

TARTU VOCATIONAL TRAINING CENTRE

Food processing department

Kristi Luht

VOCATIONAL TEACHER TRAINEE PROGRAM IN THE DANISH  
MEAT TRADE COLLEGE UDDANNELSESCENTRENT I ROSKILDE  
TRAINING REPORT

Instructor: Karen Wahlgreen

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## INTRODUCTION

Present document introduce my training in Danish Meat Trade College.

The aim of the training program was to improve my skills and knowledge's in pork processing technology in Denmark, also to learn pork cutting technology, pork meat preparations, sausage making technology, convenience products technologies.

During my training time in Roskilde I was able to familiarize with the Danish vocational education system and visit Danish meat processing companies.

The Danish Meat Trade College is a non-profit independent Education and Training Centre founded in 1964 by the Danish slaughterhouses, which considered human resource development in the meat industry to be strategically important for the future expansion of the sector. Today, The Danish Meat Trade College has developed into a modern educational institution, covering education and training at the following levels:

- Vocational education and training (VET): Industrial slaughter, retail butcher, sausage maker, cook, waiter, baker, pastry baker, nutrition assistant, cleaner and security guard
- Higher educations: Laboratory assistant, Process technology
- Training centre of labor market courses for adults in the Danish food- & service industry

Approx. 215 teachers and supporting staff are employed at the College, of this approx. 100 specialist teachers with very different technical educational background, supplemented with a pedagogical education. Many of the teachers have international experience and training and education may take place also in English.

## **1. DANISH VOCATIONAL EDUCATION SYSTEM**

Replenishment period 07.08- 05.10.2012

### **1.1. The Danish Meat Trade College**

Basic vocational training

Vocational education

higher technical education (executed by an associated University college at our premises -

knowledge of product development and food safety)

further training programmes (AMU)

International consultancy and training programmes

### **1.2. Training activities for the Danish Meat Industry**

#### **Industrial butcher education**

2 years deboning + 1 year specialization

Retail butcher education

3½ years

Casing cleaning education

2 years

All apprentice educations on contract in a meat company. Full salary during contract period, incl. during school period

#### **Subjects of 10 weeks basic educational programme for industrial butchers**

- Theory and demonstration of slaughtering
- De-boning of pork
- Knowledge of tools and equipment
- Animal anatomy and welfare
- Hygiene and microbiology
- Own control systems in production

- Health- and work environmental issues
- Information technology
- General knowledge of the meat industry
- First aid

Total number of lessons 360 lessons

### **Education for Retail Butchering & delicatessen**

3½ years vocational training programme , First module - Basic programme 20 weeks.

Modul contains:

Safety and hygiene

Deboning

Kitchen

First aid and Fire fighting

Shop

Danish language

Sales and customer service

IT technology

Environmental issues

Sausage making

Health and science

In total 658 lessons – to continue education a contract with a butcher shop is required

### **Main course four modules of 5+4+2x3 weeks**

Modules contain:

Business economy

Product development

Delicatessen

Deboning

Calculation

Sausage making (special line)

Presentation/customer service (special line)

Party service(special line)

Optional subjects

## 2. PORK PROCESSING TECHNOLOGY IN DENMARK

Replenishment period 02.10.2012

### 2.1. The Danish Pig Meat Industry

The Danish co-operative structure, in which farmers also own the companies that process their products, provides the basis for an integrated production system. Pig breeding and production, slaughtering and processing are managed by pig producers, elected to the boards of the slaughterhouse companies. The pig meat industry is also represented on the Danish Agriculture & Food Council (Landbrug & Fodevarer), where representatives from both the pig producers and the slaughterhouse companies sit on the organization's two boards.



*Figure 1. Danish Crown logo*

The Danish Crown group is an international food producer with production and sales across the world. Danish Crown, the parent company, produces and markets pork and beef. Danish Crown's subsidiaries produce and market processed food products and other products for food production.

### **Danish Crown is:**

- The world's second largest – and Europe's largest – pig slaughtering business
- Europe's largest meat processing company
- Denmark's largest cattle slaughterhouse business
- One of the two or three largest meat exporters in the world and the world's largest exporter of pork.

## **2.2. Pig Breeds in Denmark**

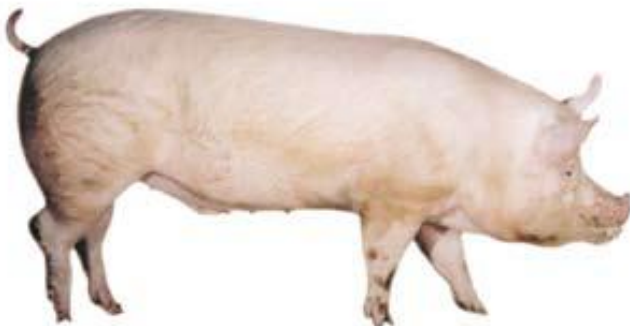
### **Landrace (L)**



*Figure 2. Pig breed Landrace*

Danish Landrace, one of the female lines in the Danish cross-breeding programme, is known for its good carcass and meat quality and for being a robust pig with strong legs. Owing to its high fertility, the Landrace is used with the Yorkshire for breeding LY and YL gilts, which are the best cross-bred sows for the production of finishers.

### **Danish Yorkshire (Y)**



*Figure 3. Pig breed Yorkshire*

Yorkshire, the other female line in the Danish breeding system, has a high meat percentage, high daily gain, high feed efficiency and good meat quality. Fertility and



mothering characteristics are excellent. Along with the Landrace, the Yorkshire provides the best cross-bred sows for the production of finishers.

### **Danish Duroc (D)**



*Figure 4. Pig breed Duroc*

Danish Duroc originates from the USA and Canada from where it was imported in the late 1970s and used for cross-breeding programs. It is the dominant male line today.

### **2.3. Meat quality**

Pork quality is animal welfare during transport, pre-slaughter handling, stunning. Processes and methods for meat quality improvement, carcass classification,

Quality aspects of meat are (consumers want): good taste, tender and juicy meat, lean meat without visible meat, nutritious and healthy meat, convenience, concerns about welfare, - environment, and food safety.

Industry processors want: higher yield, minimum drip loss, meaty products, large and equal quantities, traceability and documentation.

Meat quality is:

- Technological quality (meat content in carcass, fat and protein content in meat, meat colour, drip loss, pH)
- Eating quality (appearance, taste, tenderness, juiciness)
- Ethical quality ( animal welfare, treatment of the pig, environment, working conditions)
- Nutritional quality (fat content, protein content, vitamins, minerals)

### **3. PORK CUTTING TECHNOLOGY**

Replenishment period 07.08- 05.10.2012

During my studies in Roskilde I was able to cut half of pork carcasses several times. Every week, I had to cut pork half carcass for export and also for Danish home market. Cutting methods were different in these times. Also are the cutting methods different compared to Estonian cutting methods.

#### **3.1. Primal cutting**

Primal cutting usually means dividing the carcass into main cuts: leg, loin, belly and shoulder. The cuts may be boned and processed according to customer specifications.

Primal cutting involves the following processes:

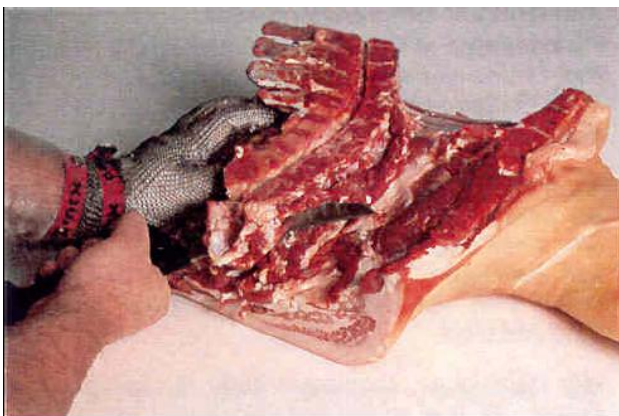
- Removal and trimming of the tenderloin
- Laying down the carcass and removal of head and hind toes at the joint
- Splitting the carcass into three parts
- Splitting of the middle from the belly.

All cutting must be precise and clearly defined. Laying down the carcasses on conveyor belts and use of automated saws considerably enhances the cutting process as well as easing the workload for operators.



*Figure 5. Meat cutting room, half carcass*

### **3.2. Cutting Fore-ends**

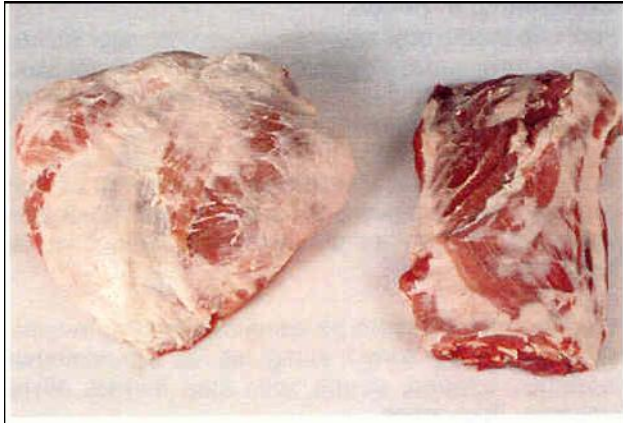


*Figure 6. Removing neck bone from fore-end*

When de-boning fore-ends the result must be the same no matter whether you are working on a right or a left fore-end.

First I have to remove the neck bone with the ribs, then cutting off and trimming the neck fillet. Remove fat and rind and bones.

Cutting Fore-ends we get main products, neck and deboned shoulder.



*Figure 7. By-products*

Also we get by products for rendering e.g. the pipe and the shank-bone and the blade bone.



*Figure 8. Fore-end after deboning*

### **3.3. Cutting Belly**

One of the products you get when cutting up a carcass is the belly. Usually this product is not processed at the abattoirs when being sold at the home market instead it is sold as one piece to the various customers, the butchers, the supermarkets etc.

However, it is quite different when you export the streaky, which is the case of the far greatest part of the total production. The streaky is being more or less processed according to the wishes of the customers.

Many kinds of streaky are being produced, some have the bones pulled out others have them cut out - some have rind, others have not.



*Figure 9. Removing cartilage from belly*

First step is cutting off the cartilage of the ribs, and then scraping the ribs, after loosening the ribs ends I had to pull the ribs out of the meat. When all the cartilage has been removed, we had to derind the belly.

The most important product from this cutting is of course the de-boned, cut out and trimmed piece of streaky.

### **3.4. Cutting Loins**

One of the products you get when cutting up a carcass is the loin. The loin is divided into different products. The most well known products in Denmark are cutlets, salted boneless top loins and centre loins. However, it is only a small part, which is being sold on the home market. Most of these products are processed at the abattoirs for export, mainly as fresh frozen loins which have been de-boned, trimmed of rind/fat and cut in different ways.



Figure 10. Removing ribs

### 3.5. Cutting Leg of Pork

The legs (hams) are exported to many countries. One of the best known products is probably canned ham, which is exported to the United States among others. They also export legs, which have been more or less de-boned and processed. These products are shipped as fresh frozen products.

Legs (hams) as raw material are comparatively *expensive* to process.

The main product from the processing - the de-boned and fat trimmed leg - is of course the far most expensive product. Consequently, it is of great importance that you all the time during the cutting are aware of the fact that even small errors involving unnecessary cutting of the meat, or if there is too much meat left on the bones etc. have to be avoided. Actually, it is only the main products that really are expensive. Consequently, *always* make sure to obtain the highest yield and at the same time check that the quality demands regarding unnecessary cuts etc. are observed.

#### Main Product

You only produce one main product of the hind leg, namely the completely de-boned and fat trimmed leg (ham).

It is important to have as much of this product as possible, as the other by-products all are far less expensive. As mentioned earlier this product is sold as a fresh frozen product and is

exported to different markets. Ham processed like this has many applications e.g. further processing into canned hams and different types of stuffing.

## 4. SAUSAGE MAKENING TECHNOLOGY

Replenishment period 20-21.08.2012 and 24-26.09.2012

### 4.1. Introduction

In the sausage making hall I was able to be for 5 days. It was very interesting to look how different is the emulsion making technology.



Figure 11. Ready to eat sausages

### 4.2. Preparation of sausage mixture

kg		%
3,000	Oksekød II, hakkes på 3 mm <i>Beef</i>	26,66
3,000	Flæskekød II, hakkes på 3 mm <i>pork</i>	26,66
2,500	Fedtafpuds, hakkes på 3 mm <i>Fat</i>	22,21
2,000	Isvand <i>ice water / cod water</i>	17,77
89,0,250	Hvedemel <i>Flour NR.</i>	2,22
87,0,250	Tørmælk <i>Dry milk</i>	2,22
82,0,090	Nitrisalt	0,80
83,0,070	Vacuumsalt	0,62
32,0,060	Krydderi: Krainer wurstl. (India) <i>spice NR.</i>	0,51
88,0,030	Fosfat	0,27
64,0,005	Ascorbinsyre	0,04
11,255	Opskrift i alt	99,98

11,255	Opskrift i alt	99,98
<b>Bindefars</b>	Der fremstilles en bindefars (se lektion bindefars).	
<b>Fedtafpuds</b>	Fedtafpuds køres i bindefarsen 30 omgange. Ved 15 omgange tilsættes krydderiet.	
<b>Flæskekød</b>	Flæskekødet tilsættes, <u>gæles</u> godt i farsen og køres med knive 10 omgange på <u>lav</u> hastighed.	
<b>Stopning</b>	Farsen stoppes i svinesmaltarme, kal. 28/30 mm. Afdræjes i større (hvid pind, 14 cm). Tarmene skal blødes godt op i lunken vand. Pølserne hænges på røgstokke med passende afstand.	
<b>Tørring</b>	Tørres ca. 20-30 min. ved 65-70°C.	
<b>Røgning</b>	Røges ca. 50-60 min. ved 65-70°C.	
<b>Kogning</b>	Koges 25-30 min. ved 78°C.	
<b>Afkøling</b>	Afkøles ca. 15 min. i koldt vand.	
<b>Efterbehandling</b>	Kan vacuumpakkes eller gaspakkes.	

Figure 12. Sausage making recipe

First step was to read the recipe and follow the steps on it. Usually we made bbq sausages, so first step was to mince the meat, using the meat mincer:





*Figure 13. meat mincer*

After grinding the meat in to 3 mm, we have to weigh the additives and spices according the recipe. All the additives where kept in special rooms, and all the additives had number and name, this way is hard to mixing them up, and weight wrong thing.



*Figure 14. Spice rooms*



Figure 15. Spice

When all the ingredients all weight and put in to a bag, then me can make sausage mixture. At first, we made the emulsion. For the emulsion we mixed up pork, salt, nitrite salt, dry milk, and spices, after the emulsion is ready when the temp. is lower than 12°C, after its ready we add the beef meat and mixed all very carefully, observing that the temperature will not rise over 14-16 °C.



Figure 16. Cutter

### 4.3. Sausage making

For sausage making we used sausage squirt



Figure 17. Sausage making

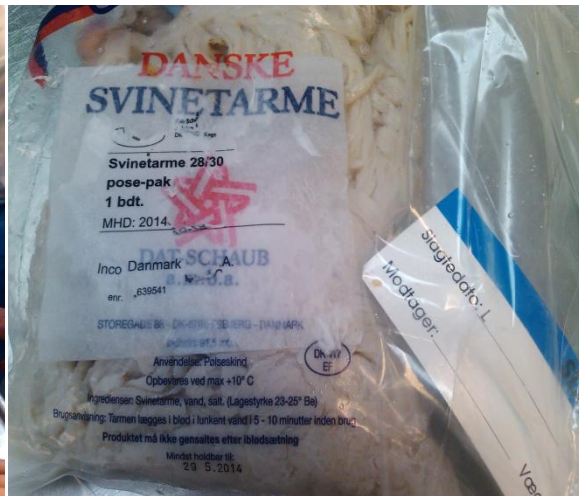


Figure 18. casings

During my studies period I was able to make sausages in natural casings. The finish products were sold in local butcher shop in the school. The sausages where raw.

If the sausage includes heat treatment, then it's important to heat them at least 75°C, after this temperature the product is safe for the costumer.

## 5. CONVENIENCE FOOD

Replenishment period 04.10.2012

### 5.1. Butcher shop

I was able to see the convenience food technology in the meat trade school and to work with the convenience food in a butcher shop in Roskilde centre.

The butcher shop name was Slater Frimann- det moderne madhus. This company was created by one man, and he was working there also all days in the week. The working day started 8 o'clock in the morning and finished until the shop was closed 18 o'clock in the evening.



Figure 19. Logo

I was able to make different meat products and see the technology of the convenience food. The convenience food means, that customer can buy food which is already prepared. The preparation can be different, it can be warm food (ready to eat food), and spiced and prepared food, which customer can buy and cook at home in the oven. This is what makes food convenience is that you don't have to think about how to spice or how to prepare meat products. It is very popular in Denmark, and it seems that it is getting popular in all-around the world.



Figure 20. Ready to eat food



Figure 21 sausages

All the products was made in the same shop, it includes the salads, sausages, fresh meat products, hamburgers, convenience foods. New products were made every day, and the choice was big.



*Figure 23 fresh meat products*



*Figure 24 convenience food*

In the figure 24 is most common food people can buy and put in to an oven to warm up. Also the shop was selling it in warm, so it`s ready to eat at the lunch break or after the working day. In the first figure is the minced meat spiced with different spices and on the top of the meat is a mashed potato. All the food is put in to the folium bottom, because the folium is heat resistant and it can be warmed in the oven.



*Figure 25 Meat products*



*Figure 26. Neck file, filled with vegetables*

It's very common for customers to buy convenience meat products. They can be very different and with different additives, in the figure 24 we can see spiced chicken files, and beef file in the pastry with different spices and vegetables. The price of these products was not very high.

## 6. SUMMARY

During 9 weeks .studies in Denmark I get many new knowledge. It was a big challenge for me to leave home and family for so long period, also because the studies were in English. All the studies period was very useful, I had a chance to meet colleges from Denmark and I get opportunity to learn from them. I can say that the teaching methods were almost the same, as they are here. Also are the student's problems same, some of them want to learn and some of them don't? The schools education system is build up a little different than ours, and I think we have to learn from them, it is not gone happened in short period, but someday I think we should equalize our education system with them. It was very interesting for me to learn in ordinary class, with young students, also I had the chance to give few lessons myself.

In my learning period I get lots of practical lessons about deboning pork half carcass, also making sausages, make different convenience food, different meat products. Also my program included theoretical lessons about, hygiene, tools and equipment, calculation and yield control, anatomy, HACCP, pig industry in Denmark, meat quality, slaughtering. Visiting local meat company and small butcher shop was unforgettable experience. If I had chance to too this all over again I would to it. I can see clearly now that probation is very important for every vocational teacher.

I am shore, which my goals were filled and I get a lot of new knowledge that I can give to my students.

## **7. USED MATERIAL**

1. <http://www.ucr.dk/>
2. <http://www.danishcrown.dk/>
3. Slagter Frimann materials
4. Materials of the vocational teachers in Meat Trade college