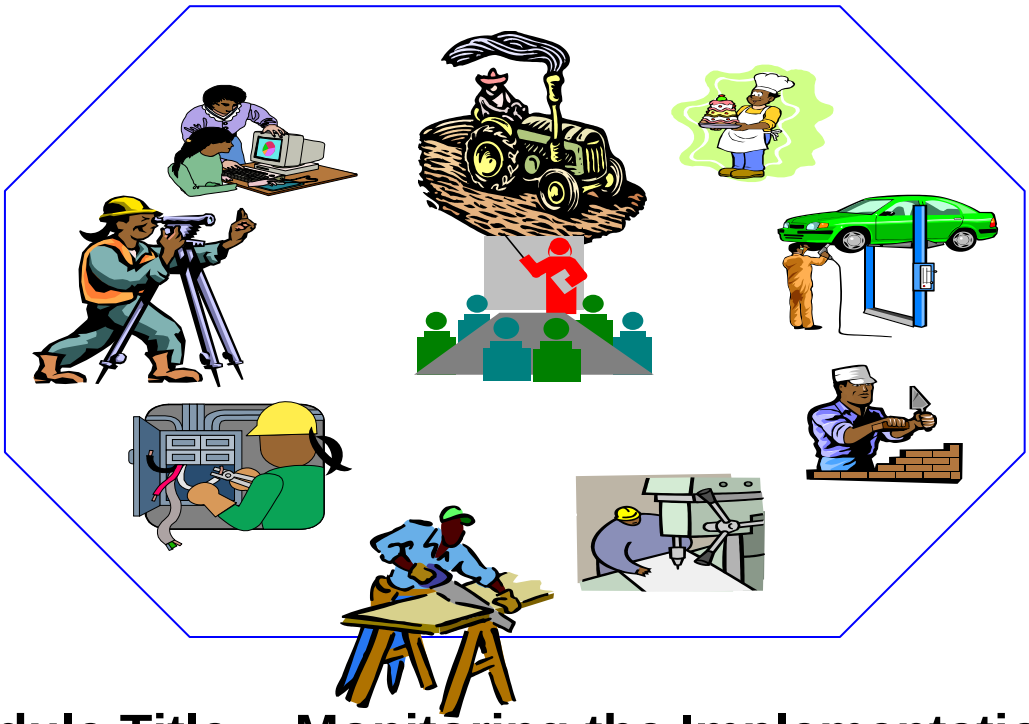
Edible Oil and Fats Processing

Level - III

Based on October 2019, Version 2 OS and March. 2021, V1 Curriculum



Module Title: - Monitoring the Implementation of Quality and Food Safety Programs

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LG #22	LO #1- Ensure others in the work area are able to meet quality and food safety requirements

Instruction sheet

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

- Identifying hazards and making risk control procedures
- Making available Hazard control equipment and fitting correctly
- Making food safety/quality responsibilities and communicate to other
- Using food safety hazards and quality control measures
- Making, monitoring and coaching implement quality and safe food handling procedures**.**
- Identifying and addressing training needs

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:

- identify hazards and making risk control procedures
- Make available Hazard control equipment and fitting correctly
- Make food safety/quality responsibilities and communicate to other
- Use food safety hazards and quality control measures
- Make, monitor and coach implement quality and safe food handling procedures**.**
- Identify and addressee training needs

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
4. Accomplish the Self-checks
5. Perform Operation Sheets
6. Do the “LAP test

Information Sheet 1- Identifying hazards and making the outcomes of risk assessment and risk control procedures

1.1 Introduction

Food safety hazard refers to any agent with the potential to cause adverse health consequences for consumers.

1.2 Definitions

- **Food hygiene:** All conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain.
- **Food safety:** Assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use
- **Risk:** The probability of causing an adverse health effect caused by the occurrence and the severity of a particular hazard in food when prepared and consumed according to its intended use.
- **Pre-Requisite Program (PRP):** Any specified and documented activity or facility implemented in accordance with the Codex General Principles of food hygiene, good manufacturing practice and appropriate food legislation, in order to establish basic conditions that are suitable for the production and handling of safe food at all stages of the food chain.
- **Hazard:** Anything (e.g. condition, situation, practice, behavior) that has the potential to cause harm, including injury, disease, death, environmental, property and equipment damage.

1.3 Identifying Food Safety Hazards

Hazard Identification: This is the process of examining each work area and work task for the purpose of identifying all the hazards which are “inherent in the job”. Work areas include but are not limited to machine workshops, laboratories, office areas, Tasks can include (but may not be limited to) using screen based equipment, audio and visual equipment, industrial equipment, hazardous substances and/or

teaching/dealing with people, driving a vehicle, dealing with emergency situations, construction. Food hazards are:

- Biological,
- Chemical,
- Physical,
- Allergenic,
- Nutritional

Biological hazard is perhaps the one that requires the highest level of caution due to the existence of micro-organisms that can multiply very rapidly in the absence of the correct conditions of thermal treatment, storage etc.

Chemical hazards include toxins from natural sources (like Roman Emperor Claudius dying from the toxins produced by his dish of poisonous mushrooms) and chemical contaminants. For example, over consuming mercury in your diet can lead to heavy metal poisoning resulting in brain and liver malfunctions.

Food allergens are also considered a chemical hazard. People with food allergies have immune responses to antigens (small proteins in foods) in foods. The major food allergies include soy, peanuts, tree nuts, shellfish, and fish. If you have a food allergy, it is essential always to be prepared, for cross-contamination

Physical hazards include fragments of broken manufacturing equipment, broken glass, plastic shards, and metal shavings. Manufacturers have to be extra vigilant when producing food products. For example, millers of wheat flour implement numerous screening methods to ensure harmful physical contaminants like broken glass and metal shards not to enter their flour products. In a flour mill I toured, there were four separate magnetic screens throughout the first phase of wheat kernel cleaning process to catch any metals that may have entered into the facility or fallen off of equipment. The hazard identification is based on:

- Sufficient knowledge and experience of a food safety team.

- The preliminary information like Food safety, Product Characteristics, (raw material, ingredients end products), intended use, flow diagrams, description of process steps and control measures.
- External information including to the extent possible and other historical data.

- Information obtained from the food chain on food safety hazards that may be related to the safety of the end products, intermediate products and the food at consumption

1.4 Making the outcomes of risk assessment and risk control procedures

After identifying all the significant biological, chemical and physical hazards for each processing step and each ingredient, all the preventive measure shall be identified to prevent hazards from compromising the safety of the finished product.

- Some of the measures which can be used to prevent chemical hazards are:
  - ✓ Use of only approved chemicals.
  - ✓ Having detailed product specifications for chemicals entering the plant. Maintenance of letters of guarantee from suppliers.
  - ✓ Inspection of trucks used to ship finished product.
  - ✓ Proper labelling and storage of all chemicals.
  - ✓ Proper training of employees who handle chemicals.
- Measures that can be taken to prevent physical hazards include:
  - ✓ Making sure the plant specifications for building design and operation are accurate and updated regularly.
  - ✓ Making sure the letters of guarantee for ingredients and product supplies are accurate and updated regularly.
  - ✓ Performing random visual examinations of incoming product and materials. Use of magnets and metal detectors to help find metal fragments.
  - ✓ Keeping equipment well maintained.
  - ✓ Training of employees to identify potential problems.

- Some of the measures to control biological hazards include:
  - ✓ Following Good Manufacturing Practices (GMP) and Good Hygienic Practices (GHP).
  - ✓ Proper maintenance and operation of equipment used to perform tasks.
  - ✓ Rinsing of food contact surfaces on equipment with disinfectant and water.

- Model safe food handling and quality practices and procedures to achieve required outcomes, including demonstrating

  - ✓ Work procedures that meet the requirements of quality and food safety
  - ✓ Cleaning and sanitizing equipment
  - ✓ Sampling and testing as appropriate according to quality and food safety requirements
  - ✓ Maintaining personal hygiene
  - ✓ Wearing appropriate clothing and footwear as required by the work task
  - ✓ Following procedures when moving within and between work areas
  - ✓ Reporting health conditions and illnesses according to workplace procedures

Handling, cleaning and storing equipment, utensils and packaging materials as appropriate

Self-Check 1	Written Test

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

I Write the correct answer

1. Define hazard analysis (2 point)
2. Define food safety hazard (2point)
3. What are food safety hazard? (2 point)

II Say true if the sentence is correct

4. Physical hazards include fragments of broken manufacturing equipment, broken glass, plastic shards, and metal shavings. (2 point)
5. Chemical hazards are typically the cause of foodborne illnesses. (2 point)

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

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

Information Sheet 2- Making available, functioning and fitting correctly hazard control, clothing and equipment

2.1 Fitting correctly hazard control, clothing and equipment

Personal protective equipment (PPE) is gear or clothing used to protect the wearer from specific hazards and hazardous materials. It is the final protection system to be used when administrative and engineering controls do not reduce risk to an acceptable level. PPE does not reduce or eliminate the hazard but only protects the wearer. See the Workplace Safety PPE page for more general information.

- **I** Face and eye protection
- **II** Lab coats and aprons
- **III** Gloves
- **IV** Foot protection
- **V** Respiratory protection

I Face and eye protection

Figure 1 Face and eye protection

Selecting the most suitable eye and face protection should take into consideration the following elements:

- Ability to protect against specific workplace hazards
- Should fit properly and be reasonably comfortable to wear
- Should provide unrestricted vision and movement
- Should be durable and cleanable
- Should allow unrestricted functioning of any other required PPE

II Lab coats and Aprons

Wear protective clothing that resists physical and chemical hazards when exposure may occur. Lab coats are appropriate for minor chemical splashes and solids contamination, while plastic or rubber aprons are best for protection from corrosive or irritating liquids. Disposable outer garments may be useful when cleaning and decontamination of reusable clothing is difficult.

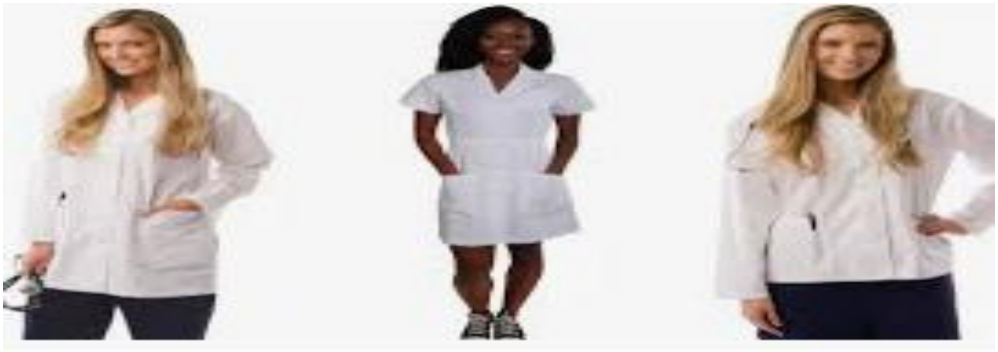

Figure 2 Lab coats and aprons

- Lab coats
- Cotton
- Synthetic
- Flame retardant materials (Nomex)
- Flame resistant treated materials
- Rubberized

III Gloves

Wear gloves protect against skin absorption of chemicals, chemical burns, thermal burns, lacerations, and cryogenic liquid exposure. Choosing the appropriate hand protection can be a challenge in a laboratory setting.

Wear gloves when handling hazardous materials, chemicals of unknown toxicity, corrosive materials, rough or sharp-edged objects, and very hot or very cold materials. Disposable nitrile or neoprene gloves are usually appropriate as protection from

incidental splashes or contact with lab chemicals. However, the SDS should be consulted to verify chemical compatibility with the gloves being used.

When working with chemicals with high acute toxicity, working with corrosives in high concentrations, handling chemicals for extended periods of time or immersing all or part of a hand into a chemical, the appropriate glove material should be selected, based on chemical and task compatibility.

- Glove Selection
- Consider the following when selecting a glove:
- Degradation rating
- Breakthrough time
- Permeation rate

IV Foot Protection

Wear closed-toe shoes at all times in buildings where chemicals are stored or used. Do not wear perforated shoes, sandals or cloth sneakers in laboratories or where mechanical work is conducted. These shoes offer no barrier between you and chemical and physical hazards.

Chemical resistant overshoes or boots may be used to avoid possible exposure to corrosive chemical or large quantities of solvents or water that might penetrate normal footwear (e.g., during spill clean-up). Leather shoes tend to absorb chemicals and may have to be discarded if contaminated with a hazardous material.

Although generally not required in most laboratories, steel-toed safety shoes may be necessary when there is a risk of heavy objects falling or rolling onto the feet, such as in bottle-washing operations or animal care facilities.

Figure 3 Foot protection

2.2 Function of hazard control clothing and equipment

The purpose of hazard control clothing and equipment is to reduce employee exposure to hazards when industrial controls and administrative controls are not feasible or effective to reduce these risks to acceptable levels.

Self-Check 2	Written Test

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

Write the correct answer

1. Define Personal protective equipment (2 point)
2. List at least five PPE (4point)

Say true if the sentence is correct

3. Peoples can wear perforated shoes, sandals or cloth sneakers in laboratories (2 point)
4. Wear closed-toe shoes at all times in buildings where chemicals are stored or used. (2 point)

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

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

Information Sheet 3- Making current, accessible and communicating on food safety/quality responsibilities and procedures

3.1 Making current, accessible and communicating on food safety.

Risk communication is the exchange of information and opinions concerning risk and risk-related factors among risk assessors, risk managers, consumers and other interested parties.it are an essential component of risk analysis; in the context of food safety it is utilized to support the exchange of information and opinions on food safety risks and related factors among relevant stakeholders. The stakeholders include

- Governments,
- Consumers,
- Industry,
- Ngos,
- Academia,
- Media and others.

Risk communication can enable people to make informed decisions, facilitate mutual understanding among stakeholders and frequently inform and enhance risk assessment and risk management.

3.2 Food safety risk communication important

Many people are exposed to food safety hazards and risks on a daily basis, in both developing and developed countries. The frequency and extent of exposure depend on the controls implemented across the food chain, the dietary habits of consumers and the access to and availability of food supplies in the local environment. Effective food safety risk communication can improve:

- People’s physical well-being;
- Consumers’ trust in the food supply and in the regulatory systems;
- The environment in which we live (animal, environment and plant health);
- People’s overall quality of life, including socio-economic factors such as livelihoods and psychological factors.

The need for effective food safety risk communication is underpinned by the ethical need to ensure that society is protected from food safety risks to the greatest extent possible.

Food safety risk communication is used to facilitate understanding and dialogue among all stakeholders, including consumers, about food safety issues. When possible, food safety risk communication should involve interaction among all those concerned with the risk communication process. It is important to engage in a two-way dialogue with those exposed and vulnerable to the risk, people who may influence and control the risk, other affected or interested stakeholders, and the public in general.

Dialogue with stakeholders offers the chance to obtain relevant information for risk communication decisions. For the development and delivery of effective. food safety risk communication, it is essential to understand the information needs of target audiences. This enables risk communication messages to be tailored to target audiences, thereby maximizing their effectiveness and dissemination. Dialogue with stakeholders may also provide decision-makers with vital or additional relevant information for risk assessments and/or management, and increase the likelihood that decisions are fit for purpose.

Self-Check 3	Written Test

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

Write the correct answer

1 Define risk communication (2 point)

2 Define risk management (2point)

3 What is food safety risk communication important? (2 point)

Say true if the sentence is correct

4 Risk assessment is the process that is used to estimate and characterize risk, quantitatively or qualitatively. (2 point)

5 Risk communication is the exchange of information and opinions concerning risk and risk-related factors. (2 point)

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

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

Information Sheet 4- Using food safety hazards and quality control measures

4.1 Definitions

CCP Decision Tree: A sequence of questions to assist in determining whether a control point is a CCP.

Control:

- To manage the conditions of an operation to maintain compliance with established criteria.
- The state where correct procedures are being followed and criteria are being met.

Control Measure: Any action or activity that can be used to prevent, eliminate or reduce a significant hazard.

Control Point: Any step at which biological, chemical, or physical factors can be controlled.

Corrective Action: Procedures followed when a deviation occurs.

Criterion: A requirement on which a judgment or decision can be based.

Critical Control Point: A step at which control can be applied and is essential to prevent or eliminate a food safety hazard or reduce it to an acceptable level.

Critical Limit: A maximum and/or minimum value to which a biological, chemical or physical parameter must be controlled at a CCP to prevent, eliminate or reduce to an acceptable level the occurrence of a food safety hazard.

Deviation: Failure to meet a critical limit.

HACCP: A systematic approach to the identification, evaluation, and control of food safety hazards.

HACCP Plan: The written document which is based upon the principles of HACCP and which delineates the procedures to be followed.

HACCP System: The result of the implementation of the HACCP Plan.

HACCP Team: The group of people who are responsible for developing, implementing and maintaining the HACCP system.

4.2 Quality control measures by HACCP principles

There are seven universally accepted HACCP principles. Every country that uses HACCP follows these principles.

Principle 1: Hazard analysis a plan is laid out to identify all possible food safety hazards that could cause a product to be unsafe for consumption and the measures that can be taken to control those hazards. For example, at the cooking step of the production process, one of the identified hazards is the survival of pathogens due to inadequate cooking time or temperature.

Principle 2: Identifying critical control points critical control points are the points in the production process where an action can be taken to prevent, eliminate, or reduce a food safety hazard to an acceptable level. For example, the cooking step is considered a critical control point because control measures are necessary to deal with the hazard of pathogens surviving the cooking process.

Principle 3: Establishing critical limits for each critical control point A critical limit is the limit at which a hazard is acceptable without compromising food safety. For example, critical limits at the cooking stage include specific time and temperature for cooking the product.

Principle 4: Establishing monitoring procedures for critical control points highly detailed monitoring activities are essential to make sure the process continues to operate safely and within the critical limits at each critical control point. For example, monitoring procedures at a cooking critical control point could include taking the internal temperature of the product with a specialized thermometer.

Principle 5: Establishing corrective actions must be taken to bring the production process back on track if monitoring indicates that deviation from critical limits has Occurred. In food production, correcting problems before end-stage production is far more effective than waiting until a product is finished to test it.

For example: If the required internal temperature has not been reached, a corrective action would require that the product be cooked further. If the cooking temperature cannot be reached, another corrective action would call for the product to be held and destroyed.

Principle 6: Establishing verification procedures verification means applying methods, procedures, tests, sampling and other evaluations (in addition to monitoring) to determine whether a control measure at a critical control point is or has been operating as intended. Verification activities also ensure that the monitoring and the corrective actions are done according to a company's written HACCP program. For example, testing and calibrating thermometers is a verification procedure that is important to ensure accurate readings. The easiest way to test a thermometer's accuracy is by submerging the probe into a pot of boiling water. If it does not read 100˚C (212˚F) then the thermometer must be adjusted to read the correct temperature.

Principle 7: Record keeping the company must keep records to demonstrate the effective application of the critical control points and assist with official verification (which is done in Canada by the Canadian Food Inspection Agency). Records must be established to document the monitoring and verification results as well as all information and actions taken in response to any deviations found through monitoring and verification. For example, the employee responsible for monitoring a cooking critical control point completes a cooking log sheet. This sheet includes the date, the start and finish time, the temperature, and the employee's signature. If a deviation has occurred in the production process, the responsible employee records the details in a deviation log book.

4.3 Guidelines for application of HACCP principles

HACCP is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product.

For successful implementation of a HACCP plan, management must be strongly committed to the HACCP concept. A firm commitment to HACCP by top management provides company employees with a sense of the importance of producing safe food.

HACCP is designed for use in all segments of the food industry from growing, harvesting, processing, manufacturing, distributing, and merchandising to preparing food for consumption. Prerequisite programs such as current Good Manufacturing Practices (CGMP) are an essential foundation for the development and implementation of successful HACCP plans. Food safety systems based on the HACCP principles have been successfully applied in food processing plants, retail food stores, and food service operations. The seven principles of HACCP have been universally accepted by government agencies, trade associations and the food industry around the world.

The following guidelines will facilitate the development and implementation of effective HACCP plans. While the specific application of HACCP to manufacturing facilities is emphasized here, these guidelines should be applied as appropriate to each segment of the food industry under consideration.

4.4 Benefit of food safety

- Science based and systematic
- It focuses on those critical points in food processing and handling required for safe food production
- Requires the implementation of measures to control hazards where significant
- Employs the principle of risk assessment allowing prevention to be based on the control program rather than inspection and testing

- Better use of resources
- Standardization of hazard management allowing for easier auditing and inspection by second and third parties
- Proactive approach to food safety which is internationally recognized
- Increases customer and consumer confidence
- Maintaining or increasing market access
- Reduce costs through reduction of product losses and rework
- Reduce risks of recalls and product withdrawals thus reducing costs associated with insurance and business liability protection
- Increase focus and ownership of food safety
- Simplify inspections primarily because of record keeping and documentation
- Provide consistent quality product
- Demonstrates conformance to the product requirements and regulations

Self-Check 4	Written Test

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

Write the correct answer

1 Define critical Control Point (2 point)

2 Define HACCP (2point)

3 What is benefit of food safety? (2 point)

Say true if the sentence is correct

4 Control Point means any step at which biological, chemical, or physical factors can be controlled. (2 point)

5 HACCP System means the result of the implementation of the HACCP Plan (2 point)

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

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

Information Sheet 5- Making available monitoring and coaching support to implement quality and safe food handling procedures

5.1 Definition

Cleaning - the removal of soil, food residue, dirt, grease or other objectionable matter.

Contaminant - any biological or chemical agent, foreign matter, or other substances not intentionally added to food which may compromise food safety or suitability.

Contamination - the introduction or occurrence of a contaminant in food or food environment.

Disinfection - the reduction, by means of chemical agents and/or physical methods, of the number of microorganisms in the environment, to a level that does not compromise food safety or suitability.

Establishment - any building or area in which food is handled and the surroundings under the control of the same management.

Food hygiene - all conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain.

5.2 Making safe food handling procedures

Safe food handling and quality practices and procedures to achieve required outcomes, including demonstrating:

- Cleaning and sanitizing equipment
- Sampling and testing as appropriate according to quality and food safety requirements
- Maintaining personal hygiene
- Wearing appropriate clothing and footwear as required by the work task
- Following procedures when moving within and between work areas
- Reporting health conditions and illnesses according to workplace procedures
- Handling, cleaning and storing equipment, utensils and packaging materials as appropriate

Self-Check 5	Written Test

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

Write the correct answer

1 Define critical Control Point (2 point)

2 Define Contamination (2point)

3 Write safe food handling procedures? (2 point)

Say true if the sentence is correct

4 Food hygiene all conditions and measures necessary to ensure the safety and suitability of food at all stages of the food chain.. (2 point)

5 Contamination means the reduction by means of chemical agents and/or physical methods (2 point)

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

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

6.1 Identifying and addressing training needs

Inadequate hygiene training, and/or instruction and supervision of all people involved in food related activities pose a potential threat to the safety of food and its suitability for consumption. Those engaged in food operations come directly or indirectly into contact with food should be trained, and/or instructed in food hygiene to a level appropriate to the operations they are to perform.

Factors to take into account in assessing the level of training required include:

- The nature of the food, in particular its ability to sustain growth of pathogenic or spoilage microorganisms;
- The manner in which the food is handled and packed, including the probability of contamination;
- The extent and nature of processing or further preparation before final consumption;
- The conditions under which the food will be stored; and
- The expected length of time before consumption.

6.2 Purpose of training

- To enhance performance,
- To increase technical knowledge
- To develop skills in matters related to food control and nutrition has been and continues to be a primary role of the food quality and standards service.

Training programmes on a full range of food control subjects including:

- Food inspection,
- Food control programme management,
- Laboratory management and good manufacturing practices.

Self-Check 6	Written Test

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

Write the correct answer

1 What are training programmes on a full range of food control subjects (2point)

2 What is purpose of training? (2 point)

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

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

Operation sheet 1 procedures for food safety and quality implementation

Objectives; to know for food safety and quality implementation

Material required; sanitizer, hot water, cold water, brush, sponge and alcohol etc.

Equipment required; PPE, tanks, pumps, centrifugal separators, mixer, heat exchanger and autoclave etc.

Following the steps outlined below will help ensure for food safety and quality implementation will be successful.

Steps

1. Wear appropriate clothing and footwear as required by the work task
2. Maintain personal hygiene
3. Clean and sanitize equipment
4. Sampling and testing food safety and quality
5. Identify the risk of food quality
6. Apply HCCP
7. Report workplace procedures
8. Record of quality and food safety information

LAP Test	Practical Demonstration

Name…… ID…… Date……

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 10 hour. The project is expected from each student to do it.

Task1 Conduct hazard critical control point (HCCP).

LG #23	LO #2- Monitor observance of quality standards and food safety programs in the work area

Instruction sheet

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

- Defining , documenting and following work place information
- Identifying , reporting and addressing deviation from identified procedures
- Consistence of personal behavior with workplace policies and procedures
- Identifying and reporting food safety hazards and/or non-conformity
- Recording food safety and quality information
- Maintaining the work area to good hygienic practice.

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:

- Define, document and follow work place information
- Identify , report and address deviation from identified procedures
- Consistence of personal behavior with workplace policies and procedures
- Identify and report food safety hazards and/or non-conformity
- Record food safety and quality information
- Maintain the work area to good hygienic practice.

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
4. Accomplish the Self-checks

Information Sheet 1-Defining, documenting and following work place information

1.1 Documentation in the Workplace

Maintaining a system of organized, accurate and consistent documentation in the workplace is both necessary and beneficial. Making documentation a priority, especially when it comes to the company's HR department, can help mitigate disputes, offer resources when they are needed and answer important questions about the company.

Documentation refers to a set of records that exist online, on paper or hard drives. It is material that provides evidence or information to serve as a record. In the workplace, documentation is retained records of employment and company actions and events as required by legal mandates and company policy. Following work place information is:

- Food safety and quality policies and programs
- Standard operating procedures (sops)
- Specifications
- Log sheets
- Written or verbal instruction incorporating food safety and quality requirements

1.2 Food safety and quality policies and programs

A food safety policy is important to the development of an improved food safety programme as it provides the overarching framework and principles that will guide the requisite interventions. The policy will cover all aspects of national, regional, and international practices, principles, guidelines, standards and agreements governing food safety systems. The policy shall include all public and private entities involved in the technical, operational and management aspects of food safety and control systems

in the country. Since food safety activities are fragmented in the Maldives, it is important to clearly define role and responsibility of each institution to avoid duplication of efforts and overlapping of functions. The policy will identify gaps in technical and institutional capacity such as handling, transport, storage of food throughout the food chain and residue monitoring programme

1.3 Standard Operating Procedures (SOPs)

Standard operating procedures cover all areas of production and support functions, which contribute to the production (and safety) of the final product. Standard operating procedures must comply with the Food Safety Standards and any relevant industry codes. They give staff clear direction for following sound hygiene procedures and often have associated check sheets that provide a range of data.

The Standard operating procedure identifies:

- The staff responsible for the activity (e.g. receiver and stores staff)
- The nature of their responsibilities (e.g. to ensure acceptable goods are received and nonconforming goods returned following correct procedures)
- Check sheets or reporting sheets that must be completed as part of the procedure.

Standard operating procedures may include:

- Cleaning schedules
- Pest control programs
- Maintenance schedules
- Calibration of equipment
- Supplier standards
- Staff training schedules.

Examples of these SOPs can be found at the end of this document.

1.3.1 Cleaning schedules

The basis of clean premises is a regular cleaning program, sometimes referred to as a cleaning schedule or a cleaning plan. This means guidelines or a schedule of tasks in writing — which cover all cleaning needs and which every member of staff can understand and follow.

The cleaning schedule identifies the best method of cleaning and equipment needed for the task. Monitoring and reporting sheets associated with the cleaning schedule will provide data showing how well the schedule is working.

1.3.2 Pest control programs

Pest control programs are planned and documented and should contain information about the methods of treatment, the frequency of treatment, what pests and areas were treated, and which chemicals were used.

1.3.3 Maintenance schedules

Regular maintenance is important, as it will ensure that all areas of the premises and all equipment are in working order. Regular maintenance also enables all the related policies and procedures to operate effectively. For example: If cracked and damaged floor tiles are replaced, it will enable effective cleaning of the floors and stop pests in the kitchen area

1.3.4 Calibration of equipment

Equipment calibration is required to ensure all equipment fitted with thermostats is working accurately. A fridge gauge might read 4°C, but it could be operating at 8°C if the gauge is faulty. Regular calibration would reduce the likelihood of this happening. Equipment that needs calibration includes:

- Hand held thermometers
- Refrigeration equipment
- Freezers
- Hot boxes
- Salad bars
- Sandwich bars
- Bain-maries
- Ovens

- Dishwashers and glass washers

1.4 Specifications

Food safety is a top priority for anyone operating in the Food & Beverage industry. Only when companies consistently provide safety and quality will customers make repeat purchases.

Without standardized procedures in place, companies may be unable to control the quality of their end-product. If consumed, these contaminated products will result in the consumer developing a host of health problems. If left unchecked, mistakes in the product manufacturing process can lead to fatalities.

To ensure food safety, it is necessary for standardized processes and procedures within the company's operations. Additionally, there should be comprehensive rules and regulations framed by regulators that companies must follow when it comes to manufacturing, handling, packaging, transporting and storing products.

Food specification management can be challenging. It isn't enough for companies to have a record of the processes they follow. They should have access to various sources of information – ingredient lists, organic certifications for ingredients, chemical formulas used, details of temperate settings used for heating and cooling, and so on. Only when companies have easy access to such information are they able to exert proper control over food safety and quality. The 5 Essentials for Food Specification Management are:

I. Purchasing Decisions

Companies must decide whether they wish to manufacture certain ingredients such as chemicals and inks.

Buying these items from an outside source would entail exerting control over the manufacturing process of another company.

This may quickly become difficult. Using global databases and software, companies can create partnerships and work together to create and maintain high-quality products.

II. Leveraging the Information from Production Reports

Production reports help managers understand the nuances of food manufacturing. They also help control costs and quality. Acting on the information in the production report will help companies rectify problems immediately and ensure the quality and safety of the product in the long run.

III. Setting up Control and Measuring Systems

Control systems and certifications such as the ISO 22000 Certification and the Safe Quality Food certification schemes help companies keep track of how their operations are being conducted and whether changes are needed to ensure the elimination of product contamination at any stage.

IV. Inventory Management

Stale or contaminated inventory can impact the quality of the end-product by utilizing control systems companies can measure the quality of inventory available and ensure their final products are safe for consumption. Furthermore, inventory management helps keep track of important information such as the manufacturing date, expiration date, and so on.

V. Sanitation in Storage

Storage and transportation are the sources of the greatest potential for contamination due to pests and the external environment. Whether the company sets up its' own storage and transportation or hires them from a third-party-vend

1.5 Log sheets

The following worksheets are intended to serve as templates to cover most of the documentation and recordkeeping that will occur as part of a typical fresh produce food safety program.

Not every size and type of operation will need to use every sheet, but most operations will want to capture and record most of the information these sheets are designed to document. It is expected that these sheets will serve as a foundation and inspiration for further customization. For example, some operations may find it beneficial to create separate log sheets to document the cleaning and sanitation of different types of equipment or different areas within a packing facility. Separate log sheets for different washing or sanitizing tanks may be useful as well.

Self-Check 1	Written Test

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

Write the correct answer

1 Define documentation (2 point)

2 Define food safety policy (2point)

3 Write legislation and food standards? (2 point)

Say true if the sentence is correct

4 Storage and transportation are the sources of the greatest potential for contamination due to pests and the external environment. (2 point)

5 A food safety policy is important to the development of an improved food safety programme. (2 point)

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

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

Information Sheet 2- Identifying, reporting and addressing deviation from identified procedures

2.1 Food safety program parameters

Food safety programs are designed to help businesses identify and manage hazards to food safety. Most licensed businesses must develop and implement a documented food safety program (FSP).

Food safety programs:

- Identify potential hazards that may occur in all food handling operations carried out in the business
- Identify where these hazards can be controlled
- Monitor these control methods
- Provide corrective actions when a hazard is found to be not under control
- Establish, document and verify detailed pre-requisite programs
- Be regularly reviewed for adequacy (at least every 12 months).

2.2 The quality parameters for specification

The quality of the product is one of the most important elements for every organization that offers goods and/or services. The quality concept may have a number of different aspects, but is interpreted within the following broad definition of “superiority (non-inferiority or excellence) of a product or a system. In quality control, several parameters such as:

- Iodine value (degree of unsaturation),
- Peroxide value (formation of primary oxidation products),
- Moisture content,
- Specific gravity (purity), and acid value (free fatty acids formation)

2.2.1 Iodine value (degree of unsaturation),

The iodine value is a measure of the relative degree of unsaturation in oil components, as determined by the uptake of halogen. Because the melting point and oxidative stability are related to the degree of unsaturation, IV provides an estimation of these

quality factors. The greater the iodine value, the more unsaturation and the higher the susceptibility to oxidation. Peanut oil (IV 82–107) is more saturated than corn (IV 103–128), cottonseed (IV 99–113), or linseed (IV 155–205) oils; however, it is considerably less saturated than coconut (IV 7.7–10.5), palm (IV 44–54) or butter (IV 25–42) oils.

2.2.2 Peroxide value (formation of primary oxidation products),

Edible oils consisting of abundant polyunsaturated fatty acids are susceptible to auto-, thermal-, and/or photosensitized oxidations and the degree of lipid oxidation can be determined using a variety of methodologies which quantify the oxidized intermediates and products during specific phases of the reaction . Among the methodologies, the acid value (AV) and peroxide value (POV) have been adopted as primary indicators which could assess hydrolytic rancidity and hydro peroxides formation of edible oils at the initial phases of lipid oxidation .

The official methods for the determination of AV and POV are ISO 660 and ISO 3690, respectively, specified by International Standards Organization (ISO). The ISO protocols have extensively been used for decades and there is no doubt about reliability and validity.

2.2.3 Moisture content of edible oil,

World health organization (WHO/FAO)guideline sets the maximum allowable limit for edible oils quality parameters including moisture (0.2%), acid value (0.6 mg potassium hydroxide/g oil) and peroxide value (10 mill equivalents oxygen/kg oil) .

2.2.4 Specific gravity (purity) of edible oil

The mean specific gravity value for the locally made and imported oils was 0.823 ± 0.14 and 0.807 ± 0.115, respectively.

2.2.5 Acid value (free fatty acids formation)

High FFA feed stock's will react with the catalyst and form soaps if they are fed to a base-catalysed system.

The maximum amount of FFAs acceptable in a base-catalysed system is about 2% by weight of oil, and preferably less than 1%. Some approaches to using high FFA feedstock use this concept to “refine” the FFAs out of the feed for disposal or separate treatment in an acid esterification unit. Quality concept within the food industry puts an emphasis on three key factors:

- Conformity with product’s intended purpose;
- Safety;
- Satisfaction of consumer’s expectations and perceptions. In general, most consumers pay attention to the first two, but their potential expectations with respect to quality involves a lot of different factors. Price, taste, and appearance are among the basic properties for assessment of product’s quality.

However, more considerate and picky customers may take into account:

- The producing country,
- Production systems,
- Packing,
- Nutritious content and criteria for fair trade and ethical production.

Few consumers would tolerate lower quality of goods and services. Besides, if the quality of the product or service fluctuates unsteadily, consumers may not know what to expect and would stop buying the unreliable products.

Therefore, the product quality needs to be sound and reliable, but at affordable prices. To meet this requirement, the company needs to develop and approve high standards to produce and sell a product within a standardized process. Each staff member should be trained to follow and apply the quality standards.

The most important components of the food quality assurance system are expressed in the following:

- Owners, managers and employees should participate in and be committed to maintaining and keeping good quality of the products and procedures;
- All employees are trained with respect to their job positions and responsibilities;

- Risk prevention, its solving and constant improvement and upgrade are key aspects of the production process;
- The company organizes document management system that is easily traceable and changeable if necessary.

Food quality Standards if an economy or a company wants to maintain its good quality standards and market image, appropriate specification schemes should be developed for all its products. Most companies need product specifications, which define the standard quality of their products and production procedures, such as picking, storage, delivery, supply and transportation. Companies that have not introduced control criteria may score sporadic success on the market.

Self-Check 2	Written Test

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

Write the correct answer

1 Define food safety programs (2 point)

2 Define food safety policy (2point)

3 Write the most important components of the food quality assurance system? (2 point)

Say true if the sentence is correct

4 The quality of the product is one of the most important elements for every organization that offers goods and/or services. (2 point)

5 Price, taste, and appearance are among the basic properties for assessment of product's quality .(2 point)

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

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

Information Sheet 3 .Consistence of personal behaviour with workplace policies and procedures

3.1 Personal behaviour with workplace policies and procedures

A workplace policy is a statement which outlines an organization's practices and procedures concerning part of its business, which can cover everything from day-to-day operational matters to compliance with employment legislation.

Policies and procedures in the workplace play an important role in expressing an organization's values and establishing a positive and productive organisational culture. A well-written and clearly communicated policy helps set clear expectations around employee.

Behavior and workplace procedures, which mean everyone, can get on with business.
Workplace policies also safeguard an organisation from risk. According to Employment Hero's HR Compliance white paper, a well-written policy will "protect your business from a range of situations, whether it's social media, inappropriate computer use, discrimination or harassment."

Policies and procedures in the workplace are an essential component of people management for any business. Firstly, they outline operating procedures and processes. Workplace policies also help articulate an organisation's mission and values and set the standard for employee behaviour and performance.

The purpose of policies and procedures in the workplace

- Workplace policies and procedures help to provide is a decision-making framework to ensure integrity and fairness are adhered to when issues arise.
- As well as help minimise legal and safety risks for you and your business.

Self-Check 3	Written Test

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

Write the correct answer

1 Define Behavior and workplace procedures (2 point)

2 Write the purpose of policies and procedures in the workplace? (2 point)

Say true if the sentence is correct

3 A workplace policy is a statement which outlines an organization's practices and procedures concerning part of its business .(2 point)

4 Policies and procedures in the workplace are an essential component of people management for any business. (2 point)

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

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

Information Sheet 4 Identifying and reporting food safety hazards and/or non-conformity

4.1 Identifying non-conformity of food safety

Non-conformance to food safety procedures may compromise product quality by causing:

- Blemishing,
- Contamination,
- Accelerated decay, or
- Exceeding of maximum residue levels,
- Unsafe for human consumption
- Unsuitable for meeting specifications of export markets.

The buyer of fresh produce would not be satisfied with a product that does not conform to the standards and specifications. Additionally, it would raise concerns for the buyer if they find repeated instances of non-conformance to the plan.

Nonconformance is when the control measures identified in the food safety manual are not being appliedor critical limits are not being met. Nonconformance may lead to the food becoming contaminated eitherby physical, chemical or biological measur which can lead to a breach of food safety legislation.

4.2 Reporting food safety hazards and/or non-conformity

Auditors should ensure their report clearly identifies areas of non-conformance, with reference to the section of the accredited FSP, the clause of the food safety standards, the specific area of the food business where the non-conformance was observed along with the date and time of the observations. The council will use the report to determine further actions, change the audit frequency or use other enforcement options, so it is important that all relevant information is provided. Additionally, the council officer may ask the auditor for further information or want to discuss the audit and the non-conformances.

Self-Check 4	Written Test

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

Write the correct answer

1 Define non-conformance of food (2 point)

2 How to identify non-conformance of food quality? (2 point)

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

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

Information Sheet 5 Recording food safety and quality information

5.1 Information that needs to be recorded

Food safety records are evidence that a mandatory activity has been completed. However, many food businesses fail to include key components to ensure effective record keeping has been implemented. At a minimum, food safety forms, and subsequent food safety records, should include the following:

I. Document control information

Including the name of the form and some type of document control is a basic requirement. The method you use for document control needs to align with the document management policies for your business. Examples of document control can include issue dates, version numbers, document dates.

II. Date and time

Recording the date and time demonstrates when the event was undertaken. All records should be completed in real time. This means, that information would be recorded at the time of undertaking the event, for example, GMP check or CCP monitoring. Make sure that that the date includes the “year” and the time includes “AM or PM”.

III. Result of monitoring

The main purpose of completing food safety records is to capture process information. When information is not captured on the record, it is very difficult to justify or evidence that the activity was completed. In a nutshell, make sure that all results are recorded as required (good or bad).

IV. Name and signature of the person completing the record

It is a requirement of the recognized good food standards to include the name of the person completing the monitoring and in the majority of cases the signature or initial of

that person as well. It makes it easier to follow-up with a staff member if there are any issues with the food product later down the track.

V. Product Name and lot code

Recoding the product name and lot code not only assists with traceability it is also a legal requirement where appropriate.

VI. Facility name and/or location

Get into the habit of recording the facility name and/or facility location. This can be included in the initial form design to save having food handlers complete this information. If you have forms that are used across multiple sites, record the site location as well. This is a legal requirement if you are required to comply with FDA Human Food PC Rule.

VII. Food Safety Record Verification

Another person in authority should check all food safety records. This process aims to verify that there are no issues missed, process parameters have been met and the record has been completed effectively and correctly. Issues can be more quickly identified when a robust record verification system is in place.

5.2 Reviewing and verifying records

Reviewing food safety and quality compliance records on a regular basis can provide an insight into the status of critical elements of your food safety system. Review provides the opportunity to identify trends in the monitoring data. Through identifying trends, we can ask ourselves many different questions like:

- Are we still on track to produce a safe food product?
- Is the system starting to get out of control?
- Is this piece of equipment starting to fail?
- Do my staffs require retraining?

5.3 Record management system

The purpose of a document management system should be to manage all of the information that is collected by or generated by your business. This also applies to your food safety and quality compliance records. Your system should consider:

- Retention time
- Control of records
- Storage, both short term and long-term
- Retrieval, and,
- Disposal

5.4 Training in good record keeping practices

When food handlers have been properly and adequately trained there is a greater likelihood of compliance to business systems. This is no different with record completion. All staff and relief staff should be trained in:

- What food compliance records need to be completed
- When they are required to be completed
- Why they have to complete the record
- Who is responsible for completing particular food compliance records
- How the record is to be completed

You may also want to include training on corrective action and/or consequence of not filling gout food compliance records correctly

Self-Check 5	Written Test

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

Write the correct answer

1 Define food safety records (5 point)

2 Write the food safety forms, and subsequent food safety records? (5 point)

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

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

Information Sheet 6 Maintaining the work area to good hygienic practice

6.1 Maintaining the work area

Maintaining a clean work environment is critical in preventing foodborne illness. Bacteria can grow on unsanitary surfaces and then contaminate food. Just because a work surface looks clean does not mean that it is sanitary. Always ensure that you clean and sanitize a work area before starting to prepare food.

6.1.1 Cleaning Procedures and Schedules

Cleaning with soap and other detergents is just one step of the cleaning procedure. It is also necessary to sanitize. Cleaning will remove any dirt or grease, but will not necessarily kill any bacteria or other pathogens. Only a sanitizer will kill bacteria and ensure the area is safe for food preparation. Leading sanitizers used in the food service industry are chlorine solutions (bleach), quaternary solutions (quats), and iodine. Use these materials according to the manufacturer's instructions that accompany the product and that are found on the material safety data sheet (MSDS) using the appropriate personal protective equipment.

A sanitation plan is important in any food service preparation area. It ensures that all surfaces are cleaned on a regular basis and reduces the risks of transferring bacteria or other pathogens from an unclean surface to clean equipment such as cutting boards or tools. A sanitation plan has two components:

- A list of cleaning and sanitizing agents or supplies with instructions on their safe use and storage
- A cleaning schedule, outlining how each item needs to be cleaned, who is responsible, and how frequently it happens

- **Dishwashing**

Procedures effective dishwashing ensures that all equipment is sanitary and ready for use when required. Using soiled or dirty china is not only dangerous, but it will tell customers that the operator as little or no regard for customer safety. Before washing, scrape dishes and pre-soak any items with hard to remove residue.

- **Routine Equipment Maintenance**

Most food equipment is intended to be disassembled for cleaning. Refer to the manufacturer's instructions and training provided by your employer or instructor on how to do this safely. Some equipment is intended to be cleaned in place. This should be identified in your sanitation plan and cleaning schedule.

All equipment must be routinely cleaned and inspected. Older equipment may have nooks and crannies where dirt and bacteria can hide, which can be difficult to clean effectively. Proper cleaning procedures must be established and followed at all times with regular review to ensure that procedures are working. If equipment is replaced or cleaning materials change, the process may have to be adjusted. If you notice any safety concerns with the equipment while cleaning it, such as a frayed cord, missing guard or loose parts, let your supervisor know immediately.

- **Importance of Personal Hygiene**

It is imperative for safe food-handling outcomes for all workers to be familiar with standard sanitation and hygiene practices. One of the basic principles is to break the cycle by avoiding cross-contamination, which can be achieved by ensuring personal hygiene practices are followed.

Proper personal hygiene is critical in any food service premise. Personal hygiene includes:

- ✓ Showering and bathing regularly
- ✓ Keeping hair clean hair and covered or tied back
- ✓ Keeping clean clothing and footwear that is used only at work

- ✓ Hand washing regularly
- ✓ Using clean utensils for tasting food
- ✓ Using separate cloths for cleaning and wiping plates

- **Handwashing**

Proper and regular handwashing is a critical part of any food safety system. You must always wash your hands after:

- ✓ Sneezing, coughing, or touching your mouth or nose
- ✓ Using the bathroom
- ✓ Smoking or using tooth picks
- ✓ Handling raw foods
- ✓ Cleaning and wiping tables, food preparation surfaces, or equipment
- ✓ Handling soiled objects, garbage, or money

The steps for proper handwashing are as follows:

- Wet hands with warm water.
- Apply liquid soap and lather for at least 20 to 30 seconds.
- Scrub backs of hands, wrists, all fingers, and under nails.
- Rinse under running water, pointing down toward the drain.
- Dry with a paper towel.
- Turn off taps and open bathroom door using the paper towel.

Self-Check 6	Written Test

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

I Say true and false

1 Proper and regular handwashing is a critical part of any food safety system. (5 point)

2 Procedures effective dishwashing ensures that all equipment is sanitary and ready for use when required? (5 point)

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

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

LG #24	LO #3- Monitor observance of quality standards and food safety programs in the work area

Instruction sheet

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

- Implementing workplace procedures to quality and food safety non-compliance
- Investigating hazardous events to identify root cause
- Implementing control measures to prevent recurrence and minimize risks of hazardous events

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

- Implement workplace procedures to quality and food safety non-compliance
- Investigate hazardous events to identify root cause
- Implement control measures to prevent recurrence and minimize risks of hazardous events

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
4. Accomplish the Self-checks
5. Perform Operation Sheets
6. Do the “LAP test

Information Sheet 1 Implementing workplace procedures to quality and food safety non-compliance

1.1 Food Safety and Quality Program

Food safety is a multidisciplinary field aimed at providing consumers with a high-quality food product, free of contaminants. It focuses on the analytical and toxicological aspects, in addition to risk analysis and management. Food safety has become increasingly important due to the globalization of the food supply chain and increased international trade.

The FSQP aims to:

A Provide knowledge, training and expertise in the production and regulation of safe food, free from harmful pathogens or chemical and physical toxicants;

B Serve as a leader in the identification and testing of new food and feed bioactive compounds with health and wellness benefits;

C Develop a multidisciplinary network of experts to foster strong food safety and quality research, and provide a venue for researchers, industry and government in which to collaborate;

D Provide specialized facilities and expertise, including regulatory aspects.

General food safety program requirements

A food business must:

a. Systematically examine all of its food handling operations in order to identify the potential hazards that may reasonably be expected to occur;

b. If one or more hazards are identified in accordance with develop and implement a food safety program to control the hazard or hazards;

c. Set out the food safety program in a written document and retain that document at the food premises;

d. Comply with the food safety program; and

e. Conduct a review of the food safety program at least annually to ensure its adequacy.

1.2 Implementing workplace procedures

Policies and procedures will vary between businesses however all operations can be expected to have internal requirements reflecting their legislated obligations and addressing identified workplace food safety hazards. Potentially, food safety hazards exist in every food premises at every stage of food handling:

- Purchasing food for use in the premises
- Receiving goods from suppliers into the premises
- Food storage prior to preparation and/or service
- De-frosting/thawing frozen food
- Cold holding and hot holding and display of prepared food for sale/service
- Serving food
- Self-service of food by customers to themselves.

In addition, workplace policies and procedures can be expected to exist to address other food safety-related issues such as:

- Cleaning and sanitising of food utensils, equipment, areas and food contact and preparation surfaces
- Specific food handling techniques required by the workplace to optimise food safety – as applicable to the equipment they use, the food they prepare and other factors applying in the premises
- Personal hygiene – and requirements applying to ensure staff do not contaminate food by their actions
- Equipment maintenance – and the need to keep food equipment, utensils (including food thermometers) and areas properly maintained to ensure they operate as required (for example, it is important for refrigerators, freezers and hot and cold holding units to reach the temperatures they are supposed to reach)
- Use of food thermometers – to check food and equipment temperatures

Self-Check 1	Written Test

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

II Say true and false

1. Proper and regular handwashing is a critical part of any food safety system. (5 point)
2. Procedures effective dishwashing ensures that all equipment is sanitary and ready for use when required? (5 point)

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

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

Information Sheet 2 Investigating hazardous events to identify root cause

2.1 Incident investigation

The Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) urge employers (owners and operators) to conduct a root cause analysis following an incident or near miss at a facility. A root cause is a fundamental, underlying, system-related reason why an incident occurred that identies one or more correctable system failures. By conducting a root cause analysis and addressing root causes, an employer may be able to substantially or completely prevent the same or a similar incident from recurring.

During an incident investigation, an employer must determine which factors contributed to the incident, and both OSHA and the EPA encourage employers to go beyond the minimum investigation required and conduct a root cause analysis. A root cause analysis allows an employer to discover the underlying or systemic, rather than the generalized or immediate, causes of an incident. Correcting only an immediate cause may eliminate a symptom of a problem, but not the problem itself.

A successful root cause analysis identifies all root causes—there is often more than one. Consider the following example: A worker slips on a puddle of oil on the plant -floor and falls. A traditional investigation may and the cause to be “oil spilled on the -floor” with the remedy limited to cleaning up the spill and instructing the worker to be more careful. A root cause analysis would reveal that the oil on the -floor was merely a symptom of a more basic, or fundamental problem in the workplace.

An employer conducting a root cause analysis to determine whether there are systemic reasons for an incident should ask:–

- Why was the oil on the floor in the first place?
- Were there changes in conditions, processes, or the environment?
- What is the source of the oil?
- What tasks were underway when the oil was spilled?
- Why did the oil remain on the floor?
- Why it was not cleaned up?
- How long had it been there?
- Was the spill reported?6

It is important to consider all possible “what,” “why,” and “how” questions to discover the root cause(s) of an incident. In this case, a root cause analysis may have revealed that the root cause of the spill was a failure to have an effective mechanical integrity program that includes inspection and repair that would prevent or detect oil leaks. In contrast, an analysis that focused only on the immediate cause (failure to clean up the spill) would not have prevented future incidents because there was no system to prevent, identify, and correct leaks. Properly framing and conducting a root cause investigation is important for a PSM or RMP-related incident. Take, for example, an incident involving an overall and subsequent leak of hydrocarbons from a relief valve system that ignites and kills multiple workers. Prior to this fatal incident, there were multiple flammable releases from the relief valve system, but none ignited. The employer previously performed.

Incident investigations on the non-lethal incidents and determined that operator error was the cause of the overalls and subsequent leaks. However, a proper root cause investigation would have looked deeper into the incident, and determined that funding cuts which resulted in a deficient mechanical integrity program and malfunctioning instrumentation led to a dangerous situation that operators could not have prevented. Had these root causes been previously identified, the employer could have taken action to improve the mechanical integrity program and repair the instrumentation system, preventing the fatal incident.

2.2 Root Cause Analysis Tools

Below is a list of tools that may be used by employers to conduct a root cause analysis. The tools are not meant to be used exclusively. Ideally, a combination of tools will be used.

- Brainstorming
- Checklists
- Logic/Event Trees
- Timelines
- Sequence Diagrams
- Causal Factor Determination

For simpler incidents, brainstorming and checklists may be sufficient to identify root causes. For more complicated incidents, logic/event trees should also be considered. Timelines, sequence diagrams, and causal factor identification are often used to support the logic/event tree tool.

Regardless of the combination of tools chosen, employers should use these tools to answer four important questions:

What happened?

- How did it happen;
- Why it happened; and
- What needs to be corrected

Interviews and review of documents, such as maintenance logs, can be used to help answer these questions. Involving employees in the root cause investigative process, and sharing the results of those investigations, will also go a long way toward preventing future similar incidents.

2.3 Benefits of Root Cause Analysis for Employers

Conducting thorough investigation that identifies root causes will help to prevent similar events from happening again.

In this way, employers will reduce the risk of death and/or injury to workers or the community or environmental damage. By using root cause analysis to prevent similar events, employers can avoid unnecessary costs resulting from business interruption, emergency response and clean-up, increased regulation, audits, inspections, and OSHA or EPA fines.

Regulatory fines can become costly, but litigation costs can often substantially exceed OSHA and EPA fines. Employers may find that they are spending money to correct immediate causes of incidents that could have been prevented, or reduced in severity or frequency, by identifying and correcting the underlying system management failure.

Finally, when an employer focuses on prevention by using root cause analysis, public trust can be earned. Employers with an incident free record may be more likely to attract and retain high performing staff. A robust process safety program, which includes root cause analysis, can also result in:-

- More effective control of hazards,
- Improved process reliability,
- increased revenues,
- Decreased production costs, l
- Lower maintenance costs, and
- Lower insurance premiums.

Self-Check 2	Written Test

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

III Say true and false

1. Incident investigations on the non-lethal incidents and determined that operator error was the cause of the overalls and subsequent leaks. (5 point)
2. Brainstorming and checklists may be sufficient to identify root causes. (5 point)

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

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

Information Sheet 3 Implementing control measures to prevent recurrence and minimize risks of hazardous events

3.1 Control food safety hazards in the industries

Control measures are actions and/or activities that are taken to prevent, eliminate or reduce the occurrence of a hazard that you have identified. Control food safety hazards in the industries are:

A Implement PRPs

B Implement either HACCP or ISO 22000:2015

C Avoid oil adulteration

D Produce/train skilled manpower/ technologists

E Implement kaizen

F Start oil fortification

A Implement Pre-Requisite Program (PRPs)

Pre-Requisite Program (PRP): Any specified and documented activity or facility implemented in accordance with the Codex General Principles of food hygiene, good manufacturing practice and appropriate food legislation, in order to establish basic conditions that are suitable for the production and handling of safe food at all stages of the food chain.

B Implement either HACCP or ISO 22000:2015

C Avoid oil adulteration

Adulteration means with respect to extra virgin olive oil (EVOO), adulteration typically consists of the addition and/or substitution of lower quality olive oils or other types of edible oils .Most edible vegetable oils are mainly composed of different proportions of the same or similar fatty acids

There is a need for reliable, rapid, and inexpensive adulteration detection methods in the commercial extra virgin olive oil industry.

A commercially effective testing method will be inexpensive and able to quickly and accurately handle large volumes of samples.

D Produce/train skilled manpower/ technologists

Skilled workers are part of the human resources, who currently hold leadership/management, professional or technician/associate professional positions.

Highly skilled labour is generally characterized by advanced education (college and higher), possession of knowledge and skills to perform complicated tasks, ability to adapt quickly to technology changes, and creative application of knowledge and skills acquired through training in their work. In essence, skilled workers are those directly and closely involved in the generation, development, spreading and application of knowledge.

E Implement kaizen

Kaizen, translated as *continuous improvement*, involves the removal of waste from the value stream. Anything that is not absolutely necessary for the creation of the product of value is considered *muda* (waste) and must be eliminated.

Implement kaizen is a process that should occur continuously. Management should be relentlessly focused on optimizing the production process and reducing non-value added waste. However, there is a defined process in which kaizen activities are performed:

- Map the value stream
- Choose a process to optimize (or choose the whole production in the case of flow kaizen)
- Implement the 5 S's
- Look for the 7 types of muda
- Design a process improvement
- Measure the results

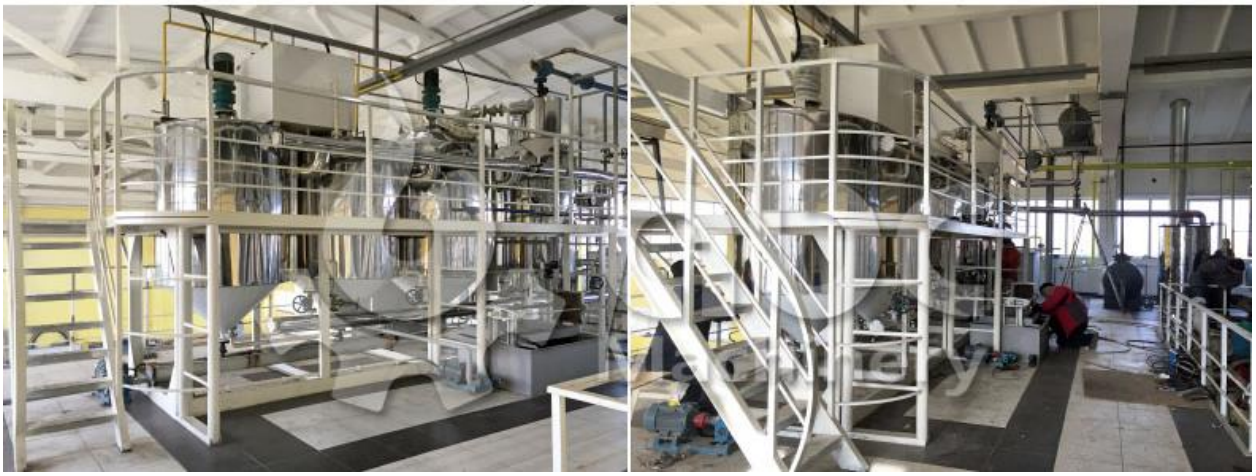

Fig 4 Oil Processing Plant kaizen

Self-Check 3	Written Test

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

1 Define adulteration (2 point)

2 Define implement kaizen (2point)

3 What means pre-requisite program (PRP) ? (2 point)

Say true if the sentence is correct

4 Skilled workers are part of the human resources, who currently hold leadership/management, professional or technician/associate professional positions. (2 point)

5 Kaizen is not continuous improvement, involves the removal of waste from the value stream. (2 point)

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

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

Operation sheet1 implement quality standards and food safety programs

Objectives; to know for quality standards and food safety programs

Material required; sanitizer, hot water, cold water, brush, sponge and alcohol etc.

Equipment required; PPE, tanks, pumps, centrifugal separators, mixer, heat exchanger and autoclave etc.

Following the steps outlined below will help ensure for quality standards and food safety programs will be successful.

Steps

1. Wear personal protective equipment
2. Identify food safety problems (hazards)
3. Identify preventive measures and their control limits.
4. Implement control measures
5. Implement either HACCP or ISO 22000:2015
6. Establish monitoring procedures.
7. Establish corrective actions.
8. Keep records.
9. Check and review.

LAP Test	Practical Demonstration

Name: _____Date: _____

Time started: _____ Time finished: _____

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

Task1 Conduct food safety and quality program

LG #25	LO #4- Maintain and improve quality and food safety in the work area

Instruction sheet

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

- Identifying, assessing , removing and reporting non -compliance of food safety procedure
- Conducting risk assessments and identifying and implementing appropriate control measures.
- Implementing recommendations arising from risk assessments
- Identifying and reporting inadequacies control measures
- Resolving and referring matters raising relating to quality/food safety
- Consulting and advising food safety matters of the work group
- Identifying and raising opportunities for improving food safety and quality
- Developing or revising food safety procedures
- Reviewing quality/food safety records

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:

- Identify, assess, remove and report non -compliance of food safety procedure
- Conduct risk assessments and identifying and implementing appropriate control measures.
- Implement recommendations arising from risk assessments
- Identify and report inadequacies control measures
- Resolve and refer matters raising relating to quality/food safety
- Consult and advise food safety matters of the work group
- Identify and raise opportunities for improving food safety and quality
- Develop or revise food safety procedures

- Review quality/food safety records

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
4. Accomplish the Self-checks
5. Perform Operation Sheets
6. Do the “LAP test

Information Sheet 1 Identifying, assessing, removing and reporting non - compliance of food safety procedure

1.1 Identifying and assessing non -compliance of food safety procedure

The extraction of edible oils by individuals who have little or no knowledge neither of modern aseptic production techniques nor of the microbiological implication of poor sanitation and storage methods, edible oils are prone to contamination by microorganisms found in the environment, raw materials and equipment's used for the processing, production, as well as those used for storage and distribution of edible oils. They often use out dated technology to crush oil seeds which are directly sold to consumers

A basic food safety plan uses the HACCP method. HACCP stands for hazard analysis critical control points. HACCP goes beyond inspecting finished food products. It helps to find, correct, and prevent hazards throughout the production process. These include physical, chemical, and biological hazards

1.2 Reporting non -compliance of food safety procedure

Food handlers must report health problems to the manager of the establishment before working with food. If they become ill while working, they must immediately report their condition, and the food handler must stop working and see a doctor.

The non-compliance reporting process allows employees to report hazardous conditions or practices as they notice them. This procedure allows for prompt reporting and subsequent corrective action without waiting for the next round of regular inspections.

Hazards can be reported verbally or by filling a simple form available at bulletin boards or other conspicuous places.

Self-Check 1	Written Test

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

Say true if the sentence is correct

1 The non-compliance reporting process allows employees to report hazardous conditions or practices as they notice them. (2 point)

2 Food handlers must report health problems to the manager of the establishment before working with food. (2 point)

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

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

Information Sheet 2 Conducting risk assessments and identifying and implementing appropriate control measures.

2.1 Conducting risk assessments

Risk assessment is: a careful examination of what, in your work, could cause harm to people, so that you can weigh up whether you have taken enough precautions or should do more to prevent harm. A risk assessment is a vital element for health and safety management.

A risk assessment will protect your workers and your business, as well as complying with law. As for when to do a risk assessment it should simply be conducted before you or any other employees conduct some work which presents a risk of injury or ill-health.

Five steps to risk assessment can be followed to ensure that your risk assessment is carried out correctly, these five steps are:

- Identify the hazards
- Decide who might be harmed and how
- Evaluate the risks and decide on control measures
- Record your findings and implement them
- Review your assessment and update if necessary

2.2 Implementing appropriate risk control measures

Risk control measures are actions that are taken in response to a risk factor that has the potential to cause accident or harm in the workplace. The control measures can either be designed to reduce the risks or eliminate them completely, with the latter obviously being preferred. Control measures follow a hierarchical pattern, with each step being worked through and implemented to control and minimise the risk identified.

- **Risk Elimination (Most Preferred)**

Risk elimination is at the top of the hierarchy, being the most preferred option to control an identified risk. It will obviously not be possible to completely remove all risks, but this should be the first option considered and assessed as it offers the greatest protection by removing the risk completely. An example of risk elimination could be rerouting cables to remove a trip hazard in walkways.

- **Risk Substitution**

Substituting a risk won't be as effective as removing the risk completely as it is possible that the new system will introduce new risks and hazards. These hazards are likely to be unknown initially and will, therefore, require a new risk assessment to evaluate any new or changed risks. An example of risk substitution could be substituting bleach-based cleaning products that can fatally interact with other chemicals with safer alternatives. In that scenario, however, a risk of chemical exposure or inhalation may still be present with the new product, but the risk of a fatal interaction has been removed or reduced.

- **Risk Isolation**

Risk isolation is a control measure designed to either isolate the risk itself from the employee or person that may experience it or isolate access to the risk factor to only authorised personnel, properly trained in its handling and usage. This could involve placing dangerous or noisy equipment in a locked or soundproof room where operators

can monitor it remotely, or it could be storing dangerous chemicals in a secure area that only chemical safety trained personnel can access.

2.3 Personal Protective Equipment (Least preferred)

While this final risk control measure is the least preferred option, that doesn't mean it should be ignored. Personal Protective Equipment (PPE) should normally be utilised even when the risks are being controlled by measures further up the hierarchy. PPE serves as the last line of defence to protect employees from the risk. Whenever possible, PPE should not be relied on as the only control measure. Examples of PPE are respirators (ranging from single-use to full filtration depending on the environment), hard-hats, protective eye-wear, and noise-reducing ear protection.

While these risk control measures follow a hierarchical structure from most preferred to least preferred, it's unlikely they will be used in isolation of each other. When controlling risks the best option will often be a combination of the above controls, for example isolating the risk while still providing employees with PPE in case isolation has to be breached.

Self-Check 2	Written Test

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

Write the correct answer

1 Define risk elimination (2 point)

2 Define risk control measures (2point)

3 What means pre-requisite program (PRP) ? (2 point)

Say true if the sentence is correct

4 Risk isolation is a control measure designed to either isolate the risk itself from the employee. (2 point)

5 A risk assessment is a vital element for health and safety management.(2 point)

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

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

Information Sheet 3 Implementing recommendations arising from risk assessments

3.1 Implementing recommendations arising from risk assessments

Recommended techniques for minimizing the volume of solid waste and by-products for disposal

Include the following:

- Reduce product losses through better production/storage control (e.g., monitor and adjust air
- Humidity to prevent product losses caused by the formation of molds on edible materials).
- Collect residues from the raw material preparation phase for conditioning (drying) and
- Reprocessing (grinding) to yield by-products (e.g., animal feed).
- Return waste and residues to fields to assist in soil nutrient management; for example, EFBs
- from oil palm plantations with tree trimmings are a valuable soil amendment and/or can be
- Composted with vegetable oil waste water effluent.
- Use waste and residues for energy generation in the project plant's boiler(s). Note, however, that
- Relatively high atmospheric emissions (such as particulate emissions (PM)) are possible when
- Burning crop residues, and potential fire risks (e.g., from combustible dust) may arise from
- Handling, storing, and processing crop residues; as such, expert advice on fuel characteristics and boiler design should be solicited when planning to use biofuels in this manner.

- Investigate the following options for the responsible disposal of spent bleaching earth:
- Use as fertilizer, if not contaminated with heavy metals such as nickel, pesticide residues, or other contaminants.
- Recover non-food-grade oils from spent bleaching earth that could be used in other
- Applications (feedstock for conversion to biodiesel or in bio-lubricants).
- Avoid direct recycling on agricultural land. Add spent earth to other organic waste and
- Compost to avoid contact with air and risk of spontaneous combustion of spent bleaching earth.
- If contaminated, manage according to the waste management guidance presented in the

3.2 General environmental health and safety (EHS) Guidelines.

- Investigate the following options for the use of distillates (e.g., free fatty acids and volatile organic compounds (VOCs)), depending on the level of contaminants (pesticides and/or residues):
  - ✓ Use free fatty acid as animal feed if uncontaminated.
  - ✓ Apply as a feedstock for chemical industry processes (e.g., antioxidants).
  - ✓ Use as fuel for energy production.

Self-Check 3	Written Test

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

Write the correct answer

1. How to implementing recommendations arising from risk assessments

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

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

Information Sheet 4 Identifying and reporting inadequacies control measures

4.1 Identifying and reporting inadequacies control measures

Reporting the implementation committee is responsible for the execution of the study and should report on the final results. Such a report should also contain the conclusions and recommendations to be discussed and agreed upon by the participating organizations at the end of the study. Interim progress reports from the implementation committee should only be required for very large and complex studies.

The writing and discussion of such progress reports involve time and resources which may be better spent on the main study and the final report. The Implementation Committee briefs the working group(s) on the various steps of the study. The tasks of each working group should be divided into well-defined steps which are then reported step-by-step to the Implementation Committee. Such reporting does not always have to be done through formal progress reports; in most cases, it may be sufficient to have the main progress points written down. The general progress report can be made by way of verbal presentation to the implementation committee.

The purpose of such progress reports is to brief the members of the implementation committee on the activities that have been carried out by the working groups and of the direction the study is taking. All changes from the main project plan and all the preliminary decisions of the working group on questions that have arisen during the course of the study must be reported on, since it is the Implementation Committee that has to decide on these matters. The progress reports of the working groups can be used as building blocks for the draft final report. In principle, the working groups are responsible for writing the draft final report of their activities, together with the appropriate recommendations. The Implementation Committee evaluates the final report and writes its own covering report with a short account of the main steps of the study and its own conclusions and recommendations.

The covering report of the implementation committee should be short. It should refer to the final report for all details, but should contain the main conclusions and recommendations of the implementation committee, to be approved by the steering committee. For complex studies with several working groups and final reports, the implementation committee has to decide if it will collect these reports and send them with a covering report of the conclusions and recommendations to the Steering Committee, or if it will send each report together with its own separate covering report, with, possibly, an additional integrated final report of the implementation committee at the end of all sub-studies.

Self-Check 4	Written Test

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

Write the correct answer

1 Define report (2 point)

Say true if the sentence is correct

2 The general progress report can be made by way of verbal presentation to the implementation committee. (2 point)

3 Reporting the implementation committee is responsible for the execution of the study and should report on the final results .(2 point)

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

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

Information Sheet 5 Resolving and referring matters raising relating to quality/food safety

5.1 Food safety problems

Food safety problems create an enormous burden on the country's economy such as consumer costs include medical, legal, and other expenses, as well as absenteeism at work and school. For many consumers who live at a subsistence level, the loss of income due to foodborne illness can perpetuate the cycle of poverty.

Chronic diseases caused by contaminated food, like reactive arthritis or temporary paralysis, can be even more damaging than the initial disease and add dramatically to the medical costs and lost wages. Costs to national governments stem from increased medical expenses, outbreak investigations, food recalls, and loss of consumer confidence in the products. Also it leads to increased demands on already overburdened and poorly funded health care systems in the countries. Food safety system in Ethiopia is not always as organized and developed as in other developed countries.

Moreover, problems of growing population, urbanization, lack of resources to deal with pre-and postharvest losses in food, and environment and food hygiene issues mean that food systems in the country continue to be stressed, adversely affecting the quality and safety of food supplies are:

I Resolving food safety problem by food safety system

II Food safety system plays a great role also in food security by:

III Contributing to improved nutrition and health status of the population there by increasing productivity and livelihoods.

IV Reducing public health costs through a decrease in food borne illness among vulnerable population and related social and economic implication.

V Reducing food losses (per/post-harvest), resulting in increased availability, stability and utilization (food chain).

VI Increasing national and international market access, increasing purchasing power and resulting in beneficial effects on farmers, food businesses and consumers

VII Initiate the establishment of National Food Safety Policy as well as Safety Council

VIII Upgrade the capacity of existing public health laboratory, personnel, food-borne diseases surveillance system and legal and policy frame work

IX Approach embassies, agencies and others to support the national food safety programmes through fund mobilization

X Disseminate food hygiene information through mass media

XI Finally it would have been good to establish a separate regulatory body the so called food safety authority at national level.

Self-Check 5	Written Test

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

Say true if the sentence is correct

1. Food safety problems create an enormous burden on the country's economy. (2 point)
2. Food safety problem is resolved by food safety systems .(2 point)
3. Food is not contaminated by inert matter.

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

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

Information Sheet 6 Consulting and advising food safety matters of the work group

6.1 Consulting and advising food safety matters of the work group

All organizations within the food supply chain are now able to implement standards regardless of company size or type. A food safety consultant can be an in valuable asset on the road to certification;

- Providing a gap Analysis,
- Training and certification to an accredited food safety standard,
- As well as providing ongoing guidance and support to senior management, and
- Offering cost-effective methods for achieving a standards scheme.

Each of the recognized food safety standards require a detailed, on site, third-party independent audit, carried out at least once per year. The purpose of this audit is to ensure that the proper systems are in place, monitored with accuracy and are effective in day-to-day operations or in times of crises. Some food safety consultants are able to offer auditing and certification services, but cannot offer both to an organization. It is considered a conflict of interest.

6.1.1 A Food Safety Consultant Can:

- Provide a gap Analysis and pre-assessment to determine a company's needs.
- Develop a written program, with input from all levels of the organization.
- Train staff in new policies and procedures, increasing their overall awareness.
- Improve upon existing food safety practices and procedures.

- Find solutions to challenges or barriers for implementing a standards scheme.
- Troubleshoot safety or food traceability issues within an organization's operation.
- Set up documentation and proper record keeping procedures.
- Assist in the preparation for pre-audits and audits with a certified registrar.
- Provide ongoing support and new standards information as it evolves, specific to food categories and industry sectors.
- Source equipment, software and services such as food laboratory testing.

6.1.2 Different kinds of food safety consultants

Consultants can be part of a consultancy firm or self-employed, working as an independent. There are benefits and advantages to employing either; for example, by engaging a large company may have access to a wider variety of food safety consultants, able to offer a range of services to meet overall business needs. An Independent food safety consultant is required to have experience in a specific food category or industry sector and may be able to provide greater insight into precise needs.

Choosing the right food safety consultant, whether an independent or part of a corporation, is an important decision because you will rely heavily on the expertise and recommendations provided to ensure your business is food safety compliant.

6.1.3 Gap Analysis

A gap analysis is a tool to determine food safety risks within an organization. Whether the organization is a primary food producer, a food processor, a transportation company or a retailer, a gap Analysis is generally the first step in the food safety certification process.

A Gap analysis allows an organization to compare its current food safety practices against an accredited food safety management standard, and will identify areas of shortfall (the gaps). Once areas of improvement have been identified, changes can be made to improve not only food safety risks, but overall business performance; an important component for staying competitive in today's marketplace, as well as reducing costly food recalls, and ensuring consumer protection and confidence.

The gap Analysis can be conducted by a series of questionnaires or an assessment using a sampling technique. The method employed will depend on a number of factors, including the food safety consultant's area of specialization and the specific requirements for implementing a particular food standard's scheme.

An independent or corporate consultant can assess existing management systems and procedures against the full requirements or revised changes of an existing food safety standard to create a unique compliance plan with the goal of certification. A compliance plan is a set of strategic steps that need to be taken for a business to be in "compliance" with a standard scheme, or to fill in the "gaps" identified by a gap Analysis.

A gap Analysis can also quickly determine the size and scope of a food safety certification project, allowing proper budgeting and time allotment for an organization's management team and staff.

Self-Check 6	Written Test

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

Write the correct answer

1 Define the meaning of consultants (2 point)

Say true if the sentence is correct

2 Food safety consultants are able to offer auditing and certification services, but cannot offer both to an organization. (2 point)

3 The GAP Analysis can be conducted by a series of questionnaires or an assessment using a sampling technique.(2 point)

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

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

Information Sheet 7 Identifying and raising opportunities for improving food safety and quality

7.1 Food industry's view of food control

The food industry takes a broad view of the term food control, which includes a large number of factors such as:

- Safety - setting standards for toxicological and microbiological hazards, and instituting procedures and practices to ensure that the standards are achieved;
- Nutrition - maintaining nutrient levels in food ingredients and formulating foods with nutritional profiles that contribute to consumer interest in healthful diets;
- Quality - providing sensory characteristics such as taste, aroma, palatability and appearance;
- Value - providing characteristics of consumer utility and economic advantage, involving attributes such as convenience, packaging and shelf-life. Some of these factors, such as value, are exclusively in the domain of industry and consumers; while others, such as safety, are shared interests of government, industry and consumers.

7.2 Setting and implementing food standards

At the heart of all food control activities is the establishment of safety, quality and labelling standards. These should be established on the broadest possible scale, in the recognition that food production and marketing is truly a global industry. Governments and intergovernmental organizations have the principal role in establishing certain food control standards. It is the role of national governments to establish uniform safety standards so that

- All consumers receive equal levels of protection;
- All food producers, whether domestic or foreign, are equitably treated through application of the same levels of safety;
- Consumers are informed about the standards of protection that are being applied.

In establishing safety standards, it is important that governments allow industry, the scientific community and the public to contribute information and ideas. Standards and guidelines should be sufficiently flexible to meet the needs of changing technology. At the same time, governments should apply those controls that will assure real and meaningful safety benefits rather than merely perceived benefits.

Any safety standards that are developed have real costs for governments, industry and consumers. Governments bear an obligation to monitor and enforce safety standards. Imposing stringent standards usually increases the government's need for resources to enforce those standards; therefore standards must be carefully set to take enforcement costs into account. Industry bears the primary responsibility for implementing safety standards and must invest the resources such as staff time, systems, training and equipment required to put the standards into practice. Ultimately, consumers will pay the costs for food safety standards both through taxes to pay for the government control authorities' activities and through food prices, which must reflect all the costs of production, including the cost of quality assurance.

Control of food safety and quality encompasses a broad number of factors, and governments must carefully select the areas in which they will set standards. In particular, quality includes attributes of food that are market concerns rather than public health matters. Governments should focus their attention and resources on the public health aspects of quality and on those market-related aspects of quality and labelling that will protect consumers against fraud and misleading claims.

Governments have three additional responsibilities related to the establishment of food controls:

- First, they should conduct research into testing and evaluation methods for determining the safety of food ingredients and processes.
- Governments need to have a good research base because food controls should only be imposed on a sound scientific basis.

- Second, governments need to audit industry performance to ensure that companies are complying with standards and that standards are being uniformly applied. This involves training inspection personnel so that they have a good understanding of the technologies and processes involved, as well as conducting inspections in an even-handed and fair manner.
- Third, governments must communicate with industry and consumers about food controls. It is important that all affected industry members know their obligations so that they can comply. It is also important that consumers know what steps are being taken on their behalf to prevent misconceptions.

Further, consumers make a contribution to food safety in handling food after purchase and need to be informed about proper procedures. Consumers and industry must have an opportunity to raise questions and comment about the appropriateness of food control standards. In those areas in which governments exercise premarket approval, this should be done in a timely manner in order to facilitate the application of new technology.

Food ingredients that are regulated as food additives, e.g. preservatives, emulsifiers and colour, require government approval before they may be used in foods. The manufacturers of such food additives must submit scientific data that demonstrate that these; substances are safe. The standards of safety are established by laws and regulations and include considerations of various types of toxicity, ranging from carcinogenicity and reproductive effects to effects on digestion.

7.3 Industry's efforts to ensure quality

The science, technology, logistics and management disciplines required to make the food supply system work, food manufacturers must be involved in the standard-setting process at both the national and international levels. They are obliged to lend their knowledge of the food supply system to this process to help guarantee its efficiency and effectiveness and to ensure that it results in a supply of safe products. This involvement is beneficial to consumers and governments as well as to industry, and this exchange of information should be facilitated by governments.

Quality assurance begins with the design and development of food products. This is not only a laboratory or conference-room process; it also involves consumer participation in evaluating new products. Before making a commitment to produce and market an important new product, a manufacturer introduces it to small groups of consumers to obtain their reactions to a wide range of matters, for example, usage and packaging as well as sensory satisfaction. Even after deciding to proceed with the marketing of a product, a manufacturer will often introduce it in a limited, regional market to obtain more widespread consumer reactions.

Self-Check 7	Written Test

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

Write the correct answer

1 Define the meaning of safety standards (2 point)

Say true if the sentence is correct

2 Safety setting standards for toxicological and microbiological hazards, and instituting procedures and practices to ensure that the standards are achieved (3 point)

3 Nutrition maintaining nutrient levels in food ingredients and formulating foods with nutritional profiles that contribute to consumer interest in healthful diets.(2 point)

Information Sheet 8 Developing or revising food safety procedures

8.1 Developing food safety procedures

Step 1: Find the food safety hazards and critical control points.

- Look at your menu. Find those menu items that are potentially hazardous foods (PHFs) or that have one or more PHFs as ingredients.
- For each of these menu items, think about the steps the food goes through from when you first get the ingredients to when you serve it to your customers.
- To make this step easier, use your recipe to review every ingredient, or make a flow chart for each menu item.

Step 2: Identify where and when you have to control the hazards for each menu item.

Highlight the critical control points in your recipe or flow chart of the menu item by underlining them or highlighting them with a marker.

Step 3: Set critical limits or procedures to control the hazards.

Identified the food safety hazards and where to control them (the critical control points), it need to set limits or procedures to control the hazard at each critical control point. This includes identifying minimum cooking temperature/times, maximum time to cool foods, minimum hot hold temperatures, etc.

Step 4: Check the critical limits

- To do this they must be checked regularly.
- For those critical control points that involve temperature, this means measuring the actual internal temperature of the food (whether cooking, cooling, or hot holding).

- For those critical control points that involve things that workers do, this means first training them to make sure they know how to do their jobs properly, and then watching them regularly to make sure they keep doing it right.

Step 5: Set up procedures to handle control problems.

Workers must also know what to do if a process or step does not meet critical limits and what corrective action can be taken. Problems happen when critical limits are not met. These procedures are called corrective actions.

Examples of corrective actions might include:

- Rejecting received products that are unacceptable (broken containers, etc.)
- Adjusting a the most at in the cooler to get the proper temperature
- Changing the food handling steps
- Throwing the food away

Self-Check 8	Written Test

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

Write the correct answer

1 Discusses food safety procedures (2 point)

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

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

9.1 Reviewing quality/food safety records

Routine HACCP records, such as daily operation records for CCP monitoring, corrective action records, and records of verification activities, must be reviewed on a routine basis. The HACCP team must be familiar with and comply with regulatory or customer requirements for review of HACCP records

Food Safety Consultant will be able to review any food safety documents & record-keeping logs and provide elaborate comments and guidance on refining your documentation which is central to building a robust food safety and quality program. Examples of the document review include but are not limited to:

- GAP analysis of the documents
- Standard Operating Procedures (SOP's)
- Sanitation Standard Operating Procedures (SSOP's)
- HACCP plan
- Food Quality plan
- Recall Plan
- GMP audit documents
- Training documents
- Verification and validation records
- Record keeping logs
- Internal audit reports
- Corrective action reports
- Environmental testing results
- Finished product testing results
- Shelf-life analysis data

Self-Check 9	Written Test

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

Write the correct answer

1. How to review food safety records (2 point)

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

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

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No	Name	Qualification	Educational background	Institution	Region	Phone Number	E-mail
1	Wondimagegn Tamiru	B	Chemical engineering (Food eng.)	Yirgalem Industrial college	Sidama	0916164466	Wondet2011@gmail.com
2	Sefinew Abere	A	Agronomy	Bahirbar Polytechnic	Amhara	0913336337	sefinew14@gmail.com
3	Misganaw Molla	A	Agronomy	Bure Polytechnic	Amhara	0924520299	mmisganaw2011@gmail.com
4	Bereket Balcha	B	Chemical engineering(Food process)	Sodo Polytechnic	Debub	0910918094	bereketbate@gmail.com
5	Cheru Petros	B	Food technology and process engineering	Arbaminch Polytechnic	Debub	0994505626	cherupeter143@gmail.com
6	Debre Shewarega	B	Food technology and process engineering	Kolfe Industrial college	Addis Abeba	0922944810	henatu3@gmail.com
7	Tesfaye Tekola	A	Agronomy	Asossa ATVET	Benshangul	0910550651	tttekola@gmail.com
8	Workineh Assimamaw			Federal TVETB Agency			