



Future of manufacturing **Meat processing workers: Occupational report**

*New tasks in old jobs: drivers of change
and implications for job quality*

Authors: Martin Eggert Hansen (Danish Technological Institute)

Research manager: Enrique Fernández-Macías

Eurofound reference number: WPFOMEEF18010

Related reports: This occupational report is one of the five occupational reports (Car assemblers, Chemical products plant and machine operators, Hand packers, Inspection engineers, Meat processing workers) conducted in the framework of the project Future of Manufacturing in Europe and produced by Martin Eggert Hansen (Danish Technological Institute) and Simone Rosini (Fondazione Giacomo Brodolini).

© European Foundation for the Improvement of Living and Working Conditions (Eurofound), 2018
Reproduction is authorised provided the source is acknowledged.

For any use or reproduction of photos or other material that is not under the Eurofound copyright, permission must be sought directly from the copyright holders.

The European Foundation for the Improvement of Living and Working Conditions (Eurofound) is a tripartite European Union Agency, whose role is to provide knowledge in the area of social, employment and work-related policies. Eurofound was established in 1975 by Council Regulation (EEC) No. 1365/75 to contribute to the planning and design of better living and working conditions in Europe.

European Foundation for the Improvement of Living and Working Conditions

Telephone: (+353 1) 204 31 00

Email: information@eurofound.europa.eu

Web: www.eurofound.europa.eu



This is a publication from *The Future of Manufacturing in Europe (FOME)* project.

FOME is a Pilot Project proposed by the European Parliament and delegated to Eurofound by the European Commission (DG GROW).

More information on the FOME project, including available and forthcoming publications and events and relevant data can be found on the FOME page of the EUROFOUND website.

<http://eurofound.link/fome>

Contact details

Donald Storrie (Project Manager) Donald.Storrie@eurofound.europa.eu

Alessandra Massaro (Project Administrator) Alessandra.Massaro@eurofound.europa.eu

Contents

Introduction	1
About the study	1
The occupation of this working paper.....	1
Comparative analysis of the case studies: Contextual factors	2
Market changes: Price competition is key	2
Technology changes.....	3
Policy and regulation	4
Workforce changes	5
Industrial relations: Fragmented with increasing use of temporary workers	6
The occupation's job content and tasks.....	8
Physical/manual tasks	9
Intellectual tasks.....	9
Social tasks.....	10
Methods and tools of the work.....	10
Comparison with Eurofound's job content scores	11
Job quality of the occupation.....	12
Intrinsic job quality	12
Employment quality	12
Workplace risks	13
Working time and work–life balance.....	13
Pay/wages	13
Conclusions	15
References	16

Introduction

About the study

The overall purpose of the study is to provide a comparative, qualitative, contextualised and detailed analysis of five specific manufacturing occupations, listed below with their International Standard Classification of Occupations (ISCO-08) code:

- meat processing worker (ISCO 8160);
- chemical products plant and machine operator (ISCO 8131);
- hand packer (ISCO 9321);
- car assembler (ISCO 8211);
- inspection engineer (ISCO 2141).

The study is based on a comparative, qualitative analysis of five key occupations in four countries (Germany, Italy, Sweden and the UK), each covering different European regions (continental Europe, the Mediterranean, Scandinavia, and Ireland and the UK). The study focuses on how job content, tasks, applied technologies and working conditions are changing the jobs and their content.

The five occupations were selected as case *examples* of classical occupations in manufacturing, and how the occupations and their content are changing due to many different factors at contextual and company level. Many other occupations in manufacturing could have been chosen. Hence, the main purpose of these comparative occupational studies is not to analyse these occupations as an end in themselves, but rather to use them to illustrate how manufacturing in Europe is changing and how this affects European jobs.

Each case study combines a contextual level (for example, company developments) and a company level. Each case study thus analyses the occupation in a specific country (for example, meat processor in Germany) and how industry developments, company strategies and other contextual factors affect the work tasks and job content of the occupation. In each country, the case study is based on desk research and interviews with employees in the occupation and employers in a case study company. In addition, interviews were conducted with relevant trade associations.

At company level, the main focus of the interviews was to analyse the contents and work tasks of the occupation. This analysis is based on a framework developed by Eurofound, which divides the job content and tasks of occupations into three generic categories (Eurofound, 2016):

- physical/manual tasks;
- intellectual tasks – such as processing and transformation of information;
- social tasks – such as interaction with other people (colleagues, customers and so on).

The information gathered from the case studies suggests that the framework is robust and applicable across all the occupations of this study.

The occupation of this working paper

This working paper focuses on the occupation ‘meat processing worker’. This occupational group works in slaughterhouses (abattoirs), meat packing companies or wholesale establishments performing precision functions involving the preparation of meat. Their typical work may include specialised slaughtering tasks, cutting standard or premium cuts of meat, making sausages or wrapping meats.

The occupational group works in the meat processing industry. The broader term ‘meat industry’ includes primary (agriculture) and secondary (industry) activity, and is hard to characterise in terms of either one alone. In this context, the working paper focuses on the secondary segment – the meat processing industry which handles the slaughtering, processing, packaging and distribution of meat from animals such as cattle, pigs, sheep, poultry, and other livestock.

Comparative analysis of the case studies: Contextual factors

This chapter discusses the main findings of a comparative analysis of the four case studies of the occupation, one per each selected country. It analyses the contextual factors and drivers of change affecting the meat processing industry, and how they influence the occupation's job content and working conditions. Contextual factors include:

- market changes and industry developments;
- technological developments;
- policy and regulation;
- workforce demographic changes;
- industrial relations;
- other factors that affect the industry and the occupation.

Market changes: Price competition is key

The overall trend characterising the meat processing industry across all the four case study countries is increasing concentration in large companies and mass production. The concentration is driven in all four countries by the same structural forces such as retailer concentration, price pressure, competition and imports from low-wage countries, and increasing regulatory costs. These factors are leading to increased focus on production efficiency. To achieve competitiveness based on efficiency and economies of scale, meat processing plants have become larger and organised along production lines where meat processors carry out specific tasks repetitively.

In Germany, for example, the meat processing industry is heavily biased towards slaughtering and the concentration process is continuing. The share of the 25 largest companies in terms of turnover in slaughtering (without poultry) reached 70% in 2014 and, when the slaughtering of poultry is included, as much as 96%. Economies of scale were especially large in slaughtering without poultry since the 70% share of the turnover was generated by only 34% of the workforce. Today, slaughtering and first cuts are concentrated on production lines in big private slaughterhouses.

In Italy, the sectoral concentration has gone hand in hand with a number of acquisitions aimed at obtaining wider economies of scale and achieving the 'critical mass' necessary to cut production costs with a view to being able to compete on the European and world markets in which the leading role is played by countries with low labour costs and vast amounts of land such as Brazil, India, Poland and Russia. This acquisition process was followed by a far-reaching industrial reorganisation plan, whose main feature is production specialisation.

In the UK, meat processing companies are also becoming concentrated; the large companies such as Two Sisters and Moy Park have become larger, and there are fewer small companies in the sector.

A parallel market for small-scale production of premium products

Not all meat processing companies, however, have responded to the increasing price competition by concentration and becoming bigger. Although concentration is the main trend, some parallel trends of small-scale production focusing on quality, eco-friendly production and animal welfare are also seen. Regular food scandals related to contaminated meat and hygiene issues are important driving forces in this trend.

Although meat processing companies in Sweden have become more concentrated, there are some signs of polarisation. On one hand, there is a growing number of small slaughterhouses, and on the other hand, there is a trend of mergers and concentration of activities in large slaughterhouses. Sweden has some of the strictest regulatory standards for animal welfare and food safety, and a large home market. These are competitive advantages favouring small-scale production, as consumers increasingly focus on local, sustainable meat production.

Similar trends can be observed in Germany. Until the end of the 1960s, slaughtering took place at municipal slaughterhouses, and local butchers were required to use these slaughterhouses. This limited the size and the growth of companies. With the current privatisation of the slaughterhouses, there are no size limits when it comes to optimising the economics of fixed capital. The cost of slaughtering a pig at a large slaughterhouse was down to €12 in 2017, making it impossible for small and medium enterprises (SMEs) to compete. Most slaughtering and packaging processes are therefore currently take place on the production lines of large companies. However, a few SMEs with premium products are still slaughtering themselves and the case study company in Germany is an example of such a small-scale production. The restructuring of the industry and the increasingly strong price competition means that the company has had to diversify, and it now specialises in high quality premium products based on traditional handicraft with meat from the region and a transparent supply chain from the farmer to the butcher's shop. The company processes meat and produces sausages and bacon at its production site.

Technology changes: Increasing mechanisation and automation

Although meat processing is still a highly labour-intensive job, the industry is increasingly supported by new technologies that mechanise and automate some of the work tasks. These technologies tend to make the work of meat processors less physically stressful. If properly used, these technologies have the potential to improve animal welfare, quality, safety, hygiene and ergonomics. However, their uptake is not yet widespread as they are costly, and companies can still make high profits with obsolete machines – particularly if labour costs are low. A mixed picture of meat processing and packing processes being partly automated can be observed in the case studies.

The Italian case study company, for example, has implemented a robot system for handling carcasses or parts of carcasses during processing and cutting. This system has replaced the old workbenches equipped with a conveyor belt that required operations to be performed horizontally. Now, cutting operations are performed vertically and ergonomics have improved.

The Swedish case study company is technologically advanced compared with the mainstream Swedish meat processing industry. It invested recently in automation technology and robots that carry out some of the initial slaughtering operations. New technologies such as condensed scalding and shock cooling have also been introduced, to increase the speed, efficiency and quality of meat processing. For example, shock cooling increases the value of the processed meat as more meat juices stay in the carcasses during processing. The company believes that automation has significantly reduced slaughtering costs. It also argues that the automation technology is vital to it remaining competitive in the meat processing industry in Europe, particularly in eastern Europe where wage levels are low compared with Sweden.

The UK case study company has also invested in automation technology and robots to carry out some of the initial slaughtering operations. The first robot opens the animal's chest bone so that the inner organs can be taken out. The second robot is an automated saw that cuts the carcass into two halves of the exact same size.

In Germany, the use of new programmable technologies for meat processing such as cutting, grinding and mixing is becoming standard even in SMEs. German meat technologies also include moveable lifting platforms for handling various carcasses and platforms with sterilisation stations for tools as well as cleaning equipment for the slaughtering operations. Robots supported by a PC-based system can deliver highly accurate, repeatable and extremely hygienic operational results for cutting or meat packing.

Adoption of robots and automation technology is still not mainstream

Although meat processing has become a mass production operation based on production lines, the adoption of available robotics and automation technology is moderate and slow. Even though new technologies are being introduced, the meat processing industry as a whole is slower than other industries at introducing them. There are a number of reasons for this. Food companies achieve lower

profit margins than companies in other industries such as the automotive industry. So if wage levels are low and cheap labour is available, manual production may still be a more economically efficient option than investing in costly automation technology. In addition, the raw used in food products materials (that is, animal carcasses) have a high degree of variability, which makes developing effective automated solutions a technical challenge.

Automation and robotics now make it possible to process meat using automated machines and robots almost without human intervention. Other robots can then take care of the packaging and sealing of the meat, making it ready for shipping and distribution to local butchers, supermarkets and finally onto the consumer's plate. However, the robot technology has still not fully mature and is far from becoming mainstream. The accuracy of robots in performing complex movements and positioning the cutting edge when cutting different sizes and shapes of lamb, pork and beef carcasses still needs refinement.

But the automation technologies are evolving

Although robotics and automation technology is still not mainstream in the meat processing industry, the technology is evolving and becoming more precise. New robot technology incorporates imaging technology that mimics the human sense of touch and vision. The vision technology takes a three-dimensional picture of the outside of a carcass, and then deduces the internal bone structure and how a robot should proceed to get maximum meat from the carcass. The technology is applicable for different protein segments including beef, pork and poultry. Such technologies are intended to enable robots to perform more dexterous and analytical functions, such as determining the specific position of bones in carcasses before stripping off high quality meat.

Policy and regulation: Increasing focus on food safety and traceability

Regular scandals related to animal welfare, contamination of meat, fraud in labelling, diseases and hygiene issues have led to increased political focus and regulations on food safety. Consumers are placing increasing emphasis on traceability, quality and animal welfare. The meat processing industry has responded by placing increasing emphasis on technologies that enable traceability and quality control. This directly influences the job content of meat processors, who operate traceability systems that control, tag and label all incoming animals and meat.

Since the BSE crisis in the 1990s,¹ all cattle must have passports recording their movements. All four case study companies have installed digital traceability systems where data on each animal's type, slaughtering date, classification of the carcass's weight, fat percentage and other information are recorded. Each animal is identified with a barcode and all the steps of the slaughtering, cutting and packaging processes are documented on a computer system.

The BSE crisis forced companies to devise production processes that ensured product safety and traceability systems that provide consumers with reliable information on the origin and destination of products. To combine quality and product safety with lower production costs, companies have invested in mechanisms to monitor production chains and their integration both upstream (making farmers aware of their joint responsibility) and downstream (through the creation of own brands and sales networks) to internalise profit margins.

¹ *Bovine spongiform encephalopathy* (BSE) – commonly known as ‘mad cow disease’ – was first identified in cattle in 1986. Among others, the UK government announced the news that the disease had jumped the species barrier to humans in 1996, when it admitted that the new brain disease, Variant Creutzfeldt-Jakob disease (vCJD), was probably linked to BSE. It seemed possible that victims had caught the disease by eating meat from BSE-infected cattle. A special BSE inquiry was set up in 1998 to investigate the public health scandal and the report cast new light on what had gone wrong.

In the UK case study company, the passport is scanned when the farmer books bovine cattle for slaughter and this is cross-checked when the animal arrives in the lairage.² A series of barcoded labels identifying the animal are attached and repeatedly cross-checked as the carcass moves through the factory, so that each cut can be traced back to a specific animal and the time it was killed. By operating a traceability system, the meat processor enables the transformation and flow of various data such as carcass performance data indicating the weight, fat percentage, passport verification of the identity of the animal pre- and post-slaughter, and detailed information on animal feed regimes provided by farms.

In the Swedish case study company, meat processors operate and monitor an automated classification system for carcasses. X-rays scan the carcasses and grade them based on electronic scanning pictures, based on an assessment of the size of the muscles and estimates of the fat coverage.

In the Italian case study company, quality, food safety and product traceability have become a priority in the past 20 years. The company also applies a passport system, whereby each animal entering the slaughterhouse is given a 'passport' detailing information such as its breed, age and the country where it was raised. The passport is processed by the company's management software and, during production, operators tasked with processing meat label the cuts being processed to allow the carcass to be identified. This enables full and clear traceability of each piece of meat.

Workforce changes: Concentration of production leads to de-skilling and harder working conditions

The concentration of the meat processing industry has tended to lead to de-skilling and harder working conditions with more repetitive and dangerous work tasks. In all four case study countries, the meat processing industry increasingly employs mainly male meat processors of foreign origin. Companies are also increasingly employing workers on temporary contracts with low levels of employment protection.

In Germany, slaughtering and meat processing used to be a job for skilled butchers who had trained for three years in the German dual apprenticeship system. With the concentration of the industry in large companies, these jobs have become increasingly unskilled or semi-skilled jobs on production lines. The large slaughterhouses and meat processing companies mostly employ skilled workers only for special tasks such as supervision, the operation of highly automated machines or quality control. In recent years, temporary agency workers and posted workers from other EU Member States have increasingly replaced Germany's native workforce – especially in the big companies.

In Italy, most of the workers in the meat processing industry are usually young men, mainly of foreign origin. There is also an increasing use of outsourcing to businesses supplying workers on temporary contracts.

A similar trend can be observed in the UK. Over the past decade, the meat processing industry – and the food industry in general – have become increasingly reliant on migrant workers, especially from the EU. Nearly a third of the UK food and drink manufacturing workforce, some 117,000 workers, is now made up of EU migrants who are mainly supplied through agencies. Analyses of the employment conditions and work practices in meat and poultry processing factories across England and Wales (EHRC, 2010) found that migrants employed in the sector, and agency workers in particular, experienced hard working conditions in the workplace, long hours and shift work.

In Sweden, the public employment agency predicts that the demand for meat processors will be very high the next 1–2 years as there is a growing home market demand for Swedish and locally produced meat. Meat processors are therefore expected to offer good employment opportunities. To cover the current demand for meat processors, the Swedish meat processing industry increasingly employs temporary workers from recruitment agencies.

² Accommodation where cattle or sheep are rested on the way to slaughter or market.

Industrial relations: Fragmented with increasing use of temporary workers

Industrial relations in the meat processing industry in the four case study countries are characterised by fragmentation of negotiations and collective agreements – particularly in Germany and the UK, while less so in Italy and Sweden. However, the meat processing industry in all four countries increasingly employs migrant and posted workers on temporary contracts. This and the increasing use of temporary workers outsourced via external recruitment agencies may jeopardise workers' protection because they prevent trade unions from monitoring company activities.

In Germany, industrial relations in the food and especially in the meat processing industry are highly fragmented. The dominant German model of strong union and employer associations negotiating industry-wide collective agreements does not apply in this sector. The German meat processing industry is known as a low-wage industry that is not covered by collective agreements, which pays lower wages than the meat processing industry in neighbouring countries. Only in the artisan sector are there regional collective agreements. In the industry sector, the employer associations concentrate on representing the economic interest of the industry (for example, product market regulations). They do not have the mandate to negotiate regional or national agreements. Only few company agreements were found, but the high fragmentation of the negotiations means that the trade union involved was not able to publish reliable information on the number and the coverage of these agreements.

In the UK, the industrial relations and working conditions of meat processors have been influenced by structural changes in the industry. The UK meat processing industry – and the food industry in general – has undergone a shift from small-scale producers and manufacturers towards large retailers and multinational corporations. This has increased the competitive pressures among subcontracted growers, producers and processors, and competition below them in the supply chain has intensified. Companies have sought to increase labour flexibility with high levels of paid overtime and temporary agency work. This has caused an increase in the incidence of low-paid, irregular and non-unionised work in the agricultural and meat processing sectors. This has made employment in these sectors less attractive to the UK workforce, which has led to labour shortages. In addition, the enlargement of the EU in 2004 and 2007 opened up a new pool of cheap labour from outside the UK with a disproportionate number of migrant workers from central and eastern European countries gaining employment in the agri-food sector and the meat processing industry in particular. Analyses of the employment conditions and work practices in meat and poultry processing factories across England and Wales found that migrants employed in the sector, particularly agency workers, experienced tough working conditions in the workplace, long hours and shift work (ERHC, 2010).

In comparison, industrial relations in Sweden are less fragmented as the trade union of meat processors, the Food Workers' Union (LIVS), has established a collective agreement with most meat processing companies and most of the food industry in Sweden. The collective agreement includes minimum terms for working hours, and extra payments for overtime and inconvenient working hours. This collective agreement is the employees' protection against wage dumping and poor working conditions at company level. However, the Swedish meat processing industry has also seen an influx of meat processing workers from eastern Europe. As these workers come from countries with lower wage levels, this has put pressure on the collective agreement for meat processors in Sweden. LIVS works hard to ensure that the wages of meat processors working in Sweden adhere to the Swedish collective agreement. At present, industrial relations at industry level are characterised by cooperation as the industry is facing difficulties attracting workers and, at the same time, the number of young people entering the industry is falling. LIVS and the employer organisation, the Swedish Food Federation (Livsmedelföretagen) have therefore launched a joint strategy focusing on the recruitment of meat processors among refugees.

In Italy, industrial relations and negotiations are less fragmented. Collective bargaining takes place at two levels, that is, the national collective bargaining agreement and a territorial or company level supplementary agreement. The former aims to ensure that all workers in a specific sector, wherever they carry out their working activity within the national territory, enjoy minimum standards in terms of wages, protection and so on. At the same time, service contracts are becoming more and more

widespread and may jeopardise workers' protection because they prevent trade unions from monitoring company activities. In the opinion of union representatives, this represents a potential risk for workers because, in case of labour litigation, the companies do not offer sufficient asset guarantees. This scenario comes about although Article 4 of the national collective bargaining agreement applicable to the sector, which sets out that in order to more effectively protect workers, companies are required to include in service agreements specific clauses that oblige contracting companies to take on business risks and comply with the obligations resulting from insurance, social security, hygiene and safety at work standards.

The occupation's job content and tasks

The meat processing industry has become concentrated into large businesses where meat processing is increasingly organised as mass production by dividing the slaughtering and packing processes into many small standardised routine operations. The industry has adopted digitally controlled automation and mechanisation technology to some extent, but meat processing is still mainly a manual, labour-intensive industry.

Based on the interviews in the case study companies, this chapter examines how this development has affected the job content and tasks of the occupation at company level. The approach taken is to look at the four case study companies to deduce the main generic tasks and job content. Table 1 presents a summary of the occupation's tasks, following the task framework developed by Eurofound researchers, which distinguishes between physical, intellectual and social tasks (Eurofound, 2016; Fernández-Macías and Bisello, 2016).

Table 1: Summary of job content and tasks performed by meat processors

Category	Tasks content and subcategories
Physical/manual tasks	Physical strength <ul style="list-style-type: none"> • Bringing in the animals and stunning them • Raising carcasses for slaughtering or skinning • Slaughtering carcasses hanging from ceiling tracks
	Dexterity <ul style="list-style-type: none"> • Manual cutting, de-boning and wrapping operations • Collection of semi-finished products and their labelling • Weighing and labelling of products • Cleaning of processing areas
Intellectual tasks	Information processing <ul style="list-style-type: none"> • Collection and labelling of head of cattle • Placement of labels for product traceability • Monitoring and operating traceability system • Monitoring grading of carcasses
	Problem-solving <ul style="list-style-type: none"> • Monitoring automated machines, performing some of the initial slaughtering operations and intervening in case of problems • Monitoring of weighing • Monitoring of product quality and compliance • Training on safety at work
Social tasks	Serving/attending <ul style="list-style-type: none"> • Cooperation with technical staff responsible for maintenance • Participating in meetings on health and safety procedures
	Teaching/training/coaching <ul style="list-style-type: none"> • Mentoring and coaching colleagues and newly recruited meat processors
	Managing/coordinating <ul style="list-style-type: none"> • Participating in meetings and cooperative action in case of problems • Providing shift information on the production for the next shift • Changing working position and helping colleagues where needed • Teamwork and social interaction

The following sections analyse the different task categories in more detail.

Physical/manual tasks

Working as a meat processor is a labour-intensive and physically demanding job that tends to include manual, repetitive routine work tasks. Meat processing companies have concentrated in large companies that pursue economies of scale and efficiency through a detailed division of labour on the production line with small repetitive tasks.

Meat processors bring in and stun animals before slaughtering. The main body of work tasks involve many different and specialised cutting and de-boning operations that require good manual skills, dexterity and experience. Typically, slaughtering activities are performed on carcasses hanging from ceiling tracks. Each operator at a specific workstation carries out a specific task or tasks. The carcass is then slid manually onto the tracks to the next workstation for the next processing step. Operators mainly use industrial saws, dehairing machines and knives. They are equipped with suitable clothing by the company.

Although the job is physically demanding, mechanisation and automation technology is increasingly eliminating some of the manual work tasks. In some of the case study companies, robot technology has automated the dehairing of carcasses and some of the initial slaughtering operations. Packing operations are also increasingly becoming automated. Conveyor belts, lifting equipment for raising carcasses and automatic saws reduce some of the hard, physical tasks undertaken by meat processing workers and improve their ergonomic working conditions.

Although automation and robotics now make it possible to reduce repetitive, physical tasks, robot technology is still far from being widely adopted. The accuracy of robots in performing complex movements and positioning the cutting edge needs improvement, primarily because cutting and de-boning are complex manual operations that are difficult to automate. In addition, robots and advanced technology are expensive and involve a high return on investment. Depending on wage levels, the use of manual labour may still therefore be a more efficient and competitive solution, provided the workers can keep up a high pace. However, automation technology is evolving and becoming more precise, suggesting that its adoption may well increase and eliminate some of the manual tasks performed by meat processing workers.

Intellectual tasks

The occupation does not include many intellectual tasks as the main body of work consists of various cutting and de-boning operations. However, the mechanisation and automation of some of the processes means that some of the manual operations are being taken over by machines and robots which are digitally controlled and equipped with sensor technology. The monitoring of machines by meat processors involves intellectual tasks related to information processing and problem-solving.

In terms of information processing, meat processors operate various systems related to traceability and quality control such as monitoring machines handling the automated grading and classification of carcasses. After being classified, the carcass passes through another machine which automatically prints a classification stamp on the carcass that shows the slaughterhouse and the date of slaughter.

In terms of problem-solving, meat processors monitor the automated machinery that carry out some of the initial slaughtering operations, including product quality and compliance with standards.

Monitoring of the production process is the responsibility of the operators responsible for weighing pieces of meat at the end of the slaughtering and boning operations. Meat processors at the end of the production line who perform such monitoring functions must be able to assess products. Should errors occur, they must be able to:

- determine which workstations they can be ascribed to;
- identify the operators responsible for them;
- work out how to tackle the problem to avoid further errors in the future.

In the Italian case study company, for example, operators oversee the weighing and check product characteristics (that is, compliance with quality standards and the batch description). If the carcass is found to be compliant, it is labelled and sent to the next department. In case of inconsistencies, the operator in charge of weighing will consult the ordering department and, if the problem has not been tackled, the departmental head.

The greater technological content of industrial plants is progressively requiring those meat processors who operate equipment to have better information and communication technologies (ICT) competences. Such operators are required to consult the company's procurement and sales departments, use the optical reading terminals and input data to the corporate management system. As well as knowing about the various types of processing, they are responsible for the most basic and easiest tasks related to cleaning and maintaining the machinery. More complex maintenance operations are contracted out to external companies.

In addition, meat processors who monitor and operate the production line are required to have in-depth knowledge of hygiene and safety standards and to adopt appropriate work practice to comply with them.

Social tasks

The number of social tasks for meat processors is not extensive as production is made up of repetitive and standardised operations carried out individually by each meat processor along a production line. The monitoring of automated equipment is also performed on an individual basis. However, to keep the production running efficiently, meat processors carry out some tasks that involve interaction with others. For instance, as foreign or migrant workers form a large part of the workforce, meat processors are increasingly required to have language skills and the ability to talk and interact with colleagues.

The social tasks involve serving tasks such as cooperating with technical staff responsible for maintenance and participating in meetings on health and safety procedures. Experienced meat processors are also involved in teaching/training/coaching as they mentor newly recruited meat processors; the use of temporary workers means that instruction and mentoring tasks have tended to increase. All meat processors are involved in managing/coordinating tasks as they participate in regular meetings and cooperative action in case of problems. Meat processors work in teams in shifts, with each shift expected to provide information on the production to the next one when it takes over.

To keep production running efficiently, meat processors are expected to be flexible and be ready to change working position and help colleagues where needed. Since workers on the production line have only a few minutes to perform their tasks, they need to be able to coordinate perfectly with upstream and downstream operators. To do so, workers are required to be able to work in teams and interact with their colleagues.

Methods and tools of the work

The previous sections analyse the content of the work in terms of the occupation's physical, intellectual and social tasks. This section focuses on the methods such as the forms of work organisation used in performing the tasks. The framework developed by Eurofound differentiates between three dimensions:

- autonomy – extent to which a worker is free to carry out the task as they want;
- teamwork – extent to which the task is carried out in direct cooperation with a small group of co-workers;
- routine – extent to which the task is repetitive and standardised.

The case studies indicate that the work of meat processors is largely routine work where the tasks are repetitive and standardised operations. The worker carries out the operations repetitively and at high speed. Most work tasks are performed individually. However, meat processing also involves some

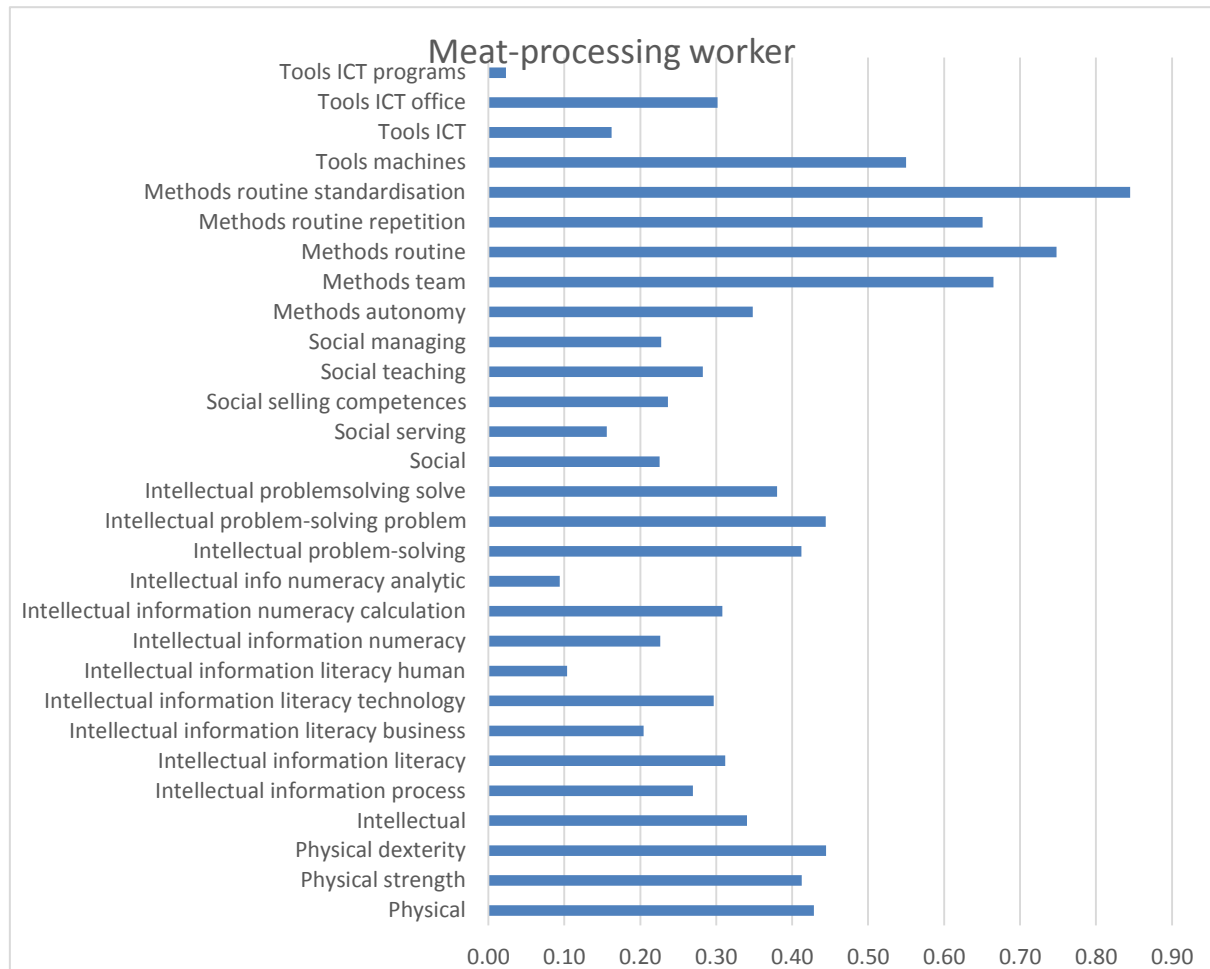
teamwork as each meat processor is expected to coordinate their work with other workers upstream and downstream on the production line.

In terms of tools, the Eurofound framework differentiates between two main types: machines (excluding ICT) and ICT. The case studies show that meat processors use machines that transport the animals, analyse and classify the animal, clean the carcasses and cut them in half (manual tools such as knives are also used). Advanced meat processing businesses have also introduced X-ray technology for classifying animal quality and robotic cutting machines for initial slaughtering operations. Machines and documentation systems are increasingly digitally controlled by ICT that is integrated with the machinery. Nevertheless, the adoption of automation technology into meat processing is slow and still not mainstream.

Comparison with Eurofound’s job content scores

Based on the task framework developed by Fernández-Macías and Bisello (2016), Eurofound has developed a score of job tasks using existing information from many different occupations in various datasets. Working as a meat processor involves a high level of repetitive, standardised, routine tasks performed autonomously (Figure 1). This is because meat processing is organised as mass production where meat cutting and processing are divided into small, simple tasks along the production line. The routine tasks require physical dexterity and physical strength. The intellectual tasks mainly relate to problem-solving and less to information literacy.

Figure 1: Scores of various manual, intellectual, and social tasks of meat processing workers



Job quality of the occupation

The concept of job quality refers to the potential impact of the characteristics of jobs on the well-being of workers. Based on information from the case studies, this chapter discusses the job quality of the work of meat processing workers. The discussion uses a Eurofound model, which has the following four main dimensions of job quality (Eurofound, 2013):

- intrinsic quality of work (autonomy, skills and social support);
- employment quality (development opportunities and contractual stability);
- workplace risks (health and safety);
- working time and work–life balance (duration, scheduling, flexibility and intensity).

A further element, pay/wages, was added for this study to enrich the analysis.

Intrinsic job quality

Intrinsic job quality has three main components:

- skills – how varied and stimulating the skills required in the job are;
- autonomy – to what degree the worker work on their own and can decide the pace of the work and how to carry out work tasks;
- social support – how stimulating and enriching the social environment of the job is.

Taken as a whole, intrinsic job quality can be understood as a measure of the richness of work as creative human activity, which is what skills, autonomy and social support are all about.

The case studies show that the intrinsic job quality of meat processors is quite poor. The job is regarded as unattractive since the working conditions involve physically hard and repetitive work with a high risk of injury and disability. Competitive meat processing companies have concentrated in big plants to pursue efficiency by organising production along production lines where meat processors carry out specific tasks at a high pace and repetitively. Hence, the autonomy of the job tends to be low.

The mechanisation and automation of some slaughtering processes mean that some meat processors increasingly monitor the automated machines that carry out some of the initial slaughtering operations. This in turn means that the work involves more intellectual tasks related to problem-solving and information processing such as the documentation and classification of carcasses. The meat processor also monitors product quality and compliance. However, automation technology has not yet been widely adopted and so meat processing largely remains hard manual, labour-intensive work.

The work organisation tends to be based on repetitive routine tasks performed individually at a high pace to achieve efficiency. The skills requirements of the job are therefore low and the social support component of the job appears to be weak. However, employee interviews indicate that working as a meat processing worker can also be a good experience. Good management, good teamwork and the culture at the workplace can be very important for the job quality of meat processors. In contrast, meat processing workers who have experienced poor working conditions typically complained about the treatment by slaughterhouses of their employees. Meat processing workers find working in slaughterhouses a negative experience when their employers care more about turnover than about their employees.

Employment quality

The case studies indicate that the employment quality and the contractual stability of meat processors' jobs vary depending on whether they are covered by collective agreements. Collective agreements that cover working time and overtime payments can provide protection and lead to good working conditions.

In the case study companies, the protection offered by collective agreements varies. In Italy and Sweden, working conditions are covered by collective agreements at industry level, while in Germany

and the UK, the trade unions' influence on contractual relations is lower. In Germany, the meat processing industry is not covered by collective agreements and the use of temporary agency workers is increasing. There is also a high incidence of non-unionised work in the meat processing industry in the UK. Recent studies in the UK suggest that agency workers were treated differently from directly employed workers, especially in terms of pay and conditions and their treatment at work, and that there are tensions between different nationalities at the workplace.

Workplace risks

In terms of health and safety, the job of meat processors is regarded as risky and having a detrimental effect on health as it involves hard and repetitive work with a high risk of wearing workers down over time. Statistics from the UK indicate that an employee in the slaughtering sector is three times more likely to become injured than the average person at work.

To improve health and safety and reduce monotonous work, health and safety authorities in the four case study countries recommend that the industry introduces job rotation, longer breaks and other mitigating measures. However, high pace production line work remains the dominant work organisation. Lifting equipment and automation technology can eliminate some of the repetitive, manual work, but the technology is still not mature and its adoption by the meat processing industry is slow.

Working time and work–life balance

The case studies indicate that the working time is a burden and that work–life balance is inadequate when meat processing workers are not covered by collective agreements. This is the case in Italy and Sweden, but less so in Germany and the UK.

In the UK, companies in the meat processing industry have sought to increase labour flexibility with high levels of temporary agency workers. This has caused an increase in the incidence of low-paid, non-unionised work in the industry. Analyses of the employment conditions and work practices in meat and poultry processing factories across England and Wales found that migrants employed in the sector, particularly agency workers, experienced hard working conditions in the workplace, long hours and shift work (EHRC, 2010). Employee interviews indicated that meat processing workers typically complain about long hours with only a few or short breaks.

Pay/wages

The pay and wage levels of meat processors vary across the four case study countries depending on the coverage of collective agreements. In Germany and the UK, meat processing is a low-wage industry which increasingly employs workers on temporary contracts hired by external recruitment agencies. Such contracts typically mean that the liability for the workforce, its payment and working conditions is passed on entirely to the subcontractor.

In the UK, for example, the average salary for meat processors is £13,500 to £15,000 (€15,216 to €16,907 as of 8 January 2018) for new workers, and £16,000 to £21,000 (€18,034 to €23,670) for experienced workers (National Careers Service, 2016). However, investigations have uncovered that migrant workers in the sector working for recruitment agencies were paid less than the UK National Minimum Wage in many cases (Rutter, 2015).

Similar trends are seen in Germany. The average wage is €21,576 to €32,232 per year (GEHALT.de, undated). However, these figures do not include the wages of temporary agency and posted workers. Investigations have uncovered low-wage practices in the industry, indicating that meat processing workers provided by temporary work agencies are often paid only €4 to €6 per hour. In particular, the foreign posted workers are often not informed about their rights and do not, for example, claim their right to holidays, sickness pay or holiday leave. The German case study indicates that the increase in such subcontracting in Germany implies that non-standard employment relations have evolved as an integral part of the meat processing industry's growth. The increase in subcontracting also has a spill-

over effect on meat processing companies covered by collective agreements: operating costs are under pressure from the low-wage business models, forcing companies covered by collective agreements to outsource core jobs to survive.

The average wage for meat processors in Sweden is €33,679. Compared with the other case study countries, Sweden's meat processing industry is regarded as having a high cost level, which is not competitive. The Swedish meat processing industry, however, benefits from a large home market and strict regulations on food security and animal welfare. However, these wages figures do not include the wages of meat processors working for temporary agencies for which no wage statistics are available.

No average wage statistics are available for meat processors in Italy.

Conclusions

The occupation of meat processing worker has become an unattractive job that involves physically hard and repetitive work at a high pace, with a high risk of injury and disability. Job satisfaction varies considerably depending on the management, teamwork and communication in the workplace.

The increasing mechanisation and automation of some of the processes mean that meat processors increasingly have to monitor the automated machines that carry out some of the operations. The monitoring of machines involves intellectual tasks related to information processing and problem-solving: meat processors operate various systems related to traceability and quality control, and monitor automated machinery that carries out some of the initial slaughtering operations. Meat processors also monitor product quality and compliance. The increased technological content at industrial meat processing plants is progressively requiring the meat processors who operate the equipment to have greater ICT competences. Digitally controlled automation technology can eliminate some of the repetitive, physical hard work, but adoption of the technology is slow – possibly due to the availability of cheap labour.

The occupation has also undergone a process of de-skilling, which means that meat processing has been transformed into a mass production operation where each meat processor carries out small, standardised operations. Whereas meat processing was previously largely carried out by skilled butchers, the occupation now mainly includes unskilled or semi-skilled jobs on the production lines. In all four case study countries, the meat processing industry increasingly employs mainly male meat processors of foreign origin. The use of temporary workers and service contracts with external recruitment agencies are becoming increasingly widespread, thus jeopardising the protection of workers because they prevent trade unions from monitoring company activities.

The shift towards mass production in large units has been driven by structural market forces such as retailer concentration, price pressure, competition and imports from low-wage countries, and increasing regulatory costs. These factors are leading to an increased focus on efficiency in production. To achieve competitiveness based on efficiency and economies of scale, meat processing plants have become larger and organised along production lines. However, meat processing does not only take place in large-scale mass production. Regular scandals related to animal welfare, contamination of meat, fraud in labelling, diseases and hygiene issues have led to increasing consumer demand and policy regulation that stresses quality, traceability and animal welfare. The meat processing industry is therefore placing greater emphasis on technologies that enable traceability and quality control. This directly influences the job content of the meat processors who operate traceability systems that control, tag and label all incoming animals and meat. This development has also given rise to a parallel market of small-scale production focusing on ecology, animal welfare and premium quality.

References

All Eurofound publications are available at www.eurofound.europa.eu

EHRC (Equality and Human Rights Commission) (2010), *Inquiry into recruitment and employment in the meat and poultry processing sector: Report of the findings and recommendations*, London.

Eurofound (2013), *Employment polarisation and job quality in the crisis: European Jobs Monitor 2013*, Dublin.

Eurofound (2016), *What do Europeans do at work? A task-based analysis: European Jobs Monitor 2016*, Dublin.

Fernández-Macías, E. and Bisello, M. (2016), *A framework for measuring tasks across occupations*, web page, VOX CEPR's Policy Portal, accessed 2 January 2018.

GEHALT.de (undated), Was verdient eigentlich ein ...? Metzger [What does one really deserve ...? Butcher], web page, <https://www.gehalt.de/einkommen/suche/metzger>, accessed 8 January 2018.

National Careers Service (2016), *Job profile: Meat process worker*, web page, <https://nationalcareersservice.direct.gov.uk/job-profiles/meat-process-worker>, accessed 8 January 2018.

Rutter, J. (2015), *Moving up and getting on: Migration, integration and social cohesion in the UK*, The Policy Press, Bristol, UK.

WPFOMEEF1810

The European Foundation for the Improvement of Living and Working Conditions (Eurofound) is a tripartite European Union Agency, whose role is to provide knowledge in the area of social, employment and work-related policies. Eurofound was established in 1975 by Council Regulation (EEC) No. 1365/75, to contribute to the planning and design of better living and working conditions in Europe.