



# COFFEE AND TEA PROCESSING

## Level-II

**Based on May 2019, Version 2 Occupational standards**

**Module Title:** - Conduct Routine Moisture Controlled Stock

**LG Code:** IND CTP2 M05 LO (1-3) LG (12-14)

**TTLM Code:** IND CTP2 TTLM 1020v1

**October, 2020**



## Table of Contents

### **LO #1- Store stock to meet temperature control requirements ..... 1**

Instruction sheet .....	1
Information Sheet 1- Identifying goods requiring temperature control .....	2
Self-check 1 .....	5
Information Sheet 2- Locating goods in correct storage areas .....	6
Self-check 2 .....	12
Information Sheet 3- Recording stores information .....	13
Self-check 3 .....	16

### **LO #2- Monitor and maintain temperature of stock within specifications**

#### **..... 13**

Instruction sheet .....	13
Information sheet -1 :- Monitoring stock temperature and storage area .....	14
Self-check 1 .....	18
Information Sheet 2 :- Monitoring residence time in temperature controlled stored.....	19
Self-check 2 .....	21
Information sheet-3:-Identifying and taking corrective action for storage temperatures	22
Self-check 3 .....	24
Operation sheet 1: Monitoring stock temperature and storage area .....	25
LAP Test.....	26

### **LO#3:-Transfer temperature controlled stock..... 27**

Information Sheet 1- Handling and transferring goods .....	28
Self-check 1 .....	30
Information Sheet 2- Recording stores transfer information .....	30
Self-check 2 .....	32
List of Reference Materials .....	33



LG #12

## LO #1- Store stock to meet temperature control requirements

### Instruction sheet:

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

- Identifying goods requiring temperature control
- Applying policy and procedure
- Locating goods in correct storage areas
- Recording stores information

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 goods requiring temperature control
- Apply policy and procedure
- Locate goods in correct storage areas
- Record stores information

### 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 your performance is satisfactory proceed to the next learning guide,



## Information Sheet 1- Identifying goods requiring temperature control

### 1.1. Goods that are requiring temperature control includes

- Raw materials/ingredients like coffee bean, tea and other products
- Storage materials like jutes, silos, cartons, crates, hoppers, sack, incoming and moving belts, terraces, and other temperature requiring goods.

**Temperature control:-** Provide thermostatic temperature control systems for all temperature controlled rooms, cold rooms, freezer rooms, refrigerators and freezers, used to store TTSPPs. Comply with the following minimum requirements:.

### 1.2. Temperature control stocks

coffee bean is extremely porous and easily absorbs flavors and aromas, which means it's important to be careful during storage and transportation. Producers, buyers, and roasters shouldn't overlook factors such as humidity, light, and temperature.

To learn more about how to safely store and transport green beans

**Require temperature control for tea and roasted coffee:-** Temperature and time are two critical things that have to keep in mind during roasting to obtain better quality coffee.

During roasting, the coffee beans are heated at 200-240 °C about 10-15 minutes depending on the degree of roasting required, which is mainly evaluated by colour.

Keep at room temperature: It's best to keep your tea stored at room temperature. Room temperature is a comfortable temperature range indoors, usually considered to be **68 to 77°F (20 to 25°C)**.

Page 2 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



(a)

Fig1a. Stock temperature controller



(b)

fig 1b thermo meter

### 1.3. Applying policy and procedure

**Work** is carried out according to

- Company policies and procedures
- Regulatory and licensing requirements:-
- Legislative requirements, and industrial awards and agreements

**Company policies and procedures:-** Company policies and procedures establish the rules of conduct within an organization, outlining the responsibilities of both employees and employers.

Company policies and procedures are in place to protect the rights of workers as well as the business interests of employers.

#### **Regulatory and licensing requirements**

#### **Regulatory requirements of coffee in Ethiopia**

The grounds of classification introduced by this regulation, basically, are

- the percent of moisture in the weight of the bean which should not exceed 11.5%,
- the number of defects which should not totally exceed 100,

Page 3 of 41	Federal TVET Agency	TVET program title- Coffee and Tea processing	Version -1
	Author/Copyright	Level -2	October. 2020



- the absence of mould and noxious fermentation and origin of the coffee which designated to be “Harar,” “Sidama,” “Jimma” or “Lekemti.”<sup>61</sup> In relation to grade,
- the regulation introduced a new grading system which rates cleaned and graded coffee from grade 1 to 5 based on the degree of defects involved in the coffee.

**General Licensing Requirements:-** The first step to determining the licenses, registrations, and certifications you will need requires deciding on: your market outlet, and the jurisdiction(s) in which you will sell your product.

**Legislative requirements:** means all requirements in relation to the Works, or the conduct of the Contractor in carrying out the work under the Contract, including all relevant laws, orders, awards, certificates, licensees, consents, permits, approvals and requirements of organizations having jurisdiction in connection with the carrying out of the work under the Contract and the payment of any fees and charges payable in connection with the foregoing;

**Industrial awards and agreements:-**Awards outline the minimum conditions(one business, a group of businesses, or an individual employee) of employment and operate as a safety net. Agreements are collective agreements establishing further conditions of employment and entitlements for specific employees and their employers.

Italy and the United Nations Industrial Development Organization (UNIDO) signed a financing agreement for a project entitled: ‘Improving the Sustainability and Inclusiveness of the Ethiopian Coffee Value Chain through Private and Public Partnership.’

Page 4 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



Self-check 1	Written test
--------------	--------------

Name..... ID..... Date.....

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

### Test I: Short Answer Questions

1. Write at least two temperature requirement goods (5 points)
2. Define legislative requirements (5 points)

Note: Satisfactory rating - 8 points      Unsatisfactory - below 5 points

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

Page 5 of 41	Federal TVET Agency	TVET program title- Coffee and Tea processing	Version -1
	Author/Copyright	Level -2	October. 2020



## Information Sheet 2- Locating goods in correct storage areas

### 2.1. Introduction

Coffee located in an open, well drained, sunny, and ventilated area, avoiding humid areas, proximity of dams, shaded places with trees or adjacent buildings

The best temperature for storing coffee is between 10 and 18 degrees Celsius. Furthermore, coffee should be stored in a dry area away from other odors.

For example, storing coffee in the refrigerator is not advisable as there is high moisture content and other odors that will affect the flavors and aromas of coffee.

Coffee structure is soft and porous which absorb aromatics; therefore you suggest storing coffee in a cupboard out of direct sunlight and not near spices or other strong smelling products.



**Fig 2 correct locating warehouse operation**

Page 6 of 41	Federal TVET Agency	TVET program title- Coffee and Tea processing	Version -1
	Author/Copyright	Level -2	October. 2020





Green coffee beans have been transported in jute or sacks .



**Fig 3 coffee correct storage areas**

**Facilities and practices area:-** Storage conditions includes moisture controlled warehouse, air tight containers, storage jars, and emergence storage

Coffee stored at Relative Humidity (RH) less than 70% were stable for all measured quality criteria

### **2.1.2. Good Stock Storage area consider the following parameters**

- Coffee cannot be stored with any chemicals
- Coffee product cannot be stored with smelling products.
- Coffee Storage area meets adequate design requirements including security, access, size, ventilation, location and utilities.
- Coffee and tea products store at temperature controlled storage area
- Stock storage area are free from any pests, humid and infestation
- Minimize handling of goods
- Enable easy access to goods
- Allow storage flexibility

Page 7 of 41	Federal TVET Agency	TVET program title- Coffee and Tea processing	Version -1
	Author/Copyright	Level -2	October. 2020



- Create lots of working space

## **2.2. Advantages of correct stock storage area for coffee**

- ✓ Keep moisture of the goods to its standard
- ✓ Prevent goods from fungal growth
- ✓ Prevent from pest infestation

## **2.3. Stock**

Stock may include: Food and beverage items, Equipment Cleaning materials and chemicals, Stationery and office supplies Vouchers and tickets

**Applying specific food safety:** checks to food and beverage items, including

Checking temperatures, where appropriate, Checking for pests, checking use-by dates, Checking integrity of packaging, checking wholesomeness of the food Rejecting unsatisfactory goods

### **2.3.2. Rotate stock Requirements include:**

Legislation relevant to this industry includes the coffee Standards Code including:-Labeling, weights and measures legislation;

Standards and protocols a number of organizations have published standards, both general and specific for the certification of organic coffee production.

The joint food and agricultural organization (FAO) with World health organization (WHO) food standards program via the codex alimentarius commission has guidelines for the production, processing, labeling and marketing of organically produced foods (CAC 32-199) ;Available at CODEX @ FAO.ORG from the secretariat in Rome. These guidelines are generalized with respect to food and not specific for coffee.

**Label stock:** is the carrier which is commonly coated on one side with adhesive and usually printed on the other side. Label stocks can be a wide variety of papers, films, fabric, foils, etc. Placing labels on storage containers and shelving to identify stock items and indicate delivery date Preparing hand written labels and attaching them to individual stock items.

### **Labeling and other information requirements:-**

- Standard 1.2.1 Requirements to have labels or otherwise provide information
- Standard 1.2.2 Information requirements – food identification

Page 8 of 41	Federal TVET Agency	TVET program title- Coffee and Tea processing	Version -1
	Author/Copyright	Level -2	October. 2020



- Standard 1.2.3 Information requirements: warning statements, advisory statements and declarations
- Standard 1.2.4 Information requirements – statement of ingredients
- Standard 1.2.5 Information requirements – date marking of food for sale
- Standard 1.2.6 Information requirements – directions for use and storage
- Standard 1.2.7 Nutrition, health and related claims
- Standard 1.2.8 Nutrition information requirements
- Standard 1.2.10 Information requirements characterizing ingredients and components of food

**Weight** is a relative mass or quantity of the matter contained by it measurement

- ✓ Mass is a measurement of the amount of matter in an object. The basic unit of mass or weight in the metric system is the gram. The most frequently used units of mass or weight used in the Canadian food industry are the gram and kilogram.

**Weights are measured in:-**Tone, Kilogram (kg), Gram (g) ,Centigram(g) and Milligram(mg)

### **Measures legislation:**

#### **Legislation covering food safety**

- A. Environmental management,
- B. anti-discrimination and equal opportunity

**Environmental management:-** Coffee is the most important commodity in the world (Chanakya, de Alwis 2004) and in Ethiopia it is produced on small and large scale farms, which can produce more than 226 971 tons of coffee per annum (CSA 2005), making Ethiopia the largest coffee producer and exporter in Africa. In addition, the presence of cheap labor market coupled with the high demand for wet processed coffee has increased the number of coffee processing stations in the country. Currently, environment-friendly processes that could significantly reduce the risks of pollution associated with coffee waste have been developed and tested in different coffee producing countries. Nonetheless, reduction of effluent volume followed by treatment is best effective, rather than the alleviation of the present problems by treatment alone (Mburu 2004; Chanakya, de Alwis 2004). For instance, most of the arabica coffee in Vietnam is processed in a centralized way by mechanical mucilage removal.

Page 9 of 41	Federal TVET Agency	TVET program title- Coffee and Tea processing	Version -1
	Author/Copyright	Level -2	October. 2020



**Occupational health safety (OHS):-** Occupational health and safety hazards and control includes the purpose and limitation of personal protective equipments.

Classification of various hazards which give rise to occupational injuries

- Physical hazards,
- Chemical and microbiological hazards

**Types of personal protective equipment (PPE)** includes:- hard hats, face shield, ear plugs, muffs, safety shoes, safety

**Stock rotation means** arrange stock in store or warehouse so that the oldest items leave the shelves first.

Applying stock rotation protocols relevant to individual stock type including:

- ✓ First In, First Out (FIFO)
- ✓ First In, Last Out (FILO)
- ✓ Last In, First Out (LIFO)
- ✓ Last In, Last Out. (LILO)
- ✓ First expire first out (FEFO)

**First in first out (FIFO) means:-** is an asset-management and valuation method in which assets produced or acquired first are sold, used, or disposed of first.

**First in last out (FILO):-** Method of inventory valuation based on the assumption that goods are sold or used in the opposite chronological order in which they are bought. Hence, the cost of goods purchased first (first-in) is the cost of goods sold last (last-out)

**Last in first out (LIFO):-** The products most recently purchased are used first. The value of inventory is represented by the unit cost of items in inventory the longest.

**First expire first out (FEFO):** This term is used in logistics and inventory management to describe a way of dealing with perishable products, or with a specified expiry date.

Page 10 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



a.



How to Rotate Stock

b.



Rotate

**Fig 4 Roasted and instant coffee bean stock**

Page 11 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



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**

1. Which one of the following are Good stock Storage areas?  
A. Labeling    B. prevent from pests    C. Stock    D. all
2. Which one the following is food standard codes?  
A. Stock    B. Labeling    C. weighing    D. "B" and "C" are answers

**Test II: Short Answer Questions**

1. Define stocks rotation?
2. Define correct storage area mean?

Note: Satisfactory rating - 8 points      Unsatisfactory - below 5 points

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

Page 12 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



## Information Sheet 3- Recording stores information

### 3.1. Recording Store information

Record keeping procedures

- Use Stock Control Ledgers, Store Cards and Stock Record Cards.
- Ensuring all items ordered have been delivered
- Checking quantities
- Checking type & brands
- Checking size, weight, volume, capacity
- Checking quality descriptors.
- Only sign for what you receive

**Table1. Store information spread sheet**

Commodity:							warehouse		
Date	in(t)	out (t)	Balance (t)	No of bags	Bar code bags	In/out stack No	Origin/destination	Document No	signature
10/11/20	Coffee bean			20	oo1	011		1122/20	
	Tea								

#### 3.1.1. Standard Operating Procedures (SOPs)

Standard Operating Procedures (SOP) is a process document that describes in detail the way that an operator should perform a given operation. SOPs involve the purpose of the operation, the equipment and materials required, how to perform the set-up and operations required for the process, how to perform the maintenance and shutdown operations carried out by the worker, a description of safety issues, trouble-shooting, a list of spare parts and where to find them, illustrations, and checklists.

Page 13 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



## Specifications

- A. Requirements
- B. Grading
- C. Methods for describing a lot/consignment of green coffee
- D. Packaging and marking

**Requirements:** General requirements Green coffee beans shall be clean and free from extraneous matter and shall not be contaminated. Chemical and physical requirements Green coffee beans offered for sale shall comply with the requirements specified below

**Moisture content:-** The moisture content should be 10-12 % and relative humidity of storage area 70%

**Pesticide residues and contamination:-** Green coffee shall not contain levels of contaminants, pesticide residues, trace metals, heavy metals and any other harmful material in excess of Codex Recommended Limits

**Infestation:-** Coffee beans shall be free from damage and infestation due to insects, fungi and rodents.

### ❖ **Grading:-**

- ✓ **Grading by size and shape:-** Coffee beans are mechanically screened and divided into various size categories for sale.
- ✓ **Defects:-** free from defects
- ✓ **Cupping quality:-** good sensory estimation of coffee quality.
- ✓ **Methods for describing a lot of green coffee:-** The seller shall declare the following information in respect of each lot of green coffee:-
  - ✓ Country of origin;
  - ✓ Category of green coffee;
  - ✓ Number of bags in the lot and the average net weight of each bag;
  - ✓ Bean size in terms of grade.

**Packaging and marking:-** Packing of green coffee shall be in suitable packaging materials capable of protecting the products from damage and deterioration which do not impart any foreign odors or harmful.

Page 14 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020





Marking of green coffee bags and packages shall be in accordance with the International Coffee Organization (ICO) requirements.

**Production schedules and instructions:-** The demand for end items is scheduled over a number of time periods and recorded on a master production schedule (MPS). The master production schedule expresses how much of each item is wanted and when it is wanted. The MPS is developed from forecasts and firm customer orders for end items, safety stock requirements, and internal orders.

Page 15 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020

**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**

1. Write the procedures of record store information? (5 points)
2. Define SOPs

Note: Satisfactory rating - 8 points

Unsatisfactory - below 5 points

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

Page 16 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



LG #13	<b>LO #2- Monitor and maintain temperature of stock within specifications</b>
-----------	---

### Instruction sheet

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

- Monitoring stock temperature and storage areas
- Monitoring residence time in temperature controlled stored
- Identifying and taking corrective action for storage temperatures

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:

- Monitor stock temperature and storage areas
- Monitor residence time in temperature controlled stored
- Identify and take corrective action for storage temperatures

### 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”.

Page 13 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



## Information sheet -1 : Monitoring stock temperature and storage area

### 1.1. stock temperature of goods

**stock to be stored at optimum temperature** :-coffee beans are stored at “room temperature,” which generally falls between 20 and 25°C (68 to 77°F). However, that it also depends on the packaging. Hermetic packaging, will protect coffee beans in warehouses with temperatures anywhere between -30 and 90°C (-22 to 194°F). As air temperature rises, it can retain more water molecules. In other words, warmer air means more moisture in the air and cooler air means less moisture in the air.

Tea leaves stored at optimum temperature of falls between 20 -25 °c



a



b.

**Fig5. Digital coffee and tea thermometer**

### 1.2. Monitoring condition of storage environment

Moisture control of stored coffee should be done on a regular basis for taking corrective actions.

Moisture meters should be regularly calibrated by qualified person, at least once a year; Hygrometers should be used to monitor Relative Humidity(RH) in the storage area.

There is no exact standard for ideal moisture content. Not all coffee is the same, and circumstances differ from country to country. In general, 11-12.5% is probably a good

Page 14 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



target for most coffee. Coffee above 12.5% moisture should never be shipped. When getting close to the moisture target, monitor every hour.

A properly processed tea has a moisture level between 3-6% and optimum relative humidity falls between 60-70%. The instrument of tea should be calibrated by qualified person.



(a) Moisture meter



(b) hygrometer

**Fig 6 moisture and relative humidity measuring instruments**

### 1.3. factors affect storage area of stocks

- Moisture content of the goods
- Relative humidity of environment
- Time and temperature
- Light level
- Pests
- oxygen level in bag (storage), pests, light level and humidity.
- ware house and transportation temperature

Page 15 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



**Fig 7: store stock area**

### **How to use and calibrate hygrometer**

Equipment /tools

Coffee bean

Hygrometer

### **materials**

$\frac{1}{2}$  cup table salt

large resalable bag

$\frac{1}{4}$  of coffee

Instructions of calibrating hygrometer

1. **Mix Salt and Water:-**Place  $\frac{1}{2}$  cup of salt in the coffee cup and add the water. Stir for a bit to totally saturate the salt. The salt won't dissolve in this amount of water; instead, the salt should have the consistency of wet sand.



2. **Put Hygrometer and Salt Mix in a Bag:-**Carefully place the cup containing the salt/water mix in a re-sealable plastic bag. Place the hygrometer in the bag, away from the cup of salt and water.

Page 16 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



**3. Let the Sealed Bag Sit:-**Place the sealed bag aside at room temperature for eight to 12 hours. Pick a location free of drafts, out of direct sunlight and away from heating or cooling vents. The temperature should be fairly constant.



**4. Check the Reading:-**After being in the sealed bag for eight to 12 hours, check the reading of the hygrometer. It is best to read it while still in the bag. If your house air is dry the reading may go down quickly once you take the hygrometer out of the bag. The relative humidity in the sealed bag with the salt/water mix should be 75 percent. My hygrometer read about 72 percent.



:

### **Adjusting after Calibration**

If yours is the adjustable type, adjust the screw or setting so that it would have read 75 percent. You will have to do this very quickly or remember how much you need to adjust the setting (e.g. for mine, it read 72 percent when it should have been 75 percent, so I would need to set it ahead by 3 percentage points). You may want to put the hygrometer back in the bag for another eight hours to double check your adjustment.

If yours is not adjustable (like mine), simply make a note of how "off" your hygrometer reads. If it reads below 75 percent, you will need to add the difference to your actual readings. If your hygrometer read above 75 percent on the calibration, you will need to subtract the difference from your actual reading. Here are some examples to help:

Case 1: After sitting in the bag for calibration, my hygrometer read 72 percent. It should have read 75 percent, so the difference is 3 percent. I will now add 3 percent to the

Page 17 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



readings I take on the hygrometer (e.g. in a tank) to get the actual relative humidity.

Case 2: After calibrating in the bag, a hygrometer read 80 percent. It should have read 75 percent, a difference of 5 percent. I would have to subtract 5 percent from readings when using the hygrometer to get an accurate relative humidity.

#### **1.4. Purpose of monitor stock temperature**

- ✓ Minimize air temperature variation to avoid reduction in quality and reduction in shelf life of product;
- ✓ Minimize door openings and/ or traffic movement in and out of the cold store;
- ✓ Take correct steps to reduce the product temperature should any increase occur;
- ✓ Ensure cycle systems and adequate designed that alarms in a place
- ✓ Conduct regular checks to ensure alarms, compressors, defrost cycles,
- ✓ thermostats and cooling towers are running safely and in good working order;
- ✓ Ensure that any damaged walls and door seals that could leak cold air out and allow hot ambient air in are correctly repaired; and
- ✓ Ensure optimum stacking patterns and floor layout to facilitate airflow.

Page 18 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020





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**

- a. Which one of the following factors affects storage area?
- A. Moisture content of the goods B. Relative humidity of environment C. Time and temperature  
D. all
2. Which one of the following is Purpose of monitors stock temperature?
- A. Conduct regular checks to ensure alarms, compressors, defrost cycles,  
B. thermostats and cooling towers are running safely and in good working order;  
C. Ensure that any damaged walls and door seals that could leak cold air out and  
Allow hot ambient air in are promptly repaired; and D. all

Note: Satisfactory rating - 8 points      Unsatisfactory - below 5 points

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

Page 18 of 41	Federal TVET Agency	TVET program title- Coffee and Tea processing Level -2	Version -1
	Author/Copyright		October. 2020



## Information Sheet 2 : Monitoring residence time in temperature controlled stored

### 2.1. Temperature controlled storage facilities

- Temperature controlled environment
- Climatic controlled storage

#### 2.1.1. Temperature Controlled Environments

Airflow designs and manufactures a comprehensive range of temperature controlled enclosures.

Airflow Sound attenuated environments can simultaneously provide the control:-

- Humidity Control
- Temperature Control
- Vapor Control
- Light Control and include air locked human interfaces.

Airflow Temperature Controlled Environments are used in a wide range of industries including Aerospace, Pharmaceutical, Formula One Racing, Oil Exploration, Industrial Processing, Food manufacture and Surface Coatings.

**3.1.2. Climate controlled storage, sometimes referred to as temperature controlled storage,** is a type of storage unit that is specially designed to maintain steady temperatures and humidity levels. Typically, the temperature will remain stagnant at between 55 degrees and 85 degrees Fahrenheit. Climate controlled storage is most often found at storage facilities with indoor storage units, though it is worth asking an outdoor or drive-up storage facility if they have climate controlled options.

### 3.1. Residence Time is one of the most important requirements at an air monitoring station

- ✓ Determine the Identity Determine (ID) sizes, length, and flows
- ✓ Maintain the residence time below 20 seconds to restrict reactivity in the probe line

Page 19 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



**Table2. Quality assurance work sheet**

### QA AUDIT WORKSHEET PROBE RESIDENCE TIME

Site Name: \_\_\_\_\_ Date: \_\_\_\_\_

Auditors: \_\_\_\_\_

Booster pump flow = _____ LPM		Pollutant _____							
	Probe	Manifold	Manifold to Instrument	Manifold to Instrument	Manifold to Instrument	Manifold to Instrument	Manifold to Instrument	Manifold to Instrument	Manifold to Instrument
Material	Teflon	Glass	Teflon	Teflon	Teflon	Teflon	Teflon	Teflon	Teflon
ID (mm)	_____	_____	_____	_____	_____	_____	_____	_____	_____
Length (m)	_____	_____	_____	_____	_____	_____	_____	_____	_____
Flow (Q) (lpm)	_____	_____	_____	_____	_____	_____	_____	_____	_____
Time	_____	_____	_____	_____	_____	_____	_____	_____	_____
<b>Total Residence Time =</b>			_____						

Residence Time Calculation =  $\frac{3.14(ID)^2 \times LENGTH \times 0.015}{FLOW}$  =  $\frac{3.14 \times radius^2 (mm) \times LENGTH (m) \times 60 (sec/min)}{FLOW (lpm) \times 1000}$



Common Sample Line Diameters										Manifolds			
Outside Diameter (in.)	1/8"	3/16"	1/4"	1/4"	5/16"	5/16"	3/8"	3/8"	1/2"	1/2"	O.D. (in.)	1.25"	2.0"
Wall Thickness (in.)*	.030"	.030"	.030"	.062"	.030"	.062"	.030"	.062"	.030"	.062"	W.T. (in.)	.25"	.25"
Inside Diameter (mm)	1.6	3.2	4.8	3.2	6.4	4.8	7.9	6.4	11.1	9.5	I.D. (mm)	25.4	44.5
											Length (m)	0.25	0.30


\* "thin wall" is typically = 0.030", while "thick wall" is typically = 0.062"

Data recorded and verified by: \_\_\_\_\_

California Air Resources Board

MLD/QAS-034 (Rev.11/5/13)




**Fig8. Measuring residence time**



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 at least two Temperature controlled storage facilities (5 points?)
2. Define residence time mean? (5 points)

Note: Satisfactory rating - 8 points      Unsatisfactory - below 5 points

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

Page 21 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



### Information sheet-3:-Identifying and taking corrective action for storage temperatures

#### 3.1. Identifying out of specification and taking corrective action

##### 3.1.1. Minimum standards for exportable coffee

- For Arabica, has in excess of 86 defects per 300 g sample or Robusta, has in excess of 150 defects per 300 g (Vietnam, Indonesia, or equivalent)
- For both Arabica and Robusta, has a moisture content below 8 percent or in excess of 12.5 percent, measured using the ISO 6673 method
- Where moisture percentages below 12.5 percent are currently being achieved, Members shall Endeavour to ensure that these are maintained or decreased.
- Exceptions to the 12.5 percent maximum moisture content shall be permitted for specialty coffees that traditionally have high moisture content, e.g. Indian. Such coffees shall be clearly identified by a specific grade name.

3.1.2. **Out of specification:** is when a product or drug is not meeting documented standards. The item produced is outside of the specifications the manufacturer has set for the product.

If coffee failing to comply with the above standards is identified through the normal course of trade, importing Members shall Endeavour to notify the ICO of because of defects

##### **Out of specification of stock in store:**

- a. infestation and Fungal growth
- b. absorb air moisture
- c. absorb storage environment odor
- d. Beans that are too wet can become moldy
- E. beans that are too dry can lose their flavors and aromas.

##### 3.1.3. Measures for controlling the application of the standards

- a. Store Low relative humidity by controlled stock storage temperature
- b. Facilitate stock storage area

Page 22 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



- c. Inspect air tight
- d. Stock stored in hermetic packaging
- e. separate stocks from odour during storage

Page 23 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



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**

1. Define out of specification stock(3 points)
2. Write at least three corrective action for out of specification(3 points)
3. List at least four out of specification of storage temperature (4 points)

Note: Satisfactory rating - 8 points      Unsatisfactory - below 5 points

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

Page 24 of 41	Federal TVET Agency	TVET program title- Coffee and Tea processing	Version -1
	Author/Copyright	Level -2	October. 2020



### Operation sheet 1: Monitoring stock temperature and storage area

The following procedures should be taken into account to monitor the stock temperature

#### Procedure

Step1. Wear proper personal protective equipment

Step2. Properly control the warehouse room

Step3. Calibrate temperature and relative humidity measuring equipment

Step4. Determine the sample of coffee and tea

Step5. measure and record readings

Step6. Taking corrective action if out of specification

Step7. Report and verify

Step8. Implement Monitoring as a Pilot Study

Step9. Ready for the next stock temperature and storage area.

Page 25 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020





LAP Test	Performance Test
----------	------------------

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Time started: \_\_\_\_\_ Time finished: \_\_\_\_\_

**Instructions:** Given necessary templates, tools and materials you are required to perform the following tasks within 3 hours.

Task -1 **monitor stock temperature and storage area**

Page 26 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



LG #14

## LO#3:-Transfer temperature controlled stock

### Instruction sheet

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

- Handling and transferring goods.
- Recording stores information.

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:

- Handle and transfer goods.
- . Record stores information.

### 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 your performance is satisfactory proceed to the next learning guide,



## Information Sheet 1- Handling and transferring goods

**Definition:-** Stock handling means making decisions about which produce will be displayed in the retail area and which produce will be kept in storage.

### 1.5. Handling and transferring goods

- Reduce the likelihood of damage to products. Cartons and items in a cluttered and busy receival area can suffer more damage the longer they are left there.
- Eliminate confusion regarding stock checks and counts. It can be difficult to distinguish different orders when the receival area is full or cluttered
- Maintain the safety of food. Refrigerated and frozen food must be stored under appropriate conditions, or taken as soon as possible to the areas/kitchens where it will be used.

**The basic options for transfer stock in a venue:**

- Forklift, bag, loading container, conveyer and carton
- Trolleys
- Carrying items by hand Reloading stock into another vehicle to transport to another location  
Using pallet jacks (or forklifts) to move pallets of stock.

**different models or types of trolleys available.such as:**

- Two-wheel trolleys
- Four-wheel flatbed trolleys
- Trolleys with hard wheels or pneumatic tires.

#### 1.5.1. handling goods

When handling or moving stock it is vital appropriate OHS skills are applied – these relate to manual handling activities including: Lift fork of stock, cartons, boxes Carrying items from storage areas to trolleys, moving stock from place to place Pulling boxes and cartons forward in storage areas Pushing trolleys.

**The steps in stock handling** include: Receiving goods,Checking them,Marking the goods with information, Delivering them to a place to be used, stored, or displayed for sale

**Handling of stock quality parameters includes:** storage temperature, time, moisture and relative humidity.

Page 28 of 41	Federal TVET Agency	TVET program title- Coffee and Tea processing	Version -1
	Author/Copyright	Level -2	October. 2020



**The following steps are essential to implement a coffee stock rotation:**

- ✓ Checking dates on coffee when it is delivered, used or put on display
- ✓ Storing or displaying coffee with a short shelf life at the front of the shelf
- ✓ Storing or displaying coffee with a longer shelf life at the back
- ✓ Always using coffee in the correct order
- ✓ Checking that coffee is in good condition before using it
- ✓ Removing any out-of-date stock from storage or display

**1.6. Process for Receiving Stock**



**Figure 9 receiving stock into a store**

**Stock handling Procedure for receiving**

- ✓ Check temperature of stock and coffee bean on the truck
- ✓ Sweep floor of store room / chiller. Condense stock to make room for new stock
- ✓ Forklift pallets from the truck to the inwards goods area.
- ✓ Count all crates, pallets and bins to be returned to Foodstuffs Fresh DC. Write amounts in the Crates and Pallets Return Book. Get transport to confirm the quantities and sign the book.
- ✓ Count load delivered. Check quantity of crates, bins and pallets delivered by the truck against the quantity listed on the Foodstuffs Fresh Invoice (delivery docket).
- ✓ Check date stickers on all crates, bins, cartons, etc.

Page 29 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



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 II: Short Answer Questions

1. Briefly explain about handling of stock? (5points)
2. Write at least three steps of implement a solid food stock rotation? (5 points)

Note: Satisfactory rating - 8 points      Unsatisfactory - below 5 points  
You can ask you teacher for the copy of the correct answers.

Page 30 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



## Information Sheet 2- Recording stores transfer information

### 2.1. Definition

**Recording** is documenting the information or data that used the store keeper in the workplace like flow diagram in store, instruction, rotation and safety device.

Stock is often transferred between different stores owned by the same company. Unless the proper steps are taken to process this transfer, stock control issues could arise. In order to account for the movement of stock, a Returned Goods has to be recorded in the store the stock is leaving, and a Goods Received has to be recorded in the store the goods are arriving. As this is an internal transfer the supplier used for both transactions will be a newly created supplier called Stock Transfer. Below are the steps involved in recording the transfer

### 2.2. Temperature and humidity records

**Temperature records:**-Monitor and record storage temperatures in all temperature-controlled rooms, cold rooms, freezer rooms, refrigerators and freezers, as follows:

- Check and record temperatures at least twice daily in the morning and evening and preferably continuously.
- Review temperature records monthly and take action to rectify systematic excursions.
- Systematically file temperature records for each storage environment or piece of equipment to ensure traceability. Keep records for at least one year after the end of the shelf-life of the stored material or product, or as long as required by national legislation.

**Humidity records:**-When storing products which are adversely affected by high relative humidity, monitor and record humidity levels in all temperature-controlled rooms as follows:

- Record humidity at least twice every 24 hours or preferably continuously.
- Check humidity records daily.
- Review humidity records monthly and take action to rectify systematic excursions.

Page 30 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



- Systematically file humidity records for each temperature-controlled room to ensure traceability. Keep records for at least one year after the end of the shelf-life of the stored material or product, or as long as required by national legislation

#### Information of recorded goods should be:

- ✓ Select the stock item
- ✓ Select the location to transfer the stock item from using the warehouse list in stock location
- ✓ Check stock levels
- ✓ A receiving number
- ✓ Person who received the shipment
- ✓ Place from which the goods were shipped
- ✓ Number of items delivered and condition
- ✓ Shipping charges
- ✓ Department or store that ordered the merchandise
- ✓ Date the shipment was received
- ✓ Incoming and shipping goods
- ✓ the stack base and under pallets for signs of insects or rodents (e.g., nests, droppings).  
Stained bags or packaging leaks.
- ✓ Examine stacks for damaged items mixed in with regular stock
- ✓ Check that damaged goods are stacked separately in the warehouse.
- ✓ Check expiry dates on items with limited shelf life.
- ✓ Follow rotation stocks

**Table 3.recording store transfer information spread sheet**

Store transfer information spread sheet								
Stock item	Stock reference	Batch No	Stock temp(IN)	Storage temp.	Stock RH	Initial stock	Stock out	Final stock
Coffee bean								
Tea leaf								

Page 31 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020



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** (5 point)

1. Which one of the following is includes Information record?
  - a. Check stock levels
  - b. receiving number
  - c. Person who received the shipment
  - d. all.
2. The recording requirements of the standard dictate that employer's records?
  - a. Shipping charges
  - b. Follow rotation stocks
  - c. forklift
  - d. "a" and "b" are answers
- d. none

Note: Satisfactory rating - 8 points      Unsatisfactory - below 5 points

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

Page 32 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1 October. 2020
---------------	---	---	-----------------------------





## List of Reference Materials

- ASHRAE(1981) Handbook -Chapter 6 Psychometrics. American Society Heating, Refrigerating and Air-Conditioning Engineers Inc., Atlanta, USA CIBSE (1975) Guide Section CI & 2 Properties of Humid air, water and steam. Chartered Institution of Building Services Engineers, London
- Excels us Cold Chain Management, 2013. PDA Technical Report No. 39 (revised 2007); Guidance for Temperature-Controlled Medicinal Products: Maintaining the Quality of Temperature-Sensitive Medicinal
- For more information contact MDI 978 937-3460 ([www.mesoamerican.org](http://www.mesoamerican.org)); or Grain Pro
- O'Donnell, K., Wright, A. Good Distribution Practices by Air, Road & Ocean Workbook and Resource Guide, Products through the Transportation Environment. Parenteral Drug Association, 2007.
- Oxfam GB Ethiopia. 2006. Coffee history, production and economy [Online]. Available
- [https://store.pda.org/Product\\_Catalog/Product.asp?ID=1270](https://store.pda.org/Product_Catalog/Product.asp?ID=1270) USP Good storage and shipping practices for drug products. United States Pharmacopeia. 2009.
- Receive and store stock D2.TGA.CL6.11 Trainee Manual
- Receiving, Handling and Storing Stock - WordPress.com
- Stock handling and storage | Engineering360 – Global Spec
- Volkmann, T, E, Berry, W.L., and Why bark, D.C. (1992) Manufacturing Planning and Control Systems, Third Edition, IRWIN, Burr Ridge, IL
- [www:http://www.treecrops.org/country/ethiopia\\_coffee.htm](http://www.treecrops.org/country/ethiopia_coffee.htm) ICO (International Coffee Organization).

Page 33 of 41	Federal TVET Agency Author/Copyright	TVET program title- Coffee and Tea processing Level -2	Version -1
			October. 2020