Spice and Herbs Processing

Level-II

Based on May 2019, Version 2

Occupational standards

Module Title: Operating Sieving and Blending Process

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LG #71	LO #1- Prepare the sieve and blend, equipment and process for operation

Instruction sheet

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

- Confirming materials available to meet operating requirements
- Identifying and confirming cleaning and maintenance requirements
- Fitting and adjusting machine components and related attachments
- Entering processing and operating parameters to meet safety and production
- Loading or positioning materials, ingredients, product and/or consumables
- Checking and adjusting equipment performance
- Carrying out pre-start and service checks workplace requirements

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:

- Confirm materials available to meet operating requirements
- Identify and confirm cleaning and maintenance requirements
- Fit and adjust machine components and related attachments
- Enter processing and operating parameters
- Load or position materials, ingredients, product and/or consumables
- Check and adjust equipment performance
- Carry out pre-start and service checks workplace requirements

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
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Information Sheet: 1-Confirming materials available to meet operating requirements

1.1 Introduction

Mixing (or blending) is a unit operation in which a uniform mixture is obtained from two or more components, by dispersing one within the other. Hence it is a process which involves manipulating a heterogeneous physical system, with the intent to make it more homogeneous.It has very wide applications in in many industries including food processing, pharmaceuticals, mining and powder metallurgy, and in processes involving physical and chemical changes. The larger component is called as the continuous phase and the smaller component as the dispersed phase. This process is generally used in food processing to combine ingredients to achieve different functional properties or sensory characteristics. In some foods, adequate mixing is necessary to ensure that the proportion of each component. Extruders and some types of size reduction equipment also have a mixing action.

The terms “mixing” and “blending” are often used interchangeably, but technically they are slightly different. Mixing and Blending are terms that have specific meaning in the food industry. Most food processing experts use the word mixing to describe the process of combining wet and dry materials. Blending is a process of combining materials, but blending is a relatively gentle process compared to mixing. In terms of the phase of material, blending is the process of solid-solid mixing or mixing of bulk solids with small quantity of liquid. Blending is the term used to describe the process of combining only dry ingredients. The terminology mixing is more closely associated with liquid-liquid, gas-liquid, and viscous materials.

1.1. Confirming and make available materials

Raw materials should be trimmed to remove any damaged, rotten or moldy material. Spices and aromatic herbs or their source plants should not be accepted by the establishment if they are known to contain contaminants which will not be reduced to acceptable levels by normal processing procedures, sorting or preparation. No raw material or ingredients should be accepted by an industry if it is known to contain parasites, undesirable pathogens, pesticides, drugs, or toxic ,decomposed or extraneous substances that would not be reduced to an acceptable level by normal

sorting and / or processing where appropriate specifications for raw materials and ingredients should be identified and applied.

Raw materials or ingredients should, where appropriate, be cleaned, inspected and sorted prior to processing. Where necessary laboratory tests shall be performed to establish fitness for use only sound, suitable raw materials or ingredients should be used. The accepted/confirmed raw materials stored in spice and herb processing industry shall be:

- Maintained under conditions that will prevent spoilage,
- Protected against contamination by pests, physical, chemical or microbiological hazards and other objectionable substances;
- Protected from detrimental changes to temperature and or other physical parameters that may be caused by crushing, abrasion and vibration;
- Not processed or used unless inspected for contamination, spoilage and moulds before processing and found to be in compliance with the accepted criteria in this standard.
- Clearly labeled with all the relevant details to ensure traceability.

To confirm material/ingredient, apply standard Operating Procedures. When you confirm based on the quality parameters of raw spice and ground ingredients are something that enters an element into mixture**.**

These ingredients are listed as the following: Essential Ingredients for pepper (berbere)

- Garlic
- black pepper,
- vanilla
- clove
- Basil
- Ginger
- Turmeric
- Thyme
-
- Rosemary
- salt

Self-check 1	Written test

- onion
- Fenugreek
- Cinnamon

Coriander

Name…… ID…… Date…….

Short Answer Questions

1. What is mixing?(3)
2. What is the difference between blending and mixing?(3).
3. Why you make Confirming raw materials? (4).

Score = _____

Rating: _____

Answer Sheet

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

Information Sheet: 2. Identifying and confirming cleaning and maintenance requirements

2. Identifying and confirming the cleaning and maintenance

2.1 Identifying and confirming the cleaning

Pre cleaning, by removing heavy accumulations of soil and debris with appropriate tools, will save water during later washing operations. Effective cleaning to eliminate invasive species materials and prevent their spread can be accomplished by thoroughly removing soil and debris using pressurized water. In certain situations, cleaning with compressed air, rather than water, could prevent damage to certain equipment areas such as engine wiring systems and vehicle cabs.

During confirming the cleaning:

- Workshop should be kept neat and tidy.
- Work areas and equipment are to be thoroughly cleaned.
- Ensure that gangways, access routes and exit ways to fire exits are kept clear.
- Keep access to fire and emergency equipment clear at all times. Fire doors must never be locked or be difficult to open.
- Keep gangways and exit ways clear of rubbish; do not use them as storage area even on a temporary basis.
- Avoid tripping hazards such as boxes, trolley handles, trucks and materials

Frequency of cleaning

The following terms must be understood when defining frequency:

- Daily clean
- Task of the day
- Weekly clean
- Team Cleaning

2.2. Maintenance

Maintenance is carried out following detection of an anomaly and aimed at restoring normal operating conditions. This approach is based on the firm belief that the costs sustained for downtime and repair in case of fault are lower than the investment required for a maintenance program.

preventive maintenance programs must include all devices used to monitor and/or control food safety hazards and cover the maintenance procedure, frequency and identification of the person (and/or external agency) responsible for maintenance activity. It shall be carried out regularly as per the instructions of the manufacturer.

Corrective maintenance shall be carried out in such a way that production on adjoining lines or equipment is not at risk of contamination and post maintenance verification to be get recorded. Internal & External calibration schedule for critical food safety equipment's should be maintained.

Lubricants, heat transfer fluids or any other similar material used shall be food grade where there is a risk of direct or indirect contact with the product.

It is recommended as best practice to maintain plant equipment's breakdown records. Loose items control policy (Nut & bolts, Nails broken pieces or smaller parts of machines) should be followed to prevent any contamination with product or packaging material.

Self-check 2	Written test

Name…… ID…… Date…….

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

Short Answer Questions

1. What is maintenance?(3)
2. What is the purpose of cleaning ?(2**)**

Answer Sheet

Score = _____

Rating: _____

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

Name: _____ Date: _____

Information Sheet: 3. Fitting and adjusting machine components and related attachments

3.1. Fitting and adjusting the materials handling, mixing /blending equipment

Fitting is the process of applying craft methods such as skilled filing to the making and assembling of machines. Fitting means ready, appropriate, or in keeping, whereas proper means suited or acceptable to the purpose or circumstances. Fitting is also noun with the meaning: a small part, especially a standardized or detachable part of a device or machine. Check to ensure accuracy and dependable operation of the proposed equipment and methods prior to the start mixing /blending operations and after making any changes in the location or arrangement of the mixer/blender equipment. Plant calibration is the responsibility of the Producer. Whenever possible, avoid the arrangement and erection of batching plants in congested locations which are not conducive to proper handling of materials. Once mixer/blender equipment is erected in such a location, it is difficult to improve conditions. When fitting or adjusting the equipment's follow the following points:

- Check for partially collapsed lines, leaks, or restrictions that would divert or otherwise hamper the flow of water to the meter.
- Inspect gears, pivots, etc., for excessive wear.
- Check legibility of dials, numerals, and pointers.
- Correct any problems noted above before proceeding.
- Safety grille which prevents access to the bowl during the work process.

Figure 1. vertical blender

Figure 2. Shaker blender

Figure 1.gross bagger

Figure 4. Sew and crepe machine

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: Choose the best answer

1. When fitting or adjusting the equipment's you must check?
   A. Check for partially collapsed lines, leaks, or restrictions that would divert
   B. Check legibility of dials, numerals, and pointers.
   C. Correct any problems noted above before proceeding
   D. All

Test I: fill in blank space

1. _____ is the process of applying craft methods such as skilled filing to the making and assembling of machines or other products
2.

Answer Sheet

Score = _____

Rating: _____

Note: Satisfactory rating ≥4 points **Unsatisfactory - below 4 points**

Name: _____ Date: _____

Information Sheet: 4. Entering processing and operating parameters to meet safety and production

4.1. Entering the Process/operation parameters to meet safety

Confirmed raw materials should be inspected and sorted prior to processing (foreign matter, odor and appearance, visible mould contamination). Mixing is performed to allow heat and/or mass transfer to occur between one. Potential food safety hazards resulting from primary production and processing of tea is identified. Such as: Chemical contamination (chemical hazards), Foreign matter (physical hazards) and microbiological contamination (biological hazards)

The producers should monitor:

- To keep clean and, to disinfect, in an appropriate manner, facilities, equipment, containers, crates, vehicles and vessels;
- To ensure, where necessary, hygienic production, transport and storage conditions for, and the cleanliness of, plant products;
- To use potable water, or clean water, to prevent contamination;
- To ensure that staff handling foodstuffs are in good health and undergo training on health risks.

The most operation parameters that meet safety and production of spice and herbs such as:

- Temperature
- Time
- moisture content

Self-check 5	Written test

Name…… ID…… Date…….

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

Answer Sheet

Score = _____

Rating: _____

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

Name: _____ Date: _____

Information Sheet: 5 loading or positioning materials, ingredients, product and/or consumables

According to the mass transfer, spice and herbs are transferred into the blending drum machine and blended according to the product specification and to meets product standard operating procedure. Material handling is the movement, protection, storage and control of materials and products throughout manufacturing, warehousing, distribution, consumption and disposal. There are three basic stages of handling. Such as: material collection, manufacturing, product distribution. Use the following equipment for handling in spices and herbs processing industry.

- Fork lift/vacuum lift
- Conveyor, hopper, bag, crates,
- Bag/Container Unloading (super sacks/bulk bags or drums)
- Silo/Hopper Unloading
- Screw Conveyors
- Vehicles and container Filling/filler

Spice and herbs arrives on pallets in either bags or crates are stored in warehouses to wait blending and packaging. These bags and crates are moved either by hand or by material-handling devices such as fork-lifts or vacuum lifts. The blended spice is conveyed to hoppers for packaging in which operations can vary from highly automated equipment to labor-intensive hand packaging operations.

Modifying work stations to be more ergonomically correct and/or automating equipment on packaging lines can reduce worker exposure to repetitive tasks. Most warehouse operations require the use of fork-lift trucks. Coffee handling environment requires focus on safety, energy consumption and reliability.

Bag/Container Unloading: Raw ingredients can arrive in a variety of bulk containers super sacks/bulk bags or drums, boxes needs to be transported to the process from these containers. Material handling equipment to empty and fill various containers and conveying and controlled feed for conveying whole green coffee beans and roasted coffee beans and ground coffee from the containers to the roasting process.

Silo/Hopper Unloading: slide gate or butterfly valve with a volumetric feed loss in weight, load cell and Program Logic Control (PLC) weight controlled feed using a bin activator. Bin activators use the angle of repose of the material and with vibration assistance to control product flow in an accurate and controlled feed to the next part of the process. Screw Conveyors (FSC) provides dust free, low energy, low maintenance and low cost conveying. Container Filling is a complete packaging after roasting to move bulk volumes of coffee and require a filling system.

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

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet: 6 Checking and adjusting equipment performance

6.1. Check and adjust equipment performance Condition

Blending processing requires adjustments before starting operation. At the beginning an operator should know. How perform whether your mixer needs adjusting there‘s no magical bell or whistle that sounds or light that signals your attention, so how do you know. It can mix powdery substances and powdery substances evenly. It is a machine that mixes two or more different substances together evenly. The specification has to be checked from time to time to ensure that the equipment is working properly.The purpose and location of sensors and related feedback instrumentation. One simple check is to drop about a pound of black pepper into a beaker and use a steam of water to flush the pepper berries out, leaving any rocks or heavier foreign material in the bottom of the beaker. If anything is found, the system needs some adjustment. Testing equipment should be tested regularly to ensure it provides the level of protection required. Testing intervals will depend on several factors including:

- the frequency of use
- the environment in which it is being
- Manufacturer’s advice.

6.2 Adjustment method of blending machine

After all raw materials are prepared from preparation room, we need to make some adjustments to the machine, and adjust all aspects of it to a suitable state. This adjustment is related to the use of the machine behind, and whether the mixed product meets the qualified requirements. If bowl height is too high, the adjustment needing to be made before see any signs of damage to your bowl or blades. It sounds like, well, metal on metal. If your bowl is too low, you won‘t hear it, but will notice that the bottom and sides are continually not being scraped down

Therefore, we should pay attention to the adjustment of the machine, and be responsible and serious, not careless at all.

First of all, every mixer has different requirements for voltage.

Some machines need low voltage and some machines need high voltage. If we give it low voltage, then the machine cannot run or even burn up, so the generator of the machine will be ruined and can no longer be used.

The supply on machine to be provided with a three phase it is imperative that the outlet to which this plug is connected be properly earthed (grounded). Prior to installation, testing the electrical service to assure it agrees with the specifications on the machine data plate located on the back side of the stand is necessary.Components having adjustments protected (e.g. paint sealed) by the manufacturer, are only allowed to be adjusted by an authorized service agent.

- Next we need to connect the power supply,

If the direction of operation is different, we need to adjust, reinstall the connection of the motor so that the direction of the winch can return to the normal direction.

Of course, when the mixer is running, we should pay attention to whether the machine emits some abnormal sounds. If the mixer emits some abnormal sounds, we should stop immediately and repair it.

- **Fitting the Bowl**

The bowl must be installed before the agitator. To install the bowl, fully lower the bowl support Position the bowl so the alignment bracket on the back of the bowl is in the bowl retainer and the alignment pins on the front of the bowl support fit in the holes on the sides of the bowl.

- **Fitting the Agitators**

To install an agitator, the bowl must be installed and fully lowered. Place the agitator in the bowl, push it up on the agitator shaft, and turn it clockwise to seat the shaft pin in the slot of the agitator shank.

Check for signs of damage

Once bowl height has shifted, the more using without taking a moment to adjust it, the more damage it will cause. Check the bottom of the beater blade and the inside bottom of the bowl for wear and tear. If there are loose bits of metal, it might be time to get a new beater, and if there‘s an issue with the finish or deep scratches, then it might be time to look into another bowl for sanitary reasons. Mostly, it will just look gnarly, but be just fine. You just don‘t want any loose metal in your food.

Unplug the mixer

This is the first rule in any electronic repair. Safety first!

The screw on a model with a stationary head will be directly behind the piece that contains the arms that hold the bowl. When it‘s in the down or lowered position you‘ll be able to see it. When the bowl is raised, it will go into hiding, so lower those bowls.

Making the adjustment

To make the beater and the bowl further apart (so lowering bowl or raising head depending on the model), then turning the screw to the right.

For shorten the distance (if it keeps leaving food on the sides and bottom) turning the screw to the left.

Reattach the parts

Adding blade back on the mixer and placing bowl into place. Lock things in and check first to see if your blade is touching in places it shouldn‘t. Checking visually first will help in case turned the screw the wrong direction and will save you before grinding blade into your bowl.

Test the mixer

With everything hooked up, plug the mixer in and turn it on. Start it on low and listen. Hopefully you shouldn‘t have any metallic sounds coming from the mixer. Turn the speed up and listen again. Turn the mixer off.

Self-Check -6	Written Test

Name: _____ ID.NO._____ Date: _____

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

Test I: short Answer

1. How to adjustment blending machine?(3)
2. How to install an agitator, If the bowl not installed and fully lowered?(3)

Answer Sheet

Score = _____

Rating: _____

Note: Satisfactory rating ≥6 points Unsatisfactory - below 6 points

Name: _____ Date: _____

Information Sheet: 7 Carrying out pre-start and service checks workplace requirements

7.1. Carrying out pre-start checks

Pre start checks are pretty much exactly what they sound like, they are checks made to something - most often a piece of plant, equipment or machinery prior to that thing being started or used; or checks made prior to doing something specific - like a day's work or specific hazardous activity. Pre-starts often involve routine inspections conducted by the machine or equipment operator. Because of this, pre starts often take the form of a pre start checklist or inspection form. A pre-start inspection involves a routine examination of a piece of equipment by its operator that is standardized via a checklist. Whether it be a light vehicle, heavy vehicle, mobile plant or tools, pre-start inspections are an important task with financial, and more importantly, safety implications. Pre-start inspection can potentially be the difference between life and death. Before starting the mixer, it is also necessary to perform the following checks

- Check that all screws and bolts are tightened. - Vent the air in the area of the mechanical seal, if necessary.
- Check that all moving parts are inaccessible and all their guards are properly installed.
- For mixers with double mechanical seal: check the connections of tubes and accessories.
- Immediately after the first startup of the mixer, check the following:
    - ✓ Check that the mixer does not produce "strange" noises.
    - ✓ Check that the mixer does not produce evident vibrations or oscillations
    - ✓ Check that there are no leaks of oil, grease, water or other fluids.

7.2. Carrying out service check

The facilities are essential services that play a vital role to industry. Quality facilities and utilities provided in spice processing particularly in spice cleaning includes water, power, vacuum, compressed and instrumentation air hygiene facilities etc. are prerequisite in an effective spice cleaning operation. Adequate natural or artificial lighting should be provided throughout the factory to enable personnel to operate in a hygienic manner. Only potable water should be used for all process related activities are including

washing and cleaning of machines/equipment that come in contact with food and hand washing. Pre-startup checks can minimize the following problems during startup:

- Waste raw materials and energy
- Produce excessive amounts of product that is off-specification
- Cause equipment damage and lost production time
- Cause injury to personnel
- Waste time due to failure in identifying the requirements for the work

LG #70	LO #2- Operate and monitor the blend, sieve and bagging process

Instruction sheet

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

- Sieving spice and herbs before blending
- Delivering ingredients to the blender to meet recipe specifications
- Conducting work
- Monitoring equipment to identify variation in operating conditions
- Identifying variation in operation of equipment and reporting maintenance Requirements
- Monitoring the process to confirm ingredients
- Identifying, rectifying and reporting out-of-specification product/process outcome
- Maintaining the work area
- Conducting the work in accordance with work place
- Maintaining workplace records
- Following workplace information and procedures

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:

- Sieve spice and herbs before blending
- Deliver ingredients to the blender to meet recipe specifications
- Conducting work
- Monitoring equipment to identify variation in operating conditions
- Identifying variation in operation of equipment and reporting maintenance
- Requirements
- Monitoring the process to confirm ingredients
- Identifying, rectifying and reporting out-of-specification product/process outcome
- Maintaining the work area
- Conduct the work in accordance with work place\
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Information Sheet 1- Sieving spice and herbs before blending

1.1. Sieving spice and herbs

Sieving is a simple technique for separating particles of different sizes.

A sieve such as used for sifting flour has very small hole. This is done successively, using increasingly smaller screens, to give a series of particles classified into size ranges. Coarse particles are separated or broken up by grinding against one another and the screen openings. The material is shaken or agitated above a mesh or cloth screen; particles of smaller size than the mesh openings can pass through under the force of gravity.

Many spices and herbs are ground to give easier dispersion in the final food product. This process also aids the dispersion of flavor. Particle size is generally specified and is carried out using standardized sieves. Aperture sizes give a particle size, the products being ground to pass a certain sieve, and coarse matter recycled through the mill until it finally passes through the sieve. Sieves are characterized in micron sizes and typical requirements will be a 95% pass on a specified size of sieve. The older method of measuring sieve (whole) sizes was that of mesh which related to the number of holes per inch. Rates of throughput of sieves are dependent upon a number of factors:

- Nature and the shape of the particles,
- Frequency and the amplitude of the shaking,
- Methods used to prevent sticking or bridging of particles in the
- Apertures of the sieve and tension and physical nature of the sieve material

• Mesh number. It is defined as the numbers of holes per linear inch.

• Aperture of screen is the maximum clear space between the edges of the screen opening. It is usually given in inches or mm.

Depending upon the types of particles to be separated, sieves with different types of holes are used. Sieves are also used to separate stones from sand. Sieving plays an important role in food industries where sieves (often vibrating) are used to prevent the contamination of the product by foreign bodies.

Factors Affecting the Effectiveness of sieving

- Mesh size and wire diameter
- Capacity
- Direction of approach of particle to screen surface
- Cohesion
- Adhesion

Moisture content

No	*Item*	*Mash size (mm)*
1.	Whole black pepper	6-8
2.	Half cracked black pepper	6-8
3.	Quarter cracked black pepper	8-10
4.	Coarse black pepper	12-14
5.	Table ground black pepper	18-28
6.	Restaurant ground black pepper	22-28
7.	Fine ground black pepper	30-34
8.	Ground white pepper	60

Table 1.1. Mash size of spices

Whole black pepper

half black pepper

Quarter cracked black pepper

Table grind pepper

Fine ground white pepper

Self-Check – 1	Written test

Name…… ID…… Date…….

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

Short Answer Questions

1. What is Sieving?(3)
2. Write Factors Affecting the Effectiveness sieving ?(4)
3. Mash size for Whole black pepper_____ ?(3)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet 2- Delivering ingredients to the blender to meet recipe specifications

Delivering the different blending components together, mixing operations may bring about other desirable changes in the materials being mixed, such as mechanical working (as in spice mixing. The degree of uniformity attainable in a mixing operation varies, depending on the nature of the components.

The purpose of blending spice and herbs

- increasing the nutritious
- for sweetness, aroma, appearance
- sensory of new spice

Ingredient and additive additions

To understand what is the right order of ingredients into the mixer we must consider the physical properties of the ingredients that affect mixing such as size, shape, density, water absorption capacity, static electricity and adhesiveness of each component of mixes.

- **Ingredients density**

Heavier ingredients will sink and lighter ingredients will float. Low density ingredients with long particle length, such as hay, should be added first followed by high density ingredients of small particle size that will sink.

Factors consider during ingredient mixing

one exception to this is calcium, which is normally added separately due to its large bulk requirement

- **Nutrient Ratio**

If the premix has been properly designed, manufactured and mixed, the ratio between the different nutrients is constant. Because of this constant ratio, testing of only one of the nutrients in flour can verify that the delivery dose was correct for all. This assumes no destruction of vitamin activity or separation of the micronutrients after the premix was

added. This single nutrient then acts as an indicator for all the other nutrients. Iron is often used as an indicator nutrient.

- **Standardized Addition Rates**

The dilution of the premix can be adjusted through the use of a carrier to give a standardized addition rate that meets the needs of the production facility to produce a uniform level of fortification. Some mills are large enough to allow use of concentrated premixes while others are small and require a more dilute premix when the feeder cannot accurately handle the necessary low feed rate. Also, there is better dosage accuracy and mixing homogeneity with dilute premixes than with straight nutrients if the feeder is able to operate in the middle of its delivery range rather than at the lower end.

- **Single Weighing**

A single premix requires only one weighing for batch systems or feed rate adjustment in continuous systems. This reduces labor requirements and greatly lessens the chance for error.

Salt is used to enhance the flavors and sweetness of other ingredients in food. If salt is omitted or reduced, other spices or flavorings in the recipe should be increased slightly. In yeast dough, salt slows yeast fermentation. Omitting or reducing the amount of salt in yeast dough can cause the dough to rise too quickly, adversely affecting the shape and flavor of bread.

In order to blend spice steps**:**

- Follow the instruction for blending process
- Clean and prepare appropriate tools and equipment use for blending
- Select quality raw material
- Take the milling
- Identify the blending ratio of the spice and herbs to red pepper
- Check the moisture content appearance (, flavor, colour, aroma, taste)
- Identify the nutritional value added
- Weighing the ingredient accurately and ready for operation
- Record the measurement

- Blending When selecting a mixer it must have the following features:
- Ability to mix different types of product
- Sufficient capacity to meet the intended rates of production
- Hygienic design in which no oil or grease from the motor/gearbox can contaminate the product
- Good mixing efficiency to produce an acceptable product in a short time with minimum energy consumption
- Adequate safety features to protect operators from trapping their hands in the mixer or receiving electric shocks
- Mixing bowls should have a smooth internal surface without corners, and all welds should be ground to a smooth finish

Ingredients

- 2 teaspoons coriander seeds
- 1 teaspoon cumin seeds
- 1/2 teaspoon fenugreek seeds
- 1 teaspoon black peppercorns
- 2 whole allspice berries
- Seeds of 4 green cardamom pods
- 4 cloves
- 5 dried red chilies , seeds and membranes removed and broken into small pieces (see Note)
- 3 tablespoons sweet paprika
- 1 teaspoon salt
- 1/4 teaspoon nutmeg
- 1/2 teaspoon ginger

1. In a heavy skillet over high heat, toast the whole spices (seeds) and chilies, shaking the pan regularly to prevent scorching, until very fragrant, about 3 minutes. Transfer to a bowl and let cool completely.

2. Grind the cooled spices in a spice or coffee grinder. Add all remaining ground spices and salt and grind everything together.
3. Store in an airtight container in a dark place.

The procedure to pepper spike pickle

Pepper spike pickle

Ingredients	*Approximate measure*
1. Green pepper spike	1 kg
2. Vinegar	600 ml
3. Garlic	1 pod (big)
4. Green chillies	10
5. Ginger	2 inch piece
6. Salt	$\frac{1}{2}$ cup
7. Turmeric	1 teaspoon
8. Oil	2 tablespoons

Method

1. Wash the pepper spikes, wipe and sprinkle over with salt and set aside for some time
2. Peel and slice garlic and ginger, slit green chillies
3. Heat oil. Add garlic, ginger and green chillies
4. Remove pan from fire and add turmeric, stir well
5. Add vinegar and salt. Bring to boil
6. Remove, cool and add prepared pepper spikes
7. Pack and store in airtight jars

2.1. Packaging Requirements

The bulk material is unpacked in a paddle mixer and then fed into a buffer hopper at the outlet of the mixer. The pallet mixer ensures a gentle mixing that preserves the material. The material is transferred to a vibrating dosing unit with an open cover. The bag placed by the operator on the station is used to package the spices**.** Bagging station for packing spice and powder mixtures in bags from 1 to 25kg.

Spices e.g. dried chili peppers, should not be sprayed with water as it may result in growth of moulds and microbial pathogens, if present.

- Bags with food grade liners should be used to protect the spices from Moisture, contamination, infestation of insects and rodents.
- It is recommended that new bags or containers be used for food contact packaging. If reusable containers are used, they should be properly cleaned and disinfected before use. Particular attention paid to the potential for loose bags fibers that can become potential contaminants.
- Secondary containment bags/containers providing additional protection can be reused but should not have been previously used to hold non-food materials such as chemicals or animal feed.
- Only packaging materials required for immediate use are kept in the packaging or filling area.

2.1.1. Bagging & Weighing

The packing operation is tight thanks to the presence of a flexible sleeve DN300.

Bagging scale is a piece of equipment that weighs and dispenses a specific amount of dry bulk material (powder, pellet, granule, etc…) into an open mouth bag. Depending on the application and product characteristics, the bagging scale will utilize one of four main material metering methods, use the bulk and dribble feeding technique and operate based on net-weigh or gross-weigh functionality.

- Correct handling to minimize loses
- Establishing recording procedures
- Checking for physical appearance of container/package
- Checking for vital points like shelf life and date of manufacture.

Only new and clean bags should be used for packing dried turmeric. It is preferable to use polythene laminated gunny bags.

Material Metering Methods for Open Mouth Bagging Scales:

The goal in determining which metering device to use is based on what will transfer the material in the most consistent manner. The more consistent the material flow, the easier it is for the controller to decide which step to take to achieve accuracy and speed. Knowing flow characteristics of various products is invaluable when designing a project

and Magnum Systems through its Taylor Products and Smoot brands has more than 105 years of experience, application knowledge, and material handling expertise.

Gravity:

Gravity bagging scales use the flow characteristics of the product to fill the open mouth bag by use of cutoff gates. These gates close when the bag has reached the desired weight. Free flowing granular products such as grains, fertilizer, salt and small pellets are packaged using the gravity method.

Vibratory:

Vibratory feeding scales utilize side-to-side movement of the vibratory tray to transfer the product into the bag. These scales use varying vibratory speeds to move difficult materials or provide precise, accurate measurements of granular material. Materials that do not flow easily or have irregular shapes such as ground coffee, light density grass seed or granola usually incorporate vibration with open mouth bag fillers.

Belt:

Belt feeding scales are used for packaging material that tends to stick to itself during the fill process. The belt feeder uses adjustable product height and speed settings to deliver the product into the open mouth bag accurately. Sweet molasses based cattle feed, mulch and topsoil are bagged on belt feeder units.

Screw:

Screw feeding scales transfer dry materials volumetrically either horizontally or at an incline through the scale into a bag. A variable speed drive on the screw feeder along with the shut of gates on the scale allow for bulk and dribble feeding cycle to ensure accuracy. Various powders and granules from flour ingredients to asphalt can be metered with a screw.

Bulk and Dribble Feeding to Increase Accuracy

Most open mouth bagging scales utilize the bulk and dribble feeding method. Bulk and dribble feeding follows the same principle as gravimetric feeders; filling fast to nearly the target amount, and then filling slow to achieve accuracy of the last 10-20% of the target amount. Each bagging scale utilizes two gates. The first portion of the bulk operation is filling with the gates completely open. Then the dribble portion is achieved by partially

closing the gate opening to hit the desired target fill. When using a screw to meter material, like the APO Dual, it uses two different sized augers – one large and one small – to complete the same method. The large auger fills the bulk of the target fill and the smaller auger does the dribble or “trim” filling of the target amount. Now there is also a lot of programming that goes into the controls to make all of this happen in a smooth efficient fashion.

Net-Weigh

Capturing the net weight of a dry material during the bagging process is done by filling a “bucket” inside the scale until the desired weight is met. The scale controls are only concerned with the weight of material that is in the “bucket”. Net-weigh feeding allows for faster bagging rates typically an increase of 1-2 bags per minute since you are doing two actions at the same time. The next weighment (volume of product being weighed) is dispensed into the bucket while a new bag is being placed or held in position.

Capturing the gross weight of a dry material during the bagging process is done by zeroing out the weight of equipment and bag being placed on the discharge spout in programming. Gross-weigh feeding is typically slower than net-weigh feeding since you have to wait until the bag is filled and released from the spout before you can place another bag and begin filling.

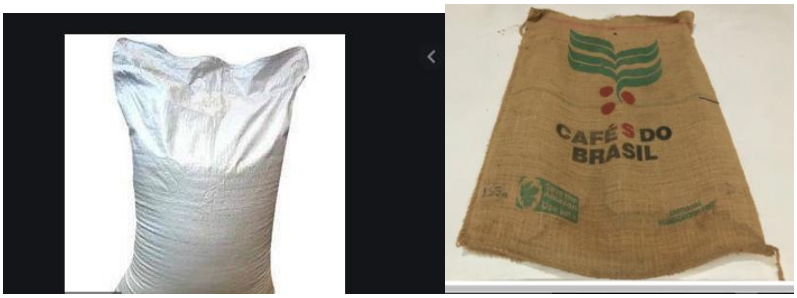

Figure 2.1. Packaging materials for spices

Figure 2.2.Weighing finished 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

1. List duties of operator while setting up working
2. Write down all the safety requirements for grinding machine operation.
3. Write three examples of Hazards parts of machines? (3points)
4. Why should a grinding fluid be used in very copious quantities when performing wet grinding?
5. What are the common causes of grinding accidents?

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet 3: Conducting work in accordance with workplace legislative requirements

3.1. Legislative requirements

Food legislation includes acts, regulations, and requirements or procedures prescribed by the government relating to export of foodstuffs to meet requirements of the importing country while ensuring conditions of fair trade.

Food control needs to be simple, complete, covering various aspects of the food chain as needed and address requirements of importing country - both issues of safety and quality. Legislation may also include provisions for registration of establishments or listing of certified processing plants, establishment approval, licensing or registration of traders or agents, equipment design approval, penalties, coding requirements and charging of fees. Necessary provisions need to be included for ensuring integrity, impartiality and independence of the official and officially recognized inspection and certification systems.

Labeling is regulated to protect consumers who should have the correct information to make confident and informed food choices based on diet, allergies, personal taste or Product identification.

- Hazard symbols
- Precautionary statements
- First aid measures

Use material that will not be a source of contamination for wrapping and packaging store wrapping materials so they are not at risk of contamination wrap and package the food in a way that avoids contamination of products. Make sure that any containers are clean and not damaged, particularly if you use cans or glass jars be able to keep the wrapping or packaging material clean.

Food authenticity

Food authenticity is when food matches its description. Mislabeled food deceives the consumer and creates unfair competition with manufacturers or traders. Everyone has the right to know that the food they have bought matches the description given on the label. Part of our role is to help prevent mislabeling or misleading descriptions of foods.

The description of food refers to the information given about its: name ingredient origin processing.

Lot/Code/Batch identification

A batch number or code number or lot number which is a mark of identification by which the food can be traced in the manufacture and identified in the distribution, shall be given on the label.

Name and complete address of the manufacturer

The name and complete address of the manufacturer and the manufacturing unit if these are located at different places and in case the manufacturer is not the packer or bottler, the name and complete address of the packing or bottling unit as the case may be shall be declared on every package of food;

Net quantity

Net quantity by weight or volume or number, as the case may be, shall be declared on every package of food; and In addition to the declaration of net quantity, a food packed in a liquid medium shall carry a declaration of the drained weight of the food.

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 (3 points each)

1. Write the legislative requirements of food labels?
2. List different legislative requirements of food?

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

Note: Satisfactory rating 9 points Unsatisfactory below 9 points

Information Sheet 4: Monitoring equipment to identify variation in operating conditions

4.1 . Monitoring equipment variation in operating conditions

Monitoring is the systematic process of collecting, analyzing and manipulating of machine like blending machine packing machine by using the using information on machine like time and temperature controller to achieve a programme's progress toward reaching. Measuring machinery health by performance monitoring has the potential to give warning of a developing failure through the changing levels of a suitable parameter (like accuracy, precise, efficiency, effectiveness being measured, there by indicating a change in condition of a component machine. There are several techniques of monitoring they can be categorized into the following:-

- •Temperature measurements
- •Dynamic monitoring
- •Oil analysis
- •Corrosion monitoring
- •Non-destructive testing
- •Electrical testing
- •Observation and surveillance
- •process monitoring

4.2 Confirming equipment status

Confirming is allowing the functionality of the equipment status as efficiently, effectively, accurately work and also bought according to the specification standards based procedure for spice and herbs process.

To give approval or ratify/ confirm the equipment based on:-

- checking hygiene and sanitation standards to meet equipment
- Check Safe sanitation systems to meet the equipment status
- Regular health checks.
- washing surface of equipment for smoothness

- Keep all safety guards are in place
- Operate equipment

Figure 4.2. Ribbon mixer

Self-Check – 4	Written test

Name…… ID…… Date…….

Directions: Answer all the question

ns listed below. Examples may be necessary to aid some explanations/answers.

Test I: Short Answer Questions

1. What do you mean by monitoring?
2. What is the role of monitoring?
3. What are the techniques of monitoring?

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet 5: Identifying variation in operation of equipment and reporting maintenance requirements

5.1. Identifying variation in equipment operation and reporting maintenance requirements

Condition monitoring and process analysis most machine and process characteristics which affect quality, availability, capacity, safety, risk and cost can be continually evaluated throughout an asset‘s lifetime. This is essential in identifying impending failure and will be applied to critical areas identified in the reliability plan.

The current state-of-health of process plant is important information related to current information, diagnosis and prognosis of various defects, and predicted useful life in the optimization of safety, quality and high production rates. A combination of one or more equipment failures, human errors, or both causes a loss of system function. The following factors may influence the prospect of dough making equipment failure

The following factors may influence the likelihood of equipment failure

- Design error
- Faulty material
- Improper fabrication and construction
- Improper installation
- Improper operation
- Inadequate maintenance
- Maintenance errors

4.2. Reporting maintenance requirements

Maintenance requirements can be identify through inspection and risk assessment. The purpose of an inspection is to identify whether the equipment can be operated, adjusted and maintained safely with any deterioration detected and remedied before it results in health and safety risk. Not all work equipment needs formal inspection to ensure safety and, in many cases, a quick visual check before use will be sufficient. However, inspection is necessary for any equipment where significant risks to health and safety may arise from incorrect installation, reinstallation and inspection frequencies should be determined through risk assessment.

You should inspect the equipment if your risk assessment identifies any significant risk to operators and others from the equipment's installation or use. The result of the inspection should be recorded and this record should be kept at least until the next inspection of that equipment. Work equipment that requires inspection should not be used, unless you know the inspection has taken place. Where it leaves your undertaking, or is obtained from another, it should be accompanied by physical evidence of the last inspection, such as an inspection report or, for smaller items of equipment, some form of tagging, color coding or labeling system. Equipment can be inspected by anyone who has sufficient knowledge and experience of it to enable them to know:

- what to look at
- what to look for
- what to do if they find a problem

4.2.1Types of maintenance

1. **Planned maintenance**: it refers to scheduled maintenance to cope with equipment failures before they actually occur.

   It can be broken down into preventive and predictive maintenance.

   Preventive maintenance is carried out at predetermined intervals by following prescribed criteria. It is time-driven and based on the assumption that usability of a mechanical component will decline over its useful life-cycle. It includes activities like regular equipment inspection, partial or complete overhauls, oil changes and lubrication etc.

   Predictive maintenance is different from preventive maintenance such that it depends on the working condition of the machinery rather than its average life expectancy. It requires monitoring equipment during its normal operations to see if it's working at its best. Some companies use periodic vibration analysis to continuously monitor high value assets and simply check them in for maintenance when their vibration fluctuates.

2**. Corrective maintenance:** this type of maintenance restores any failed pieces of equipment. It is typically performed at irregular intervals since technicians don't know

when a certain machine will break down. The main aim here is to fix a problem in the shortest possible time using three steps: diagnosis, repair and verification.

3. **Routine maintenance**: it is not dependent on any broken parts or downtime; it includes some necessary activities such as cleaning, lubricating and replacing batteries on small-scale equipment. This is generally performed on a weekly basis. The maintenance recordkeeping system must be kept current so that a complete maintenance history of each piece of equipment is available at all times.

.

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

1. Identify some of the equipment variations?(2.5)
2. Write factors influence the likelihood of equipment failure?(2.5)

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

Note: Satisfactory rating 5 points Unsatisfactory below 5points

Information Sheet 6: Monitoring the process to confirm ingredients

The definition of condition monitoring embraces the concept of performance monitoring also: the process of systematic data collection and evaluation to identify changes in the performance or condition of a system or its components, such that remedial action may be planned in a cost effective manner to maintain reliability. Condition monitoring and process analysis most machine and process characteristics which affect quality, availability, capacity, safety, risk and cost can be continually evaluated throughout an asset's lifetime. The moisture content in well-dried pepper is never more than 11 %. Scientists of the Central Food Technological Research Institute stipulate that the optimum moisture content is 10.5%. If the moisture content is too high pepper will be susceptible to fungal attack. Poisonous substances secreted by the fungi render the pepper will be susceptible to fungal attack. Poisonous substances secreted by the fungi render the pepper unfit for human consumption.

Monitoring control points and conducting inspections as required to confirm process remains within specification, such as:

- ✓ characteristics of blend
- ✓ flow to sieves
- ✓ sieve/screen condition

- monitor and regulate the supply and flow of materials to and from the process

Quality attributes of spices

- Appearance
- Aroma
- Flavor
- Taste
- Strength
- Volume

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

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet 7: Identifying, rectifying and reporting out-of-specification product/process outcome

7.1. Out-of-specification product or process outcomes

Main objective is to Identify and rectify out-of-specification product/process outcomes in order to take corrective action in response to out-of-specification results. Identification of product/processes outcomes used to check either the products or processes are out of specification or not because every products or processes have their own specifications and have effects on the outcome after processing. The specifications of blended spice have their own specification. Out of specification results can result from either of two situations. Only fully ripe pepper should be plucked from the vines for marketing of dried pepper. Only clean, cement or concrete floors should be used for threshing the plucked pepper spikes. Never do the threshing on floors smeared with cow dung. Green pepper contains 75-85% moisture. It is best to use plastic or aluminum vessels to handle green pepper. Out of specification such as off flavor, contaminated (live or dead insects, insect fragments), decayed, foreign matter>2%, extraneous matter (Herbs >2%, Spices >1%), over wetting when cleaning, discolored products should be report to responsible person. Piperine that contributes the pungency and Volatile oil that is responsible for the aroma and flavor.

Table. 7.1. Pepper harvesting for various end products

Products	Maturity at harvest
White pepper	Fully ripe
Black pepper	Fully mature and nearly ripe
Canned pepper	4–5 months after fruit set
Dehydrated green pepper	10–15 days before full maturity
Pepper powder	Fully mature with maximum starch

Table 7.2. Average composition of dried pepper

content	% of composition
Moisture	8.7–14.0
Total nitrogen	1.5–2.6
Volatile ether extract	0.3–4.2
Non-volatile extract	3.9–11.5
Alcohol extract	4.4–12.0
Starch	28.0–49.0
Crude fiber	8.7–18.0
Piperine	1.7–7.4
Total ash	3.6–5.7
Acid soluble ash	0.03–0.55

7.2. Control of non-conforming products

ASTA recommends that all of its members, and their suppliers, adhere to the following guidelines for control of non-conforming product

- Clearly label and isolate “on hold” products so that they are not accidentally released.
- Products should only be released after necessary controls are made and specification limits are achieved.
- Inform brand owner if applicable.
- Initiate corrective action in response to customer complaints.
- If non-conformance does not affect the use or safety of the product, then corrective action completes the response.
- If non-conformance affects the safety of the product, recall is initiated with management approval.
- Until the recall is completed, products from the same lot cannot be shipped and must be quarantined.

- Determine the corrective action required to eliminate non-conformance of future product, i.e., through re-work or other means. Upon completion, re-check the quality of the product to ensure the elimination of the non-conformance and seek approval for shipment.
- Document any destruction/disposal of non-conforming product.
- Where customer-branded products not meeting specifications are sold to staff or passed on to charities, this shall be with the prior consent of the brand owner, and shall be fit for consumption, meeting the legal requirements.

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

1. Define out-off specification products and out comes?
2. Write Control methods of non-conforming products?

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

Note: Satisfactory rating 5 points Unsatisfactory below 5 points

Information Sheet 8: Maintaining the work area according to housekeeping standard

8.1. Maintaining the work area according to housekeeping standard

Good housekeeping is an important part of safety and accident prevention. Good housekeeping involves the maintenance of good lighting and heating, power supply lines, tools, machinery and the facilities for the efficient storage of materials and equipment.. Good housekeeping can significantly reduce the risk of an accident and injury, failure to maintain a clean and tidy. Work areas and equipment are to be thoroughly cleaned after use. A clean work environment leads to pride in workmanship and a safe operation. Everyone is responsible for safety and means that all management and every employee should have an understanding of good housekeeping practice, and how it can help to prevent a large number of accidents at work.

8.1.1. Workplace Housekeeping

Effective housekeeping can help control or eliminate workplace hazards. It includes keeping work areas neat and orderly, maintaining halls and floors free of slip and trip hazards, and removing of waste materials (e.g., paper, cardboard) and other fire hazards from work areas.

Effective housekeeping results in:

- Reduced handling to ease the flow of materials
- Decreased fire hazards
- Lower worker exposures to hazardous products (e.g. Dusts, vapors)
- More efficient equipment cleanup and maintenance
- Better hygienic conditions leading to improved health
- More effective use of space
- Reduced property damage by improving preventive maintenance
- Improved morale
- Improved productivity

Self-check- 8	Written test

Name…… ID…… Date…….

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

Short Answer Questions

1. What is the of benefits good housekeeping?
   A. Increased efficiency.
   B. The reduction of accident hazards.
   C. The reduction of fire hazards.
   D. All of the above
2. Good housekeeping involves the maintenance of:
   A. good lighting
   B. heating and power supply lines,
   C. tools and machinery
   D. All of the above
3. Which of the following is the characteristics of good housekeeping standard
   a. Change burned-out light fixtures in work areas, walkways, and exits.
   b. Keep floors and work areas clean, dry, and grease-free
   c. Keep steps and ladders in serviceable condition
   d. All of the above

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Note: Satisfactory rating – ≥5 points Unsatisfactory - below

Information Sheet- 9: Conducting the work in accordance with work place environmental guidelines

9.1. Conducting the work in accordance with guidelines

This describes the interpreting of schedules and plans, as well as a clear understanding of procedures to be undertaken and the targets to meet. When the requirements of the standards' met, employees understand the role their work.

- Maintaining quality output
- Motivated work force supports management in detecting, solving, correcting and preventing problems in the production area.
- Identification of the required resource
- Doing any work related with spice and herbs processing we have to allocate the necessary resources which, proper and suitable to undertake the general work activities. The following requirements should be fulfil to conduct work in accordance with guidelines including :-
    - Develop Health and Safety Program
    - Written Health and Safety Policy
    - Written Safety Rules
    - Safety Director/coordinator
    - Employee Training
    - Workplace Inspection
    - Injury Emergency Plan

Self-Check 9	Written Test

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

Test –I choose the best answer

1. _____is the interpreting of schedules and plans, as well as a clear understanding of procedures to be undertaken and to meet in working place **(2)**

A. Develop Health and Safety Program C. Written Health and Safety Policy

B Clarification of work requirement D. Written Safety Rules

Part II Fill the black space

1. Write the purpose of documenting work place Injury emergency occurred (3%)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

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

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

Information Sheet-10. Maintaining workplace records with workplace recording requirements

10.1. Maintaining workplace records

Records/reports records provide evidence that the relevant specifications and /or instructions have been complied with. Records should be made or completed at the time each action is taken. Any change to a record should be approved, signed and dated by authorized persons. Records must be kept to allow proper equipment management and control. The records should enable the entire history of a batch to be traced. Additionally, the records/reports should form the basis for assessment of the suitability for certification and release of a particular batch.

- name of the product and batch number;
- dates and times of commencement, of critical intermediate stages, and of completion of production;
- quantities and batch number of each starting material;
- quantities and batch number of critical raw materials;

All Records should be:

- legible and clear
- Dated
- readily identifiable and retrievable
- carry authorization status
- retained for a designated period
- Protected from damage and deterioration while storage.
- All calculations should be duly recorded
- Workplace records are an important part of any work environment and should be accurately, reliable, easy to follow, consistent as the basis used and be very simply.maintained within the required timeframes.

Workplace information

- batch/recipe instructions
- verbal or written operating procedures

- specifications: detailed description of design criteria for a piece of work
- production schedules
- respond to and/or report equipment failure within level of responsibility
- locate emergency stop functions on equipment
- follow isolation and lock out/tag out procedures as required to take process and related equipment off-line in preparation for cleaning and/or maintenance within level of responsibility
- demonstrate batch/product change over's

There should be appropriate documentation of policies and procedures to be applied by the manufacturer with a view to safeguard the quality of the product, including:

- Qualification of premises and equipment.
- Validation of manufacturing process
- Maintenance and calibration of equipment.
- Cleaning procedures.
- Environmental monitoring.
- Investigations into deviations and non-conformances.

Self-check 10	Written test

Name…… ID…… Date…….

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

Short Answer Questions (2 point each)

1. List the required documentation in document recording procedures?
2. Write appropriate documentation of policies and procedures to be applied by the manufacturer?
3. Describe record keeping and documentation activities?
4. Write the importance of records?

Test -II: write true/false

1. Workplace records are an important part of any work environment (1point)
2. There are not different types of records according to workplace guidelines and requirements. (1points)

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

Answer Sheet

Score = _____

Rating: _____

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

Name: _____ Date: _____

Information Sheet 11.Following workplace information and procedures

11.1. Work place information

Each workplace relies on the exchange of information to carry out its daily business. Information is passed from employee to employee, customer to employee, supervisor to team member, supplier to customer, and so on. Dealing effectively with information and records is necessary and important for all organizations. The quantity and variety of information kept by an organization can be huge. Information needs to be sorted into related groups so that it can be stored easily and found when needed.

An organization success depends largely on how well it manages its information. Finding and using information is a large part of many jobs, so knowing how to deal with it is an important workplace skill. Being confident and efficient in this skill helps you and your organization succeed.

11.2. Workplace Safety Procedures

The most important concept to remember is that you are responsible for your own safety and the safety of others. Most safety practices are common sense. Unfortunately, they can be forgotten or overlooked unless you make safe practices a habit or an instinct. General Safety By doing things right, you and your co-workers will commit yourselves to safety on the job and everyone will benefit. Accidents occur in many ways but most often can be traced back to one of two basic factors: ignorance or carelessness. You must always be concerned with your own safety and with the safety of others around you. The following is a general list of safety precautions you must observe in any work area

- Don’t fool around. “Horseplay” is one of the biggest causes of injuries on the job and it may be grounds for dismissal.
- Never work while under the influence of drugs or alcohol, as you are a hazard to yourself and your co-workers.
- Pay particular attention to moving objects, such as equipment, dollies, mixers, and slicers.

- Do not run, in the work areas.
  - ✓ Stay completely alert on the job.

Self-check 11	Written test

Name…… ID…… Date…….

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

Short Answer Questions

1. List of safety precautions you must observe in any work area? (2)
2. Write the some of the standard operating procedures of work place? (2)
3. Type at least four work place safety guidelines? (2)

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

Note: Satisfactory rating 6 points Unsatisfactory below 6 points

Operation Sheet 1	Sieving spice and herbs

Apparatus

- Stack of test sieves
- Balance (with accuracy to 0.01g)
- Rubber pestle and mortar (for crushing the test material if lumped or conglomerated)
- Sieve shaker
- Oven.

The balance used should be sensitive to 0.1% of total weight of sample taken.

Procedure to Sieving procedure

Step 1: Take a representative oven-dried sample that weighs approximately 500g.

Step 2: If particles are lumped or conglomerated, crush the lumps but not the particles using the pestle and mortar.

Step 3: Determine the mass of sample accurately – Weight (g).

Step 4: Prepare a stack of test sieves. The sieves are stacked in order, with the largest aperture size at the top, and the smallest at the bottom. A receiver is placed under all of the sieves to collect samples.

Step 5: Weigh all the sieves and the pan separately.

Step 6: Pour the samples from step 3 into top of the stack of sieves and put the lid on, place the stack in the sieve shaker and fix the clamps, adjust the timer to between 10 and 15 minutes, and switch on the shaker.

Step 7: Stop the sieve shaker and measure the mass of each sieve and retained soil/material.

Operation sheet: 2	**Starting Blending process**

Step 1: Wear the appropriate personal protective equipment (PPE)

Step 2: Set up the blending machine or blender

Step 3: Have all of your ingredients and accessories nearby, things can happen quickly

Step 4: Weighing and sampling the ingredient /material for blending process.

Step 5: Monitor blending equipment/machine for process

Step 6: Apply the blending process

Step 7: Check the final quality of blended product (sensory analyze)

Operation sheet -3	**Bagging blended spice**

The Procedure of bagging blended spice

Step1: Wear personal protective equipment (PPE)

Step2: Adjust packaging machine or sealer machine

Step3: Weight tea amount of tea blended

Step 4: Avoid the letting out gas

Step 5: Use vaccumized sealer machine

Step 6: Press automatic/manual packaging machine

Step 7: Fill the blended product to the bag/carton or container

Step 8: Pack the filled products

Step 9: Deliver to the store (storage room)

Operation sheet -3	**Chili Powder**

Steps:

1. Put on gloves. Use caution when w*orking with hot peppers! Open the kitchen window.
2. Wash chili peppers of choice. Select peppers in good condition, free of disease or damage.
3. Cut off the top stem portion, then cut the peppers in half lengthwise.
4. Remove excess seeds and membranes from inside the peppers.

5. Bring a pot of water to a rolling boil. Add prepped chili peppers, and blanch for one minute.
6. Remove peppers from hot water and directly to an ice bath (ice water in bowl). Once they're fully cool, strain peppers from water.
7. Place blanched peppers on dehydrator trays, or baking sheets for the oven. Do not overlap.
8. In a food dehydrator: dry chili peppers on 125F for until they are completely dry, and crunch and snap when bent. Time will vary depending on peppers and dehydrator use, but should be done within 12-24 hours.
9. In the oven, dry the peppers on 175-200F until crunchy dry.
10. Once fully dry, either store whole dried peppers in a jar with a tight-fitting lid until needed, or grind into chili powder for immediate use.
11. Grind dry peppers into a powder using a blender, food processor, coffee grinder, or mortar and pestle.
12. Store in a glass container with an air-tight lid. It will be good for over a year stored in the pantry.

LAP TEST	**Performance Test**

Name……. ID……..

Date…….

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **4** hour. The project is expected from each student to do it.

Task-1 Perform sieving spices and herbs

Task-2 Start blending process

Task 3: Prepare chili powder

Task 4: Bagging blended spice

LG #71	LO #3- Shut down the blend, sieve and bagging process

Instruction sheet

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

- Identifying the appropriate shutdown procedure
- Shutting down process according to workplace procedures
- Identifying and reporting maintenance according to workplace

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 the appropriate shutdown procedure
- Shut down process according to workplace procedures
- Identify and reporting maintenance according to workplace

Learning Instructions:

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

Information Sheet **1-** Identifying the appropriate shutdown procedure

1.1. **Identifying the appropriate shutdown procedure**

Shut down means and includes isolation of mechanical, electrical drives, pipework (pressure) rotating equipment etc. utilizing electrical lock-off isolators, mechanical and power driven valves etc. in accordance with standard operating instructions. Pull plug or throw switch to off position before cleaning or adjusting any machine. Keep fingers, hands, spoons, etc., away from moving parts. Wait until machine stops before moving food.

Relevant regulations:

- Under taking Shut-down sequence safely and to standard operating procedures.
- Depressurizing the machine/equipment to standard operating procedures.
- Verify Safe shut-down of machine/equipment is
- Install safety/security lock-off devices and signage to standard operating procedures.
- Do not start a mixer until the bowl in place securely fasting and the attachments
- When using a mixer, turn off motor before you scrape down the sides of the bowl.
- Machine/equipment is clean and safe stat
- When working with tools at height makes sure they cannot fall
- Switch off when disconnected from their power do not leave power tools
- Ensure that cables, power lines, pipes and hoses
- Check insulation, switches and fuse boxes for possible hazards. Ensure warning signs are clear and easily seen.
- Ensure that correct type of firefighting equipment
- Remove empty cartons, wrappings and other flammable waste as soon as possible
- Never use any machine you have not been train to use.
- Check all switches to see that they are off before plugging into the outlet.
- First pull the plug.
- Turn the gauge to zero in order to cover the edge of the blade
- Clean the blade from the center out.
- Clean the inside edge of the blade with a stick that has a cloth
- You must be aware of the lock-out procedures that are to be follow before repairing or cleaning any machine.
- Lock-out procedures must be clearly posted by management near each machine.

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: Choose the best answer (4 point)

1. Relevant regulations for shut down spice mixing equipment

A. Shut-down sequence is undertaken safely and to standard operating procedures.

B. Machine/equipment is to standard operating procedures.

C. Safe shut-down of machine/equipment is verified.

D. .All

Test II: write "True" or "False" for the following questions

1. Before shutdown remove empty cartons, wrappings and other flammable waste as soon as possible.

Score = _____

Rating: _____

Answer Sheet

Name: _____ Date: _____

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

Name…… ID…… Date…….

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Information Sheet **2-** Shutting down process according to workplace procedures

2.1. Shutting down process:

An occasion when a large piece of equipment stops operating, usually for a temporary period or the act of closing a factory or business of stopping a machine.

Reading, interpreting and following information on written job instructions, specifications and other applicable reference documents

- checking and clarifying task-related information
- Entering information onto preforms and standard workplace forms.
- Shutting down machine/equipment.
- Purging/de-energizing equipment.
- Installing safety/security lock-off devices and signage

2.1.1 Berbere Mixer Lock-Out Procedure

- Shut off mixer at stop/start switch.
- Shut off at disconnect behind mixer.
- Apply lock to disconnect. Put key in pocket. Do not leave key in lock!
- Attempt to start mixer, reset or return switch to “off” position.
- Complete work on mixer.
- Ensure bowl and mixer are clear of loose pieces, tools, etc
- Remove lock.
- Restart mixer and run up to operating speed.

2.2. Shut-down the process according to company procedures.

This is final process of blending and packing coffee and tea process will shut-down based on the specifications and guidelines of the manufacturer.

The Purpose of Shut-down process /cleaning is to make clean and avoid the fundamental factors that expose to blending and packing in tea and coffee process.

Normally shutdown includes steps to render the systems safe, such as removal of hazardous materials and waste. The systems might be cleaned as part of the shutdown; cleaning is often a process up to itself requiring its own set of startup, operation in shutdown procedures for any food processing industry.

3.2 Steps to shut down blending machine

- Perform full back flush of water.
- Plug off all equipment/machinery that used for blending and packing process

- Clean the surface of blending machine screens and steam on the machinery and around the machine that you work like roasting, blending, grinding and sealing machine carefully carry out in order to keep healthy of machine.
- Flush lots of hot soapy water down the drain.
- Flush lots of hot soapy water down the discharger rinsed after the cleaning is done.
- Make Empty blending hopper and packer until it empty.
- Switch off the power from the machine at all on the right side the wall.
- Close the main water tap connecting water to the machine.

3.3Restarting blending and packing machines:-

- Switch ON the machine you want
- Monitor the machine as it work functionally
- Clean the machine you want to work with
- Connecting tap hot water to the machine for properly clean.
- Wash the internal and external surface of machine in order to avoid the hazards
- Finally make tidy equipment/machine for next process.
- Rinse and dry machine interior and external parts.
- Place machines from locations where there is a risk of frost in a protected area respective and contact technician for frost protection.

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: Choose the best answer (10 point)

1. Shutting down procedures
   A. checking and clarifying task-related information
   B. Entering information onto preforms and standard workplace forms.
   C. Shutting down machine/equipment.
   D. Purging/de-energizing equipment
   E. All
2. When you shut down the machine?
   a. After you fished the task
   b. When same problems has happened
   c. During the during cleaning a machine
   d. All

Test II: Choose the best answer (10 point)

1. Write the shutting of machine procedures
2. What you do before you shut down?

Score = _____

Rating: _____

Answer Sheet

Name: _____ Date: _____

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

Information Sheet- 3	Identifying and reporting maintenance requirements

3.1. Identifying and reporting maintenance requirements

Maintenance is the upkeep of equipment and machinery in proper working condition at all times. Maintenance plan in spice processing includes:

- maintenance activities and schedules
- Staff resource and supply requirements

- staff roles and responsibilities
- contingency plan for staff and supply problems
- reporting requirements
- hazard and risk control measures
- OHS procedures, personal protective clothing and equipment requirements
- environmental impact control measures

Enterprise requirements include:

- Standard Operating Procedures (SOP),
- Industry standards and production schedules,
- Material Safety Data Sheets (MSDS)
- Legislative and licensing requirements
- Work notes, product labels and manufacturers specifications,
- Operator's manuals, enterprise policies and procedures (including waste disposal, recycling and re-use guideline, and OHS procedures

Reporting for maintenance

Report to your immediate supervisor any tool or piece of equipment that is broken or does not function properly or unsafe equipment to a responsible individual to prevent serious injury.

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 -1 Choose the best answer (6 point)

1. What is the primary purpose of a preventive maintenance program?
   a. Increase the use of backup equipment

b. Correct equipment breakdowns
c. Eliminate inventory of spare parts
d. All

2. What are enterprises requirements?
   a. Work notes
   b. product labels and manufacturers specifications
   c. policies and procedures
   d. all
   e. none of the above

Test –II Give short answer for the following questions

1. For whom you report if there is machine or equipment broken?
2. Why you report?

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

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

Operation Sheet 1 **-** Shut down the mixing or blending process

1.1 Wearing personal protective equipment's(PPE)

- glove
- eye goggle
- safety shoe
- guan
- hair net

2.1 Shut down procedures the mixing or blending process

1. Shut off mixer at stop/start switch.
2. Shut off at disconnect behind mixer.
3. Apply lock to disconnect. Put key in pocket. Do not leave key in lock!
4. Attempt to start mixer, reset or return switch to “off” position.
5. Complete work on mixer.
6. Ensure bowl and mixer are clear of loose pieces, tools
7. Remove lock.
8. Restart mixer and run up to operating speed

LAP TEST	**Performance Test**

Name……. ID……..

Date…….

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **1** hours. The project is expected from each student to do it.

Task 1. Perform shutdown procedures of mixing and blending machines

Reference materials

Book:

1. Christensen, G. H. 1973. Statistical properties of random and non-random mixtures of dry solids. Part I. A general expression for the variance of the composition of samples, Powder Technology 7(5): 249–257.
2. Heywood, H. 1961. Techniques for the evaluation of powders I.-Fundamental properties of particles and methods of sizing analysis, Powder Metallurgy 7: 1–28.

WEB ADDRESSES

http://www.youtube.com/embed/SlFdlkAmhNQ

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