresponding professional profiles.

The next point details the general skills of each professional profile. Since some skills are common to more than one profile, the sub-sector(s) to which it belongs is shown in brackets beside the profile, using the code that is given in the next table.

Professional profiles in the Production area

Livestock slaughter and meat preservation (1)	Lairage worker
	Slaughterer
	Cutter
	Meat product preparer / packer
	Trimmer
	Cold store / warehouse worker
Manufacture of meat products (2)	Raw meat product preparer
	Heat-treated meat product preparer
	Meat industry machine tender
	Meat product packer
	Cold store / warehouse worker
	Logistics expert
Wholesale meat marketing (3)	Logistics expert
	Cold store / warehouse worker

Professional profiles in the Quality area



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Livestock slaughter and meat preservation	Quality control expert
	Veterinary assistant
Manufacture of meat products	Quality control expert
Wholesale meat marketing	Quality control expert

Areas and professional profiles that are common to all three sub-sectors

Area	Professional profile
Maintenance	Maintenance technician
	Cleaner
Administration	Administrative worker
Marketing	Distributor
	Marketing agent
	Director of operations
Prevention	Expert in work-related risk prevention

2. DESCRIPTION OF THE MOST RELEVANT PROFESSIONS

Below is a description of the general functions involved in each profession.

2.1. Production area

- **Lairage worker (1).** The lairage worker unloads the animals, identifies them according to the batches and checks the documents. He takes the animals to the lairage and classifies the animals. He isolates sick animals and any animals that might be sick. He looks after the animals in the stable and ensures their welfare. He transfers them to the slaughtering bay.
- **Slaughterer (1).** The slaughterer receives the animal in the slaughtering bay, stuns it and slaughters it. He cleans, washes, weighs and marks the carcasses.
- **Cutter (1).** The cutter receives the carcass and divides it into pieces in accordance with commercial requirements. He removes bone remains, fat, etc. from the meat pieces.
- **Meat product preparer / packer (1) (2).** The preparer / packer receives the pieces and subdivides them into smaller portions, minces meat, etc. He selects seasoning and additives and mixes the products. He prepares the tripes and packs the minced meat. He closes and hangs the pieces and places them in the cold store.
- **Trimmer (1).** The trimmer cleans and prepares waste such as hooves, stomach and intestines, skin, fat, etc., and places them in their respective containers.
- **Heat-treated meat product preparer (2).** The heat-treated meat product preparer selects and prepares pieces for this process. He chooses additives



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and seasoning, applies the heat treatment, removes the product, cools it and takes it out of the moulds.

- **Meat industry machine tender (2).** His tasks depend on the type of machine in question: freezers, boilers, smokers, curing, preserving machines, etc. He starts up the machine and ensures product supply to the machine.
- **Cold store / warehouse worker (1) (2) (3).** The cold store worker is in charge of putting pieces into the cold store or warehouse and taking them out, of checking the condition of the products, and thawing them, if required. He checks that the cold store is functioning correctly.

All these professionals also have to keep their respective facilities and work tools in hygienic conditions.

- **Logistics expert (2) (3).** The logistics expert is responsible for planning supplies and distribution, reception and dispatch of goods, and storage management. He co-ordinates incoming and outgoing activities. He ensures that necessary documents are completed correctly.

2.2. Quality area

- **Quality control expert (1) (2) (3).** The quality control expert supervises the quality of raw materials, production processes and final products, controlling sampling and analyses. He defines quality parameters and informs workers about the quality programme. He draws up traceability criteria and controls suppliers. He draws up Critical Control Point Analyses programmes.
- **Veterinary assistant (1).** The veterinary assistant collects data on farms and slaughterhouses for ante- and post-mortem inspections. He controls the hygiene conditions of the stored product, hygiene measures and risk prevention.

CHANGE FACTORS IN THE MEAT INDUSTRY

There is a series of elements that will lead to changes in the meat production and preserving industry and in meat product processing. Some of these change factors are well-known, especially requirements derived from food safety control and quality control. Others are of application in the industry and companies in general, such as aspects that refer to environmental impact control and work-related risk prevention. A third group of factors related to macroeconomic changes such as changes in the market, and those that develop from the incorporation of new technologies.

All these changes will imply modifications to the functions and tasks carried out by professionals in the meat industry sector, as will be seen in the last section of this study. Many factors also involve two sectors that are closely related to the meat industry (livestock production, and marketing and distribution), and these will also be discussed in due course.

These factors are as follows:

- **Livestock health.**
- **Food safety.**
- **Quality of production, traceability and product labelling processes.**
- **Animal welfare.**
- **Work-related risk prevention.**
- **Environmental conservation.**
- **Incorporation of new technologies.**
- **Changes in market trends.**
- **Territory-related production**
- **Foreign trade.**
- **Distribution organisation.**

1. LIVESTOCK HEALTH³

When discussing food safety, the issue of animal health is a clear prerequisite. Although the food industry is the focal point of policies, actions and food safety control mechanisms, it must receive quality raw materials from the very beginning of the transformation chain, that do not entail health risks for consumers.

As in so many other fields, the food crises that have occurred during the nineties onwards, have resulted in EU institutions introducing new measures in animal health through different policies (mainly in agriculture, but also in public health and consumer protection).

With regard to livestock, the Commission has therefore brought in preventive control measures on live animals against possible cases of disease, and other measures to eradicate and control existing diseases.

Below is a brief summary of these three areas of action

³ Information taken from documents written by the European Commission's Directorate General for Agriculture.

1.1. Preventive measures in live animals

In this case measures focus on internal live animal trade. The information below focuses on the most representative types of livestock: cattle, pig, sheep and goat.

The aim of measures adopted in this area is therefore to avoid spread of disease during animal transport.

Single health certificates have been brought in for internal trade. In these documents, a veterinary officer certifies that the animal meets the health requirements laid down in EU regulations. Control requirements may be stricter in the event of an outbreak of a serious disease.

Animals that come from non-EU countries undergo control processes. These include a certificate issued by a veterinary officer in the country of origin that indicates conditions for importing into the EU. The animals are also examined by a veterinary officer when they arrive in the EU.

1.2. Disease prevention

The EU has adopted measures to prevent specific diseases: African swine fever, foot-and-mouth disease that affects cattle, bluetongue that affects ruminants, classical swine fever, etc.

Regulations laid down in the EU to prevent these diseases cover the following types of procedures:

- Measures to control infected animals in the EU territory or in specific areas.
- Measures related to disease outbreak notification.
- Guides to diagnosing diseases.
- Introduction of measures to restrict the movement of infected animals (in the case of non-serious diseases).
- EU vaccination campaigns
- Importation controls.
- Surveillance of wild animals that can transmit diseases to domestic animals.

1.3. Eradication and monitoring of diseases

Finally, the EU has launched measures aimed at progressively eliminating animal diseases that are endemic in certain areas of the Community. These diseases include bovine brucellosis, bovine tuberculosis, ovine and caprine brucellosis, African swine fever, classical swine fever, rabies, etc.

The European Commission is to finance member states' eradication programmes, and member states may submit these programmes to the Commission for the latter to check their compliance with Community criteria.

It can therefore be seen that since these diseases are located in a certain geographical area (epizootic disease), the Commission simply plays a supportive role for national governments, by evaluating and financing their eradication programmes.

A Task Force has also been created, comprised of representatives of the Commission and all Member States in order to monitor eradication programmes. Sub-groups within the Task Force focus on the more common epizoonoses and draw up a series of periodical reports on eradication programme progress.

Regulations and actions related to animal health fundamentally affect livestock producers, but by virtue of traceability principles, meat industry companies are obliged to record the origin of animals and meat used in production (this will be described later). Likewise, these regulations and actions also affect workers' skills in the meat industry sector.

2. FOOD SAFETY⁴

In general, when analysing national or community public interventions in the food sector, one thinks of the mechanisms that have been developed since the crises in the nineties, in order to ensure that food is fit for human consumption.

Indeed, since then, the European Union and Member States have launched a series of initiatives aimed at recovering European consumers' confidence in the food transformation and production sector. Therefore, actions in the field of food safety affect the meat industry directly, but also livestock production and meat distribution and trade.

All interventions in this field relate to a series of elements:

- The consumer's right to a wide range of healthy, high-quality products.
- The consumer's right to information on foodstuffs: origin of raw materials, manufacturing process, treatment, etc.
- Cross-over actions in this field developed in different policies: common agricultural policy, internal market policy, movement of goods, consumer protection policy, public health protection policy and environmental policy.

In 2000, and specifically as a result of the nineties' crises, the European Commission published a *White Paper on Food Safety*⁵. In keeping with the nature of this type of document, the white paper set up an action programme in this field.

In 2002, Regulation 178/2002 laid down the major principles and instruments in food safety community policy.

2.1. Principles

The principles behind the policies and regulations in food safety are:

- To base the food safety policy on a comprehensive and integrated approach.
- That all food chain stakeholders should be responsible for their actions (from the producer to the consumer, including public authorities).
- To introduce traceability mechanisms for foodstuffs and their ingredients.
- Risk analysis must form the foundation of this policy, based on its three components: risk assessment, risk management and risk communication.

⁴ Information in the section below is taken from documents issued by the European Commission, fundamentally from the *White Paper on Food Safety*.

⁵ Document: COM (1999) 719 final, of 12 January 2000. Since national policies in this field are very similar to that provided in the White Paper, and considering that the aim of this section is to gain an overall idea of possible interventions in the field of food safety, information given below refers solely to this document.

- The possibility of applying the precautionary principle.

2.2. Instruments

The principal instruments to achieve these objectives in food safety policy are as follows:

- Promotion of investigation in the field of food safety
- A fundamental instrument in community action is the European Food Safety Agency, created under Regulation 178/2000. It is organised as a support centre for the development of actions in this field, its issues reports, investigates potential risks, supports crisis interventions, and promotes dialogue with consumers.
- The introduction of single legal frameworks for the whole of the food chain, based on the "farm to table" principle, covering: animal feed products, aspects related to food hygiene, introduction of limits on contaminants and waste, new foods, issues related to additives and packing, safeguarding and emergency measures.
- Promotion of on-going dialogue between representatives of consumers and economic agents.
- Promotion of consumer information related to communicating risks, regulations on labelling and advertising, nutritional value of foodstuffs, etc.
- Also, products from third countries have to comply with regulations that are at least on the same level as those applied in the EU.

2.3. Scope of action

Considering that an integral food safety policy covers all the stages in the food chain ("from farm to table"), areas of intervention follow each step in the chain. Therefore, the following fields of action can be identified:

1. Animal feeding, identifying feed composition, exhaustive control of the use of animal by-products that are not fit for animal or human consumption, etc.
2. Incorporation of animal welfare contents into regulations, particularly with regard to breeding, transport and slaughter. Introduction of appropriate inspection controls.
3. Animal health, involving a large number of regulations in this field, and control mechanisms between AESA and the Food and Veterinary Office. This is of application to EU members states, EU candidates, and countries that export animal products to the EU.
4. Veterinary controls applicable to the EU, in candidate countries and exporting countries, based on common safety regulations.
5. Phytosanitary controls on plants for human consumption.
6. Control of food chain contamination, governing production and packing processes, environmental pollution, maximum permitted levels of certain components, labelling and packing regulations, etc.
7. Control of environmental factors and of genetically modified organisms (GMO).



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- 8. Control of food preparation with regard to ingredients, production, use of additives, etc.**
- 9. Measures related to consumer information and promotion of dialogue with consumers' representatives.**

Food crises have had a clear effect on the meat industry situation. Not only have they led to a reduced consumption in many cases but also, consumers now clearly claim their right to be informed about what they are eating.

In this respect, it can be confirmed that food safety policies have a clear impact on the development of the meat industry and livestock production sector, in company competitiveness, the incorporation of new components in production processes, and therefore, in the functions and tasks carried out by workers in this sector.

Therefore, having analysed the scope of action of these policies, it can be concluded that the following elements are focused on the livestock production sector and the meat industry:

Livestock production

- **Animal feeding.**
- **Animal welfare.**
- **Animal health.**
- **Veterinary controls.**
- **Food Chain contamination control.**
- **GMO control.**

Meat industry

- **Animal welfare.**
- **Veterinary controls.**
- **Food Chain contamination control.**
- **Control of environmental factors.**
- **Preparation of foodstuffs.**
- **GMO control.**

The fact that the producers themselves are responsible for guaranteeing food safety at every stage in the food chain, and for facing the consequences in the event of problems, means that it is absolutely necessary for companies in the sector to develop and apply all mechanisms necessary to guarantee food safety.

3. PRODUCTION PROCESS QUALITY⁶

The boom in all economic sectors related to regulations and mechanisms on quality assurance is widely known. In view of the above points, the food industry in general, and the meat industry in particular, are making every effort to develop and launch quality assurance mechanisms in order to recover and renew consumers' confidence.

There are many components in the area of food quality: healthiness, environmental protection, respect for animal welfare, nutritional value, subjective elements that depend on the consumer's individual perception (flavour, smell, presentation, etc.).

⁶ Information taken from European Commission documents.



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Two main tools have been introduced in Europe in order to assure food quality "from farm to table": traceability mechanisms and labelling conditions.

3.1. Traceability

This term envelops a series of mechanisms that enable the ingredients in a certain food to be identified, and traced back to their respective production, processing and distribution stages. This means that a foodstuff can be withdrawn as soon as any health risk is detected.

Thus, EU Regulation 178/2002 states that it must be possible to trace foodstuffs, animal feed, the animals themselves and any other substance added to food or feed, at every stage during production, transformation and marketing.

Any agent in the food chain will therefore be able to identify the company or person who has supplied feed, ingredients, animals, meat, etc. These agents will record the information in the form of a device that health authorities may demand to see at any time in order to determine the risk factor at any exact point along the chain, and to trace the hazard through next steps, in a precise, fast way.

3.2. Labelling

Labelling regulations laid down at a community and national level will provide consumers with comprehensive information on the components of different foodstuffs so that they are able to make decisions based on such information.

The obligation on the part of livestock farmers and meat industries to detail the origin of feed, live animals, fresh and prepared meat, semi-prepared products, etc., together with the obligation of meat producers and meat preparers to record the product characteristics and components on labels means that, again, companies will have to make changes in the functions and tasks of professional workers in this sector.

4. ANIMAL WELFARE⁷

As in the above cases, we will focus our analysis on community actions and initiatives to determine conditions required in animal welfare.

Community regulations in the field of animal protection and welfare are relatively recent. Their legal framework was laid down in the Amsterdam Treaty that came into force in 1999, and was implemented through a "Protocol on Animal Welfare". From this date on, the EU has brought in legislation in this field in other policies, and in our case, we are affected by this issue in the CAP.

With reference to action derived from policies on animal welfare, it is, as in the majority of community policies, the responsibility of the EU to introduce directive principles and also the responsibility of Member States, to develop national legislation and to manage the systems that apply such legislation.

With regard to livestock production and the meat industry, interventions in animal welfare are focused on farms, transport and slaughterhouses.

- With regard to animal conditions on farms, the EU has introduced minimum regulations, and Member States are able to impose stricter standards

⁷ Information taken from the European Commission.



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based on the former. To date, regulations have been laid down related to laying hens, cows and pigs.

- With regard to transport conditions, community regulations define the responsibilities of all stakeholders and implement control and surveillance instruments, as well as sanctions in the event of breach of such regulations. These regulations apply to all transport operations that take place throughout the food chain.

When discussing transport conditions, this does not just deal with animal comfort: if minimum conditions are not met when animals are transported to the slaughterhouse, their muscles are fatigued, leading to tougher meat.

- Finally, the EU has also brought in regulations in an area of particular interest to this study: animal slaughtering conditions, based on the principle of avoiding unnecessary suffering by using stunning methods, for example.

In addition to EU regulations, the contents of international agreements signed by the EU and Member States should also be taken into account, together instruments implemented by international organisations, such as WTO and the Council of Europe, etc.

A project undertaken by the University of Reading⁸ (UK), financed by the FAIR Community Programme, studied the impact of animal welfare on consumers' choice. The study found that consumers do not consider animal welfare conditions as a priority when choosing meat, but they do rate it on the same level as considerations such as food safety, quality and health-related issues. However, they believe that the animals' living conditions should be as natural as possible, and slaughtering should be "humane", in terms of being fast and painless. Consumers say they are concerned about animal welfare issues, but would not be willing to pay more for food produced under these conditions.

Animal welfare conditions and regulations that govern the same clearly apply to the sub-sectors of livestock production and the meat industry.

Animal welfare on farms and during transport affect producers, while animal welfare during transport and in slaughterhouses affect slaughterers.

Therefore, the application of this regulation and implementation of controls and inspections on animal welfare will imply changes in production organisation on farms and in slaughterhouses alike. And this, in turn, will mean changes in the functions and tasks of professional workers in the sector.

⁸ EU Fair CT98-3678.

5. WORK-RELATED RISK PREVENTION⁹

Issues regarding protection of workers' health and safety have been incorporated in the meat industry as in other sectors, with contents being adapted to the peculiarities of this sector.

The aim of this point is to identify specific risk factors and their prevention, bearing in mind that the meat industry has one of the highest accident rates in industry as a whole.

Amongst the risk factors and prevention elements highlighted in the "Encyclopaedia of Occupational Health and Safety", written by the ILO, and classified according to each production phase, the following are of particular importance:

Phase	Risk	Prevention
Lairage, transport, slaughter.	Biological risks, toxic, infectious or allergic effects derived from zoonoses, animal diseases that are transmissible to humans (brucellosis, tetanus, anthrax, bovine tuberculosis, etc.).	<ul style="list-style-type: none"> - Suitable hygiene conditions and premises - Suitable equipment and working clothes.
Transfer from pen to slaughterhouse.	Injuries from charging animal.	<ul style="list-style-type: none"> - Limit worker's exposure during this phase in the process. - Suitable training in handling of live animals
Lifting and loading carcasses.	Injuries from lifting weights of up to 140 kg.	<ul style="list-style-type: none"> - Use of auxiliary equipment such as pulleys and chains.
Slaughter and sticking.	<ul style="list-style-type: none"> - Use of slaughter tools (stunning guns that can be fired accidentally). - Falling stunned animal. - Use of tools such as hooks, chains, moving rails, ... from which carcasses may fall. 	<ul style="list-style-type: none"> - Safety catches in slaughter tools. - Equipment maintenance. - Use of arm and hand protectors. - Use of knives with protection.
Slaughter, sticking and cutting.	<ul style="list-style-type: none"> - Injuries from using tools for slaughter, sticking, primary and secondary cutting. - Slipping on oily substances or liquids 	<ul style="list-style-type: none"> - Use of protective equipment (helmet, footwear, aprons, gloves, mesh sleeves, protective goggles, etc.) - Use of protected tools. - Provide sufficient space between workers

⁹ Information taken from the *Encyclopaedia on Occupational Health and Safety*, written by the ILO.

Phase	Risk	Prevention
Conveyor belt transport and processing machines.	<ul style="list-style-type: none"> - Unexpected machine start-up. - Cleaning when machine is in operation. 	<ul style="list-style-type: none"> - Use blockage procedures. - Put up warning signs.
Box transport.	<ul style="list-style-type: none"> - Repetitive strain injury. 	<ul style="list-style-type: none"> - Use of ergonomically-designed tools to prevent these injuries.

These risks are specific to the meat industry. There are other risks in this sector that are also inherent to other sectors, and these are listed for informative purposes. No reference is made to preventive measures because they are of common application in all sectors:

- Wet or slippery floors and stairs, elevated platforms with risk of falling.
- Electrical wiring in wet or damp zones.
- Transport and lifting of heavy elements along passages and corridors.
- Loud noise levels caused by machines.
- Contact with toxic chemical products, such as cleaning, refrigerating and packaging products.
- Hot or humid conditions; cold in certain areas.

In this point we have specifically studied the risk factors in the meat industry since this is the sector that we are analysing. Considering that it is one of the sectors that has the highest risk of accidents, it is easy to conclude that it is particularly necessary to equip workers in this sector with a series of skills, especially those who are in contact with machines and tools, or work in environments that have a high incidence of work-related accidents.

6. ENVIRONMENTAL CONSERVATION¹⁰.

In the field of environmental protection and control of environmental impact, the European food industry, which is the more general sector that envelops the meat industry, is increasingly aware of the repercussion that this industry has on the environment. The Confederation of the Food and Drink Industries of the EU (CIAA) that represents these companies at a community level, bases one of its main lines of action on the on-going analysis of the impact that this industry has on the environment, and of information and awareness of the same on the part of producers and consumers.

Thus, this organisation has determined the following key environmental performance indicators: water, energy, air emissions, wastewater and disposed waste generation.

¹⁰ Information taken from the "Environment review" written by the CIAA – Confederation of the Food and Drink Industries of the EU.

- For example, with reference to water, 20 % of water is used in industry, and up to 8% in the food industry (this is the case of Holland, for example). This industry is making a great effort to protect water resources, reducing consumption, recycling water and limiting water loss. However, it is difficult to limit water consumption in industry because of food hygiene considerations. In short, a balance must be sought between food safety requirements and the rational use of water.
- With regard to energy, the food industry is also the principal consumer of energy (for example, in Holland again this sector accounts for 10% of energy consumption). The food industry's efforts in energy efficiency correspond to the use of cleaner energy sources, better energy resource management, recycling of agricultural by-products as energy sources, innovation of equipment and processes, etc.
- Different production processes also contribute towards environmental sustainability, for example by reducing the amount of packaging material used, recycling packaging, etc.
- Another important area for environmental control in meat industries is sustainable management of air emissions. In this field, the industry has invested heavily in reducing CO₂ emissions and other ozone depleting gases. The food industry is responsible for 5 to 13% of emissions, depending on individual countries.
- The CIAA has also analysed the issue of food industry waste. Thus, wastewater is purified in companies' installations or in public wastewater treatment installations. In the last few years there has been a reduction in the amount of wastewater produced by this industry. Companies are also trying to reduce solid waste, and progress has been made during the same period.
- It should also be pointed out that there has been a generalised introduction of integrated environmental management principles that is leading to the application of environmental management systems (EMS), the process of certification through environmental management standards, such as ISO 4001, and the implementation of production process analysis, etc. Also a large part of R+D resources are used for this purpose.

The points made above are a clear example of how environmental sustainability and control of the impact of the food industry are, or should be, priority issues when defining business strategies. They will therefore imply changes in company organisation and, in turn, in the functions and tasks of workers in this sector. This applies to the food industry in general and to the meat industry in particular, as a sub-sector of the former.

7. NEW TECHNOLOGIES

As with all other economic sectors, the meat industry has benefited from the incorporation of new technologies in its productive processes, and, as a result, it has had to adapt to these changes. This study will not make a detailed analysis of



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these changes, since the great majority have been discussed in general in earlier points.

The changes mentioned above, fundamentally those introduced in the field of animal health, food safety and quality, are those that result from adapting to new technologies. However, changes have also been seen in the prevention of work-related risks and animal welfare.

Therefore, here are a few examples of innovative technologies that have been applied in the meat industry sector in the following fields:

- **Labelling and traceability.** All the information provided on product labels and information related to raw materials, semi-prepared and prepared products that are added to the final product, is computer processed in order to achieve a more efficient use. As explained earlier, these areas are related to food safety issues.
- **Also, in the area of food safety, new technologies now permit a closer control of production processes and components in companies, and this in turn permits earlier identification of potential risks.**
- **The same applies to the mechanisms that are to be put into practice, using the potential of new technologies, to improve the working conditions of a sector that has one of the highest rates of health and safety risks for its workers. Several prevention elements that require new technologies have already been discussed in the above point on health and safety risk prevention.**
- **Finally, the best example of the application of new technologies is that which refers to animal welfare conditions, using slaughtering methods that reduce animal suffering.**

The incorporation of new technologies in meat companies will logically imply changes in production methods, company organisation and workers' functions and tasks. Since this is an instrumental issue (in the sense that the use of new technologies implies changes in the above mentioned points), remarks on changes in workers' functions and tasks have already been discussed in earlier points.

So far, we have analysed change factors in the meat industry that affect the production process and company business organisation. However, there are other factors that are more related to market changes, which will also play an influential role, and these factors will be discussed below.

8. CHANGES IN CONSUMER TRENDS¹¹

Before considering changes taking place in the meat product market, i.e. offering statistical data on how trade is developing within the EU and with third countries, it would be advisable to make a brief analysis of changes in consumers' demands.

In the European Union, and developed countries as a whole, consumers are increasingly demanding about the food they eat: they demand more safety, more

¹¹ Data and information taken from CIAA documents.



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quality, more information, etc. The food crises that have occurred since the mid-nineties have highlighted this trend even more clearly.

Thus, some of the demands of meat product consumers are focused on the following elements, some of which have already been discussed.

8.1. Quality

Quality-related issues clearly involve other more pressing aspects for consumers, especially those related to food safety. But other quality-related aspects should also be considered, that do not only refer to health risk factors.

In general, consumers have a higher expectation of quality. They are more demanding about what they eat, and price is now not the only factor considered when choosing between two similar products.

The demand for higher quality goes hand in hand with appropriate information on the product characteristics: ingredients, production process, place of production, etc. As discussed earlier, this demand for information has to be met through the use of suitable labelling, and mechanisms for assuring the traceability of foodstuff components.

In some cases, consumers also demand "extra" quality products, such as designation of origin, for example. This has led to a boom in quality labelling. This subject is of such importance that it will be the object of further analysis in the point below.

8.2. Safety

We have already discussed in detail that the major changes in the meat industry sector are focused on assuring maximum food safety. A large part of concern for food quality is related to consumers' confidence that foodstuffs do not involve any health risk.

Consumers are increasingly aware that, despite the fact that the quantity and quality of foodstuffs are constantly increasing, on the other hand, there is also an increasing number of risk factors in food production.

The meat industry and livestock sectors have been greatly jeopardised by the recent food crises: from the mad cow disease crisis, to the more recent bird flu, with more recurrent situations in between (such as outbreaks of *salmonella* and *legionella*, for example). These sectors are therefore close scrutiny on the part of consumers' organisations and health authorities.

Therefore, the industry is faced with a great challenge to be able to respond to safety demands that are increasingly imperative and strict. And the industry's future development clearly depends on it.

8.3. Diversity and health food

European consumers no longer simply look for quality, risk-free food; they also look for diversity. This is clearly seen in shops that now offer different dietary foods: "bio", "ecological", "designation of origin", etc, that are healthy in general (cholesterol-free, without certain additives, with extra dietary components...)

In short, the food industry in general, and the meat industry in particular have got to follow consumers' trends very closely, and be flexible enough to adapt to a growing demand for greater diversity of foodstuffs.

8.4. Sustainability and animal welfare

The growing social demand for a greater respect for the environment is a general concern that goes beyond consumption but also influences the meat industry and economic activity as a whole.

It has already been discussed how the food industry, including the meat sub-sector is making great efforts to limit the impact of its activity on the environment.

In this area, livestock production and the meat industry are specifically subject to these general demands, but there is also room for new markets with products that offer the distinction of environmental respect. In this way, there is increased consumption of ecological products and a boom in sustainable farming, in harmony with nature.

Although the University of Reading study that we mentioned earlier, demonstrated that European consumers do not consider animal welfare amongst their priorities when making choices, it does show that these issues are starting to become a subject of concern as a criterion for choosing meat products.

9. GEOGRAPHICALLY-LINKED PRODUCTION¹²

Furthermore, from a formal point of view, quality is linked to: a geographical region; the traditional form of producing a product; or to compliance with certain ecological production standards.

Designation of quality is used by the EU to regulate quality guarantee mechanisms in the food industry. The purpose of this designation is to protect a product's good reputation, by laying down strict production criteria and guaranteeing product quality. This prevents other producers in the same geographical region or in others, from elaborating lower quality products and creating unfair competition for producers who actually comply with these criteria.

EU Regulations 2081/92 and 2082/92 lay down the legal framework of these designations. Regulation 2081/92 defines the concepts of protected designation of origin and protected geographical indication, the formal terms and contents for applying for a PDO or PGI; the role played by national and community authorities; protecting PDOs and PGIs against imitations, false indications about the origin of certain products, etc.

Regulation 2082/91, for its part, defines a register for agricultural products and foods with specific characteristics, and the terms for applying for registration. It therefore refers to certain foods that may be included on this register, due to their specificity, but may not be designated as a PDO or a PGI.

Therefore, the EU has laid down three categories for quality designations:

- The Protected Designation of Origin is the strictest instrument used in designation protection. This is because the entire production process, transformation and preparation must all be carried out in a certain zone, using a specific process.
- The Protected Geographical Indication provides a link with the geographical zone of reference in at least one of the stages of production, transformation and preparation, and the good reputation of the product.

¹² Information taken from the European Commission website.



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- **The Traditional Speciality Guarantee (TSG) certification does not refer to a certain geographic origin, but to either the composition or to a traditional means of production.**

The European Commission has established a register for PDO, PGI and TSG products.

It is clear that access to a quality designation can contribute added value to the farm production and the meat industry. From a production point of view, this access depends on the introduction of strict standards in production controls, compliance with certain techniques, the use of well-established components, and strict control of quality and safety standards.

It can be confirmed that the growing interest shown by consumers in selecting quality products, and the possibility of distinguishing one's own production are the advantages that can be reaped by producers with regard to this type of mechanism.

Thus, one of the elements that will clearly imply changes in the meat industry sector will be the development of these instruments that visibly demonstrate quality. They will have a specific influence on the functions and tasks of workers in this sector.

10. FOREIGN TRADE¹³

For the agro-food sector as a whole, it can be observed that there is an upward trend in exportations when third countries are considered as a whole. Thus, from 1999 to 2001 the exportation figure increased from almost 42,000 million € to almost 50,000 million, although it then fell slightly in 2003 (to 49,000 million €).

With regard to imports, there was also an increase between 1999 and 2001 (from just over 50,000 million € to almost 58,000), with a slight recession from 2001 to 2003 (with a figure of just over 57,000 million €).

Thus, the foreign trade balance remains negative for the EU by about 8,000 million € per year, during the aforementioned period.

However, considering the EU's principal trading partners (USA and Japan), not only is there a clear upward trend, but the foreign trade balance is positive for the EU.

11. DISTRIBUTION ORGANISATION

The causes and factors behind the different change factors in the meat industry have been analysed earlier. However, these change factors have led to the need to adapt distribution to these new demands.

¹³ Eurostat data.



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Thus, distribution organisation is influenced by aspects that have been analysed earlier:

- **Food safety, covering the whole process from “the farm to the table”, and therefore including distribution.**
- **Production process quality, with reference to labelling, for example.**
- **Animal welfare, including regulations related to live animal transport.**
- **Environmental impact, with reference to packaging, for example.**
- **The incorporation of new technologies in distribution organisation and management. It is important not to neglect the potential of electronic business developments in this sector, and this will necessarily alter production channels, and other aspects such as storage procedures.**
- **Issues related to national, EU and foreign commerce, and changes in consumers’ habits and demands. The meat industry is being challenged to offer greater diversity in production, leading to more flexible distribution and adaptation to increasing diverse production.**

In short, distribution organisation is not only yet another cause for change in production processes, but it, in turn, is also influenced by other factors.

Workers in Marketing, Distribution, Logistics areas are especially affected by the impact of these changes on the criteria of distribution organisation involved in the tasks carried out by this sector’s professionals.

Their functions must respond to new distribution criteria, that will fundamentally imply constant adaptation and greater flexibility in distribution channels.

The need to respond to an increasingly diversified demand, in an increasingly competitive market due to the importing of products from third countries, together with increased demands regarding quality and safety, and changes in consumers’ trends, etc. all means that companies will have to meet demands imposed by increasingly atomised markets, and, moreover, these demands will change at a fast rate.

CHANGES IN THE PROFESSIONS

When analysing each of the change factors in the meat industry sector, we highlighted the changes that will be implied in workers' functions and tasks. We also described the trends that are occurring in the different professions, detailing those which are growing and those which are stable.

It cannot be said that new professions are emerging, but different profiles are being introduced, and new functions must also be incorporated.

In this section on conclusions, we aim to state which functions will need to be introduced in the most relevant professions, in view of the production change factors that have been analysed.

GROWING PROFESSIONS

Quality Expert

The boom in quality experts is a result of the importance that is being placed on quality-related issues in the meat industry sector. The quality expert's function will be to assure the quality aspects of production with regard to material quality (e.g. conditions of machines, installations and tools), and bureaucratic quality (traceability and labelling regulations).

Veterinary assistant

This position is also growing in the meat industry sector. This growth is principally explained by the veterinary assistant's function to ensure that the meat complies with the increasingly demanding requirements in safety and food hygiene, ante and post mortem. Veterinary assistants assure compliance with regulations in safety and food hygiene in all its different aspects (animal welfare, veterinary inspections, control of contaminant factors, etc.)

Director of operations

The director of operations is responsible for buying and selling activities and therefore, for establishing marketing and distribution channels. Changes in these areas have already been analysed. Marketing and distribution aspects have now come very much into the foreground in this industry and therefore this director's role is of greater importance, since he/she must be capable of setting up increasingly agile and flexible distribution channels.

The Internet and electronic business possibilities will become a fundamental tool in order to meet an increasingly atomised demand, reducing costs that are implied in meeting this demand. These changes will also imply a greater part played by other professionals who work in related fields, such as sales personnel.

Logistics expert

Logistics experts are responsible for distribution and supply, and will therefore acquire a greater weight in view of trends in trade and consumption, and, in turn, distribution. Basically, the logistics expert will have to learn to respond to an atomised demand that undergoes constant change.

Expert in work-related risk prevention

In view of the importance of risk prevention in this sector, which is one of the sectors with the highest accident rates, it is easy to see that this profession will be of great importance.



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PROFESSIONS THAT REMAIN STABLE

Considering that there is a slight upward trend in production in the EU, logically the professions that are most closely related to production - the most traditional ones - will maintain a stable weight (or slightly downward trend) in their share of employment in the sector.

Clearly, these professionals will also have to incorporate certain know-how and develop new tasks. Workers who are responsible for animal slaughter will have to learn to use new slaughter tools that minimise animal suffering; workers in the cutting chain will have to apply training received on safety and hygiene, work-related risk prevention, etc.

EMERGING SKILLS

In the analysis of change factors in the meat industry, mention was made of the new tasks that will have to be carried out by the professionals in this sector. A detailed analysis of these tasks does not correspond at this stage in the project. The table below lists the areas of new skills in the most relevant professions in this sector.

It should be understood that this table provides a starting point for the next work phase, and therefore the table contents are not definitive.

AREA / ACTIVITY	PROFESSION	AREA OF CHANGE								
		Animal health	Food safety	Production quality	Animal welfare	Work-related risk prevention	Conservation of the environment	New technologies	Changes in consumption trends	Geographically-linked production
PRODUCTION – Livestock slaughter and meat preservation	Lairage worker	X	X		X	X	X			
	Slaughterer		X		X	X	X			
	Cutter		X	X		X	X		X	
	Meat product preparer / packer		X	X		X	X		X	
	Trimmer		X	X		X	X			
	Cold store / warehouse worker		X	X		X	X			
PRODUCTION – Manufacture of meat products	Raw meat product preparer		X	X		X	X		X	
	Heat-treated meat product preparer		X	X		X	X		X	
	Meat industry machine tender		X	X		X	X		X	
	Meat product packer		X	X		X	X		X	
	Cold store / warehouse worker		X	X		X	X			
PRODUCTION – Wholesale meat marketing	Logistics expert					X	X	X	X	X
	Cold store / warehouse worker		X	X		X	X			



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QUALITY – Livestock slaughter and meat preservation	Quality control expert	X	X	X	X	X	X	X	X	X
	Veterinary assistant	X	X	X	X	X	X			
QUALITY – Manufacture of meat products	Quality control expert	X	X	X	X	X	X	X	X	X
QUALITY – Wholesale meat marketing	Quality control expert	X	X	X	X	X	X	X	X	X
MAINTENANCE	Maintenance technician		X			X	X			
	Cleaner		X			X	X			
ADMINISTRATION	Administrative worker					X	X	X		
MARKETING	Distributor					X	X	X		
	Sales agent					X	X	X	X	
	Director of operations					X	X	X	X	
WORK-RELATED RISK PREVENTION	Expert in work-related risk prevention					X	X	X		

CONCLUSIONS

As it has been explained, changes in the meat industry have an impact on competences structures of professions in the sector. This will mean changes both in permanent training for workers in the sector and in qualifications transparency.

The following research steps in the "Euromeat" project are centred in a deeper analysis of changes in competences, in how the training offer has to be conformed, and, considering the integration of the market of meat products, how to ensure the recognition of qualifications, in the wider framework of EU policies in this field.

In the current situation of the development of this research, the following conclusions have been reached, that will be the basis for the next phases of the research:

- **Changes in the meat industry lead to changes in the competences structure of professions.**
- **There is a need, then, to adapt the contents of permanent vocational training.**
- **The trends in the meat industry market, and in the legal framework of this industry, make possible, and needed, the definition of qualifications transparency tools at European level.**