



*Vocational excellence ensuring food product safety, consumer protection and competitiveness in Western Balkans*

06 October 2012

HACCP CASE STUDY



# PRODUCTION OF BEEF IN ACCORDANCE WITH THE HACCP



This project is financed by the EUROPEAN UNION.

## **PRODUCTION OF BEEF IN ACCORDANCE WITH HACCP**

Application of the HACCP system is very important for protection of health of all food consumers as there is a vast number of situations which may, more or less, result in contamination and food safety issues.

It is generally known that agricultural production is exposed to various risks, including a number of very serious hazards faced by cattle production such as abuse of medications, different hormones, growth stimulators, etc which can contaminate cattle products (meat and/or milk). In addition to these, sources of contamination may include different spices and emulsifiers, packaging and packaging materials, hygiene products, insect and rodent repellants, etc. Food contamination can also be caused by inadequate position and structure of production and working premises, inadequate construction and fitting materials, working surfaces, tools, clothing and footwear of the employees, etc. Cause of contamination may also inadequate technological processes involved in production, storage, transportation and distribution. Also contamination may occur during direct consumption of food in the households and there are several other situations that may result in contamination and food product perishability.

In the light of these facts and the importance of food in the life of humans, there was a need to design control systems which would ensure sufficient quantities of safe food which would not jeopardize health of consumers in any way. One of such systems is the HACCP standard.

### **Description of HACCP concept introduction**

- Person responsible for quality assurance and the HACCP team leader is general manager of the company.
- The HACCP team leader is authorized to take all and any necessary measures for successful operations and development of the HACCP system.

### **Preparatory activities**

- The HACCP team is responsible for consistent application, successful operations and constant improvements, in particular the heads in charge of Quality Assurance Department, Cooperation Department and Production Department. Ultimate responsibility lies with the representative of the quality assurance management (the HACCP team leader) and the general manager of the company.

The HACCP team has a permanent, expert and operational body which includes:

- Representative of the quality assurance management;
- Head of cooperation department;
- Head of Production Department; and
- External expert (not required).

The training is provided in the company. Individual certificates on completed training are filed with the personnel files of the trainees. If needed, the company will organize the training for all employees who work on the Critical Control Points (CCP).

**Description of products and their purpose**  
**Production of beef**

**Brief description of technological process of production**

Technological process starts with a customary slaughter of cattle, primary processing and chilling of carcasses. The carcasses are cut in halves or quarters, and they include the musculature and associated fatty and connective tissue and bones.

Every product (veal, baby beef and beef) is strictly specified. Products, composition, production technology, control methods, quality requirements, transport requirements, requirements for storage by buyers and end user, distribution, and instructions on how to store the products until its actual use are detailed in the specifications.

The meat comes in different categories with associated. Additives, preservatives and other substances are not added.

The packaging is different, depending on the packaging requirements and needs but it normally includes cardboard boxes and plastic bags,

Defined quality indicators

	Physical and chemical	Sensory
Veal	Meat from animals that were mostly fed with milk or adequate milk replacement. At the time of slaughter they should not be more than six months old. The cartilage between the pubic bones should not have any signs of ossification.	Meat should be of light pink color or pink color of the muscle tissue and light yellowish color of the fatty tissue.
Baby beef	Meat from male non-castrated animals which at the time of slaughter should not be older than 18 or younger than 6 months or from female animals and castrated male animals which at the time of slaughter should not be younger than 6 months or older than 30 months	Color of bone marrow on cross sections at, coccygeal, sacral, lumbar and thoracic vertebrae should be red and there should not be traces of deposited fat of yellowish color. The structure of the meat should not be rough and it should be characteristic for the meat of grown cattle.
Beef	Meat from animals beyond 30 months of age	The meat is of dark red color and the muscle tissue is rougher, the fatty tissue is of yellow or yellowish color. The degree of cartilage ossification is higher than that of specified for physiological age of beef.

## Storing the meat

Type of meat	Storage	Transportation	Retail sale
- Veal - Baby beef - Beef	In dedicated, dry, well-lighted, well aired refrigeration facilities at $2^{\circ}\text{C}; \pm 2^{\circ}\text{C}$	Dedicated transport vehicle that use Thermo King refrigeration units	In dedicated refrigerated cabinets, at up to $+7^{\circ}\text{C}$

## Market

Fresh meat is sold in the Federation of Bosnia and Herzegovina.

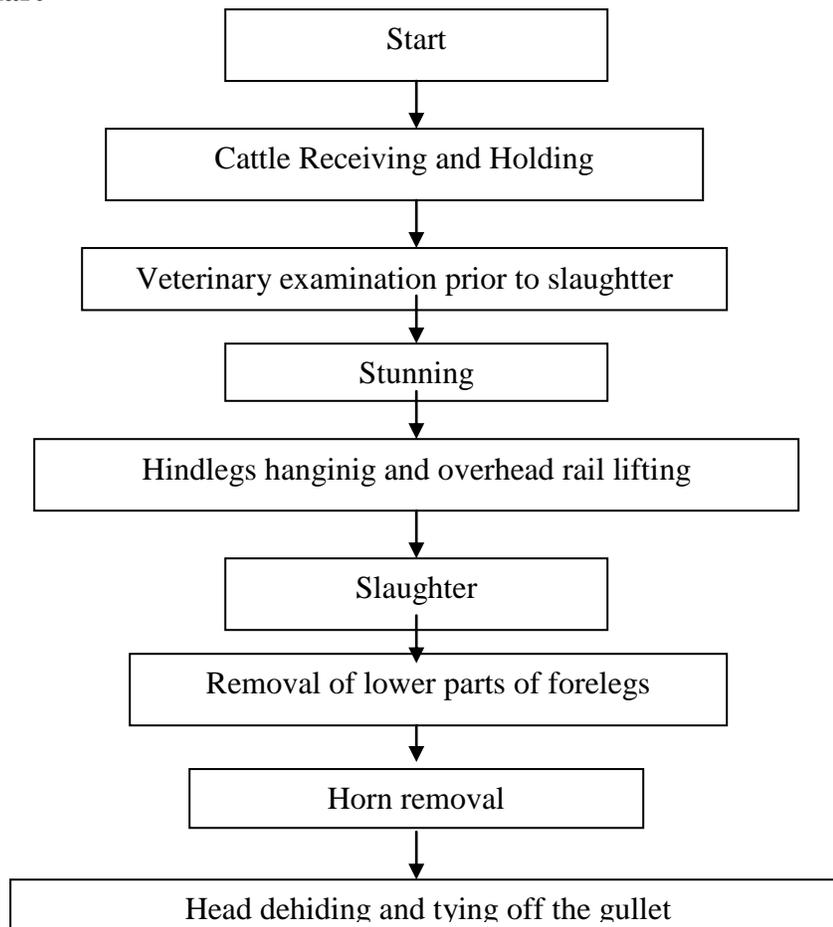
## Preparation of products for consumption

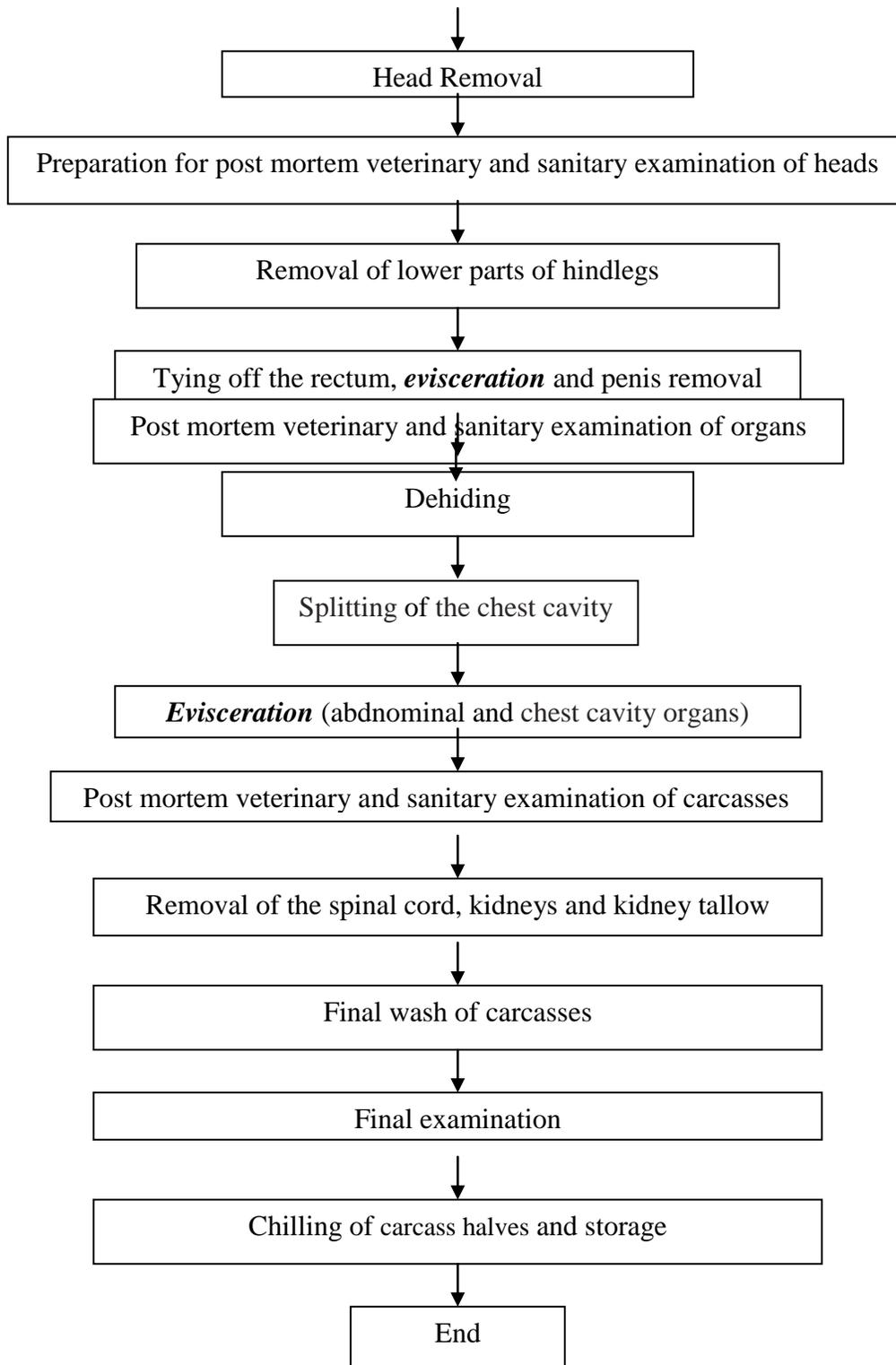
In the households, chilled meat should be kept refrigerated at  $+7^{\circ}\text{C}$ . Preparation depends on age of cattle (veal, baby beef, beef) and anatomy origin (different cuts) of meat using one of the customary techniques such as frying, roasting, cooking or stewing.

## Identification of eligibility for consumption

There has been no reports of allergies or any other adverse occurrences that are may compromise human consumption of the meat.

## Process flow chart





### **Hazard analysis** (the first HACCP principle)

The HACCP team conducts an expert assessment based on knowledge, experience (in-house and from other companies in the industry) and professional literature on possible hazards in the process of meat production. Preventive actions are put in place to prevent and keep under control the potential hazards. All hazards are classified in the three major groups:

- Biological (bacterial, viruses, parasites, molds);
- Chemical; and
- Mechanical/physical hazards.

The HACCP team meets on regular basis to assess potential hazards following of the process stages as provided on the flowchart. Each stage of the process is assessed and the findings are recorded on a relevant HACCP plan forms – Hazard (Risk) Analysis and Identification of Critical Control Points (CCP).

### **Critical Control Points (CCP)** (the second HACCP principle)

At this stage a control can be applied to prevent or eliminate a food safety hazard, or reduce it to an acceptable level. During the production process, the HACCP team assesses Critical Control Points and recorded on a relevant HACCP plan forms – Hazard (Risk) Analysis and Identification of Critical Control Points.

#### Key control actions

There are four major control points in the meat production industry:

1. Water pressure on the shower used for washing of the carcasses by showering;
2. Appearance of carcass halves (no contamination and bone fragments);
3. Temperature in chilling chamber used to chill and store carcass halves;
4. Maximum allowed temperature at the center of the rump.

### **Critical Limits** (the third HACCP principle)

Critical limits are criteria that effectively meet each preventive action – within each Critical Control Point (CCP). Those are maximum allowed numerical values which have to be fully complied with in order to ensure full safety of the products. This is why this aspect is particularly focused on in the process of meat production. All Critical Control Points, through the use of optimum preventive actions, are under constant control and this something that allows health and sanitary safety of the products (meat) in all conditions.

Many values (such as, time, temperature, pH value and other values) are defined under the standing regulations which are applied and fully complied with. There are four control limits in the production of beef:

1. Water pressure on the water-saving shower must be minimum 2 bar;
2. Carcass halves with no contamination and/or bone fragments (determined by visual inspection);
3. Temperature in chilling chamber in maximum 4<sup>0</sup>C both as read on the display and on the reference thermometer inside the chamber;

4. Maximum allowed temperature at the center of the rump is 7<sup>0</sup>C.

The HACCP team records the determined critical limits readings in the relevant columns of the HACCP plan form.

#### **Monitoring system** (the forth HACCP principle)

The HACCP team keeps track of (monitors and/or measures) each critical control point (CCP) in a planned and systematic way. It is defined what should be monitored, in what way (how and/or using what instruments) such monitoring is preformed, who is to perform the monitoring (the responsible person) and when (frequency) the monitoring is preformed. Thus at this stage all planed activities (monitoring and/or measurements) implemented in order to carry out the assessment are scrutinized to make sure that critical control point are under the control.

#### Monitoring for the first CCP

Every two hours during the operation of the slaughter line, the designated persons checks the water-saving shower and reads the shower water pressure gauge values. The readings are then recorded in the log.

#### Monitoring for the second CCP

Applying continuous visual control inspection, each carcass half is individually checked for “zero tolerance” to traces of local contamination and bone fragments. This action is formally recorded only if a corrective action is required.

#### Monitoring for the third CCP

Every two hours the designated person checks all refrigeration chambers at the plant and constantly checks temperature readings off the display and thermometer.

#### Monitoring for the fourth CCP

The designated person involved in loading of the meat for the end users randomly selects minimum three carcasses as they are being loaded on the transport vehicle and checks the temperature at the core of the carcass using a core thermometer. The readings are then recorded in the log.

All CCP monitoring data are recorded on a special HACCP plan form titled *Monitoring and Verification of Critical Control Points*.

#### **Corrective Actions** (the fifth HACCP principle)

The HACCP team developed a number of corrective actions for each critical control point that will be immediately and consistently followed in case of any deviation in the critical limit.

Corrective actions include the following details:

- How and who will be notified in case of deviation;
- Actions to be carried out and person who decides on corrective actions;
- Who is responsible to keep the log on corrective actions

#### *Corrective actions for the first critical control point (CCP)*

Carried out by the responsible person after a deviation in the critical limit is detected. These actions may include but are not limited to setting the water pressure on the water-saving shower and/or halting of the slaughter line until such time as the noncompliance has been removed.

*Corrective actions for the second CCP*

Carried out by the responsible person (controller) after a deviation in the critical limit is detected. These actions may include but are not limited to: after limited/local contamination of carcass is detected, the contaminated parts are removed by cutting followed by re-showering. Any bone fragments are removed by showering.

*Corrective actions for the third CCP*

Carried out by the responsible person (head of the slaughter line) after a deviation in the critical limit is detected. These actions may include but are not limited to: setting the refrigeration temperature, moving of the carcass halves into the refrigeration unit with appropriate temperature or destruction of reject carcass halves.

*Corrective actions for the fourth CCP*

Carried out by the warehouse manager at the loading on the transport vehicle. Each noncompliance is reported to the head of the production, who is then responsible to either approves the loading or orders return of the carcass halves back to the refrigeration unit and then takes further actions aimed at removing the noncompliance.

Corrective actions for each individual CCP are registered on the relevant forms.

In case of deviations which are not covered by the existing corrective action, the HACCP team leader should:

- Conduct an investigation to determine if the compromised product is safe for human consumption;
- Carry out actions to separate and mark such products which are not safe for the health of consumers and carry out appropriate activities and corrective activities to prevent its distribution and marketing;
- Conduct in-house investigation to consider if such deviation or contingency situation should be covered by the HACCP plan.

Prepared by:

HACCP- TEAM

The Chamber of Economy of Sarajevo Canton