Spice and Herbs Processing

Level-II

Based on May 2011, Version 2

Occupational standards

Module Title: Operating a Chilling and Freezing Processing of Spice and Herbs

LG Code: IND SHP2 M10 LO (1-4) LG (35-38)

TTLM Code: IND SHP2 TTLM 1020v1

October, 2020

United Nations
Educational, Scientific and
Cultural Organization

Table of Contents

LG #35	LO #1- Prepare and maintain process machineries and tools

Instruction sheet

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

- Checking the performance of all machineries and equipment
- Cleaning machineries and tools used for chilling and freezing
- Ensuring different chilling and freezing technique
- Ensuring that there is no leakage of refrigerant machine or room
- Placing the necessary tools required for process
- Attending minor repairs/faults of all machines
- Selecting and setting the machines and tools required

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:

- Check the performance of all machineries and equipment
- Clean machineries and tools used for chilling and freezing
- Ensure different chilling and freezing technique
- Ensue that there is no leakage of refrigerant machine or room
- Place the necessary tools required for process
- Select and set the machines and tools required
- Attend minor repairs/faults of all machines
- Select and set the machines and tools required

•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”.

Information sheet 1: Checking the performance of all machineries and equipment

1.1. Checking the Performance of Machineries and Equipment

A machine's performance score compares the number of units it produces per hour with the ideal production rate it would meet if it ran at its maximum rated speed at all times. Planning regular equipment checks monthly, bimonthly, or quarterly can be a great way to keep a schedule and record issues as they arise. Scheduling regular checks by a service technician can also prevent any malfunctions. Mechanical equipment requires regular attention to ensure problem-free operation. Maintenance schedules must be strictly carried out. Work area, materials, and equipment are routinely monitored to ensure compliance with purification requirements.

Checking cooling equipment on a refrigerated van

- Equilibrate the temperature of the inside of the van to the prevailing ambient.
- Place a temperature probe inside the vehicle in such a manner that it does not touch the floor, roof or walls.
- Close all doors and vents and switch on the refrigeration unit, having set its thermostat to the design temperature (e.g. +2°C to +8°C).
- Verify that the inside temperature of the empty equipment can be brought to the design temperature using either the electric standby or the diesel engine at high speed within a period of six hours. Both should be tested if they are independent systems.
- In low ambient temperatures, verify that the design temperature can be maintained for a minimum period of two hours when the engine is maintained at the idle speed.
- Check all fan set screws and tighten if needed.
- Check all fan blades for signs of stress or wear.

Figure 1.Checking refrigerator

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Self-check1	Written test

Name……

ID…… Date…….

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

Choose the best answer

1. What is importance of performance of all machineries and equipment?(4)

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

Note: **Satisfactory rating – 4 points** **Unsatisfactory – below 4 points**

Information Sheet-2 - Cleaning machineries and tools used for chilling and freezing

2.1. Cleaning machineries and tools

- Clean steel surface on the inside and on the outside of the equipment with a damp cloth and a neutral, non-abrasive cleaning agent.
- Wipe the surfaces thoroughly with a piece of cloth (do not rinse them with water) and dry them thoroughly.
- Do not scrub the surfaces with sharp objects.
- Do not use any aggressive substances or solvents because their residues may damage the machine and interfere with its operation.
- Perform cleaning (of the condenser) with compressed air or a brush with long bristle.
- Clean them regularly, especially air-cooled types
- You should periodically empty the water tank and sanitize the water tank approximately every 3 days.
- Periodic cleaning can be accomplished by using a brush, pressurized water or a commercially available evaporator coil cleaner or mild detergent. Never use an acid based cleaner. Follow label directions for appropriate use. Be sure the product you use is approved for use in your particular application.
- You must ensure that the water tank is always clean so that it does not become ideal environment for bacteria to reproduce.
- Before you can re-organize your fridge, you should first clean it out, remove all expired food products, and sanitize everything.

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. Write the procedure of cleaning freezer(4)

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

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

Information Sheet-3 - Ensuring different chilling and freezing technique

3.1 Definition of Chilling and Freezing

Chilling is the unit operation in which the temperature of a food is reduced to between 1ºC and 8ºC. It is used to reduce the rate of biochemical and microbiological changes, and hence to extend the shelf life of fresh and processed foods. It causes minimal changes to sensory characteristics and nutritional properties of foods and, as a result, chilled foods are perceived by consumers as being convenient, easy to prepare, high quality and 'healthy', 'natural' and 'fresh'. Chilling and freezing as food preservation processes are technically rather simple operations and have been applied since centuries wherever the environmental conditions offered appropriate possibilities.

Chilled foods are grouped into three categories according to their storage temperature range as follows:

1. -1ºC to +1ºC (fresh fish, meats, sausages and ground meats, smoked meats and breaded fish).
2. 0ºC to +5ºC (pasteurized canned meat, milk, cream, yoghurt, prepared salads, sandwiches, baked goods, fresh pasta, fresh soups and sauces, pizzas, pastries and unbaked dough).
3. 0ºC to +8ºC (fully cooked meats and fish pies, cooked or uncooked cured meats, butter, margarine, hard cheese, cooked rice, fruit juices and soft fruits).

3.2. Different chilling and freezing technique

3.2.1. Cryogenic Chilling

The use of cryogenic systems to quickly chill products also has distinct benefits. Quick chilling of raw food products dramatically reduces food safety concerns by slowing or stalling the growth of spoilage organisms and by allowing the products to reach a safe holding temperature quickly. CO_2 infiltration is some of the benefits the cryogenic chilling methods can provide compared to conventional methods. As with freezing, cryogenic cooling offers increased cooling speed, improved quality, extended shelf life and cost savings.

3.2.2 Freezing Technique

Freezing is the most successful technique for long term preservation of food since nutrient content is largely retained and the product resembles the fresh material more

closely than in appetizer foods. Foods begin to freeze somewhere in the range — 0.5 to — 3 °C, the freezing point being lower than that of pure water due to the solutes present. The temperatures used in frozen storage are generally less than 18 °C.

Cooling down to the storage temperature will prevent any further microbial growth once the temperature has dropped below 10 °C. Finally, during storage there will be an initial decrease in viable numbers followed by slow decline over time.

3.2.2. Cryogenic freezers

Freezers of this type are characterized by a change of state in the refrigerant (or cryogen) as heat is absorbed from the freezing food. The heat from the food therefore provides the latent heat of vaporization or sublimation of the cryogen. The cryogen is in intimate contact with the food and rapidly removes heat from all surfaces of the food to produce high heat transfer coefficients and rapid freezing. The two most common refrigerants are liquid nitrogen and solid or liquid carbon dioxide. Cryogenic systems are enabling food processors to improve both their product quality and operational efficiency.CO_2 is a consumable refrigerant that is sprayed directly onto the product. To ensure efficient and economical use of nitrogen, the system must contain a vapor heat exchange area. In standard cryogenic freezers, liquid nitrogen is injected into a single zone, and the cold vapors are directed to the ends of the freezer to completely envelope the food product.

- Constant freeze
- Vertical plate freezer
- Rotary freezer
- Horizontal cryogenic freezer

Vegetable and Spice and Herbs Storage

Temperature	Length of Storage
0ºF	1 year
5ºF	5 months
10ºF	2 months
15ºF	1 month
20ºF	2 weeks
25ºF	1 week
30ºF	3 days

Figure 3.2. Vegetable and Spice and Herbs Storage

Self-check 3	Written test

Name…… ID…… Date…….

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

Choose the best answer

1. Define what is chilling?(2)
2. Define what is freezing?(2)
3. Write Different chilling and freezing technique?(2)

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

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

Information Sheet-4- Ensuring that there is no leakage of refrigerant machine or room

Refrigerants leak detection can be done using simple methods such as listening to using more advanced tools such as electronic leak detectors. Others may leak more due to the harsh temperature, environment and vibration that cause these joints to leak. If not rectified, these defects will cause a drop in efficiency to the heating or the cooling system.

One of the more effective ways to check for a refrigerant leak in your air conditioning system is to conduct a dye test. Leaks can also be detected at a distance, as long as enough light from the detection lamp is administered. Additionally, this dye test can be performed when your AC unit is running or not. The only downside to this method is leaks can only be identified in specific areas, where the electronic leak detector touches refrigerant components.

If there are leaks in your system, air bubbles will be visible. You can then mark these areas so that an HVAC technician knows precisely where patches are required.

If you do, these elements could wear down your refrigerant components and leave you with costly repairs. You also should be careful about not applying enough air bubbles, because once this solution enters the system, it may be hard to tell where exactly the air bubbles are coming from.

When a refrigerant leak is present in your AC system, sometimes oil will also leak out. This substance is pretty simple to detect given its thick, dark consistency. It also has a potent smell that is easily distinguishable, even if you're far away.

Feel around different components and keep checking your gloves for visible signs of oil. If an area produces a lot, chances are there is a leak that needs to be repaired right away. If you don't have protective gloves, you can also use cloth.

Self-check-4	written test

Name…… ID…… Date…….

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

1. How to check leaking in refrigerator?(3)

Short Answer Questions

1. Why placing tools necessary for freezing?(3)

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

Information Sheet-5 - Placing the necessary tools required for process

When tools are not organized, workers can unintentionally waste time trying to locate them or wondering where they belong when it is time to return them. Place your freezer in a cool, dry area where the temperature is constant. Keep your freezer at least ¾ full for efficient operation.

By tidying up the space and implementing a tool organization strategy, workers can easily find and put back tools as they work through the manufacturing process. Keep workers moving efficiently: Having tools kept in hard-to-reach areas are placed in illogical manner can keep workers from moving around the space efficiently. A significant amount of time and energy can be saved when tools and materials are kept in the sequence used, or in places a worker can easily reach. Keep customers satisfied: The wasted time it can take to locate tools, or the time that is wasted as employees move around inefficiently actually impacts the production process more than you may think. It takes longer for products to be manufactured and it will take longer for items to be delivered to customers.

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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

2. Why placing tools necessary for freezing?(3)

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

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

6.1 Minor repairs/faults

Cleaning your refrigeration equipment's parts can help prevent lots of malfunctions, particularly with fans and coils. Using a dry dustin cloth to wipe down equipment that uses static to attract particles of dust and dirt can keep coils dry and clean. Your commercial refrigerator should have a defrost cycle set, which helps to remove any frost buildup and excess condensation inside the unit. If this cycle is not adjusted properly, frost can build up. Here are the most common commercial refrigeration problems you may find, and a few tips on how to determine what's wrong with your unit. Make sure that the drain lines are clear as well. You may notice that only a part of the evaporator coil is freezing up, which could indicate you have a low charge, so the pressures and sub-cooling may need to be checked either by you or a certified technician. The more you use your refrigeration equipment, the more frequently you should have someone inspect. By checking every part of your refrigeration equipment for consistent functioning, you can prevent many malfunctions

- Check refrigeration equipment regularly for malfunctions.
- Verify that the compressor has been cleaned recently
- Thermostats and other parts must be checked and maintained on a routine basis so that larger problems can be prevented before they disrupt your entire business day.
- The coils of the evaporator should be clean and you can locate cleaning tips in your model's manual
- Adjust the defrost cycle so that the unit defrosts more often and this may address the problem.
- Always read the manual that accompanies your appliance to make sure you're using the proper recommended repair option.
- Clean equipment regularly. Cleaning your refrigeration equipment helps it run more efficiently.. When cleaning, you may see problems with your freezer and cooler you could otherwise miss.

- Check fan blades. You should clean any fan blades from time to time. To do this, remove any protective covers and wipe each fan blade clean
- Replace worn parts promptly. If you find a worn or outdated part while cleaning or during maintenance checks, it is best to replace it right away. You may forget and then have a complete refrigeration break down at the most inconvenient time.
- **Perform routine maintenance**. Schedule times for a qualified commercial refrigeration technician to inspect your equipment.

If your ice maker isn't making ice

- **Make sure the bail wire** above the ice tray is in the down position. When it's up, it shuts off the ice maker.
- **Check the water supply line** beneath or behind the refrigerator. Be sure it isn't kinked and is supplying water.
- **Be sure the little fill tube** that fills the ice tray isn't frozen. If it is, melt the icy tube with a hair dryer.
- **Look for ice in the ice mold** and make sure the motor that turns the ice ejection arm is working.
- **Check the tap valve** that connects the supply tube to the water pipe.
- **Check the solenoid.** For more detail about this and all of the above steps, see below

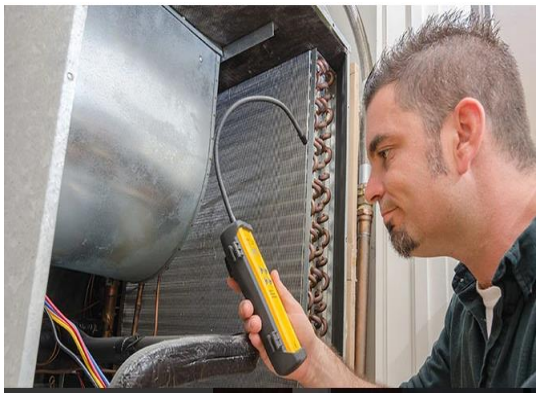

Figure 6.1. Repairing freezer

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

1. What are Minor repairs/faults of machines?(2)

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

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

Information Sheet-7 - Selecting and setting the machines and tools required

7.1 Selecting machines and tools

- Multi meter
- Vacuum Pump.
- Mobile HVAC Software.
- Refrigerant Scale.
- Cordless Drill.
- Screwdrivers.
- Pipe Wrenches and Pliers.
- Tin Snips and Shears.
- Reciprocating Saw Blades
- Thermometer
- Hygrometer

7.2 Setting time for refrigerator

Setting the time Use the Read button to adjust the time. Each time you press the Read button, the number in the flashing digit will increase by 1.

For example, if you want to set the time to 12:42 you have to perform the following

Step:1. The first digit is flashing: Press Read once. “1” will appear as the first digit. Press SET to save.

Step: 2 The second digit will start flashing. Press Read two times, when “2” appears as the second digit press SET to save.

Step: 3 The third digit will start flashing. Press Read four times to set the digit as "4". Press SET to save.

Step: 4. The last digit will start flashing. Press Read two times to obtain “2”. Press SET to save. If during this operation, you press read more then you were supposed to, continue pressing the Read button until you obtain the desired number, then press SET button to save your setting

Figure 7.2.time setting

Operation sheet 1. Cleaning machineries and tools

The procedure of cleaning freezer

Step1: Unplug Your Refrigeration Units. Before cleaning starts, disconnect the equipment from the power supply mains. To eliminate the possibility of electrocution, the first thing you should do is unplug your refrigerator or freezer. It's a quick and easy step, but it's also vitally important to preventing work-related injuries

Step2: Empty Each Shelf of All Items

The second step should be to remove all of the products in your fridge or freezer. Make sure to actually remove the containers; don't just move them to the other side of the fridge.

Step3: Brush out the inside of the cooler Use a soft cloth or sponge to sweep the inside of the air cooler. Some Debris can get inside it. As it will cause blockages that stop up the cooler, and may lead to unclean water cycling through it.

Step 4: Disinfect with a Sanitizer

Operation sheet 2. Detecting leaking

Steps for detecting leaking

1. Found the gas leak
2. Fix it
3. Charge it
4. Frist you need to weld a valve to be to finish the job on service point you will find it in the side of compressor
5. Hyc pressure
6. We go to use only the blue to check the fridge.
7. Low side pressure is the blue hose
8. I use an old fridge compressor to pressure th e system put to cham=ne where is leak.
9. Put the yellow house high side of the pressure to charge the system with air
10. Pressurize the system 70psi to 90 psi
11. Use water and dis-soap to check on leak.
12. Very small leak
13. Release the pressure
14. Re-weld the damage pipe
15. Pressurize the system again between 70psi to 09psi
16. Check for leak
17. Release the pressurized and yellow hose on vacuum
18. Put the yellow hose on the gas bottle and open the valve
19. turn on the fridge and start slowly you need to see the blue gauges read between 5psi to maximum 8 psi and stop charging the system level it run for 30 min and the fridge.

LAP TEST1	**Performance test**

I. Performing the following practical assessment. Allowed Time 3hr.

Task 1: Perform cleaning refrigerator

Task 2: detect refrigerator leaking

LG #36	***LO #2- Plan* equipment utilization**

Instruction sheet

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

- Using personal safety.
- Reading and understanding the processing order.
- Reporting malfunctions of machine.
- Following precautions of chilling and freezing
- Contacting of refrigerant with the skin
- Controlling and monitoring temperature, pressure and relative humidity of refrigeration room
- Protecting cylinders from direct sunlight and radiation heat
- Avoiding direct contacts with refrigerant/oil solutions.
- Calculating process time for effective utilization of machineries and manpower.

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- Read and understanding the processing order.
- Report malfunctions of machine.
- Follow precautions of chilling and freezing
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Information Sheet .1: Using personal safety.

1.1. Wear suitable protective clothing and PPE

Personal protective equipment (PPE) is protective clothing, helmets, goggles gloves, safety shoes and overall equipment designed to protect the wearer's body from injury or infection. Choosing protective clothing that suits the environment and job role you are working in is vital in keeping safe in a cold storage environment. The a Choosing suitable cold Store clothing, choosing suitable cold Store Footwear, choosing suitable cold store gloves and choosing suitable cold Store Headwear. Appropriate clothing and equipment should be worn at all times when working in cold environments.

- Body – Wear at least three layers of clothing to provide insulation – a synthetic material for inner clothing, a wool or lofty material in the middle and a waterproof fabric for outer clothing.
- Head – A wool knit cap under a hard hat is ideal to help reduce heat loss.
- Hand – Gloves can prevent cold related injuries and maintain dexterity.
- Eye and face protection – Use eye protection that is separate from the nose and mouth.
- Freezer boots with leather uppers are recommended, as it is porous, meaning your feet will be able to breathe and will sweat less.

Personal hygiene includes:

- Showering and bathing regularly
- Keeping hair clean hair and covered or tied back
- Keeping clean clothing and footwear that is used only at work
- Hand washing regularly
- Using clean utensils for tasting food
- Using separate cloths for cleaning and wiping plates

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 PPE ?(3)
2. What is personal hygiene?(3)

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

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

Information Sheet 2- Reading and understanding the processing order.

- By reading equipment's manuals and process documents understand the equipment operation and process requirement.
- Understand customer requirements and their priority and respond as per their needs.
- Have Knowledge on sanitizers and disinfectants and its handling and storing methods.
- Read and interpret the process required for refrigerating various spice and herbs products.
- Plan and organize the work instructions, order and jobs received from the supervisor.
- Plan to utilize time and equipment's effectively.
- Organize all process/ equipment manuals so as to access information easily. Support supervisor in solving problems by detailing out problems.
- Apply domain information about maintenance Processes and technical knowledge about tools and equipment.
- Use common sense and make judgments on day to day basis.
- Analyses critical points in day to day tasks through experience and observation identify control measures to solve the issue
- Read and understand the processing order i.e. the amount of spice and herbs that is to be chilled and Freeze from the supervisor.
- Receive Instructions from the supervisor how to mince the garlic to uniform pieces.

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 advantage of understanding the processing order? (3)

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

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

Information sheet 3. Reporting malfunctioning machine

In the event of equipment breakdown, you should call professional repairmen immediately to save your day. Commercial equipment such as ice cream freezers is designed to be used for long hours per day. However, these kinds of equipment are also prone to potential damage just like any other machines. That is why it is important to choose a reliable ice cream freezer repair company in case your machine breaks down without warning. Freezer is an important investment for your business. There are a lot of ice cream freezer machines out there, so it's important to choose one that will last you for years. But at some point, calling commercial freezer repairs services may be necessary. Among common ice cream freezer issues you need to watch out for include the following:

1. *Power*

If the freezer function does not work, it may be due to a defective power source so make sure to check if the power cord is plugged in properly. Also, check whether the cord is damaged or the fuse is working properly. If one or both of these show signs of damage, they should be replaced immediately.

2. *Light*

If your ice cream freezer lighting does not turn on or off, check whether the lamp and lamp socket has any damage or signs of corrosion. In such cases, you should replace them immediately.

3. *Thermostat*

Aside from power issues, your ice cream freezer may also have problems with the thermostat. The latter may be the reason why the machine does not cool up the way it should do. You can try adjusting the temperature to check whether the thermostat is working properly.

4. Compressor

If the compressor is producing a bee-like sound, consider replacing the compressor coil. Also, check whether the fan, evaporator, and condenser coils work as well. Make sure that the coils do not have leakages. Freezer machines including commercial ice cream machines, ice makers, and refrigerators all have a self-defrosting mechanism. This function is meant to melt excess ice, to maintain cleanliness, and to maximize the freezer's function. On the other hand, you can also hire commercial refrigerators repairs specialists to help you with defrosting. These professionals can also provide additional tips on proper care for your commercial ice cream freezers. Also, make sure to determine your machine's maximum capacity to prevent premature damage and additional stress on your part.

Impact of icing problems to your freezer machine

Not defrosting your freezer can cause problems on your machine in the long run. That is why it is important to defrost regularly. Ice build-up may be due to improper sealing or leaving the equipment's door not properly closed. Apparently, warm air from the outside causes icing issues. Ice buildup may also occur on your evaporator coil due to fan problems. Likewise, ice can also form on the freezer's insulation panels that can cause equipment malfunction and even take a toll on your utility costs. The latter can happen especially if the machine is more than a decade old.

DAMAGED OR MALFUNCTIONING EQUIPMENT REPORT

This form is to report any broken or malfunctioning equipment. Return this form immediately to a Cage operator or the Media Asset Coordinator. Please clearly explain the problem and when/how it occurred.

NAME:_____ DATE:_____

MALFUNCTIONING ITEM:_____
ITEM'S CMU #_____

DATE PROBLEM OCCURRED:_____

DESCRIPTION OF MALFUNCTION:

_____

_____

_____

_____

_____

_____

Figure 3.1.Maintanence format

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

1. What is malfunctioning machine? (3)

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

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

Information sheet 4. Following precautions of chilling and freezing

4.1. Precaution

Before doing any work on a refrigerator or freezer, make sure it's unplugged. After unplugging the unit, check to see if the motor/compressor has a capacitor; this component is located in housing on the top of the motor. Capacitors store electricity, even when the power to the unit is turned off. Before you do any work on a capacitor-type refrigerator or freezer, you must discharge the capacitor, or you could receive a severe shock.

WARNING

- Keep them away from belts, fan motors, engine pulleys, and hot surfaces.
- Do not apply heat to a sealed refrigeration system or container. This increases internal pressure and can cause an explosion
- Keep your hands, clothing and tools clear of the fans when the unit is running. This should also be considered when opening and closing the compressor service valves (when equipped).
- Make sure the gauge manifold hoses are in good condition

DANGER:

When performing works related to cleaning, keep in mind the following safety rules.

- Do not remove and do not tamper with protective devices while performing regular maintenance work.
- Do not work with the equipment with wet hands or feet.
- Use appropriate and compatible equipment for maintenance.
- When not in use, the equipment should be switched off and the plug should be taken out of the power socket.
- Do not pull the cable of the probe measuring the temperature of the product so as not to remove it from the product.
- Do not warm the probe measuring the temperature inside the product with flames.

In order to ensure high quality of the equipment for a long time, implement the following precautions:

- Handle the probe measuring the temperature inside the product with care because the sensor is very sensitive.
- When the equipment is not used for a long time, apply a protective film of Vaseline oil with a piece of cloth.
- During down periods, clean and dry the interior. Leave the door slightly open to improve the circulation of air. When the equipment is not in use for a long time, disconnect it from the power supply.

Self-check 4	**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 are the precaution followed during food chilling ?(4)

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

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

5.1. Cause of contacting of refrigerant with the skin

Contact of refrigerant with the skin, which can cause burns; especially when charging or discharging refrigerant make sure that the service cylinder is not overfilled.

Chlorofluorocarbons (CFCs) commonly referred to as are non-combustible liquids that were, at one time, frequently used as refrigerants and aerosol propellants, as well as for cleaning products. CFCs contribute to the loss of the protective ozone layer, which blocks ultraviolet rays from the sun. This exposes more people to UV radiation, which can cause skin cancer. Humans can come in contact with CFCs through ingestion or skin contact. After dermal interaction with CFCs, some people might have skin irritation or dermatitis and can cause nausea, vomiting, diarrhea or other upset to the digestive tract.

Ammonia, in liquid or gas form, can present hazards to workers' skin, eyes, nose, and lungs. Liquid ammonia is a clear fluid that evaporates quickly at room temperature. As a gas, ammonia is colorless and has a strong odor that is suffocating, pungent, and penetrating. It is much lighter than air, so if ammonia gas escapes from a refrigeration system or a storage container, it may collect in high areas or ceilings. Liquid releases can form aerosols that may tend to accumulate at low points. Therefore, it is important to take atmospheric readings at various locations within a space to ensure that it is safe for workers.

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. What is the effect of Chlorofluorocarbons on skin ?(3)

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

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

6.1. Controlling and monitoring RH

Controlling an appropriate relative humidity is important to control the following: water losses; decay development; incidence of some physiological disorders; Uniformity of ripening. A spice is a seed, fruit, root, bark, or other plant substance primarily used for flavoring, coloring or preserving food. Spices are distinguished from herbs, which are the leaves, flowers, or stems from plants used for flavoring or as a garnish. Relative humidity needs to be monitored and controlled in storage. Hygrometer is a device used to measure humidity. Many hygrometer products also measure temperature. RH Control can be achieved by a variety of methods:

- Operating a humidifier in the storage area.
- Regulating air movement and ventilation in relation to storage room load.
- Maintaining refrigeration coil temperature within 2°F of the storage room air temperature.
- Addition of crushed ice.
- Using moisture barriers in the insulation of the storage room or transport vehicle, and in the lining of the packing containers.
- Wetting the storage room floor.
- Using crushed ice to pack produce for shipment.
- Wetting the floor in the storage room

Figure 6.1 Hygrometer

6.2 Monitoring temperature

Temperature management is the most important tool that we have to extend shelf-life of fresh horticultural commodities after harvesting the produce. Temperature management begins with a rapid removal of the field heat by using one of the following cooling methods:

- Hydro cooling
- In package ice
- Top icing
- Evaporative cooling;
- Room cooling
- Forced air cooling and Vacuum cooling

Cold storage facilities should be well constructed and adequately equipped. They should have:

- good construction, and insulation and vapor barrier
- Strong floor
- Adequate doors for loading and unloading
- Effective distribution of refrigerated air
- Properly located controls
- Enough refrigerated coil surface
- Capacity adequate to expected needs
- Appropriate stacking of the produce.

Figure 6.1.Termometer

Table 6.1. Lists optimum storage temperatures for some spice and herbs

Commodity	Temperature (°F)	Relative humidity (percent)	Approximate storage life	Freezing point (°F)
Onions, green	32(0°C)	95–100	3–4 weeks	30.4
Onion, dry	32	65–70	1–8 months	30.6
Onion sets	32	65–70	6–8 months	30.6
Parsnips	32	98–100	4–6 months	30.4
Peppers, chili (dry)	32–50	60–70	6 months	—
Peppers, sweet	45–55	90–95	2–3 weeks	30.7

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

1. What is hygrometer?(3)
2. Write are method of controlling RH ?(3)

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

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

Information sheet 7.Protecting cylinders from direct sunlight and radiation heat

Sunlight, an essential prerequisite for life, may be extremely dangerous to human health. Excessive exposure to the sun is known to be associated with increased risks of various skin cancers, cataracts and other eye diseases, as well as accelerated skin ageing. It may also adversely affect people's ability to resist infectious diseases, and compromise the effectiveness of vaccination programme. Sunlight is electromagnetic energy, which is propagated by electromagnetic waves. Health wise, the most important parts of the sunlight electromagnetic spectrum are: ultraviolet radiation (UV), invisible to the eye; visible light that allows us to see; and infrared radiation, which is our main source of heat but is also invisible.

An excessive exposure to them poses particular risks to health. Skin: Excessive UV exposure results in a number of chronic skin changes. These include various skin cancers of which melanoma is the most life-threatening; an increased number of moles (benign abnormalities of melanocytes) and a range of other alterations arising from UV damage to keratinocytes and blood vessels. UV damage to fibrous tissue is often described as "photo ageing". Photo ageing makes people look older because their skin loses its tightness and so sags or wrinkles.

Self-check 7	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 effect of direct sunlight to cylinder? (3)
2. Why we protect cylinder from direct sunlight? (3)

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

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

The CO_2 prevents skin impairment, such as decreased skin barrier and moisturizing functions and surface roughening, which occur during the dry winter months.

Freon is not exact a chemical. Freon is actually a trade name that describes a whole class of chemicals used in refrigeration. Most of the chemicals included under the trade name of "Freon" are known as "chlorofluorocarbons." This means that their chemical structure is made up of the main chemical building blocks of carbon and hydrogen, but they also include chlorine and fluorine as well. Without knowing the exact version of Freon that was used in your refrigerator, one can only comment on the general health effects of Freon as a whole.

The most serious side effect of Freon exposure would occur at the time of initial exposure. People who have a history of heart problems should be very concerned about Freon because it can cause cardiac arrhythmia (irregular heartbeat), and palpitations at very high concentrations. For people who have a history of heart problems, being exposed to small amounts of Freon from leaking appliances should not pose any significant health risk.

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 impact of Freon on human skin ?(3)
2. What is Freon? (3)

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

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

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

Information Sheet 9: Calculating process time for effective utilization of machineries and manpower

9.1. Machine efficiency

Machine efficiency is one of the factors that are frequently overlooked by the management and this can lead towards losses which reduces the yield. Improper maintenance of machines will result in low standards of produced parts and increases the maintenance of machines. Machines are meant to work efficiently, but in some circumstances machines can be less productive due to improper preventive maintenance.

Overall Equipment Effectiveness (OEE) is a preeminent practice for monitoring and improving efficiency of the manufacturing processes such as machines, cells, assembly lines and etc. OEE is simple and practical yet a powerful calculation tool. It takes the most common sources of manufacturing productivity losses and places them into three understandable categories which are Availability, Performance and Quality.

OEE Factor	Actual OEE	Target OEE
Availability	**83.96 %**	85.00 %
Performance	**42.70 %**	90.00 %
Quality	**57.89 %**	95.00 %
Overall OEE	**20.75 %**	73.00 %

Availability

Loading time = Total available time per day (or month) – Planned downtime

Planned downtime: amount of downtime officially scheduled in the production plan

OEE (Overall Equipment Efficiency):

OEE = A x PE x Q

Possibly there are three ways that failure may occur.

1. A - Availability of the machine. Availability is proportion of time machine is actually available out of time it should be available. (the equipment can stop working completely known as a total failure),

$$Availability\ (\%) = \frac{total\ time\ available - downtime}{total\ time\ available} * 100\%$$

The equipment can work slower than it is capable of known as the partial failure (throughput rate/Performance), and

$$Performance\ (\%) = \frac{number\ of\ units\ manufactured}{possible\ number\ of\ manufacturable\ units} * 100\%$$

The equipment or product can lose quality known as quality failure (Quality).

$$Quality\ (\%) = \frac{number\ of\ units\ produced - number\ of\ defects}{number\ of\ units\ produced} * 100\%$$

b. Performance = $\frac{\text{(Total pieces /Operating time)}}{\text{Ideal Run Time}}$

Self-Check –9	**Written test**

Name…… ID…… Date…….

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

Choose the correct answer Questions

1. _____is one of the factors that are frequently overlooked by the management and this can lead towards losses which reduces the yield
   A. Temperature
   B. RH
   C. Machine efficiency
   D. availability
2. _____is proportion of time machine is actually available out of time it should be available.

   A, Performance B, Overall Equipment

   C, Efficiency D**.** Machine efficiency

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

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LG #37	LO #3- Organize equipment

Instruction sheet

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

- Referring process chart/ product flow chart/formulation chart for spice and herbs chilling and freezing product(s)
- Checking the quality of spice and herbs
- Pre-cooling spice and herbs
- Following checklist for proper pre-cooling
- Checking whether the inlet and outlet valves of refrigeration machine
- Connecting pipes from the pre-cooler to the inlet
- Starting and checking machines
- Making minor adjustments and repairs
- Keeping accessible of tools to attend repairs/faults

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:

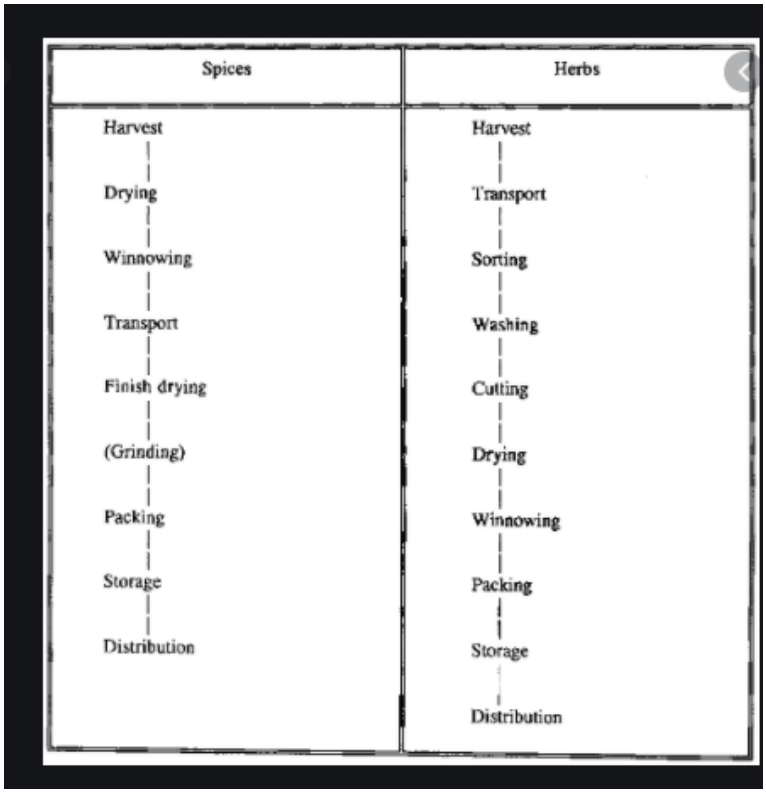
- Refer process chart/ product flow chart/formulation chart for spice and herbs chilling and freezing product(s)
- Check the quality of spice and herbs
- Pre-cool spice and herbs
- Follow checklist for proper pre-cooling
- Check whether the inlet and outlet valves of refrigeration machine
- Connect pipes from the pre-cooler to the inlet
- Start and check machines
- Make minor adjustments and repairs
- Keep accessible of tools to attend repairs/faults

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- Referring flow chart/ for spice and herbs chilling and freezing product(s)

Flow chart is a picture of the separate steps of a process in sequential order. It is a generic tool that can be adapted for a wide variety of purposes, and can be used to describe various processes, such as a manufacturing process and administrative. Elements that may be included in a flowchart are a sequence of actions, materials or services entering or leaving the process (inputs and outputs), decisions that must be made, people who become involved, time involved at each step, and/or process measurements.



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 the importance of referring flow chart?

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: _____

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2.1. Quality parameters of fresh spice and herbs

Appearance: withering, burns, bruising, blackening, yellowing, low cut, wetness, foreign matter, foreign smell, pesticide residues, clean cut, uneven color, light color.

Stems: woody, thickness, inflorescence, new growth, tipping, broken leaves and stems, lack of leaves, leaf drop.

Packaging: uniformity, incorrect labeling, defective packaging, incorrect sizing, under-weight, temperature.

Pests and pest damage: miner fly, white fly, snails, moth and other pests damage.

Diseases: botrytis, mildew, rust, decay and other diseases.

To ensure freshness, it is best to open and visually check spices and herbs annually:

Open and visually check if the spice or herb looks fresh.

Be aware; however, that different herbs naturally vary in color and should not always be compared against each other..

Red colored spices, such as paprika, red pepper and chili powder will turn from red to brown in color.

Crush a small amount of the spice or herb in your hand and smell it. If the aroma is not rich, full and immediate, the spice or herb has probably lost much of its potency.

Whole spices, such as peppercorns and cinnamon stick, have a protective outer coating and will not release its full fragrance until broken or crushed.

Spices and herbs are made up of numerous flavor components. Each component dissipates at varying rates over time, altering the overall balance of flavors in spices and herbs as they age.

The initial quality of a spice and herb can impact its shelf life, with a higher quality product retaining its good flavor longer than a lower quality version.

Sweet pepper fruits usually are picked when they have stopped increasing in size, are firm to the touch and in the green turning 70 yellow/red stage. Hot varieties are harvested either immature (green) or mature (yellow/red) stage for fresh use or processing. All peppers are harvested by hand, with approximately 1 to 2 cm of stem attached, and introduced into baskets that are then emptied into field boxes for delivery to the pack-house or in single layer cardboard boxes for the market. Harvesting of wet

peppers should be avoided. Considerable mechanical damage can occur during picking and handling if care is not taken to minimize scuffing and impact.

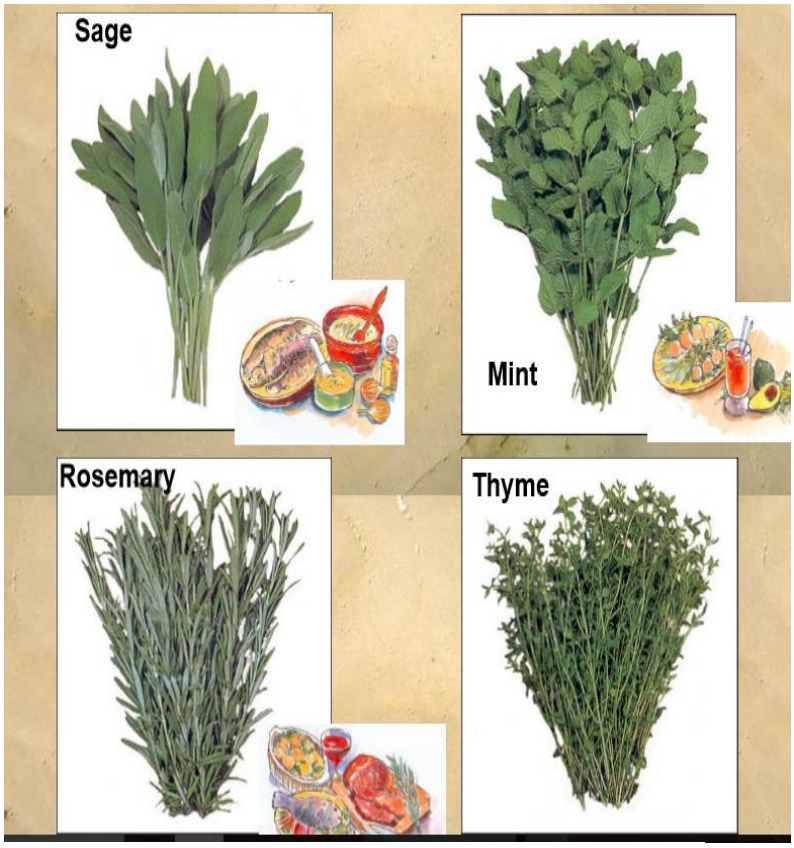

Figure 2.1 Quality Herbs

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 Question

1. What is quality parameter of fresh spice and herbs?(4)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

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3.1 Precooling

The precooling process is the removal of field heat immediately following harvest, where field heat accelerates the deterioration and senescence processes. Precooling is the rapid reduction of field temperature prior to processing, storage, or refrigerated transport. Precooling can be achieved by several techniques such as room cooling, hydro cooling, vacuum cooling, forced air cooling, and contact icing. Refrigeration equipment is designed to keep product chilled. However, they are not capable of reducing field heat rapidly. Field temperature is close to the ambient one and is much higher if produce is not protected from the sun. Generally it is a separate operation requiring special facilities, but complementary to cold storage. As deterioration is proportional to the time produce is exposed to high temperatures, precooling is beneficial even when produce returns later to ambient conditions. It is critical in maintaining quality in fruits and vegetables and forms part of the "cold chain" to maximize postharvest life.

Figure 3.1. Pre cooling basil

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 Question

1._____the removal of field heat immediately following harvest, where field heat accelerates the deterioration and senescence processes?(4)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

.

Information Sheet 4- Following checklist for proper pre-cooling

4.1. Pre-cooling checklist

Immediately after harvesting, peppers should be cooled to 7o C. If they are allowed to remain at high temperature for more than 1 to 3 hours they will begin to show signs of shriveling, shrinkage, softening, accelerates ripening and color changes. Peppers are also sensitive to chilling injuries. If kept at temperatures below 4o C, they may show signs of softening, pitting and a predisposition to decay. Peppers are sensitive to ethylene gas produced, as a natural by-product of ripening, by some fruits and vegetables (such as tomatoes, apples bananas and avocadoes) which never should be stored and shipped together with peppers.

Harvested peppers should be placed in the shade immediately after harvest and cooled, if refrigeration is available, as soon as possible to lower the field-heat. The use of perforated film carton liners or perforated plastic bags increase storage life, although it may inhibit proper cooling and may encourage diseases. Before final packing for market peppers should be selected for uniform maturity, color, shape, size and for freedom from defects (sunscald, mechanical or insect damage or decay).

Pre-Cooling Conditions Forced-air or room-cooling to 12 to 14°C (54 to 57°F) should be used. Optimum Storage Conditions Mature ginger rhizomes can be stored at 12 to 14°C (54 to 57°F) with 85 to 90% relative humidity (RH) for 60 to 90 days. Storage at 13°C (55°F) with 65% RH leads to extensive dehydration and a wilted appearance. Superficial mold growth can occur if condensation collects on rhizomes, especially on the broken ends. Young ginger rapidly loses water and will wilt in a few days at 25^{o}C (77^{o}F). To store at a high RH and avoid condensation, holding the rhizome in sand with water-absorbent polymers has been recommended.

Advantages of pre-cooling:

- It removes the field heat.

- Reduces the rate of respiration and ripening.
- Reduces the loss of moisture.
- Reduce bruise damage during transits.
- Reduces the production of ethylene.

  Reduces /inhibits the growth of spoilage organisms.

Table4.1. different cooling methods

Variable	Cooling method				
	Ice	Hydro	Vacuum	Forced-air	Room
Cooling times (h)	0.1-0.3	0.1-1.0	0.3-2.0	1.0-10.0	20-100
Water contact with the product	yes	yes	no	no	no
Product moisture loss (%)	0-0.5	0-0.5	2.0-4.0	0.1-2.0	0.1-2.0
Capital cost	high	low	medium	low	low
Energy efficiency	low	high	high	low	low

Self-Check –4	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. Write Advantages of pre-cooling? (3)

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- Checking whether the inlet and outlet valves of refrigeration machine

A valve is a device or natural object that regulates, directs or controls the flow of a fluid (gases, liquids, fluidized solids, by opening, closing, or partially obstructing various passageways. Valves are technically fittings, but are usually discussed as a separate category. In an open valve, fluid flows in a direction from higher pressure to lower pressure.

The simplest, and very ancient, valve is simply a freely hinged flap which swings down to obstruct fluid (gas or liquid) flow in one direction, but is pushed up by the flow itself when the flow is moving in the opposite direction. This is called a check valve, as it prevents or "checks" the flow in one direction. Even aerosol spray cans have a tiny valve built in. Valves are also used in the military and transport sectors..

5.2. Refrigeration Cycle

Receiver or condenser: The liquid is kept in a container namely condenser. The refrigerant is under pressure

Expansion: It is a device, which controls the rate of flow of refrigerant into the evaporator. Now high pressure refrigerant enters low pressure zone.

Evaporator: It consist of coils, here the refrigerant evaporates by absorbing heat from the space. The energy required for this process is taken from the surrounding (space which is to be cooled). In this step, liquid vaporizes, but some liquid still remains.

Liquid trap: This is used to remove the traces of liquid refrigerant and then returned to receiver (condenser).

Compressor: Saturated vapor is allowed to pass through the compressor. The compression is adiabatic and it produces supersaturated gas.

Condenser: The supersaturated gas (vapor) flows to the condenser where the gas is liquefied. The condenser can be air cooled (or) water cooled. Thus one cycle is completed as shown above and process is continued

The refrigeration cycle is an open or closed system (the below figure is a closed system), where refrigerant passes through. The refrigeration cycle begins at the compressor which compresses the refrigerant from a low temperature, low-pressure vapor into a high pressure high-temperature gas. The refrigerant then travels to the condenser where it is cooled from a high-temperature gas into a high-temperature liquid. As seen in the diagram, the high pressure, high-temperature liquid flows through the liquid line until it reaches the metering device. At the metering device, also known as an expansion valve, the refrigerant is injected into the evaporator at a low pressure. The refrigerant then “boils off” inside the evaporator coil creating a cooling effect as it evaporates into a low-pressure low temperature gas. The evaporator coil, inside the refrigerated space provides the cooling necessary to reach the temperature desired in the refrigerated space. The low-temperature low pressure vapor then travels back through the suction line to the compressor where the refrigeration cycle begins once again.

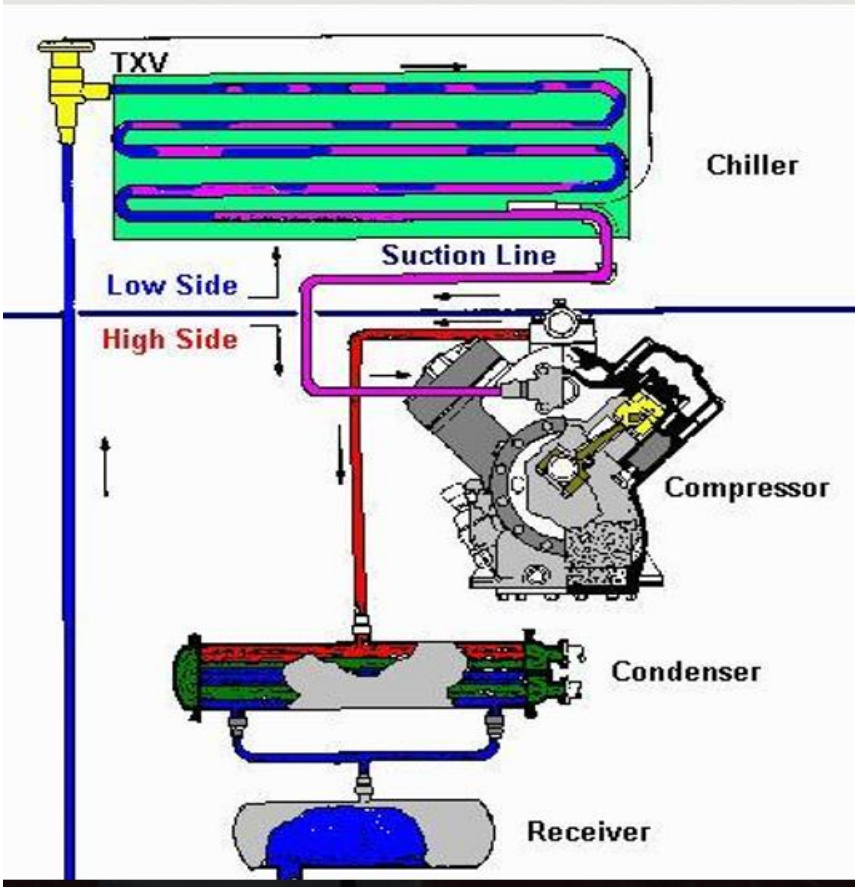

Figure 5.2. Refrigeration Cycle

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. Write Refrigeration Cycle?(3)

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 - Connecting pipes from the pre-cooler to the inlet

The plate exchangers can be used for many different applications, anything from cooling or heating and warming up diesel to exchanging heat. However, the heat exchanger that we have made is created specifically for the food boiler application. Essentially, it's a much heavier grade of plate exchanger, which hurts the efficiency a little bit but has the longevity and the quality instead of having to replace it every 4 or 5 years. We went with a heavier grade and they will last you the lifetime of the boiler, if not longer. You're trying to create a cross flow difference which means you will get more heat exchange. The boiler coming in, identified with the red pipe, is going to come in through the bottom, up the flow, and then out and return to the boiler or to your next heating system.

Figure 6. Connecting pipes from the pre-cooler to the inlet

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

1.how to connect

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: _____

Make sure all the packaging is removed before beginning the installation. Switch off and unplug your old fridge freezer from the plug socket. Be sure to watch out for condensation at the back as it may have collected over time. Keep a towel at the ready just in case. When carrying your new fridge freezer into the kitchen, you must make sure it's not laid flat because of before you move your fridge freezer into place, check that it's plugged in but the socket's switched off.

Connecting the inline external water filter

If your fridge freezer comes with an inline external water filter, you'll have to fit this to the inlet pipe before connecting the fridge to your mains water supply. If you have to cut the plastic inlet pipe in order to fit the water filter, make sure you cut it cleanly and straight. Before connecting the filter, look at the label for the direction the water has to flow in. It's important you fit the filter the right way as it channels the water through a carbon filter. The arrow indicates the way the water should flow towards the machine.

Internal water filter. Some fridge freezers have an internal filter that can be found inside the fridge department. If you can't see an inline external water filters with the instruction manual, you'll probably find your internal filter inside.

Connecting the inlet pipe

Inside your installation kit, you should find an inlet pipe. If you've got a fridge with an inline external water filter, you'll find a mounting kit too. Before you start, check that you've got the hose, rubber washer and appropriate fittings to connect it to the back. Connect the threaded end of the hose to the inlet valve. Remember, if the flag is facing the direction of water flow, it's in the 'on' position. Make sure it's in the 'off' position until you've finished setup. The inlet hose is then connected to the rear of the fridge freezer. Refer to your instruction manual to check your connecting the correct pipe. All push connections simply; just push the pipe in the connecter. If you need to disconnect for any reason, make sure the inlet valve is isolated and push the O ring down with your finger to release the pipe.

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. How start freezer machine ?(3)

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 8- Making minor adjustments and repairs

8.1. Making minor adjustments and repairs

Follows a regular schedule of office machine inspection designed to give each machine a periodic checking, and in the case of typewriters, a regular servicing; Inspects typewriters by cleaning, oiling and checking various key adjustments; Inspects dictating, transcription, adding and other office machines by cleaning, oiling, and checking adjustments and parts; Makes repairs to dictating, transcription and type writing machines including such cleaning, oiling, adjustment, replacement of parts and general overhauling as is necessary; Makes minor repairs to adding machines, such as cleaning, straightening type hammer, making minor adjustments, as to office machine replacement needs and the priority which should be given.

All maintenance and repair work should be done with the power off. If any work requires power ON, extreme care should be taken. Keep the machine always clean and keep away the tools and gauges from getting damaged. When performing power ON maintenance or checking of moving parts, extreme caution should be taken. These parts can cause serious injury. The machine should be lubricated according to the machine lubrication information given in this manual. When performing maintenance of the hydraulic systems, the power must be OFF and there should be no pressure in the lines. If you have removed any cover/guard for some reason, don't forget to refit them before you start the machine.

When performing power ON maintenance or checking of moving parts, extreme caution should be taken. These parts can cause serious injury. The machine should be lubricated according to the machine lubrication information given in this manual. When performing maintenance of the hydraulic systems, the power must be OFF and there should be no pressure in the lines. If you have removed any cover/guard for some reason, don't forget to refit them before you start the machine

Self-Check -8	**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

2. Why repair machine regular?(4)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Information Sheet 9- Keeping accessible of tools to attend repairs/faults

Facilities managers have a lot of responsibilities. They need to ensure that their company's major physical assets are in peak working condition and optimize company resource to best serve employees. To meet that goal, facility managers typically have to juggle work orders, keep track of the tools and inventory available for repairs, remember to maintain equipment and other assets on schedule, among any number of other tasks daily. The best facility managers work to stay ahead of all potential pitfalls and they can do that more easily with the help of the following modern tools.

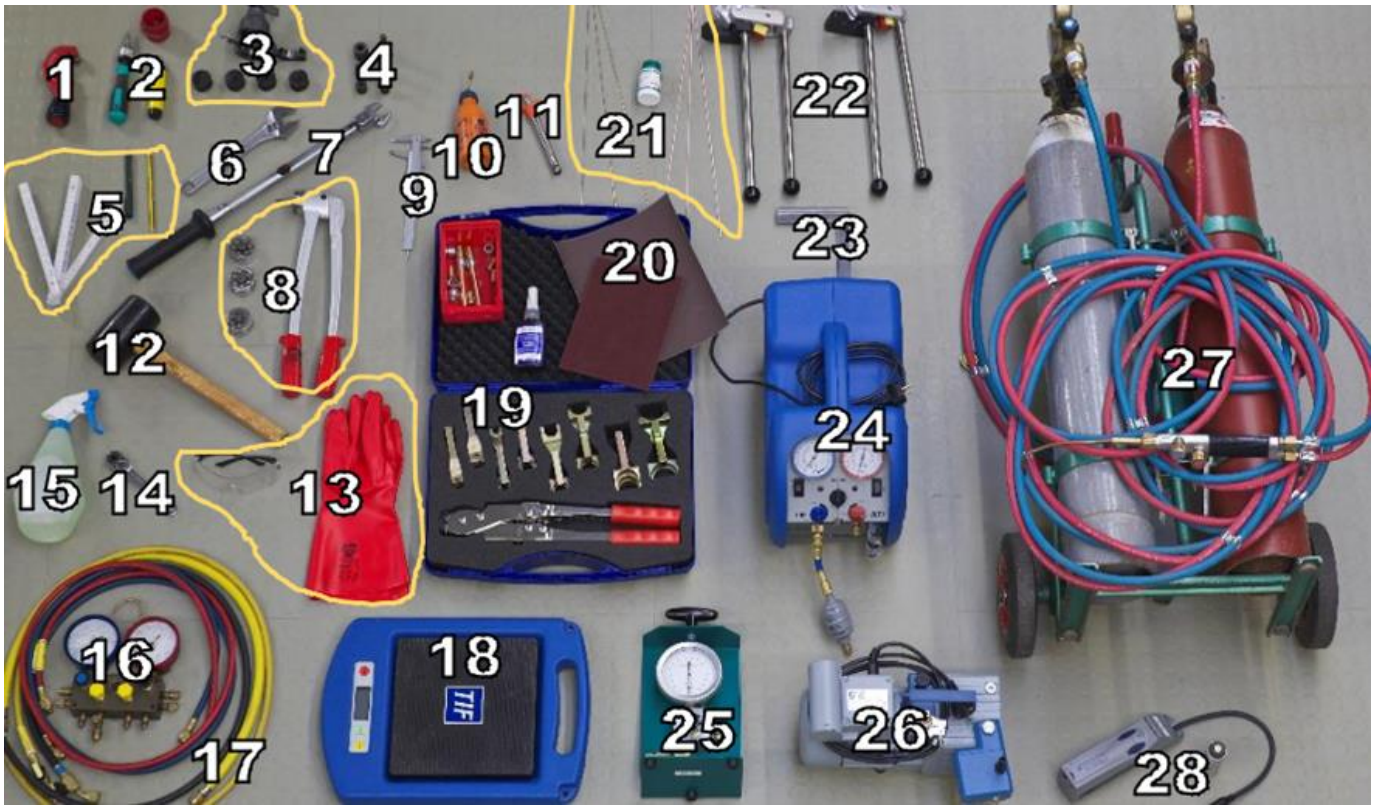

Figure 8.Maintainace tools

1. Copper tube cutter
2. De burring tools
3. Flaring tool (other types
4. are available)
5. Pipecalibration tools(internal/external)
6. Ruler, pen & pencil
7. Adjustable wrench
8. Torque wrench

9. Tube expander tool & expander heads
10. Vernier caliper
11. Oil can
12. Torch igniter
13. Rubber mallet Safety glasses & Insulating gloves
14. Refrigeration ratchet
15. Spray bottle (for leak detection)
16. Manifold gauge
17. Hoses
18. Weighing scale
19. Tool kit for press fittings
20. Non-metallic abrasive pad
21. Phosphorus brazing alloy, silver brazing alloy & flux
22. Pipe bending tools
23. Engineer's square
24. Recovery and recycling unit
25. Vacuum gauge
26. Vacuum pump
27. Oxy-acetylene torch set
28. Electronic leak detector and calibrated leak test

Self-Check –9	**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. Write tools that required for refrigerator repairs? (5)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

LG #38	LO #4- Document and maintain records of chilled spice and herbs

Instruction sheet

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

- Documenting detail process
- Documenting finished/cooled spice and herbs
- Maintaining records on observations or deviations
- Verifying documents and track from finished product to ingredients

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:

- Document detail process
- Document finished/cooled spice and herbs
- Maintain records on observations or deviations
- Verify documents and track from finished product to ingredients

Learning Instructions:

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

Information Sheet 1- Documenting detail process

Detail process are documented such as

- type of process handled, process sequence,
- equipment's and machinery details
- efficiency and capacity utilization of equipment
- Documenting mixing and blending process.
- Receivable records.
- Raw Materials Issue record.
- Product Formulation record.
- In-process record.
- Packing Report.
- Dispatch record.
- Waste record.
- Returned finished products and raw materials.
- Records should be completed at time of activity or when any action is taken
- Superseded documents should be retained for a specific period of time
- Records should be retained for at least one year after the expiry date of the finished product

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 are process documented ?(3)

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 2 - Documenting finished/cooled spice and herbs

- Finished/cooled spice and herbs documented in details such as
- catchment area,
- batch number,
- time of cooling,
- date of procurement and processing,
- other label details,
- storage conditions
- blended pepper
- record date of manufacturing

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 are the elements recorded ?(3)

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- Maintaining records on observations or deviations

Create database (software based or manual system) to assist in tracking and trending of deviations. A departure from standard practices or specifications resulting in non-conforming material / or processes, with potential to impact on product quality, safety, efficacy or data integrity.

Different levels of deviation: critical, major, minor. Document error correction not signed/dated, and didn't include a reason for the correction.

- Write-overs, multiple line-through and use of "White-out" or other masking device
- The delegation for the batch release, in case of absence of the QA manager, not recorded / documented
- Out-of-specification (OOS) procedure not detailed enough; flow chart and /or check-list not available

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

1. What is advantage of recording the deviation?(3)

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 4- Verifying documents and track from finished product to ingredients

4.1. Verifying documents and track from finished product to ingredients

The process of verification involves taking sufficient steps to ensure that the procedures set out in the HACCP plan are working in practice and in particular that the critical limits taking measurements, for example temperatures, at various points along the process to ensure that the system is behaving as expected. The quality of your food traceability records can impact the ability of your food business to quickly and correctly recall product from the marketplace. Documents and track from finished product to ingredients verified, in case kept to attend repairs/faults in case of breakdown.

Self-Check –4	**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. Why verify the document ?(3)

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: _____

Reference

Web address

1. https://www.slideshare.net/mahmudulmithun/freezing-93159526
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3. https://www.slideshare.net/vibrant_gujarat/agro-and-food-processing-sector?from_action=save
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5. https://www.youtube.com/watch?v=qqznZlQPBt4
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8. https://www.youtube.com/watch?v=Uv3GfEQhtPE
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AKNOWLEDGEMENT

We wish thanks and appreciation to the representatives of UNESCO who donated their time and expertise to prepare Teaching, Training and Learning Materials (TTLM).

We would like also to express our appreciation to the TVET instructors and experts of regional TVET bureau, TVET College, and Federal Technical and Vocational Education and Training Agency (FTVET) who prepare TTLM with required standards and quality possible.

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