



Meat and Meat Products Processing- Level II

Based on May 2019, Version 2 Occupational
standards

**Module Title: - Operate Packing and labeling
meat products**

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LG #57

LO #1- Set up packaging unit for operation

Instruction sheet

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

- Implementing work place start up procedures in packing units
- Selecting packing materials
- Identifying and reporting faults in equipment in work place
- Understanding International and Ethiopian standards of meat and meat products and Grading

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:

- Implement work place start up procedures in packing units
- Select packing materials
- Identify and report faults in equipment in work place

Understand International and Ethiopian standards of meat and meat products Grade

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- Implementing work place start up procedures in packing units

1.1. Introduction meat and meat products

Meat is a perishable product, it gets spoiled very soon if it is left uncovered and unprocessed in the ambient temperature. Meat can only be stored for future use through proper processing, packaging and storage. Food is packaged for storage, preservation, and protection traditionally for a long time. These three are the basic functions of food packaging that are still required today for better maintenance of quality and handling of foods. When considering processed meat products, factors such as dehydration, lipid oxidation, discoloration and loss of aroma must be taken into account. Many meat packaging systems currently exist, each with different attributes and applications. These systems range from overwrap packaging for short term chilled storage and/or retail display, to a diversity of specified modified atmosphere packaging (MAP) systems for longer-term chilled storage and/or display, to vacuum packaging, bulk-gas flushing or MAP systems using 100 % carbon dioxide for long term chilled storage.

1.1.1. Work place

A **workplace** is a location where someone works for his or her employer, a place of employment. Such a place can range from a home office, to large meat and meat products processing Industry.

1.1.2. Definition of Packaging

- ❖ Packaging is the technique of using the most appropriate containers and components to protect, carry, identify and merchandise any product.



- ❖ It constitutes a vital link between the processor and consumer for the safe delivery of the product through the various stages of processing, storage, transport, distribution and marketing.
- ❖ The primary function of a meat package is to present the product to the consumer in the most attractive manner possible and at the same time protect the product from physical damage, microbial deterioration and chemical changes

1.1.3. Packaging and package labeling have several objectives.

- ❖ **Physical protection** - The food enclosed in the package may require protection from, among, shock, vibration, compression, temperature, bacteria, etc.
- ❖ **Barrier protection** - A barrier from oxygen, water vapor, dust, etc., is often required.
- ❖ **Containment or agglomeration** - Small items are typically grouped together in one package to allow efficient handling. Liquids, powders, and granular materials need containment.
- ❖ **Information transmission** - Packages and labels communicate how to use, transport, recycle, or dispose of the package or product. Some types of information are required by governments.
- ❖ **Marketing** - The packaging and labels can be used by marketers to encourage potential buyers to purchase the product.
- ❖ **Security** - Packaging can play an important role in reducing the security risks of shipment. Packages can be made with improved tamper resistance to deter tampering and also can have tamper-evident features to help indicate tampering.

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- ❖ **Convenience** - Packages can have features which add convenience in distribution, handling, stacking, display, sale, opening, reclosing, use, and reuse.
- ❖ **Portion control** - Single-serving packaging has a precise amount of contents to control usage.

1.1.4. Functions of Packaging meat industry

- ❖ Protection
 - ✓ Protect against physical change.
 - ✓ Protect against chemical change.
 - ✓ Protect against microbes.
 - ✓ Present the product to the consumer in an attractive manner.
- ❖ Containment
- ❖ Preservation
- ❖ Apportionment:-the function of reducing industrial output (i.e., Dressed Carcass) to an appropriate size for further processing or consumer use
- ❖ Unitization: - the function in which primary packages are consolidated for shipment. Unitization allows optimization of materials handling by minimizing the number of discrete packages that need to be handled.
- ❖ Convenience–Microwaveable packs and meat based whole meals.
- ❖ Communication–A package must protect what it sells and sell what it protects.

1.1.5. Understanding Occupational Health and safety

Many of these solutions may also be useful for meat industry, the seafood and other meat by products

- ❖ Keep wheels on racks well maintained. Wheels that are in poor repair can be difficult to push. Racks with bad wheels should be removed from service until they can be repaired.

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- ❖ Keep all grinders, cutters and other equipment sharp and in good repair. Dull or improperly working equipment requires more force to operate.
- ❖ Provide thermal gloves for use when handling frozen items.
- ❖ Avoid continuous cutting or grinding. Whenever possible, break up these tasks with other, less strenuous tasks throughout the shift.
- ❖ Work with suppliers to get meat and other supplies in lower weight boxes to reduce the weight manually handled.
- ❖ Keep large boxes and heavy items close to the body. This helps to reduce stress on the back.
- ❖ Arrange the wrapping station so that labels are within easy reach and workers do not have to twist or walk to get to them.
- ❖ Remove, round-off, or pad sharp or hard edges with which the worker may come into contact.
- ❖ Mount controls of the roller bed close to the wrap station so that workers can reach it easily.
- ❖ If there are two wrap stations, there should be two sets of controls so that neither worker must pull or lug trays down the conveyor.
- ❖ Align the roller bed and the wrap station so that employees can slide the trays rather than lift them to the station.
- ❖ If overhead storage is necessary, use it for light items such as foam trays.
- ❖ Use a step stool to reach items on high shelves.

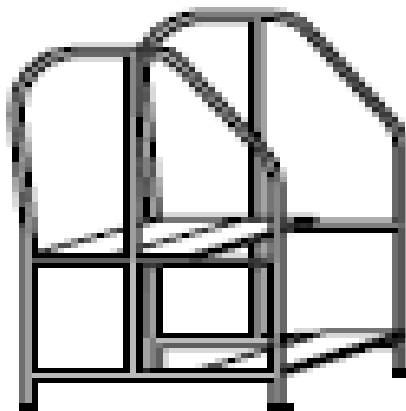


Figure 1 wheel rack

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- ❖ Position scales so that they can be used in the best work zone. Scales that are too high or too low for a worker can cause employees to work in awkward positions. If possible, make the scale table adjustable so that all workers can work in comfortable postures. Also, position the scale near the lowest part of the counter so that neither the worker nor the customer has to reach over tall deli cases for meat packages.



Figure 2 Facilities in sells shop

- ❖ Provide a small stool for employees to sit on when catching and traying meat from the grinder. Squatting and bending at the waist can lead to back and leg discomfort, especially when grinding for long periods of time.
- ❖ Grind meat into a small lug and move it to a comfortable work surface for traying. This prevents the awkward back posture that results from catching and traying the meat immediately as it leaves the grinder.
- ❖ Whenever possible, work from the long side of trays to reduce reaches and the resultant high stresses on the back.
- ❖ Avoid working with the hands/wrists held in a bent or twisted position.



Figure 3 Hand working position

- ❖ Keep knives sharp. Workers should be trained in the best knife sharpening methods. Knife sharpening systems should be used regularly, and steels and mousetrap sharpeners should be used to keep knives sharp throughout the shift.



Figure 4 Different Knife types

- ❖ Try different knives to see if they are more comfortable to use. Some designs work well for specific cutting, trimming, or portioning tasks and should be considered “special purpose” tools.
- ❖ Whenever possible, incorporate adjustable work surfaces into the department. Examples include cutting tables scales and deli slicers.

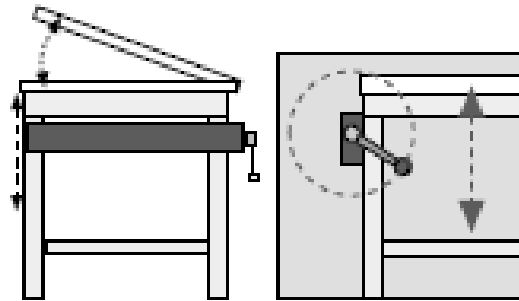


Figure 5 Cutting Machines

- ❖ Look for cases and counters that allow workers to serve customers without excessive reaches.
- ❖ Use anti-fatigue mats, footrests, and sit/stand stools where workers are required to stand for long periods of time.



Figure 6 Use of anti-fatigue

- ❖ Look for grinders that do not force the worker to bend over to catch meat or to reach too high to dump meat into the grinder.



Figure 7 Grinder



1.1.6. Automatic and Manual Packing and Labeling

A. Manual preservation and packing

Meat drying is a complex process with many important steps, starting from the slaughtering of the animal, carcass trimming, and selection of the raw material, proper cutting and pre-treatment of the pieces to be dried and proper arrangement of drying facilities. In addition, the influence of unfavorable weather conditions must also be considered to avoid quality problems or production losses. The secret of correct meat drying lies in maintaining a balance between water evaporation on the meat surface and migration of water from the deeper layers.

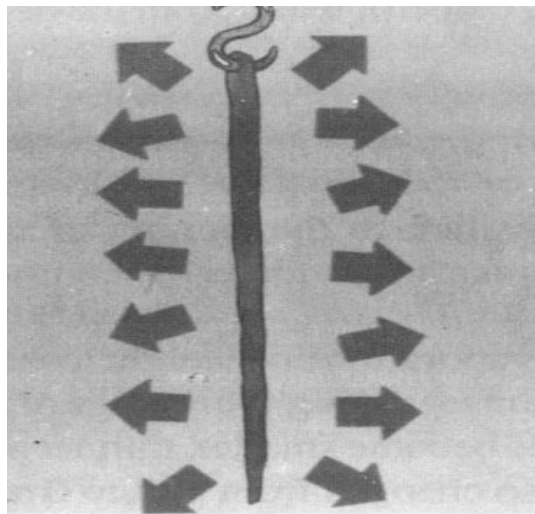


Figure 8 Dehydration process of a piece of meat suspended under drying conditions (schematic).

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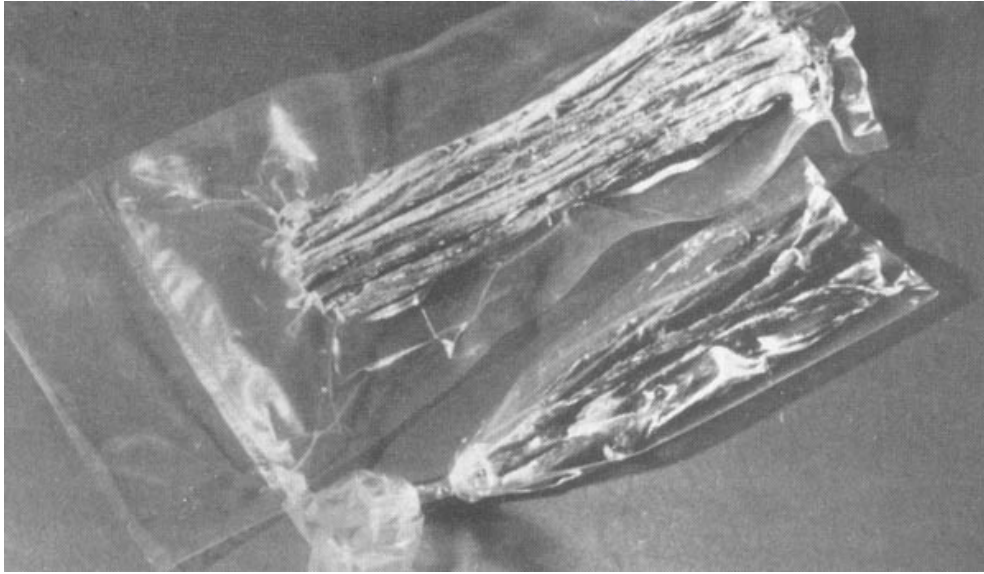


Figure 9 Dried meat strips packed in plastic bags with the opening heat sealed (above) or tied (below).

1.1.7. Vacuum Packaging

Vacuum packages for fresh meat increase the shelf life and thus improve the distribution efficiency and marketing of the product. Vacuum packaging is defined as “the packaging of a product in a high barrier package from which air is removed to prevent growth of aerobic spoilage organisms, shrinkage, oxidation, and color deterioration”.

- ❖ It is the placing of 'primal or sub primal cuts of meat into plastic bags or pouches and extracting air from them by means of a nozzle type vacuumizing machine or a vacuumizing chamber.
- ❖ The bags are then sealed to effect closure with either metal clips or heat- impulse sealing of the sides of the bags.
- ❖ The most commonly used film for fresh meat vacuum packages is PVDC.

To prevent browning, meat package oxygen levels must be less than 0.15 %. Oxygen levels of 0.15 - 2.0 % predispose fresh beef products to browning. CO₂ is produced by microorganisms, because tissue anaerobic metabolism produces mainly lactic acid. In this packing technique, carbon dioxide (CO₂) concentration rapidly increases in 10 to

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20% during the first four hours, reaching a maximum level of approximately 30%. At the same time, oxygen level is reduced to 1-3% due to the activity of meat enzymes.

In vacuum packing, air is removed from gas impermeable packages, which are immediately sealed. During storage of vacuum-packed foods, CO₂ level increases as a result of tissue and microorganism respiration. This modified gas environment hinders the development of rapidly-growing mesophilic heterotrophic aerobes and stimulates the growth of slow-growing lactobacilli. The shelf life of vacuum packed meats in gas impermeable packages is much longer compared with meats packed in the presence of atmospheric air.

The shelf life of vacuum packed meats in gas impermeable packages is much longer compared with meats packed in the presence of atmospheric air, gas used are CO₂ and N₂



Figure 10 Vacuum packing

1.1.8. Modified Atmospheric Packaging (MAP)

- It is a technology where in foods are packaged in high barrier packages in which air has been replaced with an artificial (modified) atmosphere. Commonly used gases are *oxygen, carbon dioxide and nitrogen*.

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- For red meats, high-oxygen MAP systems utilize atmospheres containing approximately 20% to 30% carbon dioxide, 60% to 80% oxygen, and up to 20% nitrogen.
- The time taken for that layer to reach the surface is increased, so display life is extended. Unlike overwrapped trays, high oxygen display packs use a film with high gas barrier properties, to prevent the gases equilibrating with the ambient atmosphere.
- The absorption of carbon dioxide can lead to pack collapse. The pack atmosphere remains reasonably stable and the pack shape is maintained when the ratio of pack volume to meat volume exceeds approximately 3 to 1. The use of high oxygen with high carbon dioxide effectively doubles the color stability and time to spoilage over that achieved using ambient atmosphere overwrapped packs
- High-oxygen MAP, which provides a chilled product life of only 5 to 10 days, is not suitable for prolonged storage of meat. Its suitability for display packaging is determined as much by commercial merchandising strategies as by the preservative capability of the packaging.



Self-check 1	Written test
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Name_____ ID_____ Date_____

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

Test I: Choose the best answer (1 points each)

- Of the following one is the function of packing in the meat industry
 - Protection
 - Containment
 - Preservation
 - Communication
 - All
- Except one the others are the objects of Packing in the meat industry.
 - Physical protection
 - Barrier protection
 - Information transmission
 - Security
 - None

Test II: Short Answer Questions

- Explain the term packing (4 point)
- Explain the difference between Vacuum packing and MAP. (4 point)

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

Note: Satisfactory rating - 10 points

Unsatisfactory - below 10 points

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Information Sheet 2- selecting packing materials

2.1. Introduction to packaging

Fresh meat requires presence of oxygen for maintaining color for consumer appeal. It has a shorter shelf life. Cured meats degrade in presence of oxygen. Two decisions are important while selecting packaging material *i.e.* **shape or form and material**. Selection of packaging material would depend on product factors such as *color, stability, storage conditions, microbial condition, preservatives and degree of processing*.

Modern Packing Materials and Package forms

- **Rigid packaging materials and package forms**

- ✓ Glass containers
- ✓ Metal cans
- ✓ Composite containers
- ✓ Aerosol containers
- ✓ Rigid plastic packages

- **Semi -rigid packaging materials and package forms**

- ✓ Aluminium containers
- ✓ Set-up paper board boxes
- ✓ Folding paper board cartons

- **Flexible packaging materials**

- ✓ Paper - the basic papers used consists of bonds, tissue, litho, krafts, glassines, parchment and grease proof.
- ✓ Films - cellophane, cellulose acetate, polyethylene (HDPE & LDPE), Polypropylene, polyamide, polyester, polyvinyl chloride, polyvinylidene chloride, polyvinyl acetate and polyvinyl alcohols
- ✓ New films - amylase films (edible), Ionomers like surlyn A, Ethylene vinyl acetate copolymers, polypropylene copolymers, co extruded structured films, aluminium foils and steel foil.

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- **Flexible package forms**

- ✓ Wrappers
- ✓ Preformed bags or envelopes
- ✓ Pouches
- ✓ Collapsible tubes

- **Packaging materials used for fresh red meat**

- ✓ Trays - made of polystyrene
- ✓ Transparent films - cellophane, LDPE (most commonly used for fresh meat), PVC
- ✓ Shrink films - PVC, cellophane, rubber hydrochloride, polypropylene, irradiated PE and PVDC are used in shrink wrapping of meat.

Packaging films utilized in packaging of meat must possess the following characteristics:

- ✓ Flexibility
- ✓ Mechanical strength
- ✓ Light weight
- ✓ Odorless
- ✓ Hygienic (clean and toxicologically harmless)
- ✓ Easy recycling
- ✓ Resistance to hot and cold temperatures
- ✓ Resistance to oil and fats
- ✓ Good barrier properties against gases
- ✓ Sealing capability
- ✓ Low-cost

Barrier against gases

- ✓ Good barrier properties against **oxygen** and **evaporation** are the critical to ensure the maintenance of colour of meat, prevent development of oxidative rancidity; and shrinkage losses and drying, respectively especially in case of processed meats.

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- ✓ However, oxygen permeability is acceptable and rather a necessity in the case fresh ready-to-sell meat portions in self-service outlets where the oxygen permeability is required to maintain bloom

Market factors which influence are distribution time/shelf-life, package size and cost, pre-market pricing and brand labeling need consideration. Processed products require more sophisticated and extensive packaging because they will be stored at higher temperatures for longer periods than refrigerated products.

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**Self-Check – 2****Written test**

Name _____ ID _____ Date _____

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers. (2 points each)

1. Of the following one is Rigid packaging materials and package forms

- A. Glass containers
- B. Composite containers
- C. Set-up paper board boxes
- D. A and B are correct
- E. None

2. Except on the others are packaging materials used for fresh red meat

- A. Trays - made of polystyrene
- B. Transparent films
- C. Shrink films
- D. All
- E. None of the above

Test I: Short Answer Questions (6 points)

1. List at least two packing materials of meat from each packing materials and forms

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

Note: Satisfactory rating - 10 points

Unsatisfactory - below 10 points



Information Sheet 3- Identifying and reporting faults in equipment's in workplace

3.1. Introduction to work place

Safe work practices are essential in helping to maintain a safe and healthful work environment. Workers must therefore be encouraged and be given sufficient time and equipment to keep surface clean and orderly. To do this, spills must be cleaned up immediately. Water, blood, or grease on floors will cause falls.also, wet working conditions pose a serious threat of electrocution. Periods during the day should also be set aside for general housekeeping, and constant surveillance should be kept to spot slippery areas.

- ❖ Non-skid floor mats can also be used successfully in potentially dangerous areas.
- ❖ Knives left carelessly in sinks or on counters can cause serious accidents.
- ❖ Knives should be kept sharpened at all times.
- ❖ Dull knives can cause serious safety hazards and worker fatigue.
- ❖ Equipment such as the band saw and the bacon press must be cleaned with the power off and locked-out, and tagged-out.
- ❖ Workers should use only tools and equipment with which they are familiar.
- ❖ Moreover, employers should check refrigeration systems regularly for leaks and should make sure that hazardous substances, such as ammonia, are identified by appropriate hazard warnings (labels, signs,
- ❖ Employers should make hand washing facilities readily available to employees working with or near toxic substances.

Quality Assurance (QA)

Quality assurance is implemented as a means of providing enough confidence that business requirements and goals (as outlined in quality planning) for a product and/or service will be fulfilled. This error prevention is done through systematic measurement, comparison with a standard, and monitoring of processes

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- ❖ A part of quality management focused on providing confidence that quality requirements will be fulfilled
- ❖ A formal and systematic exercise in identifying problems in medical care delivery, designing activities to overcome the problems, and carrying out follow-up monitoring to ensure that no new problems have been introduced and that corrective steps have been effective
- ❖ A broad spectrum of evaluation activities aimed at ensuring compliance with minimum quality standards
- ❖ All actions taken to establish, protect, and improve the quality of health care

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Self-Check – 3	Written test
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Name_____ ID_____ Date_____

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

Test I: Short Answer Questions

1. Define work place requirement and practices (4 points)

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

Note: Satisfactory rating - 4 points

Unsatisfactory - below 4 points

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Information Sheet 4- Identifying International and Ethiopian standards of meat and meat products

4.1. Introduction to meat and meat products in Ethiopia

There are some opportunities for Ethiopia meat exporters in the African market despite the fact that the beef imports throughout Africa is dominated by low grades and frozen beef while Ethiopia is primarily exporting ***chilled beef***. However, Ethiopia has exported to some of these countries in the past and can use this experience to consolidate its presence in the markets. As livestock disease profiles between Ethiopia and these countries are, by and large, similar and the countries share similar concerns with respect to food quality and safety, we conjecture that if Ethiopia manages to penetrate these markets in a significant manner, its exports volume is more likely to be stable for the subsequent years.

Meat quality is a broad term and covers a variety of characteristics. Defined meat quality on the basis of its conformational and functional qualities. Functional qualities as the desirable attributes of a product while the conformance qualities take into consideration producing products that exactly meets consumer's specifications.

Meat quality is characterized by its:-

- Tenderness
- Ph. value
- Color
- Juiciness
- Flavour and
- Nutritive value.

Quality attributes primary affected by transport and handling in cattle include pH, colour, tender, texture and moisture and degradation of these variables is collectively referred



to as dark firm and dry, high pH, and low glycogen meat . Appearance quality such as colour is measured instrumentally.

However, other aspects (juiciness and flavour) require a subjective approach, and the best ways to evaluate meat quality are scores of trained taste panelists who evaluate different components of meat eating quality. Meat with good sensory properties is what consumers' desire, so beef industry must supply meat with these attributes on a consistent and uniform basis.

4.2. Grading of meat and Grading Parameter

It is the systematic way to express meat quality and carcass value or sorting into groups according to selected characteristics. Grading plays an important role in marketing and merchandising of carcass. It is very important to buyers and value to the meat industry. Different countries have their own grading pattern and detailed specifications to suit their market and consumers' requirements.

An effective grading system in any country requires:

- ✓ Quality conscious consumers
- ✓ Availability of grades and grading agency
- ✓ Good seller.-buyer relationship
- ✓ A knowledgeable society
- ✓ Supreme honesty in the trade.

4.2.1. Importance of Grading

- ❖ Grading helps the farmers (producer) to recognize the quality of their animal and to improve breeding programme and produce high grades of animals and carcasses.
- ❖ It helps the processor to select a required type according to the needs of market and consumers.

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- ❖ It helps to producer and processor to certify their animals and carcasses for class, quality and condition through authorized agencies.
- ❖ So far the consumers are concerned, grading helps to give satisfaction to consumers over the money he spent on purchase of meat at meat products. It also helps the consumers to utilize meat more efficiently by preparing it in the manner for which it is best suited. Hence, we can say grading is a guide to quality for all those who are involved in meat production, processing and marketing.

4.2.2. USAD (United state Department of Agriculture) System of Carcass / Meat Grading

There are two types or two basis of meat grading, they are:

- (A) Palatability or Quality grades.
- (B) Cutability or Yield grades.

A Quality/Palatability Grade

In this grading system, meat are categorized into different grades on the basis of its acceptability for consumer cuts and the factors considered for quality grades are related to palatability and acceptability of meat to consumers.

There are many factors used to establish palatability/quality grades such:

- Kind and class
- Maturity
- Marbling
- Firmness/texture
- Colour and structure of lean
- Conformation, fleshing and finish.

Kind and Class: In meat grading, each species of animal is referred to as a kind. Again kind of meat is divided into classes that are quite similar in physical characteristics. Hence, the primary factor to set up the class of carcass is sex.

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For example: The sex classes for cattle are Heifer, Cow, Steer, Bull and Bullock. Likewise in case of Pig: Boar, Sow, Barrow and Gilt. Age of the animal is also an important factor in establishing the classes.

Maturity: Maturity is defined as the physiological age of the animal or bird that Meat Cutting and Grading produce the carcass. Age has a significant effect on tenderness of meat. Therefore, meat from a physiologically mature animal is less tender than meat from a young animal. Moreover, maturity is also related to texture of meat (as an animal matures the texture of lean changes from fine to course).

Marbling: It means intramuscular fat. This can be visibly detected when the muscle surface is cut. It is located in the perimyoseal connective tissues between muscle fiber bundles. Marbling is highly desirable in any cut of meat and is highly related to juiciness and flavour. Marbling also has a positive effect on tenderness of meat possibly by acting as a lubricant during chewing and swallowing

Firmness: It refers to firmness of the muscles. Firmness is evaluated in the flank area of carcass or cut surfaces of the lean meat. Firmness is greatly influenced by the amount of fat that is present in carcass.

Colour and Structure of Lean: These two factors have an important effect on the appearance of meat cuts and appearance is practically the only criterion the consumer can use to judge the acceptability of most meat at purchase.

Conformation, Fleshing and Finish: Conformation describes the shape of the carcass. On the other hand conformation is a reflection of the proportion of muscle to bone in it. Animals with high muscle to bone ratio show good carcass conformation.

B. Cutability Grade (Yield Grade)

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In yield grading, carcasses are categorized on the basis of expected yield of retail cuts. The yield of product is important because it determines how much you have to sell. Higher yield means more product and potentially greater profit.

Factors to be considered in Cutability grades

Amount of Fat: The amount of fat (internal, external and intramuscular) has more effect on retail yield of a carcass than any other single factor.

Muscle Development: The retail yield is also affected by the relative degree of development of skeletal musculature. As the beef carcass is ribbed i.e., the side is quartered, muscle development is measured as loin eye or rib eye area

Carcass Size: Carcass weight is the most widely used indicator of carcass size. In beef carcasses, loin eye area must be increased with increased carcass weight, otherwise the estimated Cutability will be lower.

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**Self-Check – 4****Written test**

Name _____ ID _____ Date _____

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers. (2 points each)

1. Of the following which one is an effective grading system in any country requires including Ethiopia
 - A. Quality conscious consumers
 - B. Availability of grades and grading agency
 - C. Good seller.-buyer relationship
 - D. A knowledgeable society and Supreme honesty in the trade
 - E. All

Test I: Short Answer Questions

1. Explain the two basic meat grading system in detail.(8 points)

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

Note: Satisfactory rating - 10 points

Unsatisfactory - below 10 points



Operation Sheet 1-Techniques of traditional drying and packing

1. Trim beef carcass correctly
2. Suspend and cut meat strips from its hindquarter
3. Soak the meat strips into 14% salt solution for 5 minutes
4. Use suspension techniques available in your surroundings to dry it.
(using loops, hooks, wooden)
5. Take a care full activities in any one of the above system or use all of the for more understanding.
6. Collect the dried meat strips from the suspension care full
7. Prepare a clean plastic bags of different size (for 0.25,0.5,1 kg)
8. Using sealing candle or packing hot iron seal the plastic opening

Operation Sheet 2-Techniques of leveling the balancing fixture

Techniques of Grading meat and meat products

1. Select the meat cuts
2. Evaluate the nutritive values based on the parameter visual and laboratorial
3. Judge the value with the standard on the international a grading system
4. Determine the actual grade of your products

LAP TEST	Performance Test
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Name..... ID.....

Date.....

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **3** hour. The project is expected from each student to do it.

1. Perform manual meat drying and packing
2. Perform Grading of meat and meat products

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LG #58

LO #2- Set weight controls

Instruction sheet

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

- Setting weight control and ensuring bagged products
- Understanding Machine set up
- Adjusting controls

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:

- Set weight control and ensuring bagged products
- Understand Machine set up

Adjust controls

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- Setting weight control and ensuring bagged products

1. Introduction

A Beam balance (or Weighing Balance) is a device to measure weight or mass. These are also known as mass scales, weight scales, mass balances, weight balances, or simply scales, balances, or balance scales.

The traditional scale consists of two plates or bowls suspended at equal distances from a fulcrum. One plate holds an object of unknown mass (or weight), while known masses are added to the other plate until static equilibrium is achieved and the plates level off, which happens when the masses on the two plates are equal. The perfect scale rests at neutral. A spring scale will make use of a spring of known stiffness to determine mass (or weight). Suspending a certain mass will extend the spring by a certain amount depending on the spring's stiffness (or spring constant).



Figure 11 Different type of weighing scale

2.1. Commercial and Law-Enforcement Equipment

To commercial weighing and measuring equipment; that is, to weights and measures and weighing and measuring devices commercially used or employed in establishing the size, quantity, extent, area, composition (limited to meat and poultry), constituent values (limited to grain), or measurement of quantities, things, produce, or articles for distribution or consumption, purchased, offered, or submitted for sale, hire, or award, or

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in computing any basic charge or payment for services rendered on the basis of weight or measure

2.2. Indicating and Recording Elements

All weighing and measuring devices shall be provided with indicating or recording elements appropriate in design and adequate in amount. Primary indications and recorded representations shall be:-

- ✓ Clear
- ✓ Definite
- ✓ Accurate, and
- ✓ Easily read under any conditions of normal operation of the device.

The following condition should be easily understood by consumers and producers or any concerned body.

- a. **Size and Character:-** In any series of graduations, indications, or recorded representations, corresponding graduations and units shall be uniform in size and character. Graduations, indications, or recorded representations that are subordinate to, or of a lesser value than others with which they are associated, shall be appropriately portrayed or designated
- b. **Values:-** If graduations, indications, or recorded representations are intended to have specific values, these shall be adequately defined by a sufficient number of figures, words, symbols, or combinations thereof, uniformly placed with reference to the graduations, indications, or recorded representations and as close thereto as practicable, but not so positioned as to interfere with the accuracy of reading.
- c. **Permanence:-** Graduations, indications, or recorded representations and their defining figures, words, and symbols shall be of such character that they will not tend easily to become obliterated or illegible.

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- d. Values of Graduated Intervals or Increments:-** In any series of graduations, indications, or recorded representations, the values of the graduated intervals or increments shall be uniform throughout the series.
- e. Repeatability of Indications:-** A device shall be capable of repeating, within prescribed tolerances, its indications and recorded representations. This requirement shall be met irrespective of repeated manipulation of any element of the device in a manner approximating normal usage (including displacement of the indicating elements to the full extent allowed by the construction of the device and repeated operation of a locking or relieving mechanism) and of the repeated performance of steps or operations that are embraced in the testing procedure
- f. Money Values, Mathematical Agreement:-** Any recorded money value and any digital money-value indication on a computing-type weighing or measuring device used in retail trade shall be in mathematical agreement with its associated quantity representation or indication to the nearest 1 cent of money value. This does not apply to auxiliary digital indications intended for the operator's use only, when these indications are obtained from existing analog customer indications that meet this requirement.
- g. Recorded Representations:-** Insofar as they are appropriate, the requirements for indicating and recording elements shall also apply to recorded representations. All recorded values shall be printed digitally. In applications where recorded representations are required, the customer may be given the option of not receiving



Self-Check – 1	Written test
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Name_____ ID_____ Date_____

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

Test I: Short Answer Questions

1. Write the condition of measuring (weighing scale) that should understood by both consumers and producers(8 points)

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

Note: Satisfactory rating - 8 points Unsatisfactory - below 8 points

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Information Sheet 2- Understanding Machine set up

1.1. Average Weight control

The average system applies to most goods which are pre-packed in pre-determined quantities by weight or volume, including most foodstuffs and non-foodstuffs. Its aim is to provide a defined regulatory framework for the automatic filling of packages. A degree of variation in the content of the packages is inherent in all such processes: the aim of the average system is to define acceptable tolerances for that variation, so that the purchaser may buy with the confidence that he is protected against short weight or measure, while businesses are protected against unfair competition.

As its name suggests, the average system allows a proportion of packages to fall below their stated quantity within a specified tolerance. This is in principle a difference from the older weights and measures legislation, which is sometimes by contrast referred to as the 'minimum' system. (In some circumstances, packers may however still find it more convenient to opt for measuring each package individually under the minimum system)

The Directive sets out three rules with which packers must comply:

- ❖ The actual contents of the packages should not be less, on average, than the nominal quantity;
- ❖ The proportion of packages which are short of the stated quantity by a defined amount (the "tolerable negative error" or TNE) should be less than a specified level; and
- ❖ No package should be short by more than twice the TNE.

In the design of the system, attention is recommended to the following issues:

- ❖ For processes controlled by sampling, that the sampling plan is specified and that the target quantity and control limits are appropriately set,

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- ❖ For packing lines controlled by check weighers, that the set points are appropriate,
- ❖ That checking or measuring equipment is properly maintained and checked,
- ❖ That the system should be formalised and reviewed regularly for its appropriateness, and include corrective actions and records that must be made,
- ❖ That the system should specify the training for staff to ensure that the system is adequately implemented



Figure 12 Different weighing and packing machine



Self-Check – 2	Written test
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Name_____ ID_____ Date_____

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

Test I: Short Answer Questions

1. Explain the rules the company should understand in machine set up (5 points)

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

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

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Information Sheet 3- Adjusting Controls

3.1. Introduction

Meat and meat products are highly perishable products which requires good care , materials clean and free of any Micro-organism's to increase the shelf life until it reaches the retailers or last consumers. Thus to keep the quality and good test of meat and meat products it is must to keep all the necessary requirements like chilling, freezing and maintaining required optimum temperature in storage areas. The following are some of the requirements and arrangements those should be kept to maintain meat without deterioration.

3.2. Chilling and adjustment control

Chilling can be defined as the fundamental operation in applying cold to meat to reduce its temperature quickly. This is done in a cold chamber with intensive air draught or movement. Rapid cooling of the meat surface not only slows and nearly stops the development of surface micro-organisms but also reduces weight loss and discoloration of the surface owing to hemoglobin oxidation. Different systems of primary chilling are in use (including immersion in iced water, especially for poultry) but air chilling is the most common.

The cold chambers where chilling takes place must have a low air temperature, a high air speed, a high relative humidity and a high refrigerating capacity.

- ✓ Air temperature must be adjusted in the region of 0°C, with no decrease below - 1°C, which could freeze the meat surface and impair its appearance.
- ✓ Adjust air speed in the range from 0.25 to 3.0 m/s. but, for economical reasons the most common speeds in use are from 0.75 to 1.5 m/s in the empty section of the cold chamber.

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- ✓ Adjust Relative humidity during the chilling operation fairly high to prevent excessive weight loss. The recommended adjustment rate is between 90 and 95 percent, though this is the most difficult factor to control.
- ✓ Adjust Primary chilling when the warmest point of the carcass has reached a temperature of about 7°C (3°C for edible offal). But in current technology these temperatures can be arrived at in 16–24 hours in small carcasses and in less than 48 hours in large carcasses (center of the hind leg).
- ✓ Avoid Quick chilling which have a problems, of 10°C or lower which cause irreversible contractions of the muscle tissue which toughen the meat even after prolonged ripening.
- ✓ Check cold chambers are refrigerated in advance to reach lower temperatures than those in operation (-5°C/-6°C for beef; -10°C/-12°C for pork), taking advantage of thermal inertia to offset the effect of warm meat loads.
- ✓ Adjust a temperature of about 4°C is used in butcher shops
- ✓ Adjust Relative humidity in between 80 and 90 percent
- ✓ Adjust preservation of edible offal at: -1°C rather than 0°C and a relative humidity close to saturation to avoid surface blemishes



Products	Practical storage life in months		
	-18 °C	-25 °C	-30 °C
Beef carcass	12	18	24
Roasts, steaks, packaged	12	18	24
Ground meat, packaged, (unsalted)	10	>12	>12
Veal carcass	9	12	24
Roasts, chops	9	10–12	12
Lamb carcass	9	12	24
Roasts, chops	10	12	24
Pork carcass	6	12	15
Roasts, chops	6	12	15
Ground sausage	6	10	
Bacon (green, un-smoked)	2–4	6	12
Lard	9	12	12
Poultry, chicken and turkeys, eviscerated, well packaged	12	24	24
Fried chicken	6	9	12
Offal, edible	4		

Table 1 Practical storage life of meat and meat products



Self-Check – 3	Written test
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Name_____ ID_____ Date_____

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

Test I: Short Answer Questions

2. Explain the importance of Chilling in meat preservation. (**3 points**)
3. Explain detail the important temperature of storage for at least seven meat and meat products (**7 points**)

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

Note: Satisfactory rating - 10 points

Unsatisfactory - below 10 points

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LG #59

LO #3- Operate packaging process

Instruction sheet

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

- Operating products packaging
- Understanding OHS, hygiene and manufacturer specification
- Checking damage, sealed and coded packs products

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:

- Operate products packaging
- Understand OHS, hygiene and manufacturer specification
- Check damage, sealed and coded packs products

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- Operating products packaging

1.1. Packaging development

Packaging design at this stage concentrates on the packaging of the individual product; the outer packaging research is only related to decisions regarding size and to the protection required during distribution. The design of the packaging for the individual product is based on the needs of the consumer and the requirements of product preservation and protection in the product design specifications, but it also considers the process and the distribution, as well as the needs of retailers and the environment.

The graphic design is usually carried out during the commercialization stage together with the promotional artwork, but consideration needs to be given to:-

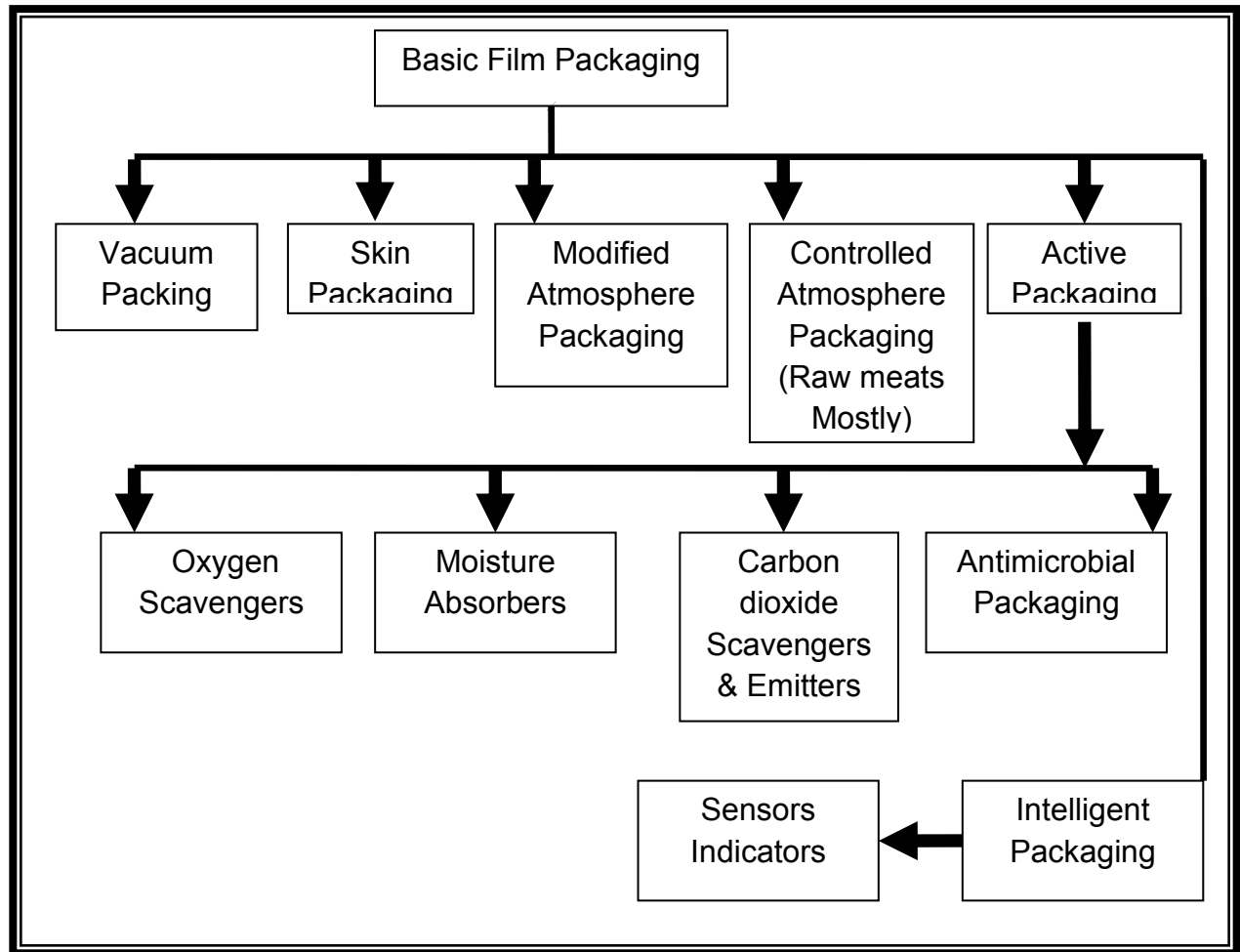
- ✓ Printing and display needs in the selection of the packaging
- ✓ The materials to be used.
- ✓ The needs of the consumer
- ✓ The retailer dictate the dimensions as the package storage time and
- ✓ consumers' shelves

Consumers have to be able to handle and open the package with their hands, the quantities are related to the serving of the food and the packaging has to stand up to the general conditions of use. The packages have also to fit into the standard outer container shapes and sizes.

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1.2. Stages of Meat Packing





The factors to consider in packaging design at this stage of product and process development are summarized in Table 2

Consumer	Buying, transporting, storing, using, eating, disposing
Product	Containment Protection in external environment, distribution Presentation for communication, promotion, selling Use by consumer: convenient, dispensable, ergonomic, information Legal requirements
Process	Process Preservation of food, processing ability, interaction with processing, Product packaging quality Machine ability in making, forming, filling, closing
Distribution	Outer packing, unitization, transport, storage conditions Retailer needs Storage, display, communication, bar coding, tamper-proofing
Environment	Resources used: energy, raw materials Waste: reuse, recycle, or disposable

Table 2 Factors in packaging design

From the research, the packaging is defined as packaging material (films, cardboard, metal, glass, solid plastic), packaging type (bottle, carton, bottle, can), packaging size, packaging method (hand, continuous, automatic, aseptic). The designer does not have a great deal of room for originality in food packaging except with regard to the graphic design, but there is still a great deal of originality as can be seen on the supermarket shelves. The use of computers with design software has made it easier to design packaging. The package is then put to the test on the processing/filling line, and for shelf life, and product protection during storage and transport. Finally the consumer has to test the packaging with the product.



Self-Check – 1	Written test
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Name_____ ID_____ Date_____

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

Test I: Short Answer Questions

1. Explain factors considered in packing design. (4 points)
2. Explain the stages of packing detail (4 points)

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

Note: Satisfactory rating - 8 points

Unsatisfactory - below 8 points

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Information Sheet 2- Understanding OHS, hygiene and manufacturer specification

Hygiene:- Hygiene is a series of practices performed to preserve health. According to the World Health Organization, "Hygiene refers to conditions and practices that help to maintain health and prevent the spread of diseases." Personal hygiene refers to maintaining the body's cleanliness

PPE:- Personal protective equipment is protective clothing, helmets, goggles, or other garments or equipment designed to protect the wearer's body from injury or infection. The hazards addressed by protective equipment include physical, electrical, heat, chemicals, biohazards, and airborne particulate matter

OHS:- Occupational safety and health, also commonly referred to as occupational health and safety, occupational health, or occupational safety, is a multidisciplinary field concerned with the safety, health, and welfare of people at occupation.

These Regulations also require that PPE is:

- Properly assessed before use to ensure it is suitable
- Fitted properly on the wearer
- Maintained in working order
- Stored in suitable accommodation
- Used by employees in accordance with instructions
- Compatible with other items of PPE worn
- Effective without increasing overall risk
- Employers are also required to provide their staff with information, instruction and training on the use of PPE.

Types of PPE used in the meat industry

A. Eye and Face Protection

The main types of eye and face protection are safety spectacles, goggles and face shields. Safety spectacles can be fitted with prescription lenses if required, but only offer

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protection to the eyes against certain types of hazard. When liquids or dust are the hazard, goggles (of which there are several categories), or a face shield will usually be required. Goggles give the eyes protection from all angles as the complete rim is in contact with the face. Face shields protect the face and most types can be worn over prescription glasses. Hazards that require eye and face protection include liquid or chemical splash including biological agents and contaminants, working with cleaning chemicals and vapour or liquid mist and particles from high pressure cleaning tools or some types of powered cutting equipment eg hand-held circular saws.

B. Hand Protection

Gloves of various designs can provide protection against a wide range of hazards including cuts, abrasions and stabs, extremes of temperature, skin irritation and dermatitis, contact with chemicals and other hazardous substances including biological hazards. There are four types of hand and arm protection including gloves (for the hand only), gloves with a cuff (for hand and wrist), gauntlet (for hand, wrist and part of forearm) and sleeving or arm protection. Care should be taken in the donning, use and removal of gloves to prevent contamination of the hands. Make sure that users are not allergic to or sensitized by the material from which the glove is made (eg if you have to use latex gloves use a powder free type or preferably use an alternative material to latex where possible). Gloves come in a range of sizes and care should be taken to select the right size for the individual.

C. Protection Against Cuts and Stabs

Knife accidents are very common in the meat industry, usually involving cuts or stabs to the non-knife hand, forearm or body. The best protection will normally be achieved by the use of chain mail.

D. Hearing Protection

The Noise Regulations 2005 specify that employers have to provide their employees with hearing protection if they ask for it, and their noise exposure is between the lower

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and upper exposure action values specified in the regulations (eg. between 80 and 85 decibels for daily exposure). Remember you should not use hearing protection as an alternative to controlling noise by other methods.

E. Protective Footwear

The safety boot or shoe is the most common type of safety footwear. They normally have steel toe caps, but may also have other safety features including slip resistant “anti-slip” soles that can reduce the likelihood of slipping on certain floors, steel midsoles and insulation. Wellington boots, usually made of rubber protect against water and wet conditions and are suitable for washing and disinfection to maintain hygienic conditions.

F. Protective Aprons

Butchers and slaughterhouse workers should wear plate link or preferably chain mail aprons if there is a risk of injury to the abdomen or chest, for example using knives or choppers in de-boning work or other work where the knife is pulled with the point towards the body.

Aprons should be sufficiently long enough to provide adequate protection depending on the nature of the work eg usually covering the body area from mid breast bone to mid-thigh.

G. Head Protection

There are several types of head protection available including industrial safety helmets or “hard hats” which protect against falling objects or impact with fixed objects, and bump caps which protect against bumping the head (eg walking into a fixed object).

H. Respiratory Protection

RPE is designed to protect the wearer against inhalation of hazardous substances in the workplace air. Respirators (filtering devices) use filters to remove contaminants in the air and are available with a range of different face pieces.

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I. Personal Fall Protection

This equipment comprises an assembly of components for protection against falls from height. Work-restraint systems prevent the user from reaching areas where the risk of a fall exists and in practice will include a body holding device such as a lanyard connected to a suitable anchorage point.

J. Thermal Protection

Many workers in the meat industry work in temperature controlled areas. Regulation requires temperature in fresh meat preparation rooms to be kept below 12 degrees Celsius. In practice to maintain product quality temperatures of 5 degrees Celsius or lower are common. In addition some staff will spend long periods inside chillers or freezers where temperatures may be kept well below zero. Protective clothing and gloves play an important part in protecting the health, safety and welfare of workers at such temperatures.

Control Measures and Risk Assessment

The company's own Risk Assessment may reveal that different controls are more appropriate and provide the same level of protection as those indicated here. If this is the case you are legally able to use the measures dictated by your risk assessment instead.

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Self-Check – 2	Written test
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Name_____ ID_____ Date_____

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

Test I: Short Answer Questions

1. Explain the types of PPE used in safety operation packing (5 point)

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

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

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Information Sheet 3- Checking damage, sealed and coded packs products

There is an old saying that "a package must protect what it sells and sell what it protects". It may be old, but it is still true; a package functions as a "silent salesman". The modern methods of consumer marketing would fail were it not for the messages communicated by the package. The ability of consumers to instantly recognize products through distinctive branding and labelling enables supermarkets to function on a self-service basis. Without this communication function (i.e. if there were only plain packs and standard package sizes), the weekly shopping expedition to the supermarket would become a lengthy, frustrating nightmare as consumers attempted to make purchasing decisions without the numerous clues provided by the graphics and the distinctive shapes of the packaging.

Other communication functions of the package are equally important. Today the widespread use of modern scanning equipment at retail checkouts relies on all packages displaying a Universal Product Code (UPC) that can be read accurately and rapidly. Nutritional information on the outside of food packages has become mandatory in many countries.

But it is not only in the supermarket that the communication function of packaging is important. Warehouses and distribution centres would (and sometimes do) become very inefficient and uncontrolled if secondary and tertiary packages lacked labels or carried incomplete details. UPCs are also frequently used in warehouses where hand-held barcode readers linked to a computer make stock-taking quick and efficient. When international trade is involved and different languages are spoken, the use of unambiguous, readily understood symbols on the package is imperative.

When items of high value are transported the secondary and tertiary packaging may contain deliberate misinformation with only the UPC providing the correct information. The cosmetic industry uses this regularly, where there is not even an easily recognized company name, in an attempt to reduce pilfering.

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Self-Check – 3	Written test
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Name_____ ID_____ Date_____

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

Test I: Short Answer Questions

1. Explain the importance of checking damaged, sealed products in eat industry. (5 points)

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

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

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Operation Sheet 1- Operating vacuum packing

Techniques of vacuum meat packing

1. Roughly clean and dry the meat before sealing
2. Cut the meat (or fish) into serving size and pack into meal sized batches and prepare a packing machine (Make it On)



3. If you want to store the meat for lengthy periods then it is a good idea to pre-freeze the meat for a short-term using freezer bags (24hours is long enough) and then seal it; long term freezing and the defrosting leads to excessive moisture and a loss of quality.
4. Place the meat flat in the bags





5. put an oxygen absorber which absorbs any oxygen left in the bag during processing
6. Use absorbent 'mats' or folded kitchen paper (on top of the meat) to soak up excess fluid so it doesn't contaminate the seal before sealing
7. Make sure meat with bones haven't compromised the bag you may need to cover any jutting bones with kitchen paper or similar before processing
8. Avoid this pre-freeze the birds and then seal in the normal way and add an oxygen absorber too.
9. Label all the bags with the product and the date.
10. Use up fish within 4-6 weeks, chicken within 3 months and red meat within 6 months

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**LAP TEST****Performance Test**

Name_____ ID_____ Date_____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **2** hour. The project is expected from each student to do it.

1. Perform Vacuum Packing Operation



LG #60

LO #4- Describe packaged products

Instruction sheet

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

- Measuring Packed products
- Labeling packed products

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:

- Measure Packed products

Label packed products

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 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- Measuring Packed Products

1.1. Introduction to products packing and measuring

When foods are packaged in bags, boxes, bottles, cans and wrappers, the consumer cannot detect the quality and quantity of the food through their senses of sight, smell, taste and touch. This means that the producer has information about the product that is not known to the consumer. Economists call this difference between sellers and buyers “information asymmetry”. Information asymmetry must be corrected to ensure that the market functions well because consumers need information about what the product is before they decide whether to purchase the product. By knowing the product identity, quantity and qualities, consumers decide if the price is satisfactory according to their needs and desires.

Marking food to inform consumers has existed since ancient times, mainly to indicate the identity, purity, quantity and freshness of the product. Labelling laws for food and drink can be traced back to the Middle Ages in Europe. In the early 20th century, governments in North America and Asia enacted laws to prevent adulteration and misbranding of foods in order to protect consumers from unscrupulous marketing of food products. Laws help to protect honest food sellers from unfair competition by sellers who mislead consumers to gain a competitive advantage in the market.

With the industrialization of agriculture and urbanization, producers sell packaged goods in large quantities to consumers in distant places. Personal contact between the food producer and buyer is becoming rare. With global trade, the distance between producers and sellers and risk of miscommunication are increased greatly. In the 21st century markets there are many foods that are unfamiliar to a large number of shoppers. These factors lead to a greater need to build trust in the integrity of the food products. Consumer confidence in the packaged product often begins with the information on the label.

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The need to inform consumers about the true quantity and quality of the product and to prevent deceptive sales practices exists in all regions of the world. Preventing misleading information is a fundamental principle of labeling policies. There are incidences when food is deliberately placed on the market, for financial gain, with the intention of deceiving the consumer.

Changing food supplies and lifestyles can mean that consumers do not know which ingredients are found in the food product and how to use the product. Labels that inform consumers about contents they may need to avoid and illustrate the proper use of the product are important for protecting the health of the consumer. Food package information is an important way to inform consumers of potential risks of food products and to ensure that consumers understand how to store, cook and prepare the products safely. Increasingly, food labels inform consumers about benefits of consuming foods which are particularly nutritious and contribute to a healthy diet.

From a business perspective, a labeling policy can improve the marketing and competitiveness of products and stimulate innovation in the food sector. Labels enable consumers to compare products and react to the specific differences in products through their purchases.

For example, some consumers may be willing to pay more for foods that enable them to obtain certain nutrients (for example, fortified food) and avoid or reduce ingredients that can present risks (for example, sodium).

Some consumers may prefer or need to know the specific conditions under which the food products were produced (for example, production facility has traces of nuts) or may decide to avoid specific ingredients (for example, wheat) and this information can be provided on a label. The food industry responds to these demands for information about particular characteristics and may create new products that better meet consumer desires and expectations in response to labeling requirements.

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Self-Check – 1	Written test
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Name_____ ID_____ Date_____

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

Test I: Short Answer Questions

1. Explain the importance of measuring products packing (5 points)

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

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

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Information Sheet 2- Labeling Packed Products

2.1 What is a food label?

A food label is the information found on the food product seen by the consumer, the ordinary person. According to the Codex General Standard for the Labeling of Prepackaged, thus we can say a food label is any tag, brand, mark, pictorial or other descriptive matter that is written, printed, stencilled, marked, embossed or impressed on, or attached to, a container of food or food product. This information can also accompany the food or be displayed near the food to promote its sale.

- ❖ **“Label”** means any tag, brand, mark, pictorial or other descriptive matter, written, printed, stencilled, marked, embossed or impressed on, or attached to, a container of food.
- ❖ **“Labelling”** includes any written, printed or graphic matter that is present on the label, accompanies the food, or is displayed near the food, including that for the purpose of promoting its sale or disposal.

2.2. Food labelling policy

A food labelling policy should contribute to an environment that supports healthy diets by providing information to the consumer about the qualities of foods; drawing consumer attention to the potential benefits and risks of particular food products and motivating manufacturers to produce healthy and safe foods.

The range of foods that carry label information is enormous including whole foods (for example, milk, oil and meat), simple processed foods (for example bread, noodles and tomato sauce) and highly -processed food products (for example ready-to-serve soups, biscuits, and crisps/chips).

Food labelling policy is based on a set of laws and guidelines, there are other aspects of an effective policy that should be considered at the onset. The policy should include strategies to assist producers to understand and comply with the laws.

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In all countries, there should be minimum requirements for labelling of packaged foods to ensure that consumers have clear non-misleading information about the product identity, content, intended use and any appropriate food safety considerations. Mandatory, minimum requirements are important to protect the consumer and contribute to safe, nutritionally balanced diets. Regarding voluntary labelling, the government should provide guidance to prevent inappropriate labels.

The following information must be on the label for those products sold:

- ❖ **Product name** (example- Chuck Roast, Hot Italian Sausage, Chicken Breasts)
- ❖ **Inspection legend and establishment number** - For USDA inspection, this is the round purple stamp if amenable, or the triangular purple stamp if non-amenable.
- ❖ **Net weight statement**- this includes packed on date, sell by date, price per pound, and net weight. Frozen meat does not require a sell-by date. Some products can be sold by the package (like sausage) as opposed to by the pound, but in this case the net weight must be on the package and the per pound price must be posted for all consumers to see.
- ❖ **Address line**- This must include the name and address of the distributor or the name and address of the farm, if the farmer is acting as a distributor (selling to the end customer). If the farmer is NOT the distributor, a second line can be added to indicate the farm from which the product came from.
- ❖ **Handling statement**- Packaged products that required special handling to maintain their wholesome condition must have prominently displayed on the principal display panel, the applicable handling statement: “Keep Refrigerated”, “Keep Frozen”, “Perishable- Keep Refrigerated or Frozen.” Additional safe handling instructions are also required.
- ❖ **Ingredient statement**- This is only needed if the product is composed of more than one ingredient, so this is irrelevant for most fresh meat products. However, products like sausage fall into this category. This list of ingredients must show common names of all ingredients in descending order of their predominance.

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- ❖ **Nutrition facts**- not essential for raw (fresh or frozen) meat but is required on meat and poultry processed products like sausage.

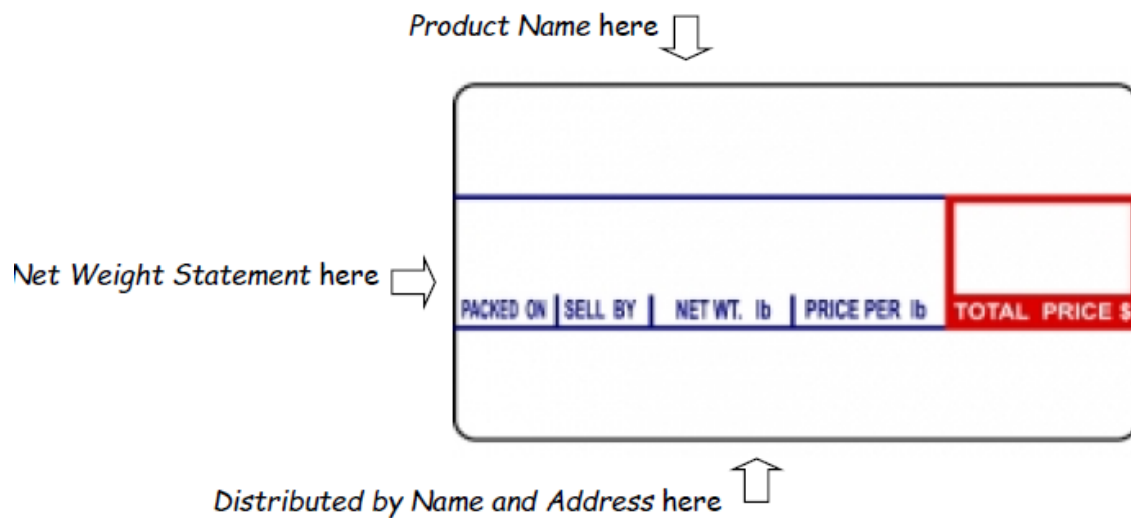


Figure 13 Package label Format

2.3. Stakeholders in food labelling

Successful implementation of food labelling policies requires the support of governments, the food industry, scientists, consumer associations and others who have a strong interest in the policy and relevant knowledge and experiences. It is important to develop effective relationships and to promote dialogue and sharing of information about different interests and concerns. Active consultations of stakeholders are crucial during the development of food labelling policies and legislation.

Table 3 The Role Of Governments, Food Producers and Consumers In Food Labelling

NATIONAL GOVERNMENTS	FOOD INDUSTRY	CONSUMER
To establish and enforce food labelling policies to support the sale of only safe and wholesome food	<p>To comply with food regulations and guidelines</p> <p>To remain current with the legal requirements for food</p>	To use food label information to make informed food choices that fit their health and other needs



<p>To ensure that foods produced domestically and from foreign countries are labelled in a manner that is truthful, not misleading, informative, transparent and easily understood by consumers</p> <p>To provide adequate guidance for food manufactures to implement food labelling policies</p> <p>To obtain independent scientific advice</p>	<p>labelling in the country where the food is being sold</p> <p>To express business concerns in consultation processes</p> <p>To assist consumers in understanding the food label information</p>	<p>To send signals to the market regarding what is desirable through purchase decisions</p> <p>To contribute valuable information on the design and implementation of food labelling by participation in consumer research and public consultation</p>
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2.4. Format, Language and Legibility

The manner of presenting food label information is important to ensure that the label is useful, clear and not misleading. The following are general guiding principles for effective labelling to keep in mind .

- ✚ A standard format to convey the same information is preferable to avoid confusion.
- ✚ Labels on packaged foods should not be separated from the container.
- ✚ Statements on the label must be clear, prominent, indelible and readily legible by the consumer.
- ✚ If the container is covered by a wrapper, the wrapper must carry the necessary information or the label must be easily read through the outer wrapper.
- ✚ The name and net contents of the food must appear in a prominent position and in the same field of vision.
- ✚ The language must be acceptable to the intended consumer.



- ✚ The same labels can have the same information in different languages.
- ✚ If the language on the original label is not acceptable, a supplementary label containing the mandatory information in the required language may be used instead of re-labelling.
- ✚ Authorities should establish the font type, style, and minimum font size as well as the use of upper and lower case letters to ensure legibility.
- ✚ A significant contrast should be maintained between the text and background so that the nutrition information is clearly legible.

2.5. Formulating a food labelling policy

National labelling policies should be based primarily on the needs of consumers and producers in the country. Before embarking on a food labelling scheme, information should be gathered. Suggestions for relevant information are provided below:

- ✚ What kinds of packaged foods are commonly consumed?
- ✚ What are the sources of packaged foods – domestic, imported?
- ✚ Are packaged foods produced in the country intended for export markets?
- ✚ Which types of people are consuming packaged foods?
- ✚ Which packaged foods provide a substantial amount of the nutrients and energy in the population's diet?
- ✚ Are the public health problems in the country related to consumption of packaged foods?
- ✚ What is essential information to be transmitted, which should be mandatory on the label?
- ✚ What information can be added to the labels voluntarily by the producer?
- ✚ Are there methods of food production/use of technologies which need to be communicated to the consumer via the label according to national laws? For example, halal and irradiation.

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- ✚ Would food labelling help consumers to choose foods that will lead to healthier diets in terms of meeting their nutritional needs and to avoid foods that may cause acute or chronic illnesses?
- ✚ Would labels help to prevent consumers from wasting money on products that are not worth the cost?
- ✚ What allergenic ingredients are commonly found in food products?
- ✚ What are the desires and concerns of food producers regarding food labels?
- ✚ What are the desires and concerns of consumer associations regarding food labels?

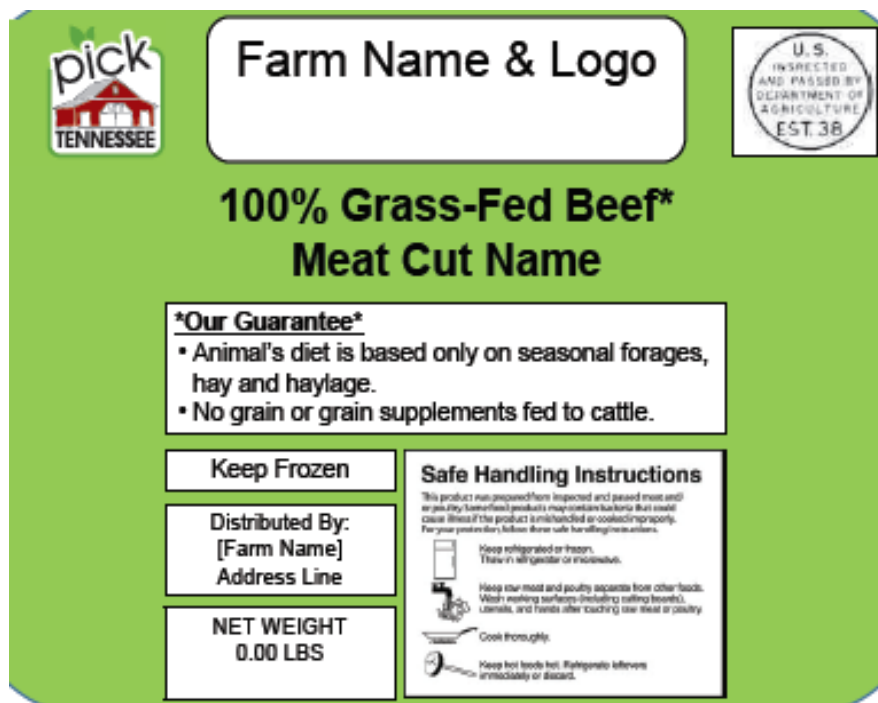


Figure 14 Example Label Sketch for “100% Grass-Fed Beef” Claim*

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Self-Check – 2	Written test
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Name_____ ID_____ Date_____

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

Test I: Short Answer Questions

1. Define label and labeling separately (5 points)
2. Explain the information those must include on the products labeling. (5 points)

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

Note: Satisfactory rating - 10 points Unsatisfactory - below 10 points

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Reference Materials

Book:

1. AN introduction to HACCP Bulletin No 71/2002
2. Food Quality and Food Safety
3. Creating new foods , products design and process development
4. Handbook on Food Labelling to Protecting Consumers, Food and Agriculture Organization of the United Nations Rome, 2016

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