Meat & Meat Products Processing

Level –III

Based on October 2019, version 1 occupational standards

Module Title: Cooking, Steaming and Cooling Products

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LG # 42	LO1 -Place product in cooking or steaming facility

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Place product in cooking or steaming facility
- Cook or steam product
- Chill or cool product

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Place product in cooking or steaming facility
- Cook or steam product
- Chill or cool product

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information sheet -1 Identifying and placing individual product

1.1. Introduction

Identifying and placing words has their own concepts. Also it comes to individual product items in the meat and meat processing sectors, recognizing and putting terms has its own philosophical meaning. Individual product identification may describe the separation of goods based on their particular physical or manufacturing features, colour, product design, and importance of usability. While, the placing also describes the arrangement and storing of specific products based on the characteristics and usability purposes of the products. The techniques of identifying and placing of individual product will be discussed in this section.

1.2. Safety requirements (OHS)

The food safety rules set in all round of any product manufacturing industries. The application might be vary from one to another due to attention given from regulatory body to industry managements. This contains the following safety general guidelines for both workers and the work. Thus, such as;

- Using personal protective equipment's properly according to food safety rules
- Keeping personal hygiene based on the safety guidelines
- Cleaning and sanitizing equipment's before, during and after operation
- Applying HACCP (identifying and giving attention to critical control point (CPP)) during reception, laboratory test and physical detection time, separation period, coding time, storage for both raw and end products, processing, packaging , cooling and loading time for identification and placing activities.
- Implement Workers health check-up within the range planned in the food safety guidelines (might be 2-3. times within year with assuring with health certificate awards) .

1.3. Individual product identifying techniques

Identifying and pacing individual products imply that segregation and layering of products according to the plan, storage capacity and product characteristics require-ments and processed in a given industry. The techniques include;

- Separating the raw and processed specific products
- Separating solid and liquid products
- Isolating chemicals, flammable gases from food storage and containers
- Separating products based on the batch number
- Identifying the storage for each specific product in type and physical properties relevance's.

1.4. Individual product placing techniques

- Locating the products in appropriate layer or order
- Laying dry products over the wet during placing in refrigerator, storage room and holding containers.
- Depositing the chemicals and flammable materials on far and different rooms from the food products
- Placing products based on color and physical condition of the products
- Retaining the products based on their manufactured batch numbers.
- Pacing based on the product temperature requirements for raw food (4%) and for processed meat products
- Placing in appropriate containers for each products
- Placing right products at right place for storage, processing and dispatching.

Figure 1. a, Properly identifying and placing food products

Figure 1. b, wrong identifying and placing the products

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Mention the individual product placing techniques in meat industry ?(5pts)

Note: **Satisfactory rating – 4 points** **Unsatisfactory – 4 below points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1.

- _____
- _____
- _____

Information sheet-2- Spacing product in cooking facility

2.1. Introduction

Spacing is the activity of putting the cooking products in cooking facility with appropriate manner in order to facilitate the cooking speed and avoid products interruption one another which exposing the products for overcooking and below standard cooking's.

2. 2. Cooking facility types

The cooking facility may be vary depend on the industries product processing capacity, customer size, availability or affordability of the facility and the availability of skill to operate the facility. The facility might be doing by electri ,feul or firewood and olso automatical or manual. Some of there are discussed as below.

- Electrical stainless steel dry oven
- Grilled cooking
- Hot air cooking

2.3. The importance of spacing product in facility

- To facilitate the cooking time
- To improve the cooking quality of the products
- Checks easiest environment for checking the cooking products

2.4. Steps Spacing products in cooking facility

- Identifying the types of product to be cooked
- List the product items according to their specifications
- Using personal protective equipment
- Cleaning and keeping sanitation of the cooking facility
- Arranging the products with their appropriate cooking containers
- Putting on the cooking facility trays, according to their specification and items
- Checking the spacing order of the products
- Reporting to the concerned bodies/supervisor.

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Mention the importance of spacing products in facility (5points)

Note: **Satisfactory rating – 5 points** **Unsatisfactory - below 5 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1

- _____
- _____
- _____

Operation sheet 1.	Individual product placing techniques

Procedures

Step 1: Prepare the necessary materials

Step 2: Locate the products in appropriate layer or order

Step 3: Lay dry products over the wet during placing in refrigerator, storage room and holding containers.

Step 4: Deposit the chemicals and flammable materials on far and different rooms

Step 5: Place products based on color and physical condition of the products

Step 6: Retain the products based on their manufactured batch numbers.

Step 7: Place based on the product temperature requirements for raw food (4%) and for processed meat products

Step 8: Place in appropriate containers for each products

Step 9: Place right products at right place

Step 10: record and report your steps and results

Operation sheet 2.	Spacing products in cooking facility

Procedures/steps

Step 1: wear personal protective equipment

Step 2: prepare the necessary tools, materials and equipment

Step 3: Identify the types of product to be cooked

Step 4: List the product items according to their specifications

Step 4: Clean and keep sanitation of the cooking facility

Step 5: Arrange the products with their appropriate cooking containers

Step 6: Put on the cooking facility trays

Step 7: Checking the spacing order of the products

Step 8: Record and report to the concerned bodies/supervisor.

LG # 43	LO 2- Cook or steam product

Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Determining cooking or steaming procedure.
- Setting and maintaining cooking or steaming cycle
- Monitoring and adjusting cooking or steaming process
- Checking internal temperature of product on completion of cooking
- Cooking or steaming products
- Recording process and results of cooking or steaming
- dying product

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Determine cooking or steaming procedure.
- Maintain and Setting cooking or steaming cycle
- Adjust and monitoring cooking or steaming process
- Check internal temperature of product on completion of cooking
- Cook or steam products
- Record results of cooking or steaming process a
- dye product

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
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Information Sheet-1- Determining cooking or steaming procedure

1.1. Introduction

Steaming is a method of cooking using steam. This is often done with a meat products steamer, a kitchen appliance made specifically to cook food with steam, but meat can also be steamed in a wok**.** Steaming is a healthy way to cook meat, fish and other foods.

1.2. Determining cooking or steaming procedure

Steaming is a moist-heat method of cooking that works by boiling water which vaporizes in to steam; it is the steam that carries heat to the food, cooking it. Unlike boiling food submerged in water, with steaming the food is kept separate from the boiling water but comes into direct contact with the hot steam. Steaming is a method of cooking using steam. This is often done with a food steamer, a kitchen appliance made specifically to cook food with steam, but food can also be steamed in a wok. In the American southwest, steam pits used for cooking have been found dating back about 5,000 years. Steaming is considered a healthy cooking technique that can be used for many kinds of food.

Figure. 2 Steaming tools

1.3. Types of steaming

There are also two kinds of steaming methods, which are “low pressure steaming,” or also known as “atmospheric,” and “high pressure steaming.” Low pressure steaming is a process where meat could be steamed through neither an indirect nor a direct contact with the steam.

Figure3: steaming meat products

1.3.1. Disadvantages of steaming

Steaming foods takes longer than cooking with other methods because it does not use super high heat. It also does not produce a high enough heat to safely cook such meats as beef and pork; you are pretty much limited to fish and poultry. Steam heat is essentially water that is past its boiling point.

1.4. Cooking process

Cooking is the process of cooking meats in direct heating with fire and cooking by equipments with electric and other heat sources. Cooking methods can be grouped into three categories:

- Dry-heat methods, with or without fat. There are like stir-frying, pan-frying, deep-frying, and sautéing rely on fats and oil to act as the cooking medium.
- Moist-heat methods.

- Methods using a combination of dry and moist heat.

There are three important temperatures to remember when cooking meat or eggs. Eggs and all ground meats must be cooked to 160°F; poultry and fowl to 165°F; and fresh meat steaks, chops and roasts to 145°F. Use a thermometer to check temperatures.

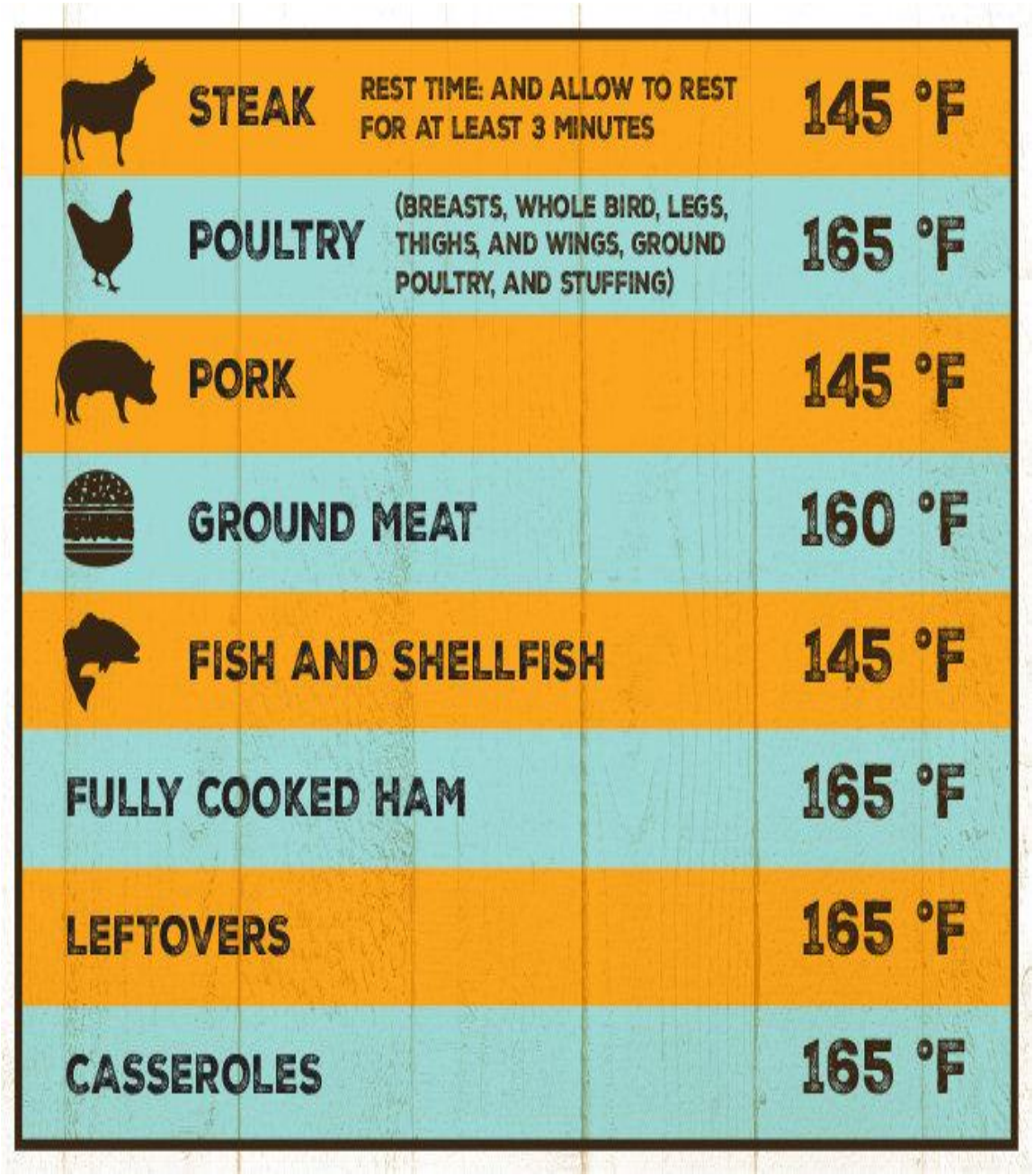

Figure 4.Cooking temperature for d/t meat products

1.5. Factors that how **quickly meat cookings**

There are many factors that will affect how quickly meat cooks, such as

- The oven temperature,
- The thickness of the meat
- The presence of a bone,
- The percent fat within the meat.

For this reason, time and temperature cooking charts for meat should only be used as a suggestion. Although internal meat thermometers are the most accurate way to determine the doneness of meat, there are times when thermometers are not available or easily used. In these instances, a combination of color, texture, and suggested time and temperature charts can be used to determine if the meat is properly cooked.

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Self-Check – 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Test: Short Answer Questions (6 points)

1._____ is a moist-heat method of cooking that works by boiling water which vaporizes in to steam;

2._____ is the same with both types of equipment: as the water boils, the steam rises and surrounds the meat with heat and moisture, cooking the meat until it is tender.

Note: **Satisfactory rating-≥10 points** **Unsatisfactory-<10 points**

2.1. Setting and maintaining cooking or steaming cycle

During the steam cycle, water is sprayed on the dryer drum after several minutes of drying with heated air to create steam. While steam adds moisture, steam dryers are still as effective as conventional dryers at drying your clothes, because heated air is still used before and after the steam to evaporate the moisture.

2.2. Maintain steaming cycle

The basic principle of steam sterilization, as accomplished in an autoclave, is to expose each item to direct steam contact at the required temperature and pressure for the specified time. Thus, there are four parameters of steam sterilization: steam, pressure, temperature, and time. The ideal steam for sterilization is dry saturated steam and entrained water (dryness fraction ≥97%).

Pressure serves as a means to obtain the high temperatures necessary to quickly kill microorganisms. Specific temperatures must be obtained to ensure the microbial activity. The two common steam-sterilizing temperatures are 121°C (250°F) and 132°C (270°F).

2.3. Steam setting

There are two methods of steam setting

I. **Canning Kettle Method**

- The pot or canning kettle must be deep enough to hold the wrapped fabric and wide enough so that the fabric bundle does not touch the sides of the pot.
- Make sure your painted or printed fabric is dry. Loosely roll the fabric, jelly roll fashion, in between a piece of muslin, cotton sheeting, pellon, blank newsprint, or Kraft paper, so the patterned surface does not come in contact with itself. Then roll it like a cinnamon roll and loosely tie it to secure this shape.

- Place the fabric bundle on top of the inverted wire basket. Wrap a towel around the lid of the canner to absorb condensed steam.

- Put water in the bottom of the steamer. Make sure the water is up to, but does not touch the bottom of the wire platform where the fabric bundle sits. Turn on the heat and once the water is boiling and is producing a good head of steam, place the fabric in the kettle.

The steam time varies depending upon the dye, and the type and weight of the fabric. For heavier fabric, remove the bundle after the allotted time, open bundle carefully and re-roll in opposite direction. Add boiling water if necessary and steam for the same amount of time.

II. Tall Steam chamber methods

- Invert a clean 10" ceramic planting pot in the bottom of the canning kettle. Use a six foot long and ten inch diameter, galvanized steel air conditioning or chimney duct. This duct fits tightly inside a canning kettle. Place the canning kettle with the inverted pot and fitted duct on top of a hot plate.
- Lay the fabric flat on a table and smooth out all wrinkles. Place a sheet of newsprint or Kraft paper that is a couple of inches wider than the fabric, on top of the fabric.
- Put water in the bottom of the steamer. Make sure the water is near, but does not touch the top of the ceramic planting pot, where the fabric bundle sits. Turn on the heat and once the water is boiling and is producing a good head of steam, place the fabric in the kettle

Self-Check – 2	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Test: Short Answer Questions (6 points)

1. What is steaming cycle?

2. Write two Methods of steam setting

Answers

Note: **Satisfactory rating-≥10 points** **Unsatisfactory-<10 points**

Information Sheet- 3- Monitoring and adjusting cooking or steaming process

3.1. Monitoring definition

It can be is defined as “The act of conducting a planned sequence of observations or measurements of control parameters to assess whether a CCP is under control.” In a HACCP system, monitoring procedures must be designed to accomplish the following objectives.

3.2. Food safety monitoring

It is the mechanism by which we regularly check to see that food safety hazards are under control, procedures are being correctly implemented and food safety compliance is followed. This type of monitoring is deeply embedded in food safety legislation around the world

3.2.1. Documenting food monitoring process

They will help control your processes and ensure that they are done in a consistent and approved manner. The records will enable you to evaluate the system, show that work was done in a manner that was planned and approved, and show that work and product complies with requirements

.

3.3. Monitoring cooking or steaming process

The method involves monitoring a cooking process in a cooking pot in which food is heated by at least one heating device. At least one part of the surface of the cooked material is detected optically with at least one optical sensor designed to output a sensor signal characteristic of the surface of the cooked material. A variation in the light intensity of the light incident on the optical sensor is detected. Independent claims are also included for the following: an arrangement for monitoring a cooking process and a cooking pot, especially for implementing the method.

To monitor the cooking process, the spatial light very division on the surface of the food or the refraction the surface of the food to be examined. Is preferred however, the change in light intensity of the option the incoming light is detected. There is lighting to illuminate the surface of the food possible with extraneous light, i.e. with light outside the Cookware or the monitoring device lying Light source, for example by means of sunlight from a transparent lid, e.g. B. a glass lid.

Self-Check – 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Test: Short Answer Questions (6 points)

1. What is food safety monitoring?

Test II: Say true or false (2 points each)

1. Monitoring is the act of conducting a planned sequence of observations

Note: **Satisfactory rating-≥10 points** **Unsatisfactory-<10 points**

Information sheet-4-Check internal temperature of product on completion of cooking

4.1. Introduction

The temperature play vital role in food or meat product cooking. The out of and below range of the temperature harms the normality of the cooking products. So checking the temperature post of the cooking completion helps to know in what extent the product is cooked or identifying the faults belongs to the temperature. Therefore; the checking method and procedure will be discussed in this section as below

4.2. Temperature checking tool

Thermometer is the tool that used to detect the internal temperature of cooked meat or products end completion of cooking process during cooking time or after cooked. There are different types of thermometers available on the market but, the only difference may be on reading speed, sizes and application method. The digital continuous thermometer checking the temperature of the product by linking with the meat as it roasts in the oven, continuously showing the internal temperature. One type is made of all metal and has a dial that beeping (making sound) when the meat reaches the desired temperature**,** so this type of temperature is linking in oven at the beginning of cooking. Then also it can be check the internal temperature of cooked meat to ensure that the meat is thoroughly cooked and hot enough to kill any harmful bacteria that might be present, without overcooking the meat. Amongst the followings are the common entirely used to measure the temperature of the meat .see the following thermometer items.

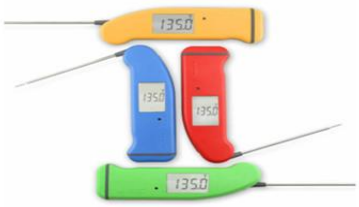

Figure 5. a, manual temprature checker thermometer

Figure. 5. b, digital continuous read thermometer (Polder Deluxe Preset In-Oven)

4.3. Cooked meat temperature detection techniques

According to United State department of agriculture (USDA) guidelines the detection technique of temperature is vary based on the meat product condition and types. See the following examples of recommended safe temperature for cooking's. .

- **Cooking Whole Cuts of Pork**: USDA has lowered the recommended safe cooking temperature for whole cuts of pork from 160 ºF to 145 ºF with the addition of a three-minute rest time. Cook pork, roasts, and chops to 145 ºF as measured with a food thermometer before removing meat from the heat source, with a three-minute rest time before carving or consuming. This will result in a product that is both safe and at its best quality—juicy and tender.

- **Cooking Whole Cuts of Other Meats**: For beef, veal, and lamb cuts, the safe temperature remains unchanged at 145 ºF, but the department has added a three-minute rest time as part of its cooking recommendations.
- In this temperature detection for cooked different meat products the "**Rest time"** is the amount of time that displays the product remains at the final temperature, after it has been removed from a grill, oven or other heat source. During the three minutes after meat is removed the heat source, its temperature remains constant or continues to rise, which destroys harmful bacteria.

4.4. Temperature checking procedures

- Wash your hand to check the product safe

Figure.6. Hand wahing for chacking cooked meat for safe

- Cutting or keep it normal the part of the cooked meat product by knife
- Inject the thermometer flat part into the meat and read the temperature, but for some meat items it required three minute rest as discussed under (section 4.3)
- Record the reading result of the current temperature
- Comparing with the recommended cooked product temperature and reporting the values for correcting purpose**.**

Look the following figures,

Figure 7. steaming cooked meat item

Refer this video -https://www.youtube.com/watch?v=YRQ47Ieddkk

Self-Check -4	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List the cooked meat internal temperature checking procedures? (5pts)
2. ----------is the tools used to detect the temperature of the cooked meat product?(2points)

Note: **Satisfactory rating – 4 points** **Unsatisfactory - below 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1

_____

_____

_____

_____

Information sheet-5- Cooking or steaming products

5.1. Introduction

Cooking or steaming is the synonym terminologies that imply the process of preparing food or meat products by adding nutritional values which can be used for consumption. However, but in another ways steaming is a single cooking components' whereas the cooking incorporates all cooking method including cooking necessary for products;

- To reduce the bacteria and microorganism in in meat or food
- To improves the shelf life of the product and
- To increase the value of demand by adding different ingredients which improves properties of the meat products., the cooking or steaming equipment and cooking method or techniques may be vary from country to country and even between individual based on the demand and interests. So these terminologies will be discussed in this section in detail according to the following**.**

5.2. Methods of Cooking or steaming product

Steaming is a moist-heat method of cooking that works by boiling water which vaporizes into steam; it is the steam that carries heat to the food, cooking it. Unlike boiling food submerged in water, with steaming the food is kept separate from the boiling water but comes into direct contact with the hot steam. Water boils at 212'F (100'c) degrees, so the highest temperature the food cooks at is 212'F (100'c) degrees and the time is depend on the product condition. This steaming process is conducted by steamer or cooker materials. The steamer might be work by electrical, gas, charcoal or wood. Then there are four types of steamers mainly used for cooking meat or food products such as Pressure less Steamers ,Convection Steamers, Pressure Steamers, and Combination Oven/Steamers and other simple and easily applicable steam-

ers can be used for food or meat products. Some of them and with there procedure discussed below.

5.3. Steam cooking procedures.

Using one of the available and affordable steamer steaming food or meat product follows the following procedures.

- Washing hands keep clean
- Using personal protective equipment
- Cleaning and keeping sanitation of the work area
- Add needed amount of water in in steaming oven container and even add water easily during operation too.
- Providing and arrange the raw meat products accordingly
- Cutting the meats based on the consumer demand
- Placing the products on each steamer trays if electrical
- Placing the meat product in the equipment like stainless steel cooker , local clay pot etc
- Adjusting the steamer temperature for electrical to 2012 ‘F or 100’c (the time depends on the product characteristics example. For chicken 25 minutes)
- Placing the product holder trays in the steamer
- Add flavouring ingredients as necessary
- Adding other additional products which can recommended for facilitating steaming time.
- Checking the product cooking and remove the products from the steamer
- Finally except temperature adjustment the procedure is applicable for other steamers too.

Figure. 8. Steaming in electrical oven

Refer the video [Rational Oven Training - YouTube]

Figure 9. Simple steamer used easily

Figure 10. Products cooked by steam

Self-Check -5.	**Written Test**

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List at least 5 steam cocking procedures (5pts)

Note: **Satisfactory rating – 5 points** **Unsatisfactory - below 5 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

_____

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_____

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_____

Information sheet-6-Recording process and results of cooking or steaming

6.1. Introduction

The recording is the action of some functions by sound and registering in different forms. In this section recording will be used to identify and having records concerning the food or meat products steaming equipments, operating procedures, standard adjustment of required temperature, the over cooking or steaming fault and result should be recording . The recording process should have the following recording materials, contents and reporting.

6.2. Importance of Recording

Keeping accurate and up-to-date records is vital to the success of any business. The business must realize that records kept will be one of the most important management tools it possesses and, therefore, it should be allocated due importance.

- To identify the non-conformance steamed products
- To know the pre-adjusted and actual temperature during steaming operation
- To assess the production and steaming operationalcost.
- To assess the return from the steamed product.

6.2. Recording material

- Record book
- Daily inspection checklist
- Video record

6.3. Recording contents

The recording contents includes,

- Procedure of steaming or cooking products standard and result
- Products steaming and cooking cost
- Production cost
- Planned and the actual temperature
- Faults before, during and after operation of steaming or cooking products (out of specification and time)
- Recommended ingredients amount and composition and the actual application
- Steamed products quality (color, flavour, sweetness or taste)
- Customer feedback assessment
- Reporting

6.3.1. Reporting

The report could be includes; daily, monthly, quarterly and annual operational works of the given industry's. So the whole activities of the processing industry should be recorded and reported to the concerned bodies accordingly.

Self-Check -6	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

2. Mention the importance of recording in meat or food product processing industry (5pts)

Note: **Satisfactory rating 5 points** **Unsatisfactory 5 below - points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1

_____

_____

.

_____

_____

Information sheet-7- dying product

7.1. Introduction

In the context of Ethiopian Food, Medicine and Healthcare Administration a Food Supplement Directive and Control Authority. The definition of additives" means a substance, other than a typical ingredient, which is in accordance with appropriate standard or appropriately evaluated for safety and quality and is included in a product for a specific reason including colorant, stabilizer, sweetener, flavor ant, emulsifier, and preservative; under Proclamation No. 661/2009, in this directive, unless the context otherwise requires:. Therefore; the coloration or dyer of food or meat by product might be implemented by the permission of the countries authority regulation. In some countries some synthetic and natural food or meat dyers are used, but belongs to linking with healthy problem in different countries it has been neglected. So based on the countries permission the meat industries might be used some identified recommended dye's in meat or food processing industries. These might be in solid or liquid forms.

7.2. The type of dyes

The types mentioned bellows are some of commonly used dyes in meat industries; such as;

a) Cochineal's carmine
b) Water-Soluble Carmine
c) Liquid Carmine and
d) Paprika

7.3. Importance of dyes

- Cochineal's carmine is one of the most viable options to obtain the desired appearance. For example, Carmine Laca provides a shade between red and pink, depending on the product, coloring process and amount used. This can be used in meat or lunch meats.

- Water-Soluble Carmine provides a shade between violet and red to the final product. This also depends on the type of product, process and amount used. We recommend its use in meats that require a bright red appearance.

- Liquid Carmine also provides a shade between violet and red to the final product, depending on the type of product, process and amount used. We also recommend its use in meat and lunch meats.

7.4. Application method

All options have been formulated for different types of lunch meats depending on whether the product is going to be subjected to cooking temperature, if it is going to be emulsified, or if it is going to be a lunch meat made of fresh meat mixed with spices and additives.

a) Powdered dyes

C) Liquid Dyes

b)Liposolubledyes

Figure 11. Natural meat product used dyes(a,b & c)

Self-Check – 7	**Written test**

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions (6points)

1. Mention two meat product dyeing types ?

Note: **Satisfactory rating-≥3 points** **Unsatisfactory-<13points**

Operation sheet 1.	Steam cooking

Procedure

Using one of the available and affordable steamer steaming food or meat product follows the following procedures.

Step 1: wear appropriate personal protective equipment

Step 2: Wash hands keep clean

Step 3: Clean and keep sanitation of the work area

Step 4: Add needed amount of water in in steaming oven container and even add water easily during operation too.

Step 5: Provide and arrange the raw meat products accordingly

Step 6: Cut the meats based on the consumer demand

Step 7: Place the products on each steamer trays if electrical

Step 8: Place the meat product in the equipment like stainless steel cooker, local clay Pot etc

Step 9: Adjust the steamer temperature for electrical to 2012 'F or 100'c (the time depends on the product characteristics example. For chicken 25 minutes)

Step 10: Place the product holder trays in the steamer

Step 11: Add flavouring ingredients as necessary

Step 12: Add other additional products which can recommended for facilitating steaming time.

Step 13: Check the product cooking and remove the products from the steamer

Step 14: Finally except temperature adjustment the procedure is applicable for other Steamers too..

Step 15: record and report your findings/results

LAP Test	Moisture content determination

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Use personnel protective equipment,

Given necessary templates tools and materials you are required to perform the following tasks within **4** hours.

Task 1: Perform individual product placing

Task 2: perform spacing products in cooking facility

Task 3: conduct Steam cooking

LG # 44	LO 3- Chill or cool product
Instruction sheet	

This learning guide is developed to provide you the necessary information regarding the following **content** coverage and topics:

- Weighing product
- Chilling or cooling product
- Identifying and storing product

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Weigh product
- Chill or cool product
- Identify and storte product

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
10. Follow the instructions described below.
11. Read the information written in the “Information Sheets”. Accomplish the “Self-checks” which are placed following all information sheets.
12. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
13. If you earned a satisfactory evaluation proceed to “Operation sheets
14. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
15. If your performance is satisfactory proceed to the next learning guide,
16. If your performance is unsatisfactory, see your trainer for further instructions or go back to “Operation sheets”.

Information Sheet-1 Weighing product

1.1 Weighing

Weighing is assessing the nature or importance of, especially with a view to a decision or action. The consequences of the move would need to be very carefully weighed

1.2. Product weighing

is one of the most important aspects of food *product* manufacturing. It is an essential element of any plant's quality control procedures.

1.3. Importance of weighing.

Weighing is an essential part of the food production process. Weighing applications can be found across every processing plant. These weighing applications can be found as early in the production process as the weighing of incoming products on the receiving dock to the weighing and labeling of finished good's boxes going into inventory. Weighing ingredients for quality compliance is extremely important. This is because ingredients must be weighed to fulfill product recipe specifications and quality requirements. Measuring ingredients with extreme accuracy ensures they are distributed equally, and the product tastes the same in every batch.

Food scales help processors adhere to production requirements and reduce the risk of creating out-of-spec product. Out-of-spec product can jeopardize the health of consumers and subject processors to fees for non-compliance with foodservice regulations. To avoid out-of-spec product, processors must invest in accurate, high-quality food scales.

Figure 12. Different weighing scale

Self-Check – 1	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions (6points)

2. Write definition of weighing
3. Write definition of weighing product

Note: **Satisfactory rating-≥3 points** **Unsatisfactory-<13points**

Information Sheet-2 -Chilling or cooling product

3.1. Chilling or cooling product

- Cooling is used to reduce the temperature of the food from one processing temperature to another or to a required storage temperature.
- Chilling is a processing technique in which the temperature of a food is reduced and kept in a temperature between -1 to 8°C.
- Product cooling is simply the removal of heat from a product following a manufacturing or grading process, or removal of heat following harvest of fresh produce from the field. Product cooling is generally done by passing air or fluid (usually water) at low temperatures over the surface of the product.
- The chilling of cooked products begins within 90 minutes after the cooking cycle is completed. All products should be chilled from 120° F (48.8° C) to 55° F (12.7° C) in no more than 6 hours. Chilling should then continue until the product reaches 40° F (4.4° C).

3.2. Cooling Meat Products.

It is very important that cooling be continuous through the given time/temperature control points. Excessive dwell time in the range of 130° to 80°F is especially hazardous, as this is the range of most rapid growth for the clostridia. Therefore cooling between these temperature control points should be as rapid as possible

- During cooling, the product's maximum internal temperature should not remain between 130°F and 80°F for more than 1.5 hours or between 80°F and 40°F for more than 5 hours. This cooling rate can be applied universally to cooked products (e.g., partially cooked or fully cooked, intact or non-intact, meat or poultry) and is preferable to (2) below.
- Over the past several years, FSIS has allowed product to be cooled according to the following procedures, which are based upon older, less precise data: chilling should

  begin within 90 minutes after the cooking cycle is completed. All products should be chilled from 120°F (48°C) to 55°F (12.7°C) in no more than 6 hours. Chilling should then continue until the product reaches 40°F (4.4°C); the product should not be shipped until it reaches 40°F (4.4°C).

3.2.1. Cooling sausages

Immediately after cooking the sausages should be showered with cold water. However, showering with hot water cleans the surface from any soot or grease accumulation better. A hot spray is applied by commercial producers and very seldom by the hobbyist. At home, a cold shower is normally practiced. As most smokehouses are located outside of the house the common method employs the use of a garden hose. Sausages cooked in water should be placed in another vessel filled with cold water (50-60º F, 10-15º C). Cooling sausages with water offers the following advantages:

- Cleans the surface from grease.
- Extends product's shelf life.
- Decreases time of air cooling which subsequently follows.

Figure 13. Cooling smoked sausage

Self-Check – 2	**Written test**

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions (6points)

1. Write difference between cooling and chilling
2. What are advantages of cooling sausages with water offers?

Note: **Satisfactory rating-≥3points** **Unsatisfactory-<3 points**

Information Sheet-3- Identifying and storing product

3.1 Identifying and storing product

3.1.1. Refrigeration

The ideal temperature for the storage of fresh meat is 28°F to 32°F. Meat should be stored in the coldest part of the refrigerator. As storage temperatures approach 40°F perishability increases. Rapid growth of bacteria begins at about 50°F. Meat in-transit from the place of purchase, or left to thaw at room temperature, invites the growth of spoilage organisms. If meat is not going to be used within a few days after purchase, it should be frozen as soon as possible to preserve optimal quality.

Figure 14. meat refrigeration

3.2. Freezing

Freezing is the most common method of meat preservation. Trimming excess fat and removing bones, if possible, will conserve freezer space. Meat should not be salted prior to freezing.

Salting draws out moisture and oxidizes meat fat giving it a rancid flavor and reducing the time meat can be left in the freezer. Animal fats, like other lipids, are subject to deterioration over time. They are especially prone to develop oxidative rancidity which results in objectionable flavors and odors. The more unsaturated fatty acids there are in the fat, the greater its susceptibility to oxidation and rancidity.

Figure.15. Meat freezing

3.4. Meat Storage Procedures

Meat should be packaged appropriately to prevent drying out, spoilage, or freezer burn. Whole sub-primal are often vacuum packed as soon as they are removed from the carcass and will have a long shelf life when kept in the original vacuum packaging. Cut meat products for retail use should be wrapped in permeable film on trays or vacuum packaged after portioning. Cut meat products for food service use may be vacuum packed after cutting or stored in food-grade containers, wrapped appropriately, and stored according to food safety standards.

Products for frozen storage should be vacuum packed or wrapped tightly in freezer paper to prevent freezer burn. Coolers should be maintained at 0°C to 2°C (32°F to 35.6°F). This is considered the safest temperature to hold meats and maintain flavor and moisture. Water freezes at 0°C (32°F); however, meat freezes at about -2°C (29°F).

Figure 16. meat storage

Self-Check – 3	Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Test: Short Answer Questions (6 points)

1._____ Meat should be packaged appropriately to prevent drying out, spoilage, or freezer burn.

2._____Freezing is the most common method of meat preservation.

3._____ The ideal temperature for the storage of fresh meat is 28°F to 32°F.

Write difference between cooling and chilling

4. What are advantages of cooling sausages with water offers?

Note: **Satisfactory rating-≥10 points** **Unsatisfactory-<10 points**

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Answer key No

Lo1.

1≠.

- Locating the products in appropriate layer or order
- Laying dry products over the wet during placing in refrigerator, storage room and holding containers.
- Depositing the chemicals and flammable materials on far and different rooms from the food products
- Placing products based on color and physical condition of the products
- Retaining the products based on their manufactured batch numbers.
- Pacing based on the product temperature requirements for raw food (4%) and for processed meat products
- Placing in appropriate containers for each products
- Placing right products at right place for storage, processing and dispatching.

2≠.

- To facilitate the cooking time
- To improve the cooking quality of the products
- Checks easiest environment for checking the cooking products.

Lo2.

1≠

2≠

3≠

4≠

5≠

6≠

7≠

Lo3.

1≠

2≠

3≠