



Meat and Meat Products Processing- Level II

Based on May 2019, Version 2 Occupational standards

Module Title: - Loading out and Dispatching Meat Product

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LG #67

LO #1- Arrange and consolidate order

Instruction sheet

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

- Consolidating orders picked from separate areas
- Placing Products and/or batches in correct dispatches
- Acquiring information of dispatch schedule
- Arranging and securing products
- Storing products in dispatches area
- using correct methods for efficient and safe loading

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:

- Consolidate orders picked from separate areas
- Place Products and/or batches in correct dispatches
- Acquire information of dispatch schedule
- Arrange and secure products
- Store products in dispatches area
- use correct methods for efficient and safe loading

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).



Information Sheet 1- Consolidating orders picked from separate areas

1.1. Consolidating picking of meat and meat

The process of consolidating (grouping) sales order lines into one consolidated pick list gives you the possibility to simplify the picking of goods and perform picking in an efficient way. You achieve this by consolidating several orders and order lines, within the same store, to be picked together. A consolidated pick list is a number of order lines grouped together (assigned) under a common identity, namely the pick consolidation number.

As an option one can select an unlimited number of sales order lines and add them to a consolidated pick list. The system optionally produces individual pick lists parallel to the consolidated pick list.

1.2. Weight and volume

The total gross weight and gross volume of a consolidation is automatically calculated by the system and stored in the consolidation header. You can manually change this information; select a preferred vehicle for transporting the goods and select an out picking location indicating where to put the goods after picking. Consolidated pick lists allow for a simpler way of adding the contents of multiple pick lists to a shipment via the shipment preparation routine.

1.3. Consolidation Creation

The creation of a consolidated pick list consists of three steps

Step 1. The assignment of pick consolidation number

Step 2. The maintenance of a pick consolidation which is optional and where additional inclusion and exclusions of order lines can be made

Step 3. The printing of the consolidated pick list.

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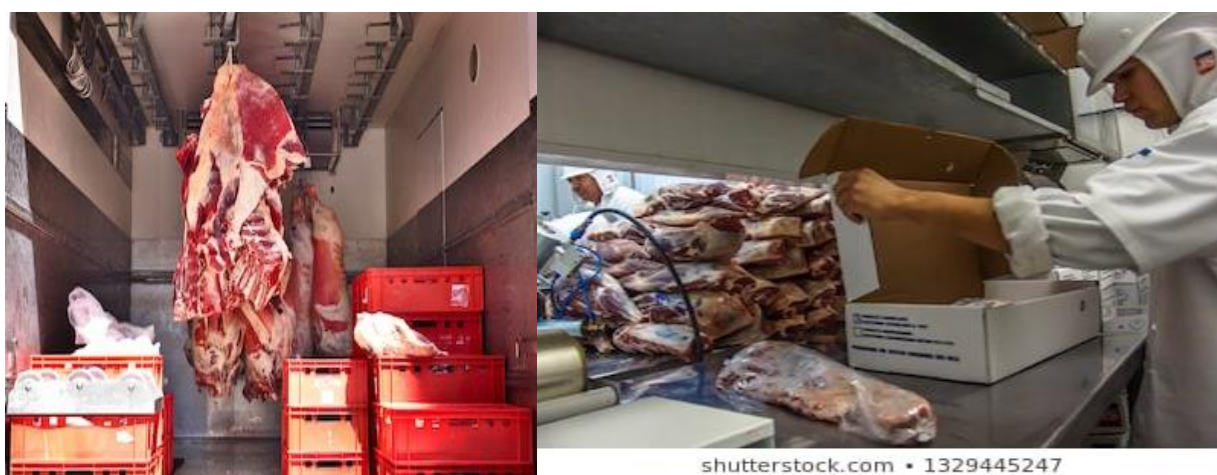


Figure 1.1 Meat and meat products consolidation

Loading Meat and meat products

Meat and poultry products must be kept refrigerated and protected from temperature changes. All persons involved in the transportation, storage, and handling of these products are responsible for keeping them at appropriate temperatures and preventing any break in the cold chain.

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Figure1.2 workers loading packed food production refrigerated truck

- Maintain the appropriate temperature of the pre-cooled product by minimizing the time of loading or unloading, conducting the loading and unloading in an appropriately chilled environment, and reducing the amount of surface contact of the product with floors and walls of the storage areas or loading equipment.
- Appropriately packaged meat, poultry, or pasteurized egg products can be stacked, provided that air circulation is sufficient to maintain the temperature of the products during shipment.
- Product should be at the desired transit temperature before loading. The boxes and pallets should be secured within the vehicle and pallets should be center-loaded off the walls of the vehicle.
- Seal vehicles shipping egg products from one official plant to another for pasteurization, re-pasteurization, or heat treatment. (A certificate stating that the products are not pasteurized or that they have tested positive for Salmonella should accompany applicable shipments.)

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Appropriate loading procedures and equipment

- Use spacers on sidewalls and at the ends of trailers as well as pallets on the floor so that proper air circulation can be maintained.
- Keep loading time as short as possible to prevent temperature changes (increases or decreases) that could threaten the safety or quality of food products.
- Close doors immediately after the truck/trailer has pulled away from dock.

Use special care with mixed or partial loads.

- Partial and mixed loads increase the frequency and duration of open doors, leading to a greater possibility of temperature fluctuations and exposure to tampering.
- Other factors affecting temperature include the time of loading and unloading, the number of stops, the total length of the haul from origin to destination, and the outside temperature.

During periods of warm weather, loading or unloading should be done in the evening or early morning to minimize the likelihood of products warming.

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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: Say true or false for the following questions (2 points each)

1. Consolidating (grouping) sales order lines into one consolidated pick list gives the possibility to simplify the picking of meat products.
2. Meat products and poultry products must be kept refrigerated and protected from temperature changes.
3. It is no essential to keep the health of the persons involved in transportation, storage, and handling of the products.

Test II: Short Answer Questions

1. List the three consolidating steps in meat industry (3 point)

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- Placing Products and batches in correct dispatches

Tracking batch or lot numbers within the food industry is fundamental for many manufacturers, wholesalers and retailers. Capturing and tracking those product attributes can be time consuming, manual and open for error without the correct controls in place. The term batch number and lot number are used interchangeably throughout this article.

Tracking specific products through the supply chain was thrown into the spotlight in with the meat products where it was found major supermarkets were seemingly unaware of the contents of products on their shelves. Although meat products itself poses no immediate threat to health, consumers took note and started to ask where does my food come from?

Track batch and lot numbers

A batch number or lot number is a mark of identification, usually generated by the manufacturer, which allows a small sample of product to be uniquely identified.

A batch number may relate to the date of production, the source of raw materials or the machines used to process the food. The batch number may also link to a job number or production plan which is typically controlled by an MRP (material requirements planning) system.

Being able to effectively track lot numbers is now a key requirement of many retailers when supplying product for human consumption.

Auditing ways in the batch transport on meat industry

- How batches are recorded
- How batches are generated
- What information the unique batch number relates to
- How much information can be provided around the life of a batch
- What process is in place if a batch needs to be recalled

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- Location management i.e. what batch is in what storage location

Recall meat products by batch number

When a small sample of overall output is identified by a lot number, a clear audit of where that product has come from and subsequently gone to be fundamental.

When product is found to have an issue and needs to be destroyed, modified or simply flagged to customers, targeting a small sample of product identified by a lot or batch number narrows down the search. Without the correct systems in place, tracking batch numbers is open for human error and time consuming, but having to recall and destroy weeks' worth of production can be catastrophic for businesses. So, it is well worth the effort.

Sell-by date (SBD) or expiry dates

Batch numbers are often very closely linked to expiry dates or best before dates. Using both a date and a lot number to track items provides additional traceability and information to the consumer.

All consumers are familiar with the well-established concept of an expiry date or best before date and for wholesalers and retailers, rotating stock by date is fundamental. Major retailers will heavily fine suppliers for sending out of rotation stock into their stores and depots. This means that if product B (with a longer shelf life) arrives in the shop before product A (with a shorter shelf life) fine can be and are imposed, even if both shelf lives are suitable for the time the product spends on the shelf.

Shelf life by customer

In addition to the complexity of ensuring both expiry dates and batch numbers are tracked correctly, it is quite common for different customers to demand different minimum shelf life against a range of product. When reviewing potential systems to support best practice food handling, be very specific in the logic required to allocate the

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correct stock for your clients. Also, ensure that the solution is robust enough to easily manage changing customer demands without hefty development costs.

Impact of batch/lot and serial numbers on trace ability

If a Batch/Lot Number AI (10) is present in the case barcode, the receiving partner should manage the traceability of the product using that value. However, if an AI (10) Batch/Lot Number is not present, then an AI (21) Serial Number should be present and that is the number the receiving partner should record to track the product. If both numbers are present, as sometimes happens on fixed-weight product, the receiving partner need only track the AI (10) Batch/Lot Number.

Table 1 Priority of Batch/Lot and Serial Numbers for Tracing Cases

CASE BARCODE CONTENTS		NUMBER USED FOR TRACKING CASE
BATCH/LOT AI (10)	SERIAL AI (21)	
•		Batch/Lot Number
	•	Serial Number
•	•	Batch/Lot Number

Key

- **AI (10)** _ Product Batch/Lot Number
- **AI (21)**-Serial Number

Industry practice for product date

Although the product date is not used at the case level for traceability, it is related to the product Batch/Lot number and because the product date is critical for inventory management, it typically appears on the case and consumer item label. You should select the date type used by the type of product you are packaging. Industry practices for product dating are:

By Product Type

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- Minimally Processed, Refrigerated or Frozen Meat Use the Production Date AI (11).
- Further Processed Foods – If the process that you use alters the life of the product such as cooking or freezing a refrigerated product, the appropriate date is the Packaging Date AI (13).
- Cutup and Repacked Meat – Neither of these dates changes the useful life of the product and should not be used on the case label in place of the original Production Date as above. The process step of Cutup or Repack, however, should be traceable by the Batch/Lot Number AI (10).
- Ground, Chopped and Otherwise Blended Meat – These blends, intended for use in other processes, should be identified by a Use-By date, AI (17). By using a Use-By date, the items can be produced to satisfy volume needs without regard for final use. The Use-By date should be calculated based on the oldest meat used to produce the product.

By Date Type:

- Production Date – To represent the actual production date, you should use the Production Date AI (11). For uses that require you to know the age of refrigerated meat, this is an appropriate entry.
- Packaging Date – This type of dating should be used if the process that you use alters the life of the product such as cooking or freezing a refrigerated product. With this type of situation the appropriate date is the Packaging Date AI (13).
- Sell-By Date – This type of date, AI (15), should be used on product destined for and that will be viewed by end customers. Examples would be fresh tray pack items or frozen retail items.
- Use-By Date/Best-By Date – This type of date, AI (17), should be used in those industries where product is going to be used in another process. Its advantage is that it shows the user the last date a product can be used. In most cases a Harvest Date is best for refrigerated meat, but there are times when a use-by date may be a useful date for consumers in addition to the Sell-By Date.

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Maintaining traceability across the product hierarchy

The best practice for traceability is to identify traceable products by their Global Trade Item Number® (GTIN®) and the associated production Batch/Lot or Serial Number information. This information should be available in human readable format, and best practices are that the information also be available in scannable format. Products should have a standard identification at all levels of the product hierarchy (shipment, pallet, case, and item). The figure below identifies information that should be used to identify each level. Linking the standard product identification with human readable and potentially scannable traceability attributes for each level of the product hierarchy ensures traceability.

Table 2 Hierarchy of Levels

HIERARCHY LEVEL	HIERARCHY STANDARD IDENTIFICATION
CONSUMER ITEM	GTIN or Product Description and Brand Owner, AND Lot Control Date OR Batch/Lot Number
CASE	GTIN and Batch/Lot Number OR Serial Number
PALLET	Serial Shipping Container Code (SSCC)
SHIPMENT	Purchase Order Number(s) or Global Shipment Identification Number (GSIN)



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: Choose the best answer (2 points each)

1. Of the following one is no included under the batches of products sold by Product type in meat industry.

- | | |
|---------------------------|----------------------------|
| A. Minimally Processed | C. Further Processed Foods |
| B. Cutup and Repacked Mea | D. Sell-By Date |

2. Of the following one is no included under the batches of products sold by Product type in meat industry.

- | | |
|--------------------|-----------------------------|
| A. Production Date | C. Use-By Date/Best-By Date |
| B. Packaging Date | D. Further Processed Foods |

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 3- Acquiring information of dispatch schedule

Dispatchers

Dispatchers are communications personnel responsible for receiving and transmitting pure and reliable messages, tracking vehicles and equipment, and recording other important information.

Meat Dispatcher provides prompt and courteous service to our customers filling their orders for various meat, seafood and poultry. Meet customer requests, preventing losses and promoting and practicing honesty, packaging, weight, and price of cremeria, sea food and meat products.

Qualities of a good dispatcher include

- Experience in fast-paced dispatch, customer service or phone centers
- Ability to multi-task through phone communications and real-time software-based tracking and dispatch systems
- Strong computer skills including Microsoft Office proficiency and the ability to become expert in the company's dispatch platform.
- Desire to work independently and proactively to support the overall team Dispatch Operations goals
- Strong communication skills and the ability to develop positive relationships with the driver fleet
- Professional image and communication skills
- Ability to adapt to changing customer needs and driver availability
- Ability to manage multiple factors in a high stress environment
- Ability to work a flexible schedule, with the understanding that different times demand more hours
- High moral character and integrity in the meat industry
- Ability to have high degree of emotional self-control
- Good Empathy and sensitivity

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- Good judgment
- Good self confidence

Dispatching

Dispatching involves issues of production orders for starting the operations, necessary authority and conformation for:-

- Movement of meat products materials to different workstations
- Movement of tools and fixtures necessary for each operation
- Beginning of work on each operation
- Recording of time and cost involved in each operation
- Movement of work from one operation to another in accordance with the route sheet
- Inspecting or supervising of work

Dispatching Procedures

Centralized Dispatching- Under this orders are directly issued to workmen and machines. It helps in exercising effective control.

Decentralized Dispatching- under this procedure all work orders are issued to the foreman or dispatch clerk of the department or section. It suffers from difficulties in achieving co- ordination among different departments.

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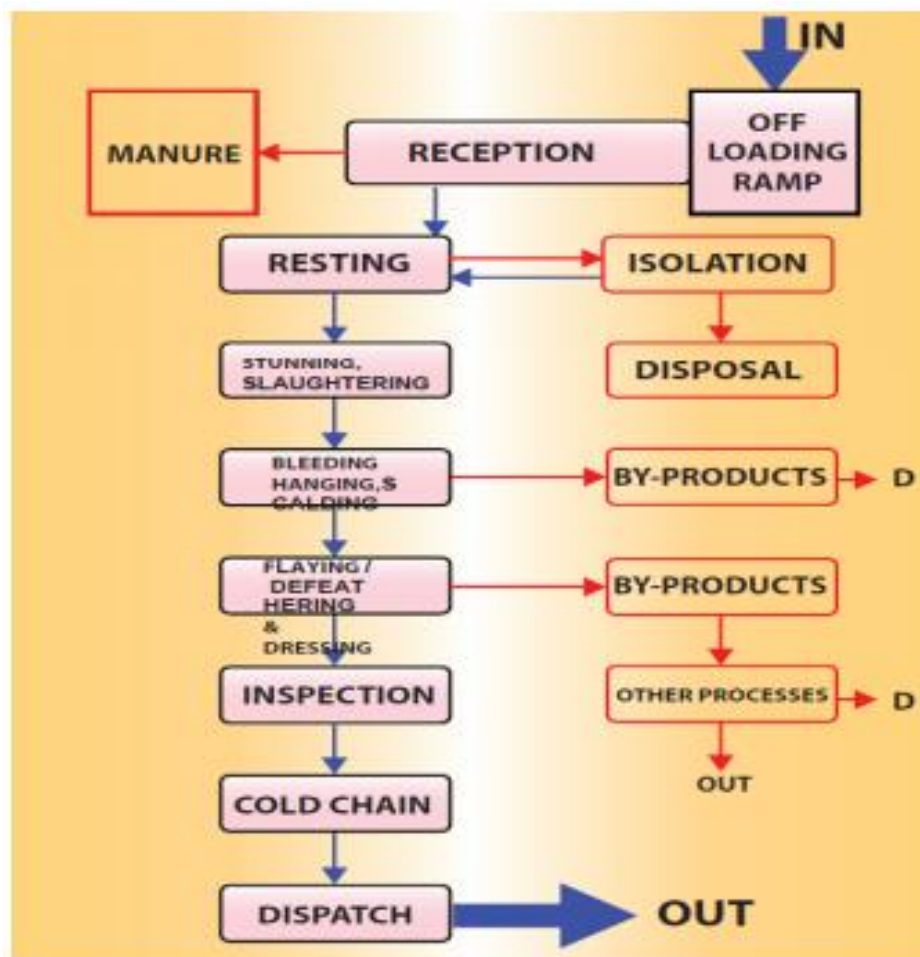


Figure 1.3 flow diagram for basic operation of a slaughter house



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: Choose the best answer (2 points each)

1. A communication personnel responsible for receiving and transmitting pure and reliable messages about meat products is known as_____.

Test II: Short Answer Questions

1. List at least three qualities of a good dispatcher (3 point)
2. List the two dispatching Procedures. (3 point)

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 4- Arranging and securing products

The relationship between shippers, carriers, loaders and receivers is key to maintaining an uninterrupted cold chain and more important than ever to ensure that expectations are clearly defined, communicated and documented in appropriate written specifications and contracts. All parties should understand their roles and responsibilities in meeting the guidelines identified by the shipper to ensure meat and meat products safety and protect liabilities including lawsuits and claims due to failure to meet specifications.

Bills of Lading, waybills or similar documentation of transport requirements should have clear and measurable requirements that eliminate the possibility of misinterpretations or legal dispute. For example, the variables are enormous when it comes to temperatures in trailer and in product; simply stating what the thermostat should be set at for a particular load and trailer configuration will provide an attainable action.

Written specifications are an industry best practice that results in a cooperative effort between the shipper, loader, carrier and receiver of perishable foods, and should be coordinated such that food is transported in a sanitary manner. In order to accomplish this over-arching goal, clearly defined and written transportation procedures, specifically related to maintaining food safety, should be developed and shared with all parties involved in the transport of perishable foods. These types of specifications should include:-

- Minimum specifications or parameters for packaging
- Minimum Storage temperature
- Optimum temperature management
- Good sanitation and handling.

Written specifications should be product specific, but can include general as well as specific instructions for maintaining product safety during transit.

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Temperature Requirements

Naturally, the type of goods being transported will determine the temperature requirements. The written specifications should include a specific numeric temperature or a range of temperatures in either Fahrenheit or Celsius to be maintained during transport with specified tolerances specified “not to exceed” (also called Upper Control Limit, UCL) and “not below” (also called Lower Control Limit, LCL) margins. Plans that reference simply ‘frozen’ or ‘chilled’ as temperature requirements should not be accepted.

At store

- Always purchase fresh meat and poultry products last.
- Meat and poultry products should feel cold to the touch. Do not purchase products that feel warm, as this indicates that the product has not been stored at the proper temperature.
- Place products in a plastic bag to prevent juices from leaking onto other raw products in your shopping cart.
- **Tip:** If plastic bags are not available at your grocer's meat counter, pick up a few extra bags in the produce section or consider bringing your own from home.
- Choose packages that are tightly wrapped and have no tears or punctures. Be sure the packages do not contain excessive liquid, which can be an indication of temperature abuse or excessive storage. For vacuum-packaged products, be sure that the seal has not been broken and that the package is not leaking.
- Purchase meat and poultry products by the sell-by date. If you purchase meat and poultry products on or within a day or two of the sell-by date, prepare or freeze the product right away.

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Self-check 4	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 (2 points each)

1. Of the following one is not a written transportation specification procedures, specifically related to maintaining food safety
 - A. Minimum specifications
 - B. Minimum Storage temperature
 - C. Good sanitation
 - D. Drug administration
2. The type of goods being transported will determine the temperature requirements and it's varying among different products. (True/False).
3. Meat and poultry products should feel cold to the touch on the store area. (True/False).

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

Note: Satisfactory rating – 6 points

Unsatisfactory - below 6 points

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Information Sheet 5- Storing products in dispatches area

Food Safety, Transporting and Distributing Frozen Meat

Meat products, poultry are particularly vulnerable to rapid bacterial growth due to their moisture and pH levels, and high protein content. It is important to follow the transportation and distribution precautions below to ensure your clients receive food that is safe to eat.

Meat storage has always been important to us and, in the past, people would smoke or cure their meat to help them survive long, cold winters; later on, these same types of preservation were used to bring a certain amount of culinary variation to the diets of seafarers embarking upon lengthy ocean voyages. In today's scientific age, we have come to understand that proper food storage at the right temperature helps to suppress and even prevent the invasion/proliferation of microorganisms, and modern meat storage relies heavily upon refrigeration and freezing.

Advice when buying and storing fresh meat

- Buy your meat towards the end of your shopping trip.
- When buying meat, think about where it has come from. When orders of meat takes place from a local butcher, ask about its origin (if it's not immediately obvious from the labelling). By doing this, in your own small way, you can make a contribution towards supporting ethical animal husbandry.
- Try to make journey to home as short as possible, and keep meat as cool as you can (consider using a cool bag/box for transport).
- It's best not to allow meat to sit in its own juices so, as soon as you're home, unpack it and, if necessary, dry it with some kitchen roll. If you bought the meat vacuum packed, it will keep for longer but take note of the 'use-by' date. Also, check that

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there is no damage to the packaging if air has entered then so have bacteria, and these can quickly spoil the meat.

- For short-term fridge storage, it is best to place meat in a firmly sealed plastic or glass container.
- Wooden containers or shelves are not suitable.
- Minced meat from the butcher should ideally be cooked immediately after purchase, or within 24 hours; at the very least, it should be well wrapped and stored in a fridge in accordance with food ministry recommendations.

A freezer blanket is essential if you aren't using a freezer truck or cooler to transport frozen meats. A freezer blanket is a water-resistant, insulated shell that is used to cover frozen food during transportation. Like a freezer blanket, pallet covers are water-resistant and insulated. They provide extra structure with access on all sides. These are ideal for transporting full pallets of frozen meat.

Insulated boxes are another safe option to transport frozen meat. They offer greater durability than a freezer and are available in multiple sizes, allowing you to choose which works best for your operation.

Distribution

Cold food should be kept at 41°F or lower. The Temperature Danger Zone is between 41-135°F. It is temperature range that allows harmful bacteria to grow most rapidly. Note that the most dangerous range in the Temperature Danger Zone is 125-70°F.

Meat should not be left out of refrigerated or freezer storage for more than 1 hour to prevent temperatures from entering the Temperature Danger Zone. The safest precaution you can take is to frequently monitor temperatures during distribution.

If you're going to freeze or refrigerate meat you've received before distributing, it's important to be aware of recommended storage times. Refer to the Food Keeper. The Food Keeper contains valuable storage advice to help you maintain the freshness and quality of foods.

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Use-by date

Food that is highly perishable and therefore likely to pose a danger to human health after only a short time should be marked with a use-by date.

Examples of food that should have a use-by date include:

- Fresh meat, fish and poultry
- Cooked meat
- Ready-made meals

Date of minimum durability

There are two types of minimum-durability date 'best before' and 'best before end' and which one to use will depend on the life of the product.

If there are certain storage conditions that have to be followed for the food to last until the given date then this must be stated on the packaging.

Foods shelf life determination

'Best before: day / month' - for example, 'Best before: Date ____ Month ____'. You may add the year ____ if you wish

Storage Food Safety System

Design and maintain storage and warehousing food safety system

- The facility should permit easy access to all areas for cleaning.
- Adequately insulate the facility and have an adequate temperature capacity.
- Prevent access by unauthorized persons through the use of locks and fences etc.
- Have an effective, systematic program for preventing environmental contamination and infestation by insects, vermin, etc.

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Self-check 5	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 (2 points each)

1. Foods perishable and likely to pose a danger to human health after only a short time use-by date.
A. Cooked meat
B. Fresh meat
C. Salads
D. All
2. One is not shelf life determination criteria written on the labelling of food
A. Date
B. Month
C. Year
D. None

Test II: Short Answer Questions

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 6- using correct methods for efficient and safe loading

Food safety protection can be improved by the control of hazards through the use of preventive methods, including good sanitation, manufacturing practices, and the Hazard Analysis and Critical Control Point (HACCP) system throughout the food production and distribution chain. Meat, poultry, and egg products must be refrigerated or frozen after processing and before shipment to inhibit spoilage and growth of pathogens. During transportation and storage, the challenge is to maintain proper refrigeration temperatures and to keep the “cold-chain” from breaking during steps such as palletization, staging, loading and unloading of containers, and in storage.

Transportation Safety Plan

In transportation safety plan vulnerable points and develop a comprehensive transportation sanitation and safety plan. Processors and distributors shipping products should assess and implement measures that can ensure the sanitation and safety of products from initial shipment through delivery to other destinations. A flow diagram from the point-of-origin to final destination, including all shipping modes/routes, can be a helpful assessment tool.

Points to be considered in transportation safe plan of meat products

- Identify potential hazards.
- If control points are identified, then determine the method, frequency, and limit that must be met.
- Identify if control is possible at the point(s) of hazard and what is the most effective point to exert control.
- This will determine where and how often monitoring and verification of the limits set should occur and what, if any, corrective and preventive actions should be taken.
- Define what controls should be put in place to prevent product adulteration or contamination during the transportation and storage process.

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As an additional check on product condition during and after transportation and storage, processors may want to include special arrangements with receivers to sample and conduct microbiological or other tests on products. The results could be compared with pre-shipment results to determine whether adjustments are needed in transport methods or procedures.

Verify that contracted transporters (e.g. air, ground, maritime, rail) and storage/warehouse facilities have a food safety program in effect. Consider including specific security measures in contracts and verify that measures are being met.

Include procedures for the immediate recall of adulterated products from trade and consumer channels (this applies to processors, transporters, and wholesale and retail distributors).

Have a system in place to track your products, including salvage, reworked, and returned products.

Train personnel

- Train managers and supervisors involved in the transportation, handling, and storage of food products in food hygiene and sanitation. They should be able to judge potential risks, take appropriate preventive and corrective actions, and ensure effective monitoring and supervision to prevent intentional and unintentional contamination from occurring.
- Train personnel involved in all phases of transport, handling and storage in personal hygiene, vehicle inspection procedures, and transportation procedures that will ensure the safety of meat, poultry, and egg products.

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Figure 10.4 Employee training program on loading

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Self-check 6	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 points each)

1. List at least 3 Points to be considered in transportation safe plan of meat products
2. Elaborate the importance of training employees in safe transportation plan.

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

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

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LG #68

LO #2- Load out product

Instruction sheet

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

- Transporting products to load out
- Loading Products based on requirements
- Documenting and recording products
- Completing products loading out based on industry standard

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:

- Transport products to load out
- Load Products based on requirements
- Document and recording products
- Complete products loading out based on industry standard

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).



Information Sheet 1- Transporting products to load out

1.1. Understanding OHS, Hygiene and sanitation, quality assurance and work place

Personal hygiene and health of food handlers is of the utmost importance when an effort is made to deliver a safe product of high quality to the consumer. Workers should be medically examined before employment in order to determine if they are physically fit to perform the work and also if they do not suffer from transmissible diseases, which can be transmitted through the food they handle to the consumer.

They must also undergo daily fitness checks for different signs of illness. Workers must be issued daily with clean clothes in a good condition in order to protect the food from contamination and also to protect the workers against potential dangers. Each worker can contribute to good personal hygiene standards.

A. Health requirements of workers

Food Handlers and Food borne Diseases Meat can transfer pathogenic organisms to the people (or animals) that eat or handle it. These organisms can originate from the slaughtered bird in other words a sick bird, or one that is a carrier of the organism or from other sources. These sources include food handlers (people who work with food) at the abattoir, wholesalers or retailers even the housewife in her kitchen.

B. Pre-employment medical examination

Persons who come in contact with fresh meat in the course of their work should have a medical examination prior to their employment. The manager must maintain the medical records of employees in such a manner that it is available for inspection. Medical examination of personnel must be conducted at least once a year and must be repeated when clinically or epidemiologically indicated or as prescribed by the controlling authority.

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If the pre-employment examination indicates that the person is suffering from tuberculosis, or if there is any suspicion that he is suffering from it or has a history of the symptoms of TB (coughing for longer than three weeks, coughing blood, weight loss, loss of appetite, shortness of breath, pains in the chest, cold sweats and constant tiredness), then such a person must be referred immediately to the nearest tuberculosis clinic, hospital or district surgeon for examination and treatment.

Such a person can only be employed as a meat handler on production of a certificate or letter from the tuberculosis clinic, hospital or district surgeon which indicates that, that person is receiving treatment for the condition and is in no danger of transmitting the disease.

C. Daily fitness checks

Care should be taken to ensure that no person, knowing to be suffering from, or is a carrier of a disease likely to be transmitted through the meat, or while afflicted with infected wounds, skin infections, sores or with diarrhea, is permitted to work or be present in any meat handling area of an abattoir or establishment in any capacity in which there is any likelihood of such a person directly or indirectly contaminating meat with pathogenic micro-organisms. Any person so affected should immediately report that illness to the manager. Such a person should then be withdrawn from his/her task as a meat handler and utilized at a position, which cannot result in contamination of the product.

1.1.1. Some practical ways to improve personal hygiene and neatness

- Keep fingernails short and clean.
- Cover long hair with a hair net.
- Wash hands and arms thoroughly and frequently with an anti-bacterial liquid soap and warm water.
- Do not wipe hands clean with linen roller towels, paper towels or rags.
- Wash hands immediately after using a toilet.

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- Do not pick your nose.
- Never spit cough or sneeze near meat always use a clean (disposable) handkerchief, which must be deposited in a refuse bin after use. Do not sneeze into your hands.
- Report any case of illness or injury immediately.
- Do not smoke, take snuff or eat and drink in any area where meat and meat products are handled.
- Use showers daily before and after work.
- Work with either meat or livestock, not both at the same time.
- Don't be a "litter bug" use the refuse bin.
- Maintain your protective clothing as clean as you can; do not sit on grass, ground, dirty walls etc.
- Cover cuts and abrasions with waterproof dressings and protective gloves or finger guards if only finger is cut.

Protective clothing

- All protective clothing must be light in colour
- Protective clothing comprises of the following
 - ✓ Head covering (hard hat: - to comply with the terms of the Factory Act)
Long hair (longer than the overall's collar) must be covered by a hairnet.
 - ✓ Washable, strong and waterproof head and neck covers for workers dispatching meat.
 - ✓ Aprons: - made of strong durable impervious material and may not be removed from the room in which they are utilized, and must be washed and hung on hooks during breaks.
 - ✓ Boots: - White boots are required.

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1.1.2. Hygiene practices in storing meat products

- See to it that physical equipment and layout are conducive to sanitary practices
- Handle, store and refrigerate food properly to prevent spoilage and contamination
- Safeguard the food during distribution and service
- Wash and sanitize dishes, glasses, utensils and equipment
- Clean floors walls, ceilings, counters, tables, and chairs regularly
- Eliminate vermin and rodents from food area
- Maintain adequate employer supervision and a constant program of education in sanitation for food service workers
- Make sure that food service employees are in good health and are not carriers of communicable diseases. The three principal groups of communicable diseases that must be guarded against in public feeding operations are respirator, intestinal, and skin diseases. Require medical examinations for food services employees
- Provide a regular employee education on food service sanitation

1.2. Transportation of Meat and Meat Products

While loading in the refrigerated containers, the temperature in the container has to be brought to -12°C (Precooling) so that there is no thawing of the frozen meat cartons while they are loaded. However, in case of chilled products, precooling temperature shall be at or below 4°C . The containers have to be clean and disinfected before loading. After loading it is sealed and taken to destination either by rail/road. The temperature should be maintained and monitored at or below -18°C for frozen and at or below 4°C for chilled/fresh products at all times. Conveyances and/or containers used for transporting shall be kept clean and maintained in good repair condition to protect meat from contamination and shall be designed and constructed to permit adequate cleaning and/or disinfection.

Meat and meat products in conveyances and/or containers are to be so placed and protected as to minimize the risk of contamination. Unpacked Fresh / Chilled / Frozen

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meat shall not be transported with other food products to avoid cross contamination. · Where conveyances and/or containers are used for transporting anything in addition to foodstuffs or for transporting different foods at the same time, there shall be, where necessary, effective separation of products to prevent cross - contamination. · Where conveyances and/or containers are used for transportation anything other than foodstuffs or for transporting different foods, there shall be effective cleaning between loads to avoid risk of contamination. · Fresh Poultry meat meant for immediate sale need not be stored in cool conditions. It can be transported in suitable a hygienic and sanitary condition in clean containers with covers to the retail shops/selling units with adequate precautions to ensure that no contamination or deterioration takes place.

Design and construct vehicles to protect product.

- Vehicles should be designed and built to make locking and sealing easy, protect the cargo against extremes of heat and cold, and prevent infestation by pests.
- Vehicle design should permit effective inspection, cleaning, disinfection, and temperature control.
- Interior surfaces should be made of materials that are suitable for direct food contact. For example, the surfaces may be made with stainless steel or be coated with food-grade epoxy resins.

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Figure 2.1 A man inside an empty vehicle using a spray to sanitize surface

Sanitize and properly maintain vehicles.

- Meat and poultry meat product transportation vehicles, accessories, and connections should be kept clean and free from dirt, debris, and any other substance or odor that may contaminate the product. They should be disinfected as needed. Cleaning and sanitation procedures should be specified in writing.
- Different cleaning procedures may be necessary for the different types of meat, poultry, or egg products that are to be transported. The type of product transported and the cleaning procedure used should be recorded. Generally, wash water should be at least 180 °F (82 °C) and an approved sanitizer may be used to reduce the number of microorganisms and dissolve any fat particles adhering to interior surfaces.

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- Cargo pallets, load securing devices, and loading equipment should be kept clean and free of potential food contaminants and be regularly washed and sanitized.
- Equipment used in transferring meat, poultry, and egg products, such as hand trucks, conveyors, and forklifts, should be well maintained and kept in a sanitary condition.
- Secure transport vehicles to prevent tampering when not in use.

1.3. Different modes of transportation

Air-freight: This is used for highly perishable frozen food products. Although this provides a rapid method of serving distant markets, the main challenge faced is the product is mainly unprotected by refrigeration for much of its journey; due to the intermittent holding time. Standard containers with insulated linings and /or dry ice are used.

Road/ Rail: Refrigerated containers (for long distance) and Small Insulated / Refrigerated / Eutectic vans (for short distance) are used to supply food to local retail outlets or directly to the consumers. All vehicles shall have the temperature monitoring device.

Handling meat products

Transporters must exercise personal hygiene and health practices so the food is suitable for sale by:

- Wearing clean clothing at the start of each day.
- Not handling food if they know, or suspect, they have an illness (for example, vomiting and diarrhoea).
- Covering open wounds with a waterproof bandage.
- Washing their hands whenever it is likely their hands could contaminate food (for example, after visiting the toilet, after meal breaks).
- Not smoking around product at any time.

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Transporters must ensure food is protected from contamination by:

- Storing ready-to-eat food away from (or placed above) raw, not ready-to-eat food.
- Ensuring the packaging does not become damaged (for example, by poor handling) or contaminated (for example, by exposure to chemicals).
- Promptly separating, removing and discarding damaged or contaminated food from the vehicle
- Not allowing animals in the area of the vehicle used to transport foods.
- Transporting chilled foods at not more than 5°C.
- Ensuring frozen foods are to remain frozen during transport.
- Monitoring food during transport to ensure it meets the above temperature requirements.
- Ensuring vehicles are fitted with a temperature measuring device (for example, thermometer, electronic data logger, thermograph) that is routinely calibrated to an accuracy of +/- 1°C.
- Ensuring cleaning chemicals are fit for their intended purpose, and used and stored according to the manufacturer's instructions.
- Ensuring chemicals are not kept in the same area of the vehicle that is used to transport food.
- Ensuring water used to clean vehicles is from a clean, good quality source which contains no moulds or algae.
- Ensuring drivers are trained in the appropriate skills and knowledge of safe food handling and food hygiene to perform their job safely and competently, and made aware of their responsibilities.

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Table 2.1 Recommended temperatures and humidities for protecting selected fresh cured, and processed meat and seafood products during transit.

COMMODITY	TEMPERATURE		RELATIVE HUMIDITY (%)
	°F	°C	
Fresh meats:			
Beef	32 to 34	0.0 to 1.1	88 to 92
Lamb	32 to 34	0.0 to 1.1	85 to 90
Pork	32 to 34	0.0 to 1.1	85 to 90
Poultry	28 to 32	-2.2 to 0.0	85 to 90
Rabbits	32 to 34	0.0 to 1.1	90 to 95
Veal	32 to 34	0.0 to 1.1	90
Cured and processed meats:			
Bacon:			
Cured, farm style	61 to 64	16.0 to 18.0	85
Cured, packer style	34 to 39	1.0 to 4.0	85
Dried beef (chipped)	50 to 59	10.0 to 15.0	15
Frankfurters	32	0.0	85
Hams:			
Light cure	37 to 41	3.0 to 5.0	80 to 85
Country cure	50 to 59	10.0 to 15.0	65 to 70
Pork sausages (links or bulk country and Polish)	32	0.0	85



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: Say true or false (2 points each)

1. While loading in the refrigerated containers, the temperature in the container has to be brought to -12°C (Precooling)

Test II: Short Answer Questions (2 points each)

1. List at least 4 practical ways to improve personal hygiene and neatness on transporting meat products.
2. List at least 6 points the transporters must ensure to avoid meat contamination during transportation.

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- Loading Products based on requirements

2.1. Legal requirements regarding the health and hygiene of workers Visitors in meat products loading

All persons entering an abattoir including management, visitors and maintenance personnel must be issued, by the owner, with clean suitable protective clothing complying with Industry standards.

Practice good personal hygiene. Wash hands and exposed portions of arms thoroughly in an adequate hand-washing facility before loading and unloading, and as often as necessary especially after smoking, eating, drinking or using the toilet or urinal. Do not eat food, drink beverages or use tobacco in any form while loading and unloading. Wear clean outer garments and some form of hair restraint. Provide insulated containers with securely attached lids for smaller-sized products. Provide a clean, designated protective tarp, industry-approved shipping bags/ shrouds or other suitable covers for products too large to fit in insulated containers. Tarps should be thoroughly sanitized and properly stored for future use (consider storing in freezer). Securely fasten covers during transport. Pack meat products in a manner that separates them from other products to prevent cross contamination. Use separate containers for raw and cooked or ready-to-eat products.

Medical records of employees

1. Before employment at an abattoir or its cutting plant, medical certification must confirm that a person is:-
 - a) Healthy and physically able to work as a meat handler; and
 - b) Not a carrier of, or suffering from, a communicable disease.
2. All medical records pertaining to medical examinations and daily fitness checks must be available to the provincial executive officer or the registered inspector.

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Prohibitions

- Jewellery, including traditional objects, may not be worn in an area where edible products are handled.
- Fingernails must be short, clean and free of nail varnish.
- Eating, drinking or using or handling tobacco are not allowed in any area where meat is handled.
- Drugs, liquor or any intoxicating substance may not be brought into any part of the premises and a drugged or intoxicated person may not be allowed to enter any part of a meat handling plant.
- Personnel must refrain from any actions that could contaminated the product.

1.2. Loading, Unloading and Transportation

Pre-Loading

Inspect the vehicle before loading. Ensure loading and unloading methods prevent product contact with the floor, ground or other surfaces that may be contaminated. Ensure any equipment or surfaces that contact meat products are made of nontoxic, noncorrosive materials that can be effectively cleaned. Loading and unloading areas should be configured, cleaned, disinfected (where appropriate), and properly maintained to prevent product contamination.

- Loading or unloading facilities should be designed to permit easy access to all areas for cleaning.
- Facilities should be adequately insulated and have an adequate temperature control capacity.
- Facilities should have an effective, systematic program for preventing environmental contamination and infestation by insects, vermin, etc.

Examine vehicles before loading.

- Trailer or truck body should be sufficiently insulated and be in good repair with no holes in the body that might allow heat, dust, or other adulterants to enter the cargo area.

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- Check for residues of previous cargoes.
- Check for residues from cleaning and sanitizing compounds.
- The cooling unit must be in good repair and operating. Both truck drivers and plant personnel should check the functioning of the trailer refrigeration unit.
- Trailers and trucks should be pre-cooled for at least 1 hour before loading to remove residual heat from the insulation and inner lining of the trailer as well as from the air of the trailer. For precooling, the doors should be closed and the temperature setting of the unit should be no higher than 26 °F. (Note, however, that poultry products labeled “fresh” must be shipped at temperatures higher than 26 °F, usually between 26 °F and 32 °F.)
- Inspect trailers prior to loading to determine that the air chutes, if used, are properly in place and that the ribbed floors are unclogged so that adequate air circulation can occur.
- Examine trailer doors and seals to ensure that they can be secured and that there will be no air leaks.
- Remove items that may contaminate meat products, including fuel, oil, antifreeze, or residues such as wood fragments, gravel, sand and garbage. Wash the vehicle, containers and equipment used for transport, and allow to air dry. Sanitize food contact surfaces..

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Figure 2..2 Inspector in hard hat doing a pre load check of conditions inside an empty trailer compartment

Retail and display

During display; the temperature, temperature fluctuations and visual monitoring (like colour of product, packaging intact, etc.) are the main parameters that determine the quality. Ensure that products are:

- Stored in clean display cases which are covered at all times
- See-through insulated lids are for consumer to look at the product at retail shops. .
- Ensure products are stored at appropriate temperatures.
- Temperature differential or range should be kept minimum.
- Adopt first-in-first-out (FIFO) method in the display of products for sale.
- Proper declaration on the products is needed & it should comply requirements of international standard (Packaging & Labelling). All containers should be cleaned and disinfected daily.

Recommended loading methods for meat:

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Fiberboard cartons:- Since meat does not produce respiratory heat, stack the boxes of meat tightly together on pallets or slip sheets. The same principle applies here as applies to frozen foods.

Pallets:-Most poultry is packed in fiberboard boxes and palletized for shipment. Ensure that the poultry is at the desired transit temperature when loaded. Secure the boxes to the pallets with strapping or stretch film to prevent them from toppling.

Seafood

Fresh and frozen fish are perishable. Shelf life is the time from when it is taken from the water until it is no longer fit to eat. Temperature and handling practices are the two most important factors in determining the shelf life of all species of fish. If the fish product is handled properly, the temperature at which it is held controls its useful life. The higher the temperature the faster fish spoil. Fresh tropical fish typically keep longer at 32°F (0°C) than fresh fish from cold and temperate waters.

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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: Choose the best answer (2 points each)

1. Most poultry is packed in fiberboard boxes and palletized for shipment is known as _____-
- A. Fiberboard cartons
 - B. Pallets
 - C. Seafood

Test II: Short Answer Questions

1. List at least two importance of having medical reports in meat industry (3 point)
2. List at least three importance of checking vehicle before transport (3 point)

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

Note: Satisfactory rating - 6 points

Unsatisfactory - below 6 points

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Information Sheet 3- Documenting and recording products

3.1. Temperature recording and tracking

Procurement must be clearly documented throughout each step of the process and documents filed for audit purposes. The internal audit department is responsible for conducting procurement reviews to find out that emergency policies and procedures are correctly interpreted and implemented

Recording and tracking product temperatures is not only one of the most important tasks to assure the quality and safety of meat and meat products, it is also a key requirement of the Food Safety Modernization Act. There are two ways to accomplish this: using telematics or temperature recorders (Figure 2.3). Telematics and, more precisely, remote temperature monitoring and/or control, as described under, “Telematics” in section I, uses a vehicle mounted device to capture the data from the refrigeration unit’s controller and/or independent sensors located either in the cargo space or inside product cartons, and transmit these data utilizing a cellular or satellite communications network. Using this method, the temperature of the product and/or the cargo space can be monitored continuously in near real-time.

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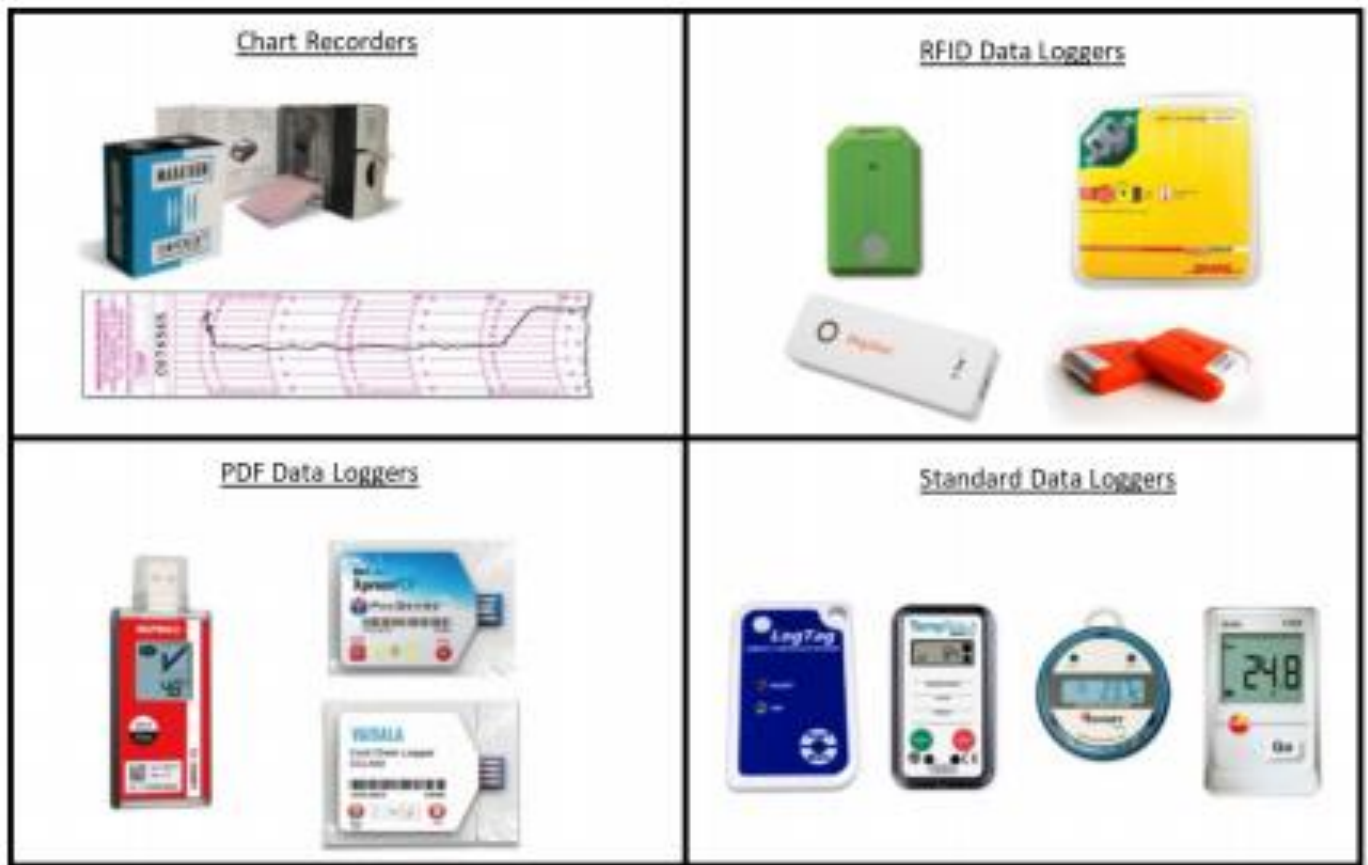


Figure 2. 3 Temperature recorders

Temperature recorders are also utilized for capturing cargo space or product temperature data and are widely accepted by growers, shippers, transportation providers, and retailers. The usefulness and effectiveness of temperature recorders may vary based on the sensor's operating range, accuracy, resolution, as well as their location. Temperature recorders may require the user to program and/or activate the device prior to placing the recorder in the desired location. The user may also need to download the data stored in the temperature recorder once retrieved from the vehicle transporting the product.

The use of a Time-Temperature Indicator (TTI) on each consumer package may be appropriate in the distribution system for reduced-oxygen-packaged products in which refrigeration is the sole barrier to outgrowth of non-proteolytic *C. botulinum* (the causal



agent of botulism poisoning), and in which the spores have not been destroyed. Portable temperature recorders (also known as temperature monitors) are routinely used to establish if a shipment of perishable foods was maintained at the desired carrying temperature for insurance purposes.

Temperature sensors inside the refrigerated cargo space may capture the temperature of the product, the temperature of the air surrounding the product, the cargo's return air temperature, or the cargo's supply air temperature. Temperature sensors may also be placed inside or outside the product's packaging. The shipper should input or mark the date and local time on the label or data file and document the specific location of each recorder in the load with a bright identifying label on the outside of the carton, and on a preloading form that is attached to cartons nearest the entry doors of the refrigerated equipment. Air temperature recorders should not be placed directly on truck, trailer, container, or railcar walls, as this may result in elevated readings that do not accurately reflect the air temperature in the load space due to heat transferred across the walls of reefer equipment.

Table 2.2. Temperature record format on shipment

Product types	shipment temperature °C /°F	Current shipment temperature °C /°F	Recommendation



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: Say true or false (2 points each)

1. Temperature recorders in cargo space or product temperature data and are widely accepted by growers, shippers, transportation providers, and retailers.
2. A Time-Temperature Indicator (TTI) control method on each consumer package is essential one to avoid the growth of MOS.

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

Note: Satisfactory rating – 3 points Unsatisfactory - below 3points

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Information Sheet 4- Completing products loading out based on industry standard

Dispatch vehicle shall be checked for presence of any contaminants, cleanliness, unacceptable odour and proper working of refrigeration system before loading. should be done in shortest possible time. Dispatch vehicles shall be cleaned and sanitized using appropriate cleaning and sanitizing agents regularly to maintain the hygiene standard.

On the completion of product during a loading process protect of products from exposure to environmental contaminants such as microbes, dust, moisture, or other physical contamination should completed based on the industry standards. Cold chain should maintain to ensure meat, poultry, products are kept at appropriate temperatures continuously throughout all phases of transport.

In-Transit

Establish procedures to periodically check integrity of the load during transit.

- Check for leakage of heating or cooling fluid onto food products.
- Monitor the temperature and function of the refrigeration unit at least every 4 hours. If there is a unit malfunction, the problem should be corrected by an authorized refrigeration mechanic before the temperature of the load rises.
- Check for breakdown of temperature control.
- Use time-temperature recording, indicator, or integrator devices, if they are available, to monitor the condition of cargo. Check the devices every 4 hours.

Establish procedures to ensure product safety during interim storage.

- Maintain logbook documenting product condition upon arrival and during storage.
- Ensure proper temperatures are maintained during storage of meat, poultry, and egg products.

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Unloading

On the process of unloading carefully examine incoming products as follows

- Product should be inspected and sorted before being accepted at any point during transportation.
- Develop and implement methods to check and document condition of product and packaging upon receipt at destination. Examine checks of time-temperature recording, indicating or integrator devices or, by prior arrangement with the shipper, test to determine if bacterial growth has occurred after the product was packaged and shipped.
- Include procedures for the safe handling and disposal of contaminated products. Identify where and how to separate contaminated products.
- Establish policy and procedures for rejection of packages and products that are not acceptable can't be verified against the delivery roster, or contain unacceptable changes to shipping documents. Have a monitoring plan and record-keeping system in place to document steps taken.
- Do not accept products known to be, or suspected of being, adulterated.

Move product from the loading dock into cold storage immediately to minimize product exposure to heat and contaminants.

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Self-check 4	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 points each)

1. List at least 4 Establish procedures to periodically check integrity of the load during transit.
2. List at least 3 Establish procedures to ensure product safety during interim storage

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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LG #69

LO #3- Maintain clean holding rooms

Instruction sheet

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

- Maintaining holding rooms regulatory and hygienically
- Checking the cleanness of holding rooms

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:

- Maintain holding rooms regulatory and hygienically
- Check the cleanness of holding rooms

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).



Information Sheet 1- Maintaining holding rooms regulatory and hygienically

1.1. Maintaining Cold Temperatures

Meat and meat products, and all goods that require temperature control have one thing in common; they all are monitored during transport to make sure they are fresh and in usable condition. That's the first indication into the concept need focus today discussing today, temperature monitoring systems in logistics. You'll learn the basics of a temperature monitoring system, what to look for in choosing a system, and how it can solve logistical problems. First, we'll jump in by answering the most basic question: What is a temperature monitoring system?

Consider the time of day and weather conditions before accepting meat products for transport. For example, if high temperatures are forecasted, arrange to pick up the shipment earlier in the day. If possible, avoid transporting on days with unsuitable weather. Ensure carcasses and other meat products have been properly chilled to 4°C (40°F) or colder at the slaughter or cut-and-wrap facility before loading. Check the temperature with an accurate thermometer before accepting the product. Maintain a temperature of 4°C (40°F) or colder during transport.

Hold frozen products at -18°C (0°F) or colder, and ship in a way that prevents thawing and refreezing.

Limit transport time when meat products are without refrigeration. Where practical, transport wrapped meat products in insulated containers with clean ice packs or ice from an approved source. Never allow meat products to be kept out of refrigeration for more than two hours unless other suitable means of maintaining temperatures are used.

Understanding temperature monitoring systems

The concept of temperature monitoring systems revolves around using technology to maintain product freshness and reduce waste by monitoring the temperature of a space.

A temperature monitoring system controls and regulates the temperature of a particular

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environment. A temperature monitoring system has become an essential part of meat and meat products and other industries in recent years. With a temperature monitoring system, you can easily track, control, and regulate the products' temperature in a specific environment. A temperature monitoring system makes sure that your temperature-dependent products stay safe as they are being transported.

Temperature Control Provisions

Poor temperature control is cited as the most common contributory factor in food poisoning outbreaks and also causes food spoilage and wastage. Time and temperature controls are therefore the most effective ways of reducing the risk of food poisoning and preventing food spoilage. Time and temperature controls and documentation are an essential part of food safety management and for the development of a due diligence defence.

General rules about holding temperatures

Food safety legislation states that cold food must be kept at or below 8°C but good practice identifies the “danger zone” at which bacterial growth will be most likely as 5°C–63°C. Therefore, most food businesses and HACCP procedures aim to keep cold food between 0°C and 5°C to minimize bacterial growth and food spoilage.

- Cooked meats and fish and meat and fish products
- Cooked meats in cans which have been pasteurized rather than fully sterilized
- Prepared salads and dressings
- Smoked or cured fish and raw fish (includes raw tuna, mackerel, salmon)
- Any sandwiches whose fillings include any of the types of food above
- Smoked or cured meats which are not ambient stable (some fermented meats, salami and Parma ham may be ambient shelf stable).

Examples of food that must be kept at 63°C or above:

- All ready-to-eat food that has been cooked or reheated
- All ready-to-eat hot food for service or on display for sale.

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This legal requirement also applies to the food described above where it is displayed in a vending machine.

Based on the regulator requirements of the country the following temperatures of different products should maintained

A. Food Holding temperature Range Guide for Meat Products:

Meat Product	Fahrenheit	Celsius
BEEF ROAST — Rare	140°F	60°C
BEEF ROAST — Med/Well Done	160°F	71°C
BEEF BRISKET	160° - 175°F	71° - 79°C
CORN BEEF	160° - 175°F	71° - 79°C
PASTRAMI	160° - 175°F	71° - 79°C
PRIME RIB — Rare	140°F	60°C
STEAKS — Broiled/Fried	140° - 160°F	60° - 71°C
RIBS — Beef or Pork	160°F	71°C
VEAL	160° - 175°F	71° - 79°C
HAM	160° - 175°F	71° - 79°C
PORK	160° - 175°F	71° - 79°C
LAMB	160° - 175°F	71° - 79°C

B. Food Holding temperature Range Guide for Poultry Products:

Poultry Products	Fahrenheit	Celsius
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Chicken - Fried or Baked	160° - 175°F	71° - 79°C
DUCK	160° - 175°F	71° - 79°C
TURKEY	160° - 175°F	71° - 79°C
Other Poultry Items	160° - 175°F	71° - 79°C

C. Food Holding temperature Range Guide for Fish / Seafood Items:

Fish/Seafood Product	Fahrenheit	Celsius
FISH — Baked/Fried	160° - 175°F	71° - 79°C
LOBSTER	160° - 175°F	71° - 79°C
SHRIMP	160° - 175°F	71° - 79°C



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: Say True or false (2 points each)

1. Frozen products should be kept at -18°C (0°F) or colder, and ship in a way that prevents thawing and refreezing

Test II: Short Answer Questions

1. List at least two Holding temperature Range Guide for Meat Products (2 point)

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

Note: Satisfactory rating - 10 points

Unsatisfactory - below 10 points

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Information Sheet 2- Checking the cleanness of holding rooms

Carcass Cleanliness

Ensure carcasses intended for human consumption and destined for sale have been slaughtered at a licensed facility. Animals slaughtered for personal use, or game animals, are the only exceptions to this rule. Carcasses from a provincially licensed slaughter facility have been examined and deemed to be clean, wholesome and fit for human consumption, which is an important quality-control step.

Ensure carcasses being transported to an approved cut-and-wrap facility are clean and not contaminated before or during transport. Carcasses should be free from contaminants such as blood, hair, offal, manure or vegetation.

In some cases, it is better to leave the hide on the carcass for additional protection of the meat while en-route to an approved cut-and-wrap facility. If the hide is removed, the carcass should be otherwise protected during transport (see below). Only those experienced and knowledgeable in hide removal should carry out this task.

The operator of an approved cut-and-wrap facility should refuse any meat that appears to be diseased, unwholesome, spoiled or otherwise unfit, so it is essential to ensure protection of the carcass during transport.

Cleaning and sanitation

Clean and sanitize the vehicle. Cleaning and sanitizing prevent bacterial, chemical, and odor contamination of food product loads. Remove all loose debris and wash or sweep the floors clean. The floor drains and grooves should be free of debris so drainage will not be blocked. Cleanliness includes visual, chemical, and microbiological aspects.

Physically Clean: All surfaces are clean to visual inspection.

Chemically Clean: All surfaces are free of residue on which microorganisms can grow.

Microbiologically Clean: The surfaces are completely free of any viable microorganisms. Certain cleaning procedures may be required by law in cases where a meat product may become contaminated by direct or indirect contact with the interior

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surfaces of the vehicle. Also, certain cleaning laws may apply due to previously hauled cargo, such as chemical residues or municipal wastes.

Consider and arrange the following points in holding rooms at meat industry

- Check the cleanliness of fatty or oily food products, such as butter, oleomargarine, and meats, are highly susceptible to contamination by strong odors.
- Check the weather the trucks were free from any spiels of meat liquid and the other.
- Check whether the best practice when visible residue on transportation equipment or cargo cannot be immediately identified is to treat it as hazardous until proven otherwise.
- Check whether samples were taken for analysis after final transport for quality after transport.
- Check whether the responsible person is wearing appropriate personal protective equipment such as respiratory protective equipment and impervious gloves.
- Check if the residue Identified is cleaned and the supervisor appointed follow all the activities correctly
- Check if the proper cleaned residues are clearly disposal of the residue (powder deposits (aluminum oxide/hydroxide), which can be removed by washing the equipment with heated fresh water or neutral pH cleaning solution with no corrosive cleaning agents.)
- Check whether the fumigating acid or hot water (hot water of at least 180°F or 82°C) was used in fumigation process to effectively clean the trucks
- Check front bulkheads periodically removed to expose the refrigeration equipment for cleaning. Care must be taken not to damage evaporator coil fins, electrical connections and thermal tape with the pressurized stream.

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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 (6 point)

1. List the important Cleaning and sanitation practices in meat industry vehicle for transportation.
2. Define the term clean

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:

AN introduction to HACCP Bulletin No 71/2002

Food Quality and Food Safety

WEB ADDRESSES

<http://www.fao.org/3/t0098e/T0098E03.htm>

https://www.gs1us.org/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&EntryId=716&language=en-US&PortalId=0&TabId=134

<https://www.moag.gov.il/vet/Yechidot/TzaarBaleyChaim/IAWP/Documents/cattle%20and%20sheep%20slaughter%20technical%20notes.pdf>



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