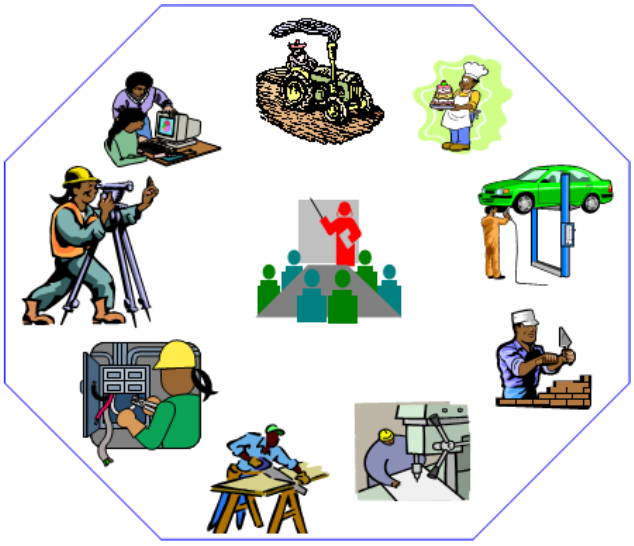
Fruit and Vegetable Processing

Level-III

Based on May 2019, Version 2 OS and March 2021,V1

Curriculum



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

LG Code: IND FVP3 M08 LO (1-4) LG (22-26)

TTLM Code: IND FVP3 TTLM 0321v1

March, 2021

Bishoftu, Ethiopia

With the support of

United Nations Educational, Scientific and Cultural Organization

Republic of Korea Funds-in Trust

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:

- Making hazard control, clothing and equipment available
- Making the information on food safety/quality in the work area
- Accessing and communicating workplace information about identified hazards and outcomes of risk assessment and risk control procedures
- Identifying food safety hazards and control measures
- Mentoring personal hygiene and coaching support
- 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:

- Make hazard control, clothing and equipment available
- Make information on food safety/quality in the work area
- Access and communicate workplace information about identified hazards and outcomes of risk assessment and risk control procedures
- Identify food safety hazards and control measures
- Mentor personal hygiene and coaching support
- Identify and address training needs

Learning Instructions:

Read the specific objectives of this Learning Guide.

1. Follow the instructions described below.
2. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.

3. Accomplish the “Self-checks” which are placed following all information sheets.
4. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).

1.1. Introduction

Hazard is a biological, chemical or physical agent that is reasonably likely to cause illness or injury in the absence of its control.

Food safety is a scientific discipline describing handling, preparation, and storage of food in ways to prevent and avoid foodborne sickness. Food safety is defined by the World Health Organization (WHO) as the assurance that the food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use Food quality is the extent to which all established requirement relating to the characteristics of a food are meet.

The food industry is highly competitive and food manufacturers are continually trying to increase their market-share and profits. To do this they must ensure that their products are of higher quality, less expensive, and more desirable than their competitors, whilst ensuring that they are safe and nutritious. To meet these rigorous standards food manufacturers need analytical techniques to analyze food materials before, during and after the manufacturing process to ensure that the final product meets the desired standards.

Hazard control program consists of all steps necessary to protect workers from exposure to a substance or system, the training and the procedures required to monitor worker exposure and their health to hazards such as chemicals, materials or substance, or other types of hazards such as noise and vibration. Food control covers all stages of production, processing and distribution of food. It covers controls on food that is produced or imported for consumption within the region and food that is exported outside the country.

The principal objective of the national food control system is the protection of public health by protecting consumers from unsafe, unwholesome, mislabeled or adulterated food. It also contributes to economic development by maintaining consumer confidence and providing sound regulatory controls for domestic and international trade in food. Its

purpose is to provide consumer protection and ensure that all foods during production, handling, storage, processing and distribution are safe, wholesome and fit for human consumption.

One of the most important concerns of the food manufacturer is to produce a final product that consistently has the same overall properties, *i.e.* appearance, texture, flavor and shelf life. A particular food product you should be expect its properties to be the same (or very similar) to previous times, and not to vary from purchase-to-purchase. Fruit and Vegetable production is to deliver a safe and wholesome final product to the consumer. Nevertheless, fresh fruits and vegetables have recently been identified and confirmed as a significant source of pathogens and chemical contaminants that pose a potential threat to human health worldwide.

1.1.1. Components of a food control system

The main components of a national food control system are:

- Food Law and Regulations
- Food Control Management
- Inspection Services
- Laboratory Services for food monitoring and epidemiological data
- Information, education, communication and training.

1.2. Wearing appropriate Personal Protective Equipment

There are different types of materials, tools and equipment and supplies to perform different activities in food safety program. Protective clothing and footwear should be selected to prevent skin contact with contaminated materials or environments. Consideration should be given to the type of work being performed by the worker when selecting personal protective clothing. Therefore, identifying, selecting, using and preparing facilities, supplies according to the working activity are very important aspect of the program. Personal protective equipment (PPE) includes:

- Overalls
- Gloves
- Safety goggles
- Plastic boots/shoes
- Respirator or face mask
- Aprons
- Protective eyewear/hair wear

Food handlers should maintain a high degree of personal cleanliness where appropriate; food handlers must wear suitable protective clothing, head covering, and footwear.

a. Handling of chemicals – gloves, safety glasses, aprons.

b. Protecting eyes from flying particles.

c. Protecting feet – safety boots.

Self-Check #1	Written Test

Name…… ID…… Date…….

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

Test I: Write short answer questions (10 points)

1. List Personal protective equipment?
2. Explain food quality?
3. What are quality parameters of fruit and vegetables?

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

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

Information Sheet 2. Communicating Information on food safety/quality

2.1. Workplace information on Food quality

Communication is an essential element in developing, implementing and maintaining a functioning food safety management system. Its importance is highlighted in the ISO 22000 standard under parts, internal and external communication. These two parts of the standard emphasize the importance of communication in ensuring food safety programs are properly maintained and managed, both within the company and with stakeholders outside the company. Within the company, the key is to ensure the food safety or HACCP team is aware of any issues that may affect the food safety management system.

There are many different means for communicating within a company, including new employee orientation, team meetings, educational programs, bulletin boards, email messaging and the use of well-documented procedures. It also is absolutely essential to establish communications procedures in the recall and traceability program. The technical requirements are a basic recall team and the means for information gathering. Ultimately, a food processor's commitment to traceability is determined by top management, whether at the corporate or plant level.

2.1.1. Food safety and quality policies and programs

Good communication systems are essential to every element in a food safety management system, from management commitment and mission statements to prerequisite programs to each principle within the HACCP system to dealing with third-party auditors and regulators. A document control protocol that includes managing how procedures, work instructions and forms are developed, implemented and modified makes the system tick.

2.1.2. Standard Operating Procedures (SOPs)

SOP is a procedure specific to your operation that describes the activities necessary to complete tasks in accordance with industry regulations, provincial laws or even just your own standards for running your business. In a manufacturing environment, the most obvious example of an SOP is the step by step production line procedures used to make products as well train staff. A written workplace hazard control program should outline which methods are being used to control the exposure and how these controls will be monitored for effectiveness.

SOPs are policies, procedures and standards you need in the operations, marketing and administration disciplines within your business to ensure success.

2.1.3. Specifications

Without standardized procedures in place, companies may be unable to control the quality of their end-product. To ensure food safety, it is necessary for standardized processes and procedures within the company's operations. Additional, 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. The company must have detailed policies and procedures relevant to the receiving, handling, manufacturing, shipping, control and evaluation of food products to assure that they meet appropriate food. Food factory must have detailed manuals that address the development, implementation and control of systems that control and assure food Safety, quality and Security. The manuals should clearly define expectations through detailed product and process specifications.

Self-Check #2	Written Test

Name…… ID…… Date…….

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

Test I: Write short answer (6 points)

1. Explain the Workplace information's?
2. What are the means of communication carrying out in Fruit and Vegetable processing industry?
3. Define SOP?

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

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

Information Sheet 3**:** Accessing and communicating workplace information about identified hazards and outcomes of risk assessment and risk control procedures

3.1. Accessing and communicating workplace information about identified hazards

Risk: The likelihood, or possibility, that harms (injury, illness, death, damage etc.) may occur from exposure to a hazard. Risk is the combination of the severity of the adverse effects of the hazard on the health of the consumer and the likelihood of the hazard occurring. It is not an easy thing to quantify.

Risk Communication is defined as the two way exchange of information/opinion on hazards, risk, risk-related factors and risk perceptions among all interested parties. This includes the explanation of risk assessment findings and the basis of the risk management decisions.

Risk Assessment: Is defined as the process of assessing the risks associated with each of the hazards identified so the nature of the risk can be understood. This includes the nature of the harm that may result from the hazard, the severity of that harm and the likelihood of this occurring. A risk assessment should include:

- Identify factors that may be contributing to the risk,
- Review health and safety information that is reasonably available from an authoritative source and is relevant to the particular hazard,
- Evaluation of how severe the harm could be]
- Evaluation of how a hazard may cause harm.

Risk Control measure

Taking actions to eliminate health and safety risks so far as is reasonably practicable. Where risks cannot be eliminated, then implementation of control measures is required, to minimize risks as far as is reasonably practicable.

Administrative Procedures

Develop work methods or procedures to reduce the conditions of risk, for example:

- Written Safe Operating Procedures
- Job rotation to restrict hours worked on difficult jobs.
- Staff trained in the correct operating procedures.

- Each measure must have a designated person and date assigned for the implementation of controls.

Use Personal Protective Equipment (PPE) and training in its use:

Offer the lowest level of protection and should only be used as a last resort to deal with the hazard, where the hazard cannot be removed or reduced by any other means, for example:

a. Handling of chemicals - Gloves, safety glasses, aprons.

b. Protecting eyes from flying particles.

c. Protecting feet – safety boots.

Monitor and Review

Hazard identification, risk assessment and control are an on-going process.

Make sure that you undertake a hazard and risk assessment when there is a change to the workplace including when work systems, tools, machinery or equipment change. The effectiveness of control measures can be checked through regular reviews as well as consultation with workers.

Self-Check #3	Written Test

Name…… ID…… Date…….

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

Test I: Short Answer Questions (6 points)

1. What is risk?
2. Definer risk assessment**?**
3. How implementations of risk control measures?

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

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

4.1. Identifying Food safety hazards

Identifying hazards is essential to preventing injuries at the workplace. It is also an important part of keeping your workplace in compliance with health and safety laws. You can identify workplace hazards by reviewing inspection and injury reports, soliciting feedback from employees, and seeking the assistance of professional health and safety experts from outside your company. Using these methods will help you protect workers at your workplace from potential harm. Foods can become unsafe and have the potential to cause harm through hazards.

4.2. Types of Food safety hazards

The production of fresh fruits and vegetables embraces different activities such as farming, harvesting, post-harvest treatment and processing. Within all these activities, specific hazards exist that affect product safety and quality and might therefore pose a health risk for the consumer. In order to reduce this risk and to increase produce safety, it is necessary to first assess the potential hazards in the production environment. Once the potential sources of produce contamination or other hazards have been identified, practices can be implemented to control, reduce or eliminate them.

4.2.1. Biological hazards

Biological hazards in fresh produce come from micro-organisms such as bacteria, fungi (yeasts and moulds), and worms, which can also be termed microbes. In some cases, microbial contamination is indirectly introduced by pests. In some cases, microbial contamination is indirectly introduced by pests. The term pest generally refers to any animals of public health importance, such as rodents, birds, insects (e.g. cockroaches, flies and their larvae), that may carry pathogens that can contaminate food.

Micro-organisms capable of causing human disease may be found in raw produce. Sometimes they are part of the fruit or vegetable micro flora as incidental contaminants from the soil and surroundings. In other instances, they are introduced into or on food by poor handling practices in agricultural production or post-harvest processes.

Type of hazard	Hazard	Cause of contamination
Microbiological **Note:** There are many microorganisms in the environment – some are totally harmless, some are beneficial, such as those used in yoghurt and cheese-making, and others are the cause of food spoilage and rotten fruit and vegetables. Only a very small number of microorganisms are harmful to humans. These are called *human pathogenic microorganisms* and are the causes of human disease. Examples include species of bacteria, such as *Salmonella* and *Listeria* and viruses, such as Hepatitis A.	Micro-organisms (microbes) on produce in population numbers that may cause food-borne illness in susceptible consumers - bacteria - viruses - parasites - algae - fungi	- faeces from or the remains of wild and domestic animals and human sewage contaminating water used for irrigating, pesticide application, harvesting, unloading, washing, top icing, hydro-cooling, cleaning - untreated organic animal products used for fertilising and soil improvement contacting produce directly or indirectly via the soil - picking produce that contacts or drops on to contaminated soil - inadequate cleaning of picking containers and harvesting, grading and packing equipment contaminated by soil, decaying matter and faeces of rodents, birds and insects - stacking of pallets, crates and bins contaminated with soil and faeces on top of exposed produce - packaging and packing material contaminated with faeces from rodents, birds and insects - handling of produce by infectious workers due to inadequate toilet and hand washing facilities, poor personal hygiene practices, and sickness (e.g. communicable diseases such as hepatitis A) - leakage of contaminated water from recirculating cooling systems in cold rooms

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Figure 4. Biological hazards

4.2.2. Chemical hazards

Chemicals from non-food grade packaging in contact with food can also leach into food. Substances like heavy metals (lead, cadmium, zinc, and cyanide), refrigerants etc. Detergents and lubricants used by the food handler or processor may also contaminate food and present a hazard. Chemical hazards exist also in natural form such as allergens, mycotoxins, alkaloids (glycol alkaloids in potatoes), and enzyme inhibitors.

Type of hazard	Hazard	Cause of contamination
Chemical	Pesticide residues in produce exceeding maximum residue limits (MRLs). **Note:** pesticides that are not registered or approved for use on specific produce (with permits) have a zero MRL	- not reading/understanding the pesticide label - incorrect advice - incorrect mixing — concentration higher than label rate - withholding period not observed - equipment incorrectly or not calibrated - spray drift from adjacent crop - pesticide in soil from previous use - pesticide residue in picking bins, crates - equipment not cleaned after use - multi-purpose use of equipment — for example, both washing and spraying - dumping, accidental spillage or seepage of pesticide into soil or water source
	Heavy metal residues in produce exceeding maximum levels (MLs)	- continued use of fertilisers with high levels of heavy metals - high levels of heavy metals present in the soil, naturally or due to previous use - development of soil conditions conducive to uptake of heavy metals by crops e.g. acidity, salinity, zinc deficiency
	Natural toxins	- unsuitable storage conditions — for example, storage of potatoes in light - peanuts, tree nuts and all their products
	Non-pesticide chemical contamination	- chemical and fertiliser spills on pallets - leakage of chemicals and fertilisers transported with produce - oil leaks and grease on equipment in contact with produce - spillage of chemicals (e.g. vermin control chemicals) near produce or packaging materials - use of inappropriate cleaning chemicals - residues in picking containers used to store chemicals, fertiliser, oil etc
	Allergenic Agents - traces of a substance which may cause a severe reaction in susceptible consumers (eg asthmatics, immune-repressed)	- Sulphur dioxide (e.g. desiccation pads used on grapes)

Figure 5. Chemical hazards

4.2.3. Physical hazards

These are pieces of metal, glass, plastic, wood, personal items, machinery and equipment. For example pins, nails, broken bulb or bottle, fragments, watch, jeweler, keys, stones, hair. These hazards can cause choking, cuts and bruises in the mouth and gastrointestinal system.

Type of hazard	Hazard	Cause of contamination
Physical	Foreign objects from the environment (e.g. soil, stones, sticks, weed seeds)	- harvesting of ground crops during wet weather - dirty harvesting and packing equipment - dirty picking containers and packing materials - stacking of dirty pallets, crates and bins on top of exposed produce
	Glass	- broken lights above packing equipment and areas where produce is exposed - broken bottles picked up by harvesting equipment — left by workers or thrown into block from passing traffic
	Foreign objects from equipment and containers (e.g. wood splinters, metal shavings, plastic objects, paint flakes)	- damaged picking containers, harvesting and packing equipment and pallets - inadequate cleaning after repairs and maintenance - workshop areas too close to packing and storage areas - shotgun pellets
	Foreign objects from human handling (e.g. jewellery, adhesive dressings, gloves)	- careless or untrained staff - inappropriate clothing

Figure 6. Physical hazard

4.3. Identifying food hazard control measures

a) Good Manufacturing Practice(GMP)

b) Hazard Analysis Critical Control Points(HACCP)

c) HACCP Prerequisite Program

d) ISO22000

Self-Check #4	Written Test

Name…… ID…… Date…….

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

Test I: Short Answer Questions (10 points)

1. Mention the three types of Hazards
2. Explain chemical food hazards?
3. Give example for biologic hazards?
4. List food hazard control measures?

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

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

Information Sheet 5- Mentoring personal hygiene and coaching support

5. 1. Mentoring personal hygiene

Personal hygiene is the basic concept of cleaning, grooming and caring for our bodies. The first principle of good hygiene is to avoid an exposure by forming a barrier over the skin with personal protective equipment (PPE) such as gloves, coveralls, and boots. It is important to check the PPE often for excessive contamination, wear, tears, cuts, or pinholes.

Mentoring is a learning process which supports much of what is currently known about how individuals learn, including the importance of experiential and work-based learning. In which the mentor provides guidance, advice, support and feedback to the mentee. In consultation with workers identify all potentially hazardous things or situations that may cause harm. It can be a focused, planned relationship where the mentor assists the mentee achieve greater self-awareness, identify and plan alternatives and initiate and evaluate actions. Mentoring relationships have a clear start, evolution and ending.

Coaching is the more specific process of learning from or about a task while actually performing it. Advice on personal hygiene should be issued to all individuals with gastrointestinal disease and should include the following:

- Avoid preparing food for other people until free from diarrhea or vomiting.
- Thoroughly wash hands after defecation, urination and before meals.
- Thorough hand washing with soap in warm running water and drying is the most important factor in preventing the spread of enteric diseases.
- Use your own separate towels to dry hands. Institutions, particularly schools, should use liquid soaps and disposable towels or hand-dryers.
- Clean toilet seats, flush handles, hand-basin taps and toilet door handles with disinfectant after use. It is a commonly held belief that coaching and mentoring relationships help to bring out the best in people.

Self-Check #5	Written Test

Name…… ID…… Date…….

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

Short Answer Questions (12points)

1. Write benefits of having a mentor?
2. Define Coaching?
3. Explain Mentoring?

Note: **Satisfactory rating – 6points** **Unsatisfactory - below -6points**

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

Information Sheet 6- Identifying and addressing training needs

6.1. Identification and addressing of training needs

Training is a planned and systematic effort to modify or develop knowledge, skills and attitudes. In order to assess what type of modification or development is required and to establish a starting point from which the training programme can begin a TNA (Training Needs Analysis) should be conducted to assess current knowledge, skills and attitudes towards safe food handling behaviour. By conducting a TNA many food industry managers may realise that most of their food handlers may not need to be trained with accredited training providers or be given formal examinations, but merely need to be given frequent refresher training by trained personnel, which could include feedback on observed practical activities or a short knowledge Safe food handling practices and Unsafe food handling practices Habits.

Identification of Training Needs e.g. Who needs training, what level, why do they need it, and when do they need it Influence of norms and significant Others e.g. support for change from appropriately trained workplace personnel Knowledge test and or practical skill assessment. Documented TNA (Training Needs Analysis) Choice of training programme e.g. Considerations include language, cost, duration, location, certification, relevance to work activities, style of delivery Belief System e.g. Concerns about adverse effects of non-compliance Knowledge gained Behavioural Intention Motivational System e.g. Incentives Practical skills gained Motivational System e.g. Encouragements Overall performance measures (Individual and Organisational)Food handlers' evaluation of the training programme. If observations and the testing of food handlers are conducted by personnel within the organisation, businesses must ensure these personnel are kept abreast of food hygiene legislation and regularly review their own professional development needs.

An important aspect of education is to promote voluntary compliance with food regulations. Voluntary compliance means that food producers and providers adhere to the food laws voluntarily, because they understand the benefits of good practice, rather than be prosecuted or penalised for breaching the regulations.

Self-Check #6	Written Test

Name…… ID…… Date…….

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

Short Answer Questions (4points)

1. How assess training needs?

Note: **Satisfactory rating – 2points** **Unsatisfactory - below -2points**

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

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 work procedures and following food safety program.
- Identifying, reporting and addressing deviation from identified procedures
- Consistenting personal behavior with workplace policies and procedures
- Identifying and reporting food safety hazards
- Recording food safety and quality information
- Monitoring Work area.
- Conducting Work with environmental guide lines

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 Work procedures and following food safety program.
- Identify, report and address deviation from identified procedures
- Consistent personal behavior with workplace policies and procedures
- Identify and report food safety hazards
- Record food safety and quality information
- Monitor Work area.
- Conduct work with environmental guide lines

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Information Sheet 1: Defining, documenting and following food safety program.

2.1 Definition of Food safety program

Food safety program is a written document that specifies how a business will control all food safety hazards that may be reasonably expected to occur in all food handling operations of the food business. Only certain high risk food businesses are required to have food safety programs: Food Safety Program is a 'live document' that outlines how a business will proactively identify and control food safety hazards when producing, manufacturing or handling food. It's designed and managed by a Food Safety Supervisor on behalf of a food business**.** The purpose of food safety programs is to prevent food safety problems arising in the food handling operations that are specific to its particular business. This food safety program tool for the commercial food service sector identifies and recommends controls for the hazards expected to be relevant to the food handling operations involved in the commercial food service sector in accordance with the components of a food safety program.

The food safety program must:

- Identify all potential food safety hazards that may be reasonably expected to occur in the food business' operations
- Identify solutions for controlling these hazards
- Provide procedures for corrective action when a hazard is found to not be under control
- Identify where, in your food handling operations, you control the hazards;
- Explain your monitoring system to ensure the controls are in place;
- Specify the corrective action you will take if monitoring indicates that a hazard is not being controlled;
- Set out the food safety program in a written document and retain that document at the food premises

- Include a documented mechanism that outlines basic food safety procedures should the Food Safety Supervisor become absent.

2.2. Quality standard

The International Organization for Standardization (ISO) defines quality as “the totality of features or characteristics of a product that bear on its ability to satisfy the stated or implied needs. ISO standards, such as ISO 9001, ISO 14001, and ISO 27001, serve as a framework for businesses food standards consist of precise descriptors for the criteria that define the quality of the product. Standard requires that your food safety program and the records you keep demonstrating compliance must be in writing and available to food safety. It is essential that the food safety program you prepare based on this food safety program

Nowadays, domestic and international trade of fruits and vegetables is regulated by quality standards in most countries, providing a common language among the different participants of the production-commercialization-consumption chain. Standards are also the legal framework to settle commercial disputes and are useful as a basis for reporting on market prices as prices only can be compared between the same quality categories.

Product standard: Specification and criteria for characteristics of products Process standard: Criteria for the way and method products are made. Table 2. Product standard:

Fruits	TSS (°Brix) 20°C	Acidity (g citric acid/100 g)	pH	Vitamin C (mg/100g)	Total natural sugars (g/100 g)	Total solids (g/100g)
Acerola	≥ 5.5	≥ 0.80	≥ 2.8	≥ 800.0	4.0 - 9.5	≥ 6.5
Pineapple	≥ 11.0	≥ 0.30	-	-	≤ 17.0	≥ 14.0
Cocoa	≥ 14.0	≥ 0.75	≥ 3.4	-	10.0 - 19.0	≥ 16.0
Hog plum	≥ 9.0	≥ 0.90	≥ 2.2	-	≤ 12.0	≥ 9.5
Cashew	≥ 10.0	≥ 0.30	≤ 4.6	≥ 80.0	≤ 15.0	≥ 10.5
Guava	≥ 7.0	≥ 0.40	≥ 3.5	≥ 40.0	≤ 15.0	≥ 9.0
Soursop	≥ 9.0	≥ 0.60	≥ 3.5	≥ 10.0	6.5 - 17.0	≥ 12.5
Papaya	≥ 10.0	≥ 0.17	≥ 4.0	-	≤ 14.0	≥ 10.5
Mango	≥ 11.0	≥ 0.32	3.3 - 4.5	-	≤ 17.0	≥ 14.0
Mangaba	≥ 8.0	≥ 0.70	≥ 2.8	-	≤ 8.5	≥ 10.0
Passion fruit	≥ 11.0	> 2.50	2.7 - 3.8	-	≤ 18.0	≥ 11.0
Melon	≥ 7.0	≥ 0.14	≥ 4.5	-	≤ 12.0	≥ 7.5
Pitanga	≥ 6.0	≥ 0.92	2.5 - 3.4	-	≤ 9.5	≥ 7.0

2.3. Verification of food safety system

The food safety system should be verifiable for the producer, processor and for the customers through certified or regulatory body.

Examples of verification activities include all of the following:

- Allergen testing on equipment and/or finished product when using the same equipment for products that contain different allergens
- The quality supervisor reviewing the records created during production each week to ensure that the correct labels were applied to product
- Visual inspection of equipment for cleanliness
- Reviewing data from environmental monitoring for sanitation controls
- Auditing a supplier
- Review of records from monitoring, corrective action, and verification activities by a supervisor
- Reanalyzing your Food Safety Plan

Self-Check #1	Written Test

Name…… ID…… Date…….

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

Test I: Short Answer Questions (6 points)

1. What are verification activities?
2. What are quality characteristics of fruit and vegetables?

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

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. Identifying deviation

Deviation is a departure from standard procedures or specifications resulting in non-conforming material and/or processes or where there have been unusual or unexplained events which have the potential to impact on product quality, system integrity or personal safety. For compliance to GMP and the sake of continuous improvement, these deviations are recorded in the form of deviation report.

Deviation should be raised when there is a deviation from methods or controls specified in manufacturing documents, material control documents, standard operating procedure for products and confirmed out of specification results and from the occurrence of an event and observation suggesting the existence of a real or potential quality related problems.

A deviation should be reported if a trend is noticed that requires further investigation. All batch production deviations (planned or unintended) covering all manufacturing facilities, equipment, operations, distribution, procedures, systems and record keeping must be reported and investigated for corrective and preventative action. If the deviation is the result of a problem in line design or equipment malfunction, a quick fix may be applied in order to continue running but a long term solution must seek. Non-compliant product must be placed hold on.

The re-evaluation process also become part of the HACCP program as the system evolves. You must maintain record of the corrective actions which occurred. HAACCP requires that immediate corrective action is already assigned and the CCP will be brought back into control before production continues. Immediately adjust the process and keep the product in compliance within the set criteria. In this case the correction action is immediate, and no production is hold because there has been no deviation. Stop the line. Hold all products not incompliance correct the problem on the line and then continues with production. A critical control point (CCP) is ‘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 ’(CCFH, 1997). Preventive measures are applied at CCPs. For every hazard identified in the hazard analysis in the process must be assessed to determine if

the step constitutes a CCP.e.g. E. coli. In raw fruit and vegetable, contaminated water.Corrective action to address deviation

- The cause of the deviation is identifying and eliminated
- The CCP will be under control after the corrective is taken
- No products that are injuries to health or otherwise adulterated as a result of the deviation enter commerce.
- Corrective actions address deviation in critical limit.
- Corrective actions should define for each CCP.
- Corrective actions address the process and the product

Self-Check #2	Written Test

Name…… ID…… Date…….

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

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

1. Mention the way to address deviation?
2. What is deviation?
3. Write general food safety requirements?

Note: **Satisfactory rating >3points** **Unsatisfactory - below -3points**

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

2.2. Personal behavior

Personal Behavior (smoking, spitting, chewing and eating, sneezing, eating food, drinking beverage and using tobacco must not be allowed in food processing area; all necessary steps have to be taken by supervisors to prevent operators from contaminating foods with microorganisms or foreign substances. People, who are actually handling food, should remove any jewelry that cannot be properly sanitized from their hands; it is necessary to wear effective hair restraints, such as hairnets, caps, headbands or beard covers; operators must not store clothing or other personal belongings in food processing areas. In food company the food handler behavior including:

- Never smoke, chewing gum and no eating of food in the production factory
- Wear suitable clean protective clothing provided by company.
- Medicines in tablets or liquid should not be brought in the production area.
- Never cough or sneeze over food.
- Shoes in production should be covered and low heeled.
- Cosmetics e.g. Lipsticks eye shadows and excessive smelling perfumes should be avoided.
- Hair should well adequate covered with head cap
- Nails should be kept short and without cutter or color
- Keep fingernails short so they are easy to clean,
- Cuts, wounds, grazes, should be covered with appropriate bandages by the company.
- Change disposable gloves regularly
- Don’t enter into production areas unless authorized.
- Remove all unsecured jewelry
- Walk do not run in the production floor
- Cleaning of hands with disinfection as you enter production area.

Self-Check #3	Written Test

Name…… ID…… Date…….

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

Short Answer Questions (6 points)

1. What are Personal behavior requirement in fruit and vegetable processing industry?
2. Explain personal hygiene?

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

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

2.3. **Reporting food safety hazards**

A food safety hazard is something that can cause serious illness, injury, or death when found in foods. In the retail food business where consumers may be impacted, a foodborne illness can be a risk to a consumer based on the likelihood of a hazard occurring in a food, the probability of the hazard causing illness or injury to that individual, and the severity of the illness or injury to the individual. The risk of an illness is best avoided by focusing on and preventing the hazard. If a single hazard in a food could cause death (e.g., an undeclared allergen consumed by a severely allergic individual), but there is very little probability that the hazard can get into the food due to rigorous preventive controls, then the risk is very low.

Monitor the health of staff. Conditions to be reported for medical examination and/or possible exclusion from food handling are:

- Diarrhea
- vomiting
- fever
- sore throat with fever;
- Visibly infected skin lesions (boils, cuts, etc.)

Table. Health status of food handler

Handling employee illness	
If	Then
The food handler has one of the following symptoms: • Fever • Diarrhea • Vomiting • Sore throat with fever • Jaundice (a yellowing of the skin and eyes)	Restrict them from working with or around food. Exclude them from the establishment if you primarily serve a high-risk population
The food handler has been diagnosed with a food-borne illness,	Exclude them from the establishment and notify the local regulatory agency. Managers must report employee illnesses resulting from the following pathogens to the local health department: ➢ Salmonella typhi ➢ Shigella spp. ➢ Shiga toxin-producing E -coli ➢ Hepatitis A virus The manager must work with the local regulatory agency to determine when the food handler can safely return to work.

Self-Check #4	Written Test

Name…… ID…… Date…….

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

Test I: Short Answer Questions (10 points)

1. Describe briefly the ways in which we can raise the food safety issues.

2. List out keeping food safe in business steps

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

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

Information Sheet 5- Recording food safety and quality information

5.1. Documentation and recording

Records help to ensure consistency of processing operations and end-product quality and safety. Maintaining adequate documentation and records of processing operations is important in the event of recall of with fresh pre-cut fruits and vegetables. Where appropriate, records should be maintained to adequately reflect product information, such as product formulations or specifications and operational controls.

Maintaining adequate documentation and records of processing operations is important if a trace back investigation of product is ever needed. Records are most useful when they begin by including the date and time, name of person(s) who completed the record, and the activity or production station being recorded. The record should include details of the food safety breach (e.g., what critical limit was exceeded at what critical control point), details about the corrective action that was taken, and why it was taken. Recording corrective actions makes it possible to identify recurring problems and trends that could be putting customers at risk and sending operational costs through the roof. For example, if there is a very high number of immediate corrective actions related to spoiled food, it could mean that there are underlying issues related to: Ineffective inventory management (e.g., ordering too much),Poor stock control (e.g., not practicing First In, First Out). Examples of fruit and vegetable records including:-

- Raw materials records
- Equipment monitoring and maintenance records
- Equipment calibration records
- Sanitation records
- Product processing records
- Pest control records
- Recall procedures
- Employee training records
- Temperature control records
- Calibration records

- Product processing batch records
- Corrective action records
- Distribution records
- Inspection records (e.g., incoming product, facility, production area)
- Microbiological contamination records (e.g., food contact surfaces, equipment)

Self-Check #5	Written Test

Name…… ID…… Date…….

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

Test I: Short Answer Questions (10 points)

1. What is the advantage of recording information on food quality?.

2. List out the information should be recorded?

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

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

Information Sheet 6- Monitoring Work area.

6.1. Monitoring Work area

Monitoring defined as the act of conducting a planned series of observations or measurements of control parameters. Monitoring includes the collection of information that indicates whether or not a preventive control is being performed. For example, the collection of temperature data for every batch of a product for which you use heat treatment as a preventive control would be a monitoring activity. Food safety practices refer to specific food handling controls related to food handling and preparation in business/industry.

In order to maintain the work place to its standards to keep food safety practices. Facilities required in the processing room should be:

- Separate hand-
  washing facilities for staff, with soap, clean water, nail brushes and clean towels.
- Toilets, which should be separated from the processing room by two doors or lo cated in a nearby building.
- First aid materials.
- Protective aprons or coats washed regularly, hats/hairnets and if necessary, glo ves

shoes.

- Appropriate storage area
- Processing area and display facilities
- Packaging and transportation facilities and also
- Cleaning and sanitizing facilities
- pests control mechanism
- Temperature controls are maintained to its standards.
- Cleaning chemicals, stored away from the processing room.
- Clean the processing room, toilets, washing facilities and storerooms every day
- Use the correct chemicals to clean equipment, make sure there are no food residu es.

Following minimum requirements are laid down in the Fruit Product Order (FPO), 1955 for hygienic production and quality standards:

- Location and surroundings of the factory
- Sanitary and hygienic conditions of premises
- Personnel hygiene
- Portability of water
- Machinery & Equipment with installed capacity
- Quality control facility & Technical staff Product Standards
- Limits for preservatives & other additive.

Following minimum requirements are laid down in the Fruit Product Order for hygienic production and quality standards:

- Location and surroundings of the factory
- Sanitary and hygienic conditions of premises
- Personnel hygiene
- Portability of water
- Machinery & Equipment with installed capacity
- Quality control facility & Technical staff
- Product Standards
- Limits for preservatives & other additives

Self-Check #6	Written Test

Name…… ID…… Date…….

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

Test I: Short Answer Questions (10 points)

1. How to monitor Work area?

2. Explain monitoring?

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

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

7.1. Conducting work with environmental guidelines

While conducting work in food safety program the following are very important points to be considered. Some of them are: include all those measures and conditions required to prevent and control produce contamination hazards, mainly biological. GMP (at primary and post-harvest stages) already includes all recommendations regarding hygiene practices to produce and handle safe products. (Reference reading: Code of Hygienic Practices for Fresh Fruits and Vegetables). Proclamation no. 513/2007 Sold waste management proclamation Food industries and restaurants shall collect, store and dispose of the food related solid waste v they generate in an environmentally sound manner. Good Hygienic Practices: Include all those measures and conditions required to prevent and control produce contamination hazards, mainly biological. In practical terms, the implementation of GAP and GMP (at primary and post-harvest stages) already includes all recommendations regarding hygiene practices to produce and handle safe products. (Reference reading: Code of Hygienic Practices for Fresh Fruits and Vegetables).

Good Manufacturing Practice (GMP)

It Is that a part of quality assurance aimed at ensuring that products are constistenting manufactured to quality appropriate to their intended use. GMP is a term that is recognized worldwide for the control management of manufacturing and quality control of food, pharmaceutical products and medical devices. GMP covers following areas are :

Raw materials, purchasing and control (including agreed specifications, supplier auditing, raw material storage, stock control, traceability, inspection, investigation of non - conformity to specification).

Process control (including identification, verification and monitoring of critical control points in a HACCP scheme, hygienic design of plant and layouts to minimize cross contamination, cleaning schedules, recording of critical production data, sampling procedures and contingency plans to cover safety issues)

Premises (including methods of construction to minimize contamination, maintenance, waste disposal)

Quality control (including product specifications and quality standards for non -safety quality issues, monitoring and verification of quality before distribution)

Personnel (including training, personal hygiene, clothing and medical screening)

Final product (including types and levels of inspection to determine conformity with quality specifications, isolating non -conforming products, packaging checks, inspection records, complaints monitoring systems)

Distribution (to maintain the product integrity throughout the chain, batch traceability and product recall systems).

Principles of GMP

1. Design & construct the facilities & equipment's properly.
2. Follow written procedures & instructions.
3. Document work
4. Validate work.
5. Monitor facilities & equipment.
6. Write step by step operating procedures & work on instructions.
7. Design, develop & demonstrate job competence.
8. Protect against contamination.
9. Control components & product related process,
10. Conduct plan & periodic audits.

Self-Check #7	Written Test

Name…… ID…… Date…….

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

Test I: Short Answer Questions (10 points)

1. How to Conducting work with environmental guidelines?

2. Explain monitoring?

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

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

LG #24	**LO # 3- Take corrective action in response to quality and food safety non-compliance**

Instruction sheet

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

- Implementing Workplace procedures
- Investigating Hazardous events
- Implement the responsibilities of operator

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
- Investigate hazardous events
- Implement the responsibilities of operators

Learning Instructions:

Read the specific objectives of this Learning Guide.

Follow the instructions described below.

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

1.1. Implementing Workplace procedures

HACCP is based on hazard analysis, a series of logical steps to identify and provide answers to potential problems. Hazard analysis is the process of data gathering and evaluation on hazards associated to a particular food and of deciding which are significant and should be approached with a safety assurance program. Prior to applying the HACCP system, prerequisite programs (GAP, GMP, GHP, training programs, traceability, standardized sanitary programs, etc.)Should be in place. Relatively few steps during processing are addressed at reducing or eliminating biological contamination in already contaminated foods; measures aim at preventing hazards as a result of GAP, GMP and GHP in place. However these programs, depending on the scale of primary operations and the producers' resources, must concentrate in applying good practices backed up only by essential records. HACCP is applied to food safety management and uses a methodology to identify and control critical points in food handling, to prevent safety problems. It is science-based and applies a systematic approach, identifying specific hazards and measures for their control to ensure food safety. HACCP consists of:

- analysis of potential hazards in production and post-harvest handling;
- identification of the points where the hazard can take place
- establishment of the critical points for product safety
- establishment of effective controls to minimize hazards
- establishment of a system to monitor critical points
- Review of hazards, hazard analysis, critical points and follow-up records.

Establishing a HACCP system

Establishing a HACCP program relies on the application of the seven HACCP principles:

1. Identify the hazards.
2. Establish the critical control points (CCPs).
3. Establish critical limits (CL) for each CCP.
4. Establish a system to monitor control of the CCP.

5. Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control.
6. Establish procedures for verification to confirm the HACCP system is working effectively.
7. Establish documentation concerning all procedures and records appropriate to these principles and their application.

Applying these seven principles requires the following 12 steps:

Step 1. Assemble the HACCP team.

Step 2. Product description.

Step 3. Identify intended use of product.

Step 4. Establish a flow diagram.

Step 5. On-site confirmation of flow diagram.

Step 6. List all potential hazards, conduct a hazard analysis and consider any measures to control identified hazards.

Step 7. Establish CCP.

Step 8. Establish critical limits for each CCP.

Step 9. Establish a monitoring system for each CCP..

Step 10. Establish corrective actions.

Step 11. Establish verification procedures.

Step 12. Establish documentation and record keeping.

Steps 1 to 5 are preliminary to the plan, steps 6 to 8 apply the 7 principles and define the plan and steps 9 to 12 support the implementation.

A critical control point as defined in the HACCP system is a phase in the process where an essential control may be applied to prevent or eliminate a hazard or to reduce this hazard to acceptable levels. For fresh fruits and vegetables, it is also difficult to establish an acceptable level for biological contaminants and efforts are directed to have pathogen free fresh foods. In any case the systematic approach involved in HACCP (steps in logical sequence, hazard analysis and control points) is valuable to apply safety assurance programs for fresh fruits and vegetables.

Step 1. Assemble the team

Diversity in scales of production for fruits and vegetables, regional and local handling practices, the environment, specifics of soils and many other production factors with their various interactions, dictate a multidisciplinary approach to safety assurance. When considering assembling the HACCP team for a product, candidates conversant with the following should be included:

- Determining contamination hazards in primary production systems and available control methods for chemical, physical and biological contaminants;
- Knowledge on production and post-harvest systems (local, national and regional);
- Experience with (principles and practice) of HACCP and GAP, GMP and GHP;
- Knowledge of the target market demands on safety;
- Experience in technology transfer to producers and others in the chain.

Responsibilities of the team.

The purpose and scope of the safety assurance program is point number one for the team to consider: The product(s) and specific process to be studied: For example, in a program at the national level, directed first at ensuring export products safety, all activities must apply to products for this market. Safety programs should cover groups of products, with specific production and post-harvest handling characteristics, and establish general recommendations for those points regarded as critical for safety in production and post-harvesting. Specific products should be covered, if possible, by specific recommended practice guidelines, i.e.: good practice guidelines for leafy vegetables and for deciduous fruit.

Establish principles and essential areas covered**:** adopt measures to ensure food safety throughout, protect the health and welfare of personnel in production and post-harvest handling, and implement practices assuring sustainability for production systems, while protecting the environment.

Steps 2 and 3. Product description and Identify intended use of product

The team must produce a clear description of produce in a safety assurance program. The description will include composition, packaging, transport conditions, distribution requirements, handling instructions and instructions for use. Handling requirements for maintaining product quality, such as storage temperature, are of value for players involved in distribution and retail sales. Consumers that may be prone to particular biological hazards should be properly identified: children, pregnant women, senior citizens, etc.

Steps 4 and 5. Establish a Flow Diagram and *in situ* confirmation

Operations involved from production in the farm to shipping to the target market need to be identified to assess the risks involved in production and post-harvest. Besides characterizing each activity, a responsible individual and times of operation should be identified as key information to establish the standard operating procedures supporting personnel job descriptions and training. If the same product is produced in different areas with different production systems, the working team will carefully identify key steps and operations to maintain safety. The Flow Diagram must reflect production areas and any specific operations taking place in particular areas. As part of the process flow, in situ verification is important to identify water resources, storage areas for agrochemicals, places for composting, facilities at the farm and for post-harvesting.

Step 6. List all potential hazards

This step identifies product safety hazards for each stage in the process and possible measures that could be implemented to prevent, control or reduce them. It is suggested that the Code of hygiene practices for fresh fruits and vegetables, is followed, identifying

Step 7. Establish CCP

Prioritize critical process steps for maintaining safety of fresh fruits and vegetables. Establish control points In those steps, where established hazards would have a

significant impact on product safety, there is a need for prevention and control measures. These points are known, in codes of practice for primary production, as "Control Points".

The following should be considered:
Collect data on microbiological analysis of on pesticides residues resulting from tests run by companies acquiring pesticides in the same production area, review data on pesticides more commonly used, review data on weed killers, records on diseases occurring in personnel, etc. This data will be of relevance when prioritizing control points and control measures to be enforced in the short, medium and long term.

Step 8. Establish critical limits

Even if one of the difficulties in applying the HACCP approach to primary production is establishing critical limits, it is important in methodologies similar to HACCP to define acceptance levels for hazards associated to each control point, for example: number of qualified people, preharvest intervals, maintenance of equipment routines and calibrating equipment routines. These parameters, even if they will not specify the hazards for fruit and vegetables contamination, once contamination takes place are basic for the acceptance of the prevention and control measures implemented, as well as for implementing corrective measures.

Step 9. Establish a monitoring system for each control point

A simple and easily applied monitoring system must be established to define the efficiency of the control or the preventive measures for each control point. The system should consider data to be collected and collection frequency, a responsible individual and actions to be taken should the objectives of the established program not be met. Records should be kept for training personnel, pesticide applications, cleaning and disinfecting facilities, fruit collection, cold rooms' temperatures, drying temperatures, gas concentration in modified atmospheres, microbiological tests, etc.

Step 10. Establish corrective actions

The company must have a self-evaluation program, allowing through a continuous review of records for each control point, an assessment that the control measures are

being met or not, and implementing actions for their compliance. Some corrective measures are: more specific records, the strengthening of training programs, establishing strict personnel hygienic measures and strategies to commit personnel in applying measures.

Step 11. Establish verification procedures

This consists in auditing all records and verification procedures, microbiological, chemical and physical analysis to verify if the safety assurance program is performing satisfactorily. Following audits, a period of time for correcting nonconformities applies. For proper verification, adequate indicators and appropriate verification means are required.

Verification procedures

Information obtained through observation that can be used to demonstrate that a control measure is being effectively implemented, for example, field visits or reviewing records. Good verification procedures must be included in the follow up system, must be relevant, accepted by all actors, be practical and possibly integrative.

Results of the verification process must be recorded through analytical results, record keeping, frequency of verification and clear sampling procedures.

Step 12. Establish documentation and record keeping

Safety assurance programs, being regulatory, require complete record keeping. These records permit external audits, traceability and certification. Field and packaging registers kept electronically or in a notebook are valid records. Documents supporting hazard analysis, records of verification procedures and planned corrective actions are also program documents.

Self-Check #1	Written Test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

Short Answer Questions (6 points)

1. What is HACCP?
2. What are seven principles?

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

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

2.2 Hazardous events

Risks associated to chemical contaminated foods, such as pesticide residues, although less dramatic and immediate in their outcome, are a permanent concern for customers. Personnel may become a safety risk for fresh fruits and vegetables if they have inadequate personal cleanliness, if they suffer from or carry diseases or have an inadequate personal behavior. Physical hazards include any potentially harmful extraneous matter not normally found in food. When a consumer mistakenly eats the foreign material or object, it is likely to cause choking, injury or other adverse health effects. Physical hazards are the most commonly reported consumer complaints because the injury occurs immediately or soon after eating, and the source of the hazard is often easy to identify. Sick persons suffering from illness transmitted through food, should not be allowed to enter any Strategies to improve personal cleanliness (protective clothing, hand washing) and practices promoting adequate behavior at work forbidding eating, smoking or spitting should also be adopted to safeguard safety food handling area.

Self-Check #2	Written Test

Name…… ID…… Date…….

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

Write Short answer questions (6 points)

1. Physical hazards

2. Explain Food handler health and working condition?

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

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

Information Sheet 3- Implement the responsibilities of operator

3.1. Responsibilities of operator

The responsibility of operator independently assessing risks and determining the effectiveness of control measures. However, they would be expected to observe day-to-day effectiveness and participate in assessment and review processes. Responsibilities at this level may include facilitating consultation processes within level of responsibility. Food business operators should control food hazards through the use of systems such as HACCP and for its Application.

They should:

- Identify any steps in their operations which are critical to the safety of food;
- Implement effective control procedures at those steps;
- Monitor control procedures to ensure their continuing effectiveness; and Control procedures may be simple, such as checking stock rotation, calibrating equipment, or correctly loading refrigerated display units.

Operator responsibilities

- Carry out production, inspection, packaging and machine operation duties
- Set up machinery and ensure all materials are readily available
- Effectively monitor production equipment
- Assist the shop technicians and materials clerk as necessary
- Perform appropriate duties as assigned by management
- Maintain a safe and clean work space
- Follow established safety rules and regulations

Self-Check #3	Written Test

Name…… ID…… Date…….

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

Test I: Short Answer Questions (6 points)

1. What is responsibility of Operator?

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

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

LG #25	LO # 4- 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:

- Identifying , assessing, removing and reporting breach of food safety procedures
- Conducting risk assessments and identifying and implementing control measures
- Implementing recommendations arising from risk assessments
- Identifying and reporting inadequacies in control measures
- Resolving and referring matters raised relating to quality/food safety
- Consulting and advising of food safety matters for work group
- Identifying and raising opportunities for improving food safety and quality
- Developing or revising procedures to control quality and food safety hazards.
- 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 reporting breach of food safety procedures
- Conduct risk assessments and identifying and implementing control measures
- Implement recommendations arising from risk assessments
- Identify and report inadequacies in control measures
- Resolve and refer matters raised relating to quality/food safety
- Consult and advise of food safety matters for work group
- Identifying and raising opportunities for improving food safety and quality
- Develop or revise procedures to control quality and food safety hazards.

Learning Instructions:

Read the specific objectives of this Learning Guide.

1. Follow the instructions described below.
2. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
3. Accomplish the “Self-checks” which are placed following all information sheets.
4. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).

Information Sheet 1 Identifying , assessing , removing and reporting breach of food safety procedures

1.1. Food law

Food Safety & Standards Authority of India (FSSAI) was institutionalized in principle. Post inception, FSSAI brought together the scientific community and the various regulatory agencies in the country to initiate an integrated food safety regulatory framework

Fruit Products Order-I955, formed under section 3 of the Essential Commodities Act -1955, with the objective to manufacture fruit and vegetable (F&V) products maintaining sanitary and hygienic condition in the premises. It is mandatory for all manufacturers of fruit and vegetable (F&V) products including some non-food products like non fruit vinegar, syrup and sweetened aerated water to obtain a license under this order.

Assessing breach of food safety procedures

Adulterated- an article of food shall be deemed to be adulterated. If the food

- sold by a vendor is not of the nature, substance or quality demanded by the purchaser and is to his prejudice
- contains any other substance which affects, or if the food is so processed as to affect, injuriously the nature, substance or quality thereof;
- inferior or cheaper substance has been substituted wholly or in part for the article so as to affect injuriously the nature, substance or quality thereof;
- had been prepared, packed or kept under insanitary conditions whereby it has become contaminated or injurious to health;
- consists wholly or in part of any filthy, putrid, rotten, decomposed or diseased animal or vegetable substance or is insect-infested or is otherwise unfit for human consumption;
- If the food contains any poisonous or other ingredient which renders it injurious to health;
- coloring matter other than that prescribed in respect thereof is present in the article, or if the amounts of the prescribed colouring matter which is present in the article are not within the prescribed limits of variability;
- contains any prohibited preservative or permitted preservative in excess of the prescribed limits;

- Quality or purity of the article falls below the prescribed standard or its constituents are present in quantities not within the prescribed limits of variability, but which renders it injurious to health.
- Contain pesticides, insecticide (except fumigant), veterinary drugs residues, antibiotic residues and microbiological counts are used;

Self-Check #1	Written Test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

Write Short answer(4points)

1. How law food of breach?

Note: **Satisfactory rating >2points** **Unsatisfactory - below -2points**

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

4.1. Conducting risk assessments

Risks associated to chemical contaminated foods, such as pesticide residues, although less dramatic and immediate in their outcome, are a permanent concern for customers. With enhanced awareness of the presence of pesticides in fresh fruits and vegetables resulting in occasional intoxications, their long-term effect is important. Pesticides residues, throughout the food chain, resulted in reduced pelican and eagle populations. Toxicological research shows pesticides to be responsible for cancer and birth defects and for damaging the interphase between the nervous, endocrine, reproductive and immunological system in mammals.

4.2. Implementation of control measures

Implementation involves giving effect to the selected control measure(s), development of implementation plan, communication on the decision on control measure(s), ensuring a regulatory framework and infrastructure for implementation exists, and a monitoring and evaluation process to assess whether the control measure(s) have been properly implemented**.**

HACCP system is as critical to ensuring food safety as the development of a good plan in the first place. When a deviation from a critical limit has occurred at a CCP, prompt corrective action is necessary in order to re-establish control at this critical step in your process. A corrective action procedure facilitates prompt action and should anticipate any deviation likely to occur at that CCP. Correcting a deviation includes:

- Temperature
- Time,
- Humidity,
- Moisture content,
- Concentration levels,
- Component rations,
- Quantity of preservative,
- Additives pH,
- Chemical or physical properties

Corrective actions are the actions that must be taken if a critical limit is exceeded at any step of food production in a food business (e.

Designing and implementing corrective action procedures

Step 1. For each control measure applied at a CCP, identify who will take the corrective actions: Identify the person(s) responsible for overseeing the corrective actions; someone who has a thorough understanding of the product, the process, and the preventive control plan. Identify the person who implements the corrective action.

Step 2. Document what will need to be done to re-establish control and how it will be done. For example: Immediately adjust the process to bring it back under control, if possible, Immediately isolate and identify all food or production lots that may be affected including the food produced after the last acceptable monitoring result, Stop production, if necessary, to prevent unsafe food from being produced

Step 3. Document the steps to be taken if the deviation affects the safety of other production lots that have already entered the marketplace.

Step 4. Document the steps for determining the root cause of the deviation and preventing recurrence:

- Investigate and determine what went wrong to cause the deviation
- Implement corrective action(s) to restore control
- Once implemented, verify the effectiveness of corrective action(s) to ensure that the parameter(s) have been brought back under control
- If corrective actions were not effective in ensuring control has been established, the food is controlled as above and additional corrective actions developed, implemented and their effectiveness verified
- If during the process of determining the root cause and adjusting control measures to prevent recurrence.

Step 5. Prepare a standardized record to document the details of the corrective actions

Name…… ID…… Date…….

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

Test I: Short Answer Questions (6 points)

1. How to Implementation of control measures for hazard (?)

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

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

3.1. Implementation of HACCP

The concept of HACCP is generally considered to be a useful tool to manage and understand the importance of food/feed hygiene and food/feed safety in a systematic way. The HACCP concept helps FBOs to evaluate and control different hazards, throughout the processing chain. The main issues to emerge concerning the implementation of HACCP principles relate to "hazard analysis", setting and monitoring of CCPs and "verification".

The HACCP requirements should take account of the principles contained in the Codex Alimentary. They should provide sufficient flexibility to be applicable in all situations, including in small businesses. In particular, it is necessary to recognize that, in certain food businesses, it is not possible to identify critical control points and that, in some cases, good hygienic practices can replace the monitoring of critical control points. Similarly, the requirement of establishing ‘critical limits’ does not imply that it is necessary to fix a numerical limit in every case. In addition, the requirement of retaining documents needs to be flexible in order to avoid undue burdens for very small businesses. The Commission published a "Guidance document on the implementation of procedures based on the HACCP principles, and facilitation of the implementation of HACCP principles in certain food businesses".

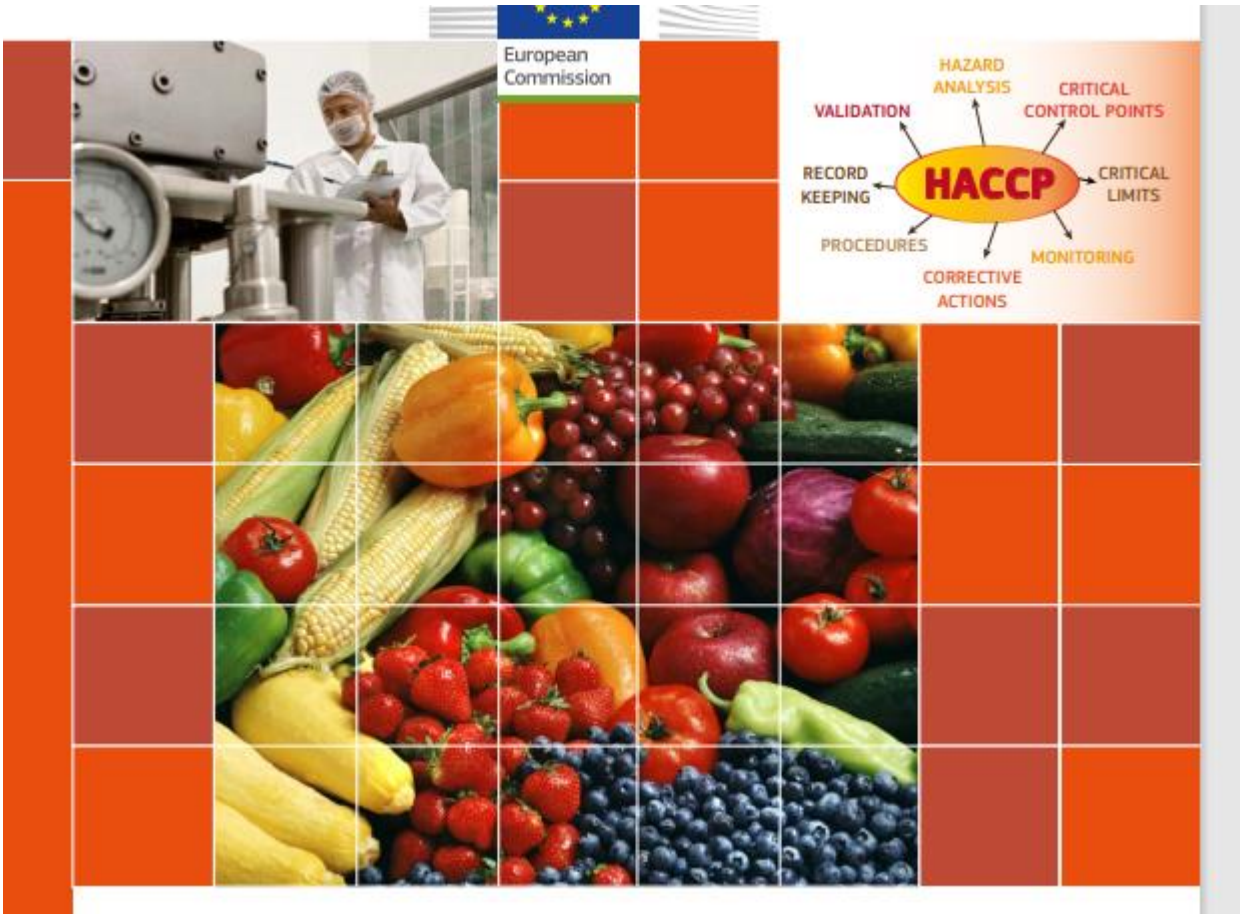

Figure 3. Techniques of hazard analysis

Self-Check #1	Written Test

Name…… ID…… Date…….

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

Test I: Short Answer Questions (6 points)

1. What is monitoring work area?

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

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

Inadequate food temperature control is one of the most common causes of foodborne illness or food spoilage. Such controls include time and temperature of cooking, cooling, processing and storage. Systems should be in place to ensure that temperature is controlled effectively where it is critical to the safety and suitability of food. Temperature control systems should take into account.

- the nature of the food, e.g. its water activity, pH, and likely initial level and types of microorganisms;]
- the intended shelf-life of the product;
- the method of packaging and processing; and
- How the product is intended to be used, e.g. further cooking/processing or ready-to-eat. Such systems should also specify tolerable limits for time and temperature variations. Temperature recording devices should be checked at regular intervals and tested for accuracy.

It should not be assumed that risk control measures will always be adequate to solve a problem. New or existing risk controls should always be checked in case they do not effectively protect health and safety. Newly implemented risk controls should tested in some way before workers begin using the new system, if this is feasible.

In the case of existing controls, changes in work practices may inadvertently introduce new risks or undermine the efficacy of existing risk controls. Checking the methods chosen to solve OHS problems is known as 'monitoring and evaluation of risk controls'. This can be done using the hazard identification procedures already covered for example, by asking workers whether they are aware of on-going risks, making observations and taking relevant measurements.

If deficiencies are found in risk controls, or better ways are found to fix a problem ('better' in this sense means using strategies from further up the hierarchy of risk control), management should promptly provide sufficient resources to enable the risk to be properly controlled. Risk management is not an optional process to be carried out when the employer has time it should be built into routine procedures such as purchasing and induction.

Self-Check #1	Written Test

Name…… ID…… Date…….

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

Test I: Short Answer Questions (6 points)

2. What is Temperature control systems

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

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

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

5.1. Traceability

Traceability is the capacity to identify a product origin: where it was produced, inputs received, tracking post-harvest handling, and through appropriate records, following it along the supply chain. These records must be kept for some time (two years) as proof of its history. In quality and safety assurance programs, traceability allows proving conformance to specific standards. Traceability, more than just being a label identifying production, origin and price, is a system promoting customer confidence and useful to settle quality and safety disputes. To allow for efficiency, traceability schemes rely on an adequate coordination of the many actors in the production and post-harvest handling chain. Proper information must flow easily from link to link, enabling the adoption of actions resulting in safe handling and storage. Consumers should also have this information available to ensure maintaining the required hygienic and use aptitudes

Self-Check #5	Written Test

Name…… ID…… Date…….

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

Test I: Short Answer Questions (6 points)

1. What is traceability ?

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

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

Information Sheet 6- Consulting and advising quality/food safety matters in the work group

6.1. Consulting and advising quality/food safety

A group of workers established to facilitate the representation of workers by one or more health and safety representatives. A work group may be all workers at a workplace but it may also be appropriate to split a workplace into multiple work groups where workers share similar work conditions or are exposed to similar *risks* and *hazards*. For example all workers on night shift. Consultation with workers and their health and safety representatives is required at each step of the risk management process.

Information Sheet 7: Identifying and raising Opportunities for improving food safety and quality

7.1. Opportunities for improving food safety and quality

Food safety and food quality are important issues in the food industry. The food manufacturers are responsible to provide a high quality, clean and safe food to consumers. Mismanaging food safety and food quality may potentially lose the food's nutritional value and bring harm to consumers' health and put the food manufacturers' reputation at risk. Safe and healthy food should be achieved by implementing food safety management system throughout the entire food production chain from raw materials through processing up until the food is ready for the consume.

Food quality is a multidimensional concept, and consumers link it with factors like food safety, nutrition, organic production, fair trade, free-range, animal welfare, origin and locally grown. Upstream food safety assessments are then carried out at the new product development level which therefore integrated into 'design safety into the product' in order to establish safety testing strategies. By this, the regulatory requirements and products specifications are established which are then translated into operational management programs. These programs help to ensure the manufacturing of safe products for all consumers. Usage of new ingredients, new applications of traditional ingredients or new process using technologies are usually involve in the new product development.

Self-Check #7	Written Test

Name…… ID…… Date…….

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

Test I: Short Answer Questions (6 points)

1. How to improve food safety?

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

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

Information Sheet 8- Developing or revising Procedures to control of quality and food safety hazards

8.1. Developing Procedures to control of quality and food safety

Periodic review of monitoring data at relevant process steps should be used to inform the effectiveness of risk management decisions and actions, as well as future decisions on the selection of specific control measures, and provide a basis for their validation and verification. Information gained from monitoring in the food chain should be integrated with human health surveillance, food source attribution data, and withdrawal and recall data, where available to evaluate and review the effectiveness of control measures from primary production to consumption. Where monitoring of hazards or risks indicates that regulatory performance goals are not being met, risk management strategies and/or control measures should be reviewed.

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. Food safety systems based on the HACCP principles have been successfully applied in food processing plants, retail food stores, and food service operations. Review control procedures periodically, and whenever the operations change. These systems should be applied throughout the food chain to control food hygiene.

The standard is based upon the principle that food safety is best ensured through the identification and control of hazards in the production, manufacturing and handling of food as described in the (HACCP) system, adopted by the joint WHO/FAO Codex Alimentarius Commission, rather than relying on end product standards alone. This standard enables states and territories to require food businesses to implement a food safety program based upon the HACCP concepts. As a part of the quality management system, the laboratory must establish a quality control (QC) programme for all quantitative tests. Evaluating each test run in this way allows the laboratory to determine if patient results are accurate and reliable.

The steps for implementing a QC programme are:

1. Establish policies and procedures
2. Assign responsibility for monitoring and reviewing
3. Train all staff in how to properly follow policies and procedures
4. Select good qc material
5. Establish control ranges for the selected material
6. Develop graphs to plot control values
7. Establish a system for monitoring control values
8. Take immediate corrective action if needed.
9. Maintain records of qc results and any corrective actions taken

Self-Check #8	Written Test

Name…… ID…… Date…….

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

Write short answer(6 points)

1. What is method of implementing quality control
2. Jot down the steps for implementing food quality control

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

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

Information Sheet 9- Reviewing Quality/food safety records

9.1. Reviewing of Food safety records

Hazard analysis involves a detailed review of the process of growing and handling food. When potential hazards have been identified, controls must be implemented to minimize risks associated with those hazards. Review safety information about products in your workplace. Review the operating manuals for all equipment and machinery used in your workplace. Also, collect information included in Safety Data Sheets (SDS) for all chemicals that are present in your workplace. Don't forget to look over the owner's manuals for computers and other common electronics, which will also include information about hazards associated with their use. The effectiveness of control measures can be checked through regular reviews as well as consultation with workers. Maintaining records of the risk management process assists when undertaking subsequent reviews or risk assessments as it demonstrates decision making processes and informs how controls were intended to be implemented. Personnel in charge of food safety programs will find a thorough review of HACCP to be beneficial as they develop GAP and GMP for their companies. Monitoring and review of food safety control systems is an essential component of application of a risk management framework (RMF).It contributes to verification of process control and demonstrating progress towards achievement of public health goals.

Information on the level of control of Salmonella at appropriate points in the food chain can be used for several purposes, e.g. to validate and/or verify outcomes of food control measures, to monitor compliance with hazard-based and risk-based regulatory goals, and to help prioritize regulatory efforts to reduce foodborne illness. Systematic review of monitoring information allows the competent authority and relevant stakeholders to make decisions in terms of the overall effectiveness of the food safety control systems and make improvements where necessary.

Self-Check #9	Written Test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

Test I: Short Answer Questions (6 points)

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

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

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AKNOWLEDGEMENT

We wish to extend thanks and appreciation to the many representatives of TVET instructors and respective industry experts who donated their time and expertise to the development of this curriculum.

We would like also to express our appreciation to the TVET instructors and respective industry experts of Regional TVET bureau TVET College/ Institutes, BEAR II UNESCO project and Federal Technical and Vocational Education and Training Agency (FTVET) who made the development of this training materials preparation with required standards and quality possible. This training materials was developed on March 2021 at Bishoftu management institute.

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