
UNIT 14 GOOD RETAIL PRACTICES, GOOD TRANSPORT PRACTICES, AND NUTRITION LABELLING

Structure

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14.0 OBJECTIVES

After studying this unit, we should be able to:

- state good practices to be followed in a retail food unit e.g. meat retail unit;
- enumerate good transport practices to be followed w.r.t. food transport;
- describe nutrition labelling requirements in a typical country (say USA); and
- outline traceability and associated records to be maintained.

14.1 INTRODUCTION

The topics of this unit are interlinked and at the outset they share a common area of concern which, interfaces between processing and consuming. Once a food item is processed the journey towards the consumption objective starts. In this journey all interested parties have to consider the associated hazards, the associated risk profile w.r.t. transport to wholesaler and / or retailer, ensuring that good retail practices are followed at retailer end, the consumer is adequately guided about the nutrient contents as per the regulations and in the event of necessity for withdrawal or recall a robust traceability system is in place.

14.2 GOOD RETAIL PRACTICES (GRP)

Risk Categorisation of Retail Food Establishments

Risk type 1

Pre-packaged, non-hazardous foods only. Limited preparation of non-potentially hazardous foods only.

Risk type 2

Limited menu (1 or 2 main items). Pre-packaged, raw ingredients are cooked or prepared to order. Raw ingredients require minimal assembly. Most products are

cooked / prepared and served immediately. Hot and cold holding of potentially hazardous foods is restricted to single meal service. Preparation processes requiring cooking, cooling, and reheating are limited to 1 or 2 potentially hazardous foods.

Risk type 3

Extensive handling of raw ingredients. Preparation process includes the cooking, cooling, and reheating of potentially hazardous foods. A variety of processes require hot and cold holding of potentially hazardous food. Advance preparation for next-day service is limited to 2 or 3 items. Establishments doing food processing at retail.

Risk type 4

Extensive handling of raw ingredients. Preparation processes include the cooking, cooling, and reheating of potentially hazardous foods. A variety of processes require hot and cold holding of potentially hazardous foods. Food processes include advanced preparation for next-day service.

Risk type 5

Extensive handling of raw ingredients. Food processing at the retail level, e.g., smoking and curing, reduced oxygen packaging for extended shelf-life.

Operational Aspects to be Controlled

Within all types and risk categories of retail establishments, research and experience has identified five specific aspects of operations that produce the greatest incidence and severity of exposure to food borne pathogens. Control of these aspects of retail operations is essential to ensure food safety. They are:

- 1) Related to sourcing : • Food from unsafe sources.
- 2) Related to processing : • Inadequate cooking • Improper holding time or temperature.
- 3) Related to cross contamination : • Contaminated equipment • Poor personal hygiene.

What are the Crucial Practices ?

Retail industry experts agree that following categories of good practices are crucial in maintaining food safety of required level in retail sector :

- 1) Time and temperature controls (including cooking temperature, cooling time, cold holding, hot holding);
- 2) Food storage conditions (potential for cross contamination);
- 3) Training and certification of managers; and
- 4) Cleaning and sanitation practices.

The practical reasoning behind choosing these categories is as follows :

Employee Hygiene

It is difficult to change human habits. First, it is difficult to prevent people from working when they are ill – especially if they are penalized financially for informing managers of their illness. Additionally, language and cultural barriers may hinder acceptance of improved personal hygiene practices.

Workers often do not realize that they have touched an unsanitary surface - picking up trash off the floor, pushing hair back, touching their face, etc. So it is difficult to get hands washed or gloves changed as frequently as needed.

- **Time and Temperature Control**

Retail grocery chains and hypermarkets traditionally do not have elaborate food service operations. Consequently, some types of time/temperature controls, over cooking temperatures, hot holding temperatures, and during cook-chill cycles, for example, are not part of traditional operating practices.

- **Cleaning and Sanitizing**

Insuring adequate cleaning is a critical challenge to management. The challenge is to provide adequate resources, adequate time, adequate supervision, and adequate training to get this critical task done thoroughly.

Following are the key areas (and associated aspects) w.r.t. GRP (in a typical meat related retail organisation) :

Area 1 : Receiving

Aspect 1 : Approved Sources

It is recommended that the retailer confirm the supplier has an effective program to prevent biological, physical or chemical hazards, such as a HACCP system.

Aspect 2 : Packaging and Labelling

Shipping containers should have labels which provide the common name, net quantity, name and address of the responsible party, and a list of ingredients. Invoices, receipts, and lot coding information should be kept to permit tracking of products should a recall be necessary.

Aspect 3 : Trailer Inspection

Trailers delivering meat products should be examined to ensure they are suitable for food delivery. Inspection should make certain that the trailer walls, ceiling and floors are clean and in satisfactory condition and that the refrigeration unit is functioning adequately. Incompatible cargo such as chemicals or other items which may contaminate food products must not be present. If conditions are found to be unsatisfactory the trailer should not be unloaded and the shipment returned to its origin.

Aspect 4 : Product Inspection

Product should be inspected for signs of contamination, damage to packaging or indications of temperature abuse. Whenever possible monitoring devices such as temperature recorders should be used to provide information on transit conditions. If product is found to be temperature abused it should be returned to origin or destroyed.

Aspect 5 : Unloading Procedures

As packaging supplies are a food contact item they should be inspected upon arrival to ensure they have not become contaminated during transport. Meat products should not be unloaded in the presence of, or at the same time as, cleaning chemicals or other sources of contamination. Perishable meat products should be moved promptly off the loading dock into refrigerated or frozen storage. Dock seals or other methods should be employed to ensure adequate temperature control is maintained during unloading.

Aspect 6 : Sanitation and Pest Control

Loading dock areas should be periodically cleaned and garbage should be removed daily to ensure adequate sanitation. Birds, mice and other pests must be kept out of loading dock areas and where pests are present effective control measures should be implemented. Whenever possible, points of access for pests such as loading dock doors should be kept closed. Excess water should not be allowed to pool in front of loading dock areas and exterior garbage storage containers should be kept away from loading dock entrances. If grass is present it should be kept short to avoid creating areas which may harbour pests.

Area 2 : Storage

Aspect 1 : Storage Conditions and Cooler Sanitation

At all times stored meat must be covered and protected from pests, dust, condensation, or any other unsanitary condition. Meat storage should never be located in an area used for locker rooms, washrooms, garbage storage, mechanical rooms, under dripping pipes or in chemical storage areas. Fresh meat must be appropriately wrapped to prevent leakage onto other products and if leakers are found any residues should be removed as soon as possible. If pallets are used for storage they should be inspected for loose nails or broken boards which may present a physical hazard. If shelves are used they must not be constructed from unsealed wood or other materials which are not smooth.

Aspect 2 : Box Placement

Ensure that boxes in coolers are not placed against a wall or directly on the floor. The use of pallets and an approximate 10cm (4 inches) space between product and the cooler walls permits air flow which facilitates rapid cooling. An air space between boxes and use of dividers between layers on a pallet is also useful. As a general rule warmer temperatures will be encountered by product placed higher up or closer to the door of the cooler.

Aspect 3 : Storage Temperature and Shelf Life

Fresh meat should be stored at no more than 4°C and lower temperatures between -1.0° and 2°C if possible. This will promote extended shelf life by slowing growth of spoilage bacteria (packaged fresh meat will begin to freeze at -1.5°C). For frozen meat, temperature should be maintained at -18°C and product properly wrapped to prevent freezer burn.

Aspect 4 : First in – First out Rotation System

A FIFO system is important to enable the customer to receive the freshest and safest product. Remember to organize boxes in the cooler to facilitate FIFO.

Aspect 5 : Storage Temperature and Food Safety

Given the crucial nature of temperature for food safety, whenever possible alarm systems should be used to monitor cooler temperatures. If boxes show signs of significant warming they should be inspected by management to determine suitability for use. It is especially important that ground, chopped or rolled meat products which have spent significant time over 4°C be destroyed.

Aspect 6 : Cooler and Freezer Facilities

Ensure that the volume and temperature of the product in the cooler or freezer is not more than the refrigeration capacity the unit can handle.

Area 3 : Fabrication**Aspect 1 : Meat Contact Surfaces**

Cutting boards should be inspected for excessive scoring and scratching and replaced if necessary. Bins used for storage or transport of meat products must be food grade. All surfaces must not pass on colours, odours, tastes or unsafe chemicals into meat products and be free of corrosion, flaking paint or other condition which would prevent cleaning. Equipment, such as bins, which may have potential for use in both inedible and edible products should be colour coded or labeled.

Aspect 2: Product Inspection

During cut fabrication, muscles should be inspected for any defect that would seriously affect product use. If conditions such as abscesses are present, where contamination may have spread to other products in a box or on the cutting board, these products should be destroyed or trimmed when possible. If surfaces such as cutting boards, knives or other equipment have been exposed to contaminated product they must be cleaned and sanitized immediately.

Aspect 3 : Dropped Product

In the event that product is dropped on the floor or contacts any other unclean surface it should be destroyed unless it is possible to trim the contamination. If possible, meat should be suspended on a hook and then trimmed.

Aspect 4 : Operational Sanitation

Cutting boards and other meat contact surfaces will support the growth of spoilage and potentially harmful bacteria which will increase in numbers during the day. It is important that where room temperatures are significantly higher than 4°C, cutting boards should be cleaned on a periodic basis throughout the day.

Aspect 5 : Sanitation and Pest Control

Be sure that all wet garbage is contained and covered. Always ensure that screens on windows opening to the outside are not torn or absent and keep doors closed when possible. All cleaning activities should be performed using only approved chemicals. Store chemicals in well ventilated areas away from food contact items and in the original labeled container. Be sure to clean surfaces thoroughly with cleaning chemicals such as detergents before applying sanitizing solutions as they will otherwise be inactivated by organic materials and bacteria will not be killed. When cleaning be sure to have all packaging materials, ingredients and meat products covered as chemicals and/or spray will contaminate products.

Aspect 6 : Employee Hygiene

Any sores or cuts must be covered with dry, tight fitting bandages and gloves worn when hands are affected. Employees must wash their hands immediately following sneezing, using the washroom, following coffee/lunch breaks or after touching eyes, hair, mouth, nose or any unclean surface. Hair nets and, when applicable, beard nets are recommended.

Area 4 : Grinding**Aspect 1 : Meat Ingredient Storage**

Ground meat and trim should be stored at 4°C or lower in bins. If shop generated trim is used it must be carefully handled to prevent contamination and to ensure adequate

temperature control while in production and storage areas. Shop trimmings should be labeled with production date and species.

Aspect 2 : Ingredient Selection and Preparation

Select meat ingredients in accordance with FIFO (first in first out) system. Inspect meat for off odour, excess purge, bone-chips, cartilage, torn or ripped packaging, or any other condition which would make the ground meat or trim unsatisfactory for use.

Aspect 3 : Grinder Preoperational Inspection

The operator should ensure that all bolts, pins or other small parts removed during disassembly are present and securely placed so that they may not enter ground products. Make certain that the grinder is free of excessive rust, water, flaking paint or other condition which could contaminate product. Ensure that the grinder has been cleaned adequately and is free of visible meat residue.

Aspect 4 : Grinding Production

Whenever possible, grind only what is required in the next few hours. Grind meat in areas where room temperature is not more than 10°C or whenever possible 4°C or colder. Particular attention should be devoted to keeping ground meat at 4°C or less as the temperature of the meat will rise during grinding due to heat generated from friction.

Aspect 5 : Rework

If whole muscle products are taken from the counter for grinding always ensure that they are free from any seasoning and are not past their “best before” date. If you find that you have ground more than you can sell it is acceptable to immediately freeze the remaining unexpired product as patties or frozen ground beef for sale in the frozen counter.

Aspect 6 : Grinder Sanitation

Completely disassemble, clean and sanitize grinder after each day of production or more often if needed. If possible use a separate grinder for each species otherwise a complete cleanup must be undertaken when switching on to another species.

Area 5 : Sausage

Aspect 1 : Casings and Meat Ingredients

To prevent growth of bacteria during storage, natural casings should be salted or kept in brine at 4°C or lower (but not frozen) in covered containers. To avoid mold growth after opening, collagen and fibrous casings should not be kept in warm humid areas but rather in sealed bags or containers in a dry cooler.

Aspect 2 : Spices and Seasonings

Spices and seasonings should be stored covered and be protected from humidity, pests and cleaning chemicals.

Aspect 3 : Ingredient Selection and Preparation

Inspect natural casings to ensure they are relatively free of patches of spongy tissue on their lining which can result in shortened shelf life. If ice is used in sausage production ensure that the ice box is cleaned regularly and that only clean scoops and never

hands are used to remove it. Inspect meat for off odour, bone chips, cartilage, glands, foreign materials or any other condition which would make it unsatisfactory for use.

Aspect 4 : Preoperational Inspection and Sanitation

Before the start of production all equipment should be inspected to ensure that it is free of visible meat residues or pooled water and that all parts and fasteners are accounted for and properly secured. A written procedure for disassembly and sanitation of the grinder, mixer, stuffer and all other equipment should be followed each production day or more often if needed.

Aspect 5 : Sausage Production

Sausage production areas should be kept at no more than 10°C and whenever possible 4°C or colder. During production, the meat block should be sufficiently cold to ensure that the finished product leaving the stuffer is 4°C or less. When moisture addition is required use ice or cold potable liquids dispensed using cleaned and sanitized containers.

Aspect 6 : Allergen Control

If potential allergens are used in the production of sausage, ensure that they are declared in applicable labelling or ingredient lists and that equipment is cleaned before other products are made.

Area 6 : Processing

Aspect 1 : Ingredients

Select meat ingredients on the basis of FIFO system and avoid the use of rework which will shorten shelf life. All meat materials should be kept covered, free of any potential contamination and at 4°C or less. If water is used as an ingredient, make certain that it is cold and is dispensed only from cleaned and sanitized containers.

Aspect 2: Tumbling

Whenever possible, tumble meat at 4°C or colder to enhance food safety, shelf life, slice ability and yield. Clean and sanitize the tumbler between batches which have a different ingredient or species composition, after each production day or more often if required. Inspect the tumbler daily before production for corrosion, damaged or loose components.

Aspect 3 : Coating

Apply all coatings in a single use method. Do not roll or dip meat in storage containers holding spices or other coatings as this will lead to cross-contamination. Place only the required amount of coating material on a clean working surface and following completion throw away all unused ingredients.

Aspect 4 : Marinating

Do not reuse marinades and ensure that a clean, sanitized, acid resistant and covered container is used to hold marinades and meat ingredients and to display the finished product. Conduct marinating activities at 4°C or colder.

Aspect 5 : Stuffing

Do not reuse any stuffing materials and prepare stuffing immediately before use with only cleaned and sanitized containers and tools.

Aspect 6 : Mechanical Tendering or Injecting

Disassemble, clean and sanitize injecting or tenderizing equipment between batches which have a different ingredient or species composition, at the end of the day or more often if required. Inspect needles or blades before production and after each batch to ensure proper function.

Aspect 7 : Allergen Control

If potential allergens are used in the production of processed products ensure that they are declared in applicable labelling or ingredient lists and that equipment is cleaned before other products are made.

Area 7 : Packaging

Aspect 1 : Packaging Storage

As food packaging contacts product directly it must always be kept clean, covered and free of any potential contamination. It is especially important to ensure packaging is protected during cleaning activities to prevent chemicals or spray from contaminating soaker pads, trays and wrap. Packaging must never be stored in the same areas where chemicals are kept.

Aspect 2 : Employee Hygiene

Any sores or cuts must be covered with dry, tight fitting bandages and gloves worn when hands are affected. Packaging employees must wash their hands immediately following sneezing, using the washroom, following coffee/lunch breaks or after touching eyes, hair, mouth, nose or any unclean surface. Hair nets and, when applicable, beard nets are recommended.

Aspect 3 : Packaging Procedures

When packaging ensure that wrap or bag is tight and maintains an effective seal which will not permit leakage. If clips or other fasteners are used then special care is needed to ensure they do not enter the product. Upon opening a new container of packaging supplies a visual inspection should be conducted to make certain no evidence of contamination is present. If packaging falls on the floor it must be thrown away. If cooked product is packaged it is very important to ensure that contamination does not occur from individuals, garments, bins, cutting surfaces or equipment from raw product areas.

Aspect 4 : Placing Meat on Trays

When placing cuts on trays, be aware of the potential for contamination which can result from stacking the tray on the top of the meat surface of the tray beneath. Also when placing meat trays on larger metal or fiberglass trays which are placed in a rack, ensure that the underside of the large tray is clean and dry to avoid contamination from falling on the meat on the tray below.

Aspect 5 : Tray and Rack Placement

When trays and racks are placed in a location to await unloading and over-wrapping, when possible ensure that they are kept in refrigerated areas and away from sources of warm air such as doors opening to unrefrigerated areas.

Aspect 6 : Metal Trays

Metal trays used for storage of meat should be cleaned and sanitized after each use. Racks should also be cleaned on a periodic basis to avoid contamination and be kept free of flaking paint or other unsanitary condition.

Area 8 : Display

Aspect 1 : Meat Display Case Sanitation

A written procedure for cleaning display cases should be constructed which contains a schedule for cleaning. Cases should be cleaned at least once per week and inspections conducted to determine if more frequent cleaning is required.

Aspect 2 : Display Case Maintenance

When maintenance or repair of refrigeration systems is required, it is essential that food products contained in the case be removed or adequately protected against contamination or a rise in temperature. Temperature measurement devices within the display case should be periodically checked.

Aspect 3 : Meat Display Temperature

The surface of all raw meat products contain spoilage bacteria and in some cases potentially harmful bacteria which grow quickly if exposed to air temperatures over 4°C. To ensure shelf life and safety, temperature of cases should be monitored at least three times per day. For optimal display, fresh meat should be maintained between 0 and 2°C (meat freezes at -1.5°C). Frozen meat should be kept at -18°C in the frozen case.

Aspect 4 : Refrigeration Failure

In the event of refrigeration system failure or power outage, product should be inspected by management and where the product temperature has exceeded 4°C for a significant period of time, meat products must be disposed of.

Aspect 5 : Inventory Rotation

Product must be removed from storage and put on display in accordance with a first in–first out program. “Best before” dates of products should be monitored daily to ensure any outdated product is not still on display.

Aspect 6 : Package Dates

When possible a sign explaining the meaning and importance of “packaged on” and “best before” dates should be posted along with the significance of these dates if meat is frozen or used fresh.

Aspect 7 : Package Conditions

Periodic inspection of the display case should be performed to ensure there are no leaking /damaged packaging or other condition which might permit contamination. Consumer handling of leaking products may result in raw meat juices containing potentially harmful bacteria contacting other products in the store or at home. Further, it is also important to make certain that all labels are still present on packages and are readable.

14.3 GOOD TRANSPORT PRACTICES (GTP)

Considerations During Design of GTP

- 1) Is the food “ready for direct consumption”?
- 2) Are the conditions of the food transportation unit likely to introduce or support the increase of a hazard?
- 3) Is it likely, that a hazard is introduced or increased during loading?
- 4) Is it likely, that a hazard may increase during transport or storage in the food transportation unit?
- 5) Is it likely, that a hazard is introduced or increased during unloading?

Categories of GTP Hazards

- 1) Hazards related to the food transportation unit
 - a) Unsuitability of the construction material and coating, lack of sealing/locking device.
 - b) Residues of previous cargoes, residues from cleaning and sanitizing materials.
- 2) Hazards related to loading and unloading
 - a) Increase/decrease of temperature of the food.
 - b) Undesirable introduction of microbes, dust, moisture, or other physical contamination.
- 3) Hazards related to transport
 - a) Leakage of heating/ cooling fluid.
 - b) Break down of temperature control.

Design of Food Transportation Units

The design of the food transportation unit should be such as to avoid cross-contamination due to simultaneous or consecutive transport. Important aspects are clean ability and appropriate coatings. Construction and design of the food transportation unit should facilitate inspection, cleaning, disinfection and when appropriate enable temperature control.

Use of means for cooling or heating should be designed and constructed such as to avoid contamination. Although hot water and steam are preferred means of heating, other substances may be used on the basis of safety and risk evaluation and inspection procedures. Upon request by the competent authority, evidence may be required to demonstrate that the heating media employed have been properly evaluated and safely used.

Inner surface materials suitable for direct food contact should be used. These should be non-toxic, inert, or at least compatible with the transported food, and which do not transfer substances to the food or adversely affect the food. Stainless steel or surface coated with food-grade epoxy resins are most suitable. The interior design should eliminate areas that are difficult to access and clean.

The appropriate design of the food transportation unit should assist in preventing access of insects, vermin, etc., contamination from the environment, and when necessary,

providing insulation against loss or gain of heat, adequate cooling or heating capacity, and facilitation of locking or sealing. There should be appropriate facilities conveniently available for cleaning and, where appropriate disinfecting of the food transportation unit. Auxiliary equipment should be (where appropriate) subjected to the above stated requirements. To maintain sanitary conditions, facilities should be provided for the storage of pipes, hoses and other equipment used in the transfer of foods.

Food transportation unit's, accessories, and connections should be cleaned, disinfected (where appropriate) and maintained to avoid or at least reduce the risk of contamination. It should be noted that depending on the commodity relevant, different cleaning procedures are applicable, which should be recorded. Where necessary, there should be disinfection with subsequent rinsing unless manufacturers instruction indicates on a scientific basis that rinsing is not required.

Dedicated Transport

Where appropriate, particularly bulk transport containers and conveyances should be designated and marked for food use only and be used only for that purpose. Bulk food in liquid, granulated or powder form must be transported in receptacles and/or containers /tankers reserved for the transport of food unless the application of principles such as HACCP demonstrates that dedicated transport for these products is not necessary to achieve the same level of food safety.

Documentation and Records

Suitable controls can be formulated by shippers or receivers to ensure food safety during transport in particular cases depending on the likelihood and nature of hazards. Such controls should be communicated in writing. Documentation is an important tool for validation and for verification that the principles have been adhered to. This documentation may include food transportation unit number, registration of previous loads, temperature/time recordings and cleaning certificates. It should be noted that some food transportation units are intended for single use only.

Transportation Spills and Salvage

Should a transportation spill occur involving a food shipment, the onus is on the transporter to ensure that:

- 1) All potentially hazardous foods that have been subjected to temperature abuse (i.e. have remained within the danger zone of 4° C to 60° C for more than 2 hours) are itemized and discarded in such a fashion that precludes the food from being utilized for human consumption.
- 2) Canned or packaged goods that have been subjected to unintentional freezing, which has compromised the integrity of the package (e.g. burst can seams) should be itemized and discarded in such a fashion that precludes the food from being utilized for human consumption.
- 3) All foods that have been subjected to contamination by exposure to the elements, chemicals or other contaminants are itemized and discarded in such a fashion that prevent the food from being utilized for human consumption.
- 4) Any foods that are salvageable and intended for human consumption shall be itemized and kept in secure storage until approved for salvage and resale by the regulatory authority.

Temperature Controls

Food requiring temperature controls shall be transported in a manner that prevents temperature abuse, which could jeopardize the safety of the food.

Food requiring refrigeration (potentially hazardous foods) shall be transported at 4° C or less. This is best achieved with mechanical refrigeration, which is mandatory for long distance transport (more than four hours), but can also be achieved through other effective means for short term transport, such as icing of chicken or fish with ice from approved sources. Therefore, all vehicles used to transport chilled foods shall be so constructed and properly insulated that, when equipped with appropriate refrigeration units, they will be capable of maintaining product temperature between -1° and +4° C throughout the load.

Whenever chilled foods are received with a product temperature of +7° C or higher, or frozen in error, the manufacturer shall be notified immediately and special handling instructions will be requested.

Frozen food should be transported at a temperature of -18° C or less to preserve the quality of the food. Therefore, all vehicles used to transport frozen foods should be constructed and properly insulated so that, when equipped with appropriate refrigeration units, they are capable of maintaining product temperature of -18° C or lower, and in the case of fish and fishery products at -21° C or lower, throughout the load in all movement.

Food (that is not potentially hazardous food) that may be damaged by freezing should be transported at a temperature of 0° C or higher.

Air temperatures within temperature-controlled transportation units should be regularly monitored. For frozen loads the temperature should be recorded at the return air intake of the chiller unit. For refrigerated loads the temperature should be recorded at the cold air outlet. Ideally, for long distance transportation (longer than four hours) of potentially hazardous foods, a written or electronic record of the temperature within the transportation unit should be produced and available for inspection.

For a refrigerated transport trailer, container, railcar or ship, it is essential that the shipment is properly loaded, ensuring adequate air circulation around the load. Failure to properly load may result in certain sections of the load being at much higher temperatures than the air supplied by or returned to the refrigeration unit.

Food requiring refrigeration (potentially hazardous foods) should be at 4° C or lower (pre-tempered) prior to loading in the transportation unit and must be at 4° C or lower once delivered to the receiver.

14.4 NUTRITION LABELLING

Consumers are exposed to a whole range of processed foods everyday. Those who do not want the inconvenience of preparing their own meals are willing to pay a premium for foods perceived to be of high quality and standard. One of their main bases of comparison is the information on the labels of these items.

Codex Alimentarius commission has published guidelines on nutrition labelling viz. CAC-GL 2-1885 (Rev. 1 1993). The purpose of these guidelines is :

- 1) To ensure that nutrition labelling is effective:
 - in providing the consumer with information about a food so that a wise choice of food can be made;
 - in providing a means for conveying information of the nutrient content of a food on the label;
 - in encouraging the use of sound nutrition principles in the formulation of foods which would benefit public health; and
 - in providing the opportunity to include supplementary nutrition information on the label.
- 2) To ensure that nutrition labelling does not describe a product or present information about it which is in any way false, misleading, deceptive or insignificant in any manner.
- 3) To ensure that no nutritional claims are made without nutrition labelling . It is based on the following principles of nutrition labelling.

A) Nutrient Declaration

Information supplied should be for the purpose of providing consumers with a suitable profile of nutrients contained in the food and considered to be of nutritional importance. The information should not lead consumers to believe that there is exact quantitative knowledge of what individuals should eat in order to maintain health, but rather to convey an understanding of the quantity of nutrients contained in the product. A more exact quantitative delineation for individuals is not valid because there is no meaningful way in which knowledge about individual requirements can be used in labelling .

B) Supplementary Nutrition Information

The content of supplementary nutrition information will vary from one country to another and within any country from one target population group to another according to the educational policy of the country and the needs of the target groups.

C) Nutrition Labelling

Nutrition labelling should not deliberately imply that a food which carries such labelling has necessarily any nutritional advantage over a food which is not so labeled.

Food Labels Information

In United States a regulation related to nutrition labelling was passed in 1973 but compliance was entirely voluntary unless nutritional claims were made or nutrients are added in the food products intended for sale. Although it was a voluntary declaration, manufacturers in United States and in other developed countries were complying with the requirement because of competitive pressure. In 1990, Nutrition labelling and Education Act (NLEA) was passed and as a consequence it is now mandatory that all foods marketed in the US market must carry nutrition information in a standardized format. Also to encourage judicious purchase decision by the consumer, the information must indicate how the food contributes to a healthy diet. The regulations are result of the growing health and nutrition consciousness of the typical American consumer.

The Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA) require labels on almost all packaged foods that include nutrition information in readable type. The information usually appears on the back or side of packaging

under the title “Nutrition Facts.” It’s also displayed in grocery stores near fresh foods, like fruits, vegetables, and fish.

Manufacturers are required to provide information on certain nutrients. The mandatory (underlined> and voluntary components and the order in which they must appear are:

- total calories
- calories from fat
- calories from saturated fat
- total fat
- saturated fat
- polyunsaturated fat
- monounsaturated fat
- cholesterol
- sodium
- potassium
- total carbohydrate
- dietary fiber
- soluble fiber
- insoluble fiber
- sugars
- sugar alcohol (for example, the sugar substitutes xylitol, mannitol and sorbitol)
- other carbohydrate (the difference between total carbohydrate and the sum of dietary fiber, sugars, and sugar alcohol if declared)
- protein
- vitamin A
- percent of vitamin A present as beta-carotene
- vitamin C
- calcium
- iron
- other essential vitamins and minerals

If a claim is made about any of the optional components, or if a food is fortified or enriched with any of them, nutrition information for these components becomes mandatory.

Nutrition Panel Format

The standard format called ‘Nutrition Facts’ must indicate per serving size, total calories, calories from fat, saturated fat, cholesterol, sodium, total carbohydrates, dietary fiber, sugars, protein, vitamin A, vitamin C, calcium and iron. For easy understanding, the values are generally given in grams for each nutrient and as a percentage of recommended daily allowance to help the consumer not only compare food quality for various alternatives available but also to decide the daily food intake to meet the daily dietary nutrition requirement. This helps to maintain consumers health and promote nutrition education.

All nutrients must be declared as percentages of the Daily Values which are label reference values. The amount, in grams or milligrams, of macronutrients (such as fat, cholesterol, sodium, carbohydrates, and protein) are still listed to the immediate right of these nutrients. But, for the first time, a column headed “% Daily Value” appears on the far right side.

Declaring nutrients as a percentage of the Daily Values is intended to prevent misinterpretations that arise with quantitative values. For example, a food with 140 milligrams (mg) of sodium could be mistaken for a high-sodium food because 140 is a relatively large number. In actuality, however, that amount represents less than 6 per cent of the Daily Value for sodium, which is 2,400 mg. On the other hand, a food with 5 g of saturated fat could be construed as being low in that nutrient. In fact, that food would provide one-fourth of the total Daily Value because 20 g is the Daily Value for saturated fat.

Nutrition Panel Footnote

The % Daily Value listing carries a footnote saying that the percentages are based on a 2,000-calorie diet. Some nutrition labels—at least those on larger packages—have these additional footnotes:

- a sentence noting that a person’s individual nutrient goals are based on his or her calorie needs; and
- lists of the daily values for selected nutrients for a 2,000- and a 2,500-calorie diet.

Nutrient Content Claims

The regulations also spell out what terms may be used to describe the level of a nutrient in a food and how they can be used. These are the core terms:

- **Free:** This term means that a product contains no amount of, or only trivial or “physiologically inconsequential” amounts of, one or more of these components: fat, saturated fat, cholesterol, sodium, sugars and calories. For example, “calorie-free” means fewer than 5 calories per serving, and “sugar-free” and “fat-free” both mean less than 0.5 g per serving. Synonyms for “free” include “without,” “no” and “zero.” A synonym for fat-free milk is “skim”.
- **Low:** This term can be used on foods that can be eaten frequently without exceeding dietary guidelines for one or more of these components: fat, saturated fat, cholesterol, sodium and calories. Thus, descriptors are defined as follows:
 - low-fat: 3 g or less per serving;
 - low-saturated fat: 1 g or less per serving;
 - low-sodium: 140 mg or less per serving;
 - very low sodium: 35 mg or less per serving;
 - low-cholesterol: 20 mg or less and 2 g or less of saturated fat per serving; and
 - low-calorie: 40 calories or less per serving.

Synonyms for low include “little,” “few,” “low source of,” and “contains a small amount of.”

- **Lean and extra lean:** These terms can be used to describe the fat content of meat, poultry, seafood and game meats.

- **Lean:** less than 10 g fat, 4.5 g or less saturated fat, and less than 95 mg cholesterol per serving and per 100 g.
- **Extra lean:** less than 5 g fat, less than 2 g saturated fat, and less than 95 mg cholesterol per serving and per 100 g.
- **High:** This term can be used if the food contains 20 per cent or more of the Daily Value for a particular nutrient in a serving.
- **Good Source:** This term means that one serving of a food contains 10 to 19 per cent of the Daily Value for a particular nutrient.
- **Reduced:** This term means that a nutritionally altered product contains at least 25 per cent less of a nutrient or of calories than the regular, or reference, product. However, a reduced claim can't be made on a product if its reference food already meets the requirement for a "low" claim.
- **Less:** This term means that a food, whether altered or not, contains 25 per cent less of a nutrient or of calories than the reference food. For example, pretzels that have 25 per cent less fat than potato chips could carry a "less" claim. "Fewer" is an acceptable synonym.
- **Light:** This descriptor can mean two things:
 - First, that a nutritionally altered product contains one-third fewer calories or half the fat of the reference food. If the food derives 50 per cent or more of its calories from fat, the reduction must be 50 per cent of the fat.
 - Second, that the sodium content of a low-calorie, low-fat food has been reduced by 50 per cent. In addition, "light in sodium" may be used on food in which the sodium content has been reduced by at least 50 per cent.

The term "light" still can be used to describe such properties as texture and color, as long as the label explains the intent—for example, "light brown sugar" and "light and fluffy."

- **More:** This term means that a serving of food, whether altered or not, contains a nutrient that is at least 10 per cent of the Daily Value more than the reference food. The 10 per cent of Daily Value also applies to "fortified," "enriched" and "added" "extra and plus" claims, but in those cases, the food must be altered.

14.5 TRACEABILITY RECORDS

Traceability

The ISO 9000:2000 guidelines define traceability as the "ability to trace the history, application or location of that which is under consideration". The ISO guidelines further specify that traceability may refer to the origin of the materials and parts, the processing history, and the distribution and location of the product after delivery. This definition of traceability is quite broad. It does not specify a standard measurement for "that which is under consideration" (a grain of wheat or a truckload), a standard location size (field, farm, or county), a list of processes that must be identified (pesticide applications or animal welfare), where the information is recorded (paper or electronic record, box, container or product itself), or a bookkeeping technology (pen and paper or computer).

Traceability is closely linked with product identification. It may relate to:

- the origin of materials and parts (food products and ingredients),

- the product processing history, and
- the distribution and location of the product after delivery.

Complete Traceability is Impossible

The definition of traceability is necessarily broad because traceability is a tool for achieving a number of different objectives. **The three dimensions of traceability systems viz. the breadth, depth and precision are influenced by the objectives to be achieved by the traceability system.**

Breadth describes the amount of information the traceability system records.

There is a lot to know about the food we eat, and a record keeping system cataloging all of a food's attributes would be enormous, unnecessary and expensive. Take for example, a cup of coffee. The beans could come from any number of countries; be grown with numerous pesticides or just a few; grown on huge corporate organic farms or small family-run conventional farms; harvested by children or by machines; stored in hygienic or pest-infested facilities; decaffeinated using a chemical solvent or hot water.

The depth of a traceability system is how far back or forward the system tracks.

In many cases, the depth of a system is largely determined by its breadth: once the firm or regulator has decided which attributes are worth tracking, the depth of the system is essentially determined. For example, a traceability system for decaffeinated coffee would only need to extend back to the processing stage. In other cases, the depth of the system is determined by quality or safety control points along with the supply chain e.g. a firm's traceability system for pathogen control may only need to extend to the last "kill" step—where product was treated, cooked, or irradiated.

Precision reflects the degree of assurance with which the tracing system can pinpoint a particular food product's movement or characteristics.

Precision is determined by the unit of analysis used in the system and the acceptable error rate. The unit of analysis, whether container, truck, crate, day of production, shift, or any other unit, is the tracking unit for the traceability system. Systems that have large tracking units, such as an entire feedlot or grain silo, will have poor precision in isolating safety or quality problems. Systems with smaller units, such as individual cows, will have greater precision.

What is a Lot ?

Product differentiation for tracking is achieved by breaking product flow into lots. Lots are the smallest quantity for which firms keep records. Firms may choose among an infinite array of unit sizes, shapes, or time, defining their own lot size by the quantity of product that fits in a container, that a forklift can move on a pallet, or that fills a truck. A lot may be an individual animal or group of animals, or production from an entire day or shift. In choosing lot size, firms typically consider a number of factors, including accounting procedures, production technologies, and transportation. As these factors vary within and among industries, lot size varies from plant to plant. There is no standard traceability unit. The size and shape of a lot is likely to change at each processing juncture. Consider an example : An apple packer-shipper may use accounting procedures to choose the incoming lot size. The shipper may receive apples from a number of growers and must pay each grower based on the type, size, and grade of the product. Since these attributes are known only after the apples have been sorted, each grower's apples need to be kept separate in the packing line. These accounting procedures thus influence the lot size of product entering the packing house.

Factors Influencing Costs / Benefits of Traceability

Factors Influencing Benefits

- 1) Value of coordination along the supply chain;
- 2) Market size;
- 3) Value of the food product;
- 4) Likelihood of safety or quality failures; and
- 5) Magnitude of penalty (loss of market, legal expenses, government fines).

Factors Influencing Costs

- 1) Breadth of traceability, the information to record;
- 2) Depth and the number of transactions;
- 3) Precision, size and exacting nature of the tracking units;
- 4) Degree of product transformation, complexity of the system;
- 5) New segregation or identity preservation activities;
- 6) New accounting systems and procedures; and
- 7) Technological difficulties of tracking.

Why have a Traceability System in your Business?

Each business has a role to play in collecting, collating and storing information about ingredients, products and processes under their control, thereby facilitating traceability through the whole food chain - from 'farm to fork'. In addition to meeting regulatory demands, traceability systems have three main roles within business:

- 1) To provide information within your business to assist in process control and management e.g. stock control, efficiency of material usage and quality control;
- 2) To assist you when problems arise. Traceability systems are important to support effective withdrawal or recall of products. They can also allow detection of the cause of a problem so that you can take targeted action to prevent recurrence; and
- 3) To help you support claims about your product and provide information to consumers. Traceability systems are important to authenticate marketing claims that cannot be supported by analysis e.g. relating to origin or assurance status.

Key Traceability Steps in the Manufacturing Process

1) When Goods are Received

At this point your records form a critical traceability link in the food chain and your recording system links up with that of your supplier.

Key Records

- 1) **From whom** : Name and address of supplier and/or transporter.
- 2) **When** : Date and time on which goods were received.
- 3) **What exactly you have received** : Identity of food / feed and the quantity.
- 4) **What you did with the goods as received** : Added to Store A, mixed with Delivery B etc.

Factors which may Need to be Addressed:

- 1) New deliveries used to top up a single store e.g. a tank of oil or silo of flour;
- 2) Deliveries or collections when no-one is on site;
- 3) Difficulties in getting the right information or poor information from suppliers; and
- 4) Limitations on the information that can be obtained where basic raw materials are used.

2) Inside a Food or Feed Business

Can you make the links between the products you have received and the goods or finished products you have sent out? The size of the unit chosen for traceability will affect the size of any withdrawal required. The unit may for example cover a single production unit or a period of time in a continuous process.

Key Records

Made where goods are separated, changed or combined together. The number of points you will need to take records to create the link depends on your processes.

- 1) **From what :** The ingredients used.
- 2) **When :** Keeping a note of the date/time at which the transformation happened.
- 3) **What is created :** The new identity of the 'in process' unit.
- 4) **Product identification :** New products must be described and linked to your records by batch or lot number in an appropriate way.

Factors which may Need to be Addressed :

- 1) Continuous processing with no obvious breaks.
- 2) Transfers between continuous and batch processing operations.
- 3) Rework.
- 4) Lag times for liquids and solids carried in pipes .

3) When Goods are Dispatched

The products may leave your control, but not necessarily your liability.

Key Records

- 1) **To whom :** To whom you have dispatched and the destination of products.
- 2) **What you have supplied :** Identity and quantity of goods you have supplied.
- 3) **When :** The date and time when goods were dispatched and received.

Where possible make it easy for your customers to link your identity number, as well as any information about the goods into their recording system. Discussions between suppliers and purchasers are important to identify critical information to ensure the traceability chain remains in place.

When the System is in Place

Who has Access to my Records?

The data you collect is your information. However, in the event of a problem, assess whether the issue is specific to your products or of wider interest to the food chain. Notify enforcement authorities if products do not meet safety requirements, and it is necessary to withdraw and / or recall such products.

How Long to Keep the Records?

For some sectors, there are specific legal requirements to keep some records for a minimum period. You also need to consider the shelf life of the products you or your customers sell and the likelihood that they will be stored by consumers.

Check it Out

- 1) Check regularly that the traceability system is working effectively, by checking the accuracy of the information and time taken to retrieve traceability data.
- 2) Check the system both backwards and forwards i.e. tracing a batch of ingredients forwards as well as products backwards.
- 3) Carry out a mock traceability exercise regularly in conjunction with product recall / withdrawal test exercises.

Enforcement officers, trading partners, or customers might be happy to help you out and create 'practice' problems to check that information can be put together quickly and reliably. Consider using a third party to do an independent check; it is in your interest that the systems work well.

Check Your Progress Exercise 1



Note: a) Use the space below for your answers.

b) Compare your answers with those given at the end of the unit.

- 1) What are the broad-level crucial practices to be followed in a retail organisation?

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- 2) State three areas to be addressed in a meat retail organisation from GRP point of view?

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- 3) State three categories of GTP hazards and their brief contents?

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4) State four elements of documents and records to be maintained w.r.t. GTP by a transporter?

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5) State briefly the purpose of nutrition labelling as per Codex guidelines?

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6) What are nutrition facts required to be declared on food package in USA?

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7) State five factors influencing cost of traceability?

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8) State the three main roles played by the traceability system in an organisation?

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14.6 LET US SUM UP

Once a food item is processed the journey towards the consumption starts. In this journey all interested parties have to consider the associated hazards, the associated risk profile w.r.t. transport to wholesaler and / or retailer, ensuring that good retail practices are followed at retailer end, the consumer is adequately guided about the nutrient contents as per the regulations and in the event of necessity for withdrawal or recall, a robust traceability system is in place. The purpose of the guidelines published by Codex Alimentarius commission on nutrition labelling is:

- i) To ensure that nutrition labelling is effective in :
 - providing the consumer with information about a food so that a wise choice of food can be made;

- providing a means for conveying information of the nutrient content of a food on the label;
 - encouraging the use of sound nutrition principles in the formulation of foods which would benefit public health; and
 - providing the opportunity to include supplementary nutrition information on the label.
- ii) To ensure that nutrition labelling does not describe a product or present information about it which is in any way false, misleading, deceptive or insignificant in any manner.
- iii) To ensure that no nutritional claims are made without nutrition labelling .

Traceability system has three main roles within business: 1) To provide information within your business to assist in process control and management e.g. stock control, efficiency of material usage and quality control. 2) To assist you when problems arise. Traceability systems are important to support effective withdrawal or recall of products. They can also allow detection of the cause of a problem so that you can take targeted action to prevent recurrence. 3) To help you support claims about your product and provide information to consumers. Traceability systems are important to authenticate marketing claims that cannot be supported by analysis e.g. relating to origin or assurance status

14.7 KEY WORDS

- Nutrition Labelling** : A description intended to inform the consumer of nutritional properties of a food.
Nutrition labelling consists of two components:
a) nutrient declaration; and
b) supplementary nutrition information.
- Nutrition Declaration** : means a standardized statement or listing of the nutrient content of a food.
- Nutrition Claim** : means any representation which states, suggests or implies that a food has particular nutritional properties including but not limited to the energy value and to the content of protein, fat and carbohydrates, as well as the content of vitamins and minerals. The following do not constitute nutrition claims:
a) the mention of substances in the list of ingredients;
b) the mention of nutrients as a mandatory part of nutrition labelling; and
c) quantitative or qualitative declaration of certain nutrients or ingredients on the label if required by national legislation.
- Nutrient Content Claim** : A nutrition claim that describes the level of a nutrient contained in a food.
(Examples: “source of calcium”; “high in fibre and low in fat”);).

Health Claim	:	means any representation that states, suggests, or implies that a relationship exists between a food or a constituent of that food and health.
Food Transportation Unit:		Includes food transport vehicles or contact receptacles (such as containers, boxes, bins, bulk tanks) in vehicles, aircraft, railcars, trailers and ships and any other transport receptacles in which food is transported.
Bulk	:	Means unpacked food in direct contact with the contact surface of the food transportation unit and the atmosphere (for example, powdered, granulated or liquid form).
Semi-packed Food	:	Semi-packed food is a food which might come in direct contact with the food transportation unit or the atmosphere (e.g. vegetables and food in crates and bags).
Traceability	:	The ability to follow the movement of a food through specified stage(s) of production, processing and distribution.



14.8 ANSWERS TO CHECK YOUR PROGRESS EXERCISE

Your answer should include following points:

Check Your Progress Exercise 1

- 1) 1) Time and Temperature Controls (including cooking temperature, cooling time, cold holding, hot holding).
 - 2) Food Storage Conditions (potential for cross-contamination).
 - 3) Training and Certification of Managers.
 - 4) Cleaning and Sanitation Practices.
- 2) 1) Receiving (approved sources, labelling, trailer inspection, product inspection, pest control).
 - 2) Storage (storage condition, box placement, storage temperature, FIFO, freezer condition).
 - 3) Fabrication (meat contact surfaces, product inspection, employee hygiene, operational sanitation, pest control).
- 3) 1) Hazards related to the food transportation unit :
 - a) Unsuitability of the construction material and coating, lack of sealing/locking device.
 - b) Residues of previous cargoes, residues from cleaning and sanitizing materials.
- 2) Hazards related to loading and unloading:
 - a) Increase/decrease of temperature of the food.
 - b) Undesirable introduction of microbes, dust, moisture, or other physical contamination.

- 3) Hazards related to transport
 - a) Leakage of heating/ cooling fluid.
 - b) Break down of temperature control.
- 4)
 - 1) Food transportation unit number
 - 2) Registration of previous loads
 - 3) Temperature / time recordings
 - 4) Cleaning certificates
- 5)
 - 1) To ensure that nutrition labelling is effective:
 - in providing the consumer with information about a food so that a wise choice of food can be made; and
 - in providing a means for conveying information of the nutrient content of a food on the label.
 - 2) To ensure that nutrition labelling does not describe a product or present information about it which is in any way false, misleading, deceptive or insignificant in any manner.
 - 3) To ensure that no nutritional claims are made without nutrition labelling . It is based on the following principles of nutrition labelling.
- 6)
 - 1) Total calories
 - 2) Calories from fat
 - 3) Total fat
 - 4) Saturated fat
 - 5) Cholesterol
 - 6) Sodium
 - 7) Total carbohydrate
 - 8) Dietary fiber
 - 9) Sugars
 - 10) Protein
 - 11) Vitamin A
 - 12) Vitamin C
 - 13) Calcium
 - 14) Iron
- 7)
 - 1) Breadth of traceability, the information to record
 - 2) Depth and the number of transactions
 - 3) Precision, size and exact nature of the tracking units
 - 4) Degree of product transformation, complexity of the system
 - 5) New segregation or identity preservation activities
- 8)
 - 1) To provide information within your business to assist in process control and management e.g. stock control, efficiency of material usage and quality control.

- 2) To assist you when problems arise. Traceability systems are important to support effective withdrawal or recall of products. They can also allow detection of the cause of a problem so that you can take targeted action to prevent recurrence.
- 3) To help you support claims about your product and provide information to consumers. Traceability systems are important to authenticate marketing claims that cannot be supported by analysis e.g. relating to origin or assurance status.

14.9 SUGGESTED READING

American Meat Institute (AMI) (<http://www.meatami.org>)

Code of Hygienic Practice for the Transport of Food (CAC/RCP 47-2001)

Food Drug Administration (FDA) (<http://www.fda.gov/>)

Food Marketing Association (FMI) (<http://www.fmi.org>)

Grocery Manufacturers of America (GMA) (<http://www.gmabrands.com>)

International Association for Food Protection (IAFP) (<http://www.foodprotection.org>)

National Food Processors Organisation (NFPA) (<http://www.nfpa-food.org>)

National Food Safety Information Network (<http://vm.cfsan.fda.gov>)

National Restaurant Association (NRA) (<http://restaurant.org>)

U.S. Department of Agriculture (USDA) (<http://www.fsis.usda.gov/>)