Oil Seed and Pulse Processing

Level II

Based on October 2019, Version 2 Occupational standards

Module Title: Operating seed size reduction

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LG #25	LO 1- Prepare the size reduction process for operation

Instruction sheet

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

- Confirming materials for crushing, flaking, cracking and milling
- Preparing product and materials
- Confirming Services
- Checking equipment
- Confirming equipment status
- Setting process

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

- Confirm materials for crushing, flaking, cracking and milling
- Prepare product and materials
- Confirm Services
- Check equipment
- Confirm equipment status
- Setting process

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the information Sheets
4. Accomplish the Self-checks
5. Perform Operation Sheets
6. Do the “LAP test”

Information Sheet- 1 Confirming materials for crushing, flaking, cracking and milling

1.1 Introduction

Batch processes are mainly performed within a single piece of equipment; the process steps are sequential in time. The input is discontinuous at the start of the sequence, the output discontinuous at the end. In continuous processes, the process steps are simultaneous in different pieces of equipment; both input and output are more or less constant over time.

1.2 Confirming materials for Crushing, flaking, cracking and milling of oil seed

1.2.1 Feeders

- Vibratory; high cost, high maintenance, easy automation
- Roll feeders; low cost, low maintenance, difficult to automate
- Rotary Pocket Feeders; low cost, low maintenance, easy to automate

1.2.2 Cracker mill rolls

Applications:

Cracking of oilseed (like soybeans, rapeseeds, canola, mustard seed), cracking of coffee beans, crushing of flour, processing in feedlots

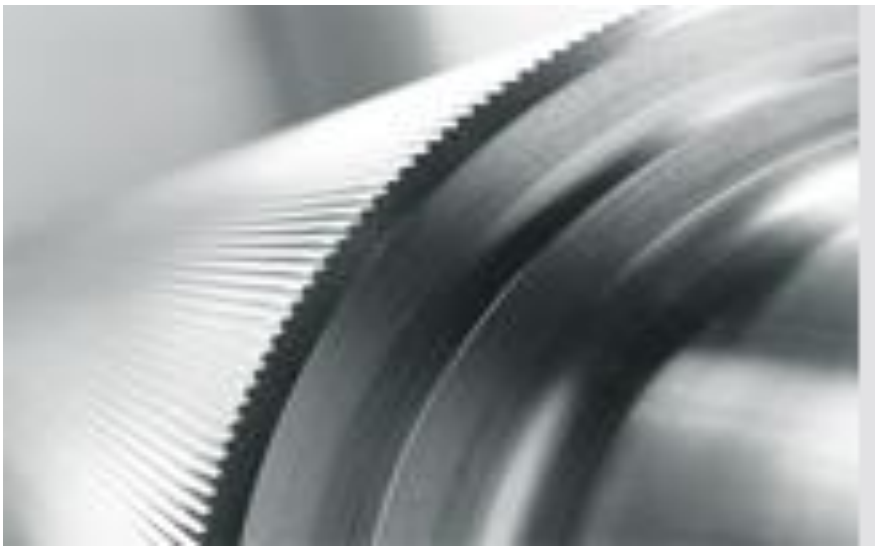


Figure 1 Cracker mill rolls

1.2.3 Flaker mill rolls

Applications:

Flaking of oilseed (like soybean, canola, rapeseed, sunflower), processing feedlots, breakfast cereal, corn flakes, rice flakes, guar gum, oatmeal and cotton seed.

Figure 2 Flaker mill rolls

Self-Check 1	Written Test

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

1. Define application of cracker rolls (5 point)

2. Write three types of feeder (5 point)

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

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

Information Sheet-2 Preparing product and raw materials

2.1 Oil seed

Oil seed raw materials are soyabean, sunflower, sesame rapeseed, and groundnut. The great increase in the production of soyabean oil has been the major development on this market in the past decades. The production of vegetable oils from palmfruits, sunflower seed and rape/mustard has doubled over the same period. The group of oils made from cottonseed, groundnut and coconut, however, is more or less constant. Since many vegetable oils are direct competitors, the relative importance of these oils may well change in the future, but the dominance of soyabean oil is unlikely to change.

In terms of volume of world production, other vegetable oils are of minor or only regional importance. Olive oil, for example, is almost exclusively produced in the Mediterranean countries where it meets a unique consumer preference. Since it has not gained acceptance in other regions, olive oil will not be dealt with in the present publication. Other oils, however, are of particular relevance for specific areas in developing countries (e.g. Sheanut in West-Africa) and will therefore be described in more detail than their overall importance would appear to justify.

World trade in oil fruits and oil seed is even more dominated by soyabean than the other production. With one quarter to one third of the total production entering the world market, soyabean is in fact the only oil crop with considerable exports in an unprocessed condition. Most prominent exporter is the USA, which has two thirds of the whole market. The soyabean exports of all developing countries together only amount to about half of this share, showing South America (Argentina and Brazil) in a leading position. The main direction of the soyabean trade is towards Europe, which imports more than half of the available quantity.

Palm oil alone accounts for about one third of the trade, the major exporters being Malaysia and Indonesia, with Singapore as the major port of the region. Africa produced and exported most palm oil, but has now lost this position due to the massive planting of high yielding varieties in South East Asia. For palm oil, Asia has also the highest

demand, although import statistics do not correspond to actual consumption due to substantial re-exports (Singapore).

2.2.1 Soybean

The soyabean or soyabean, Glycine max, is a member of the Papilonaceae, which includes some forty species of frequently twinning shrubs, distributed generally in the Asia and Australasia region. It is considered as having its origin in northeastern China, although the genus has two major centers. One is in eastern Africa, the second in the Australasian region with a secondary Centre in China. From China soyabean spread to the neighboring countries Korea, Japan and South-East Asia and finally around the world. As a cultivated crop it remained basically confined to Asia until the beginning of the century, when the USA developed soyabean into a major commercial crop.

The wet subtropics provide the best climate for the soyabean with average annual temperatures of around 25° C and optimal rainfall of 500 to 750 mm per year. The plant is extremely photoperiodic, with most varieties only flowering with day-light less than 14 hours a day. Day- light periods shorter than 12 hours lead to dwarf growth and reduced yields. All varieties are adapted to specific conditions. Cultivation of certain varieties is limited to particular geographic latitudes.

Soya oil normally contains 10 % linolenic, 55 % oleic and 30 % linoleic acid with up to 50 % variation in a specific component. Without going into details, one might say that these components make the oil without further processing rather poor and unstable in flavour for direct human consumption. As an industrial raw material, it is mainly used for the production of margarine. Soyabean contain a toxic factor which blocks the activity of the digestive enzyme trypsin. Before feeding whole seeds to pigs or poultry, this trypsin inhibitor should be destroyed by heating. Since soyabean are normally heat treated during processing, oil cake is generally inhibitor free.

2.2.2 Sunflower

The sunflower, Helianthus annuus L., is a member of the Compositae, a large and successful family of flowering plants occurring throughout the world. The genus Helianthus is named from the Greek hellos meaning sun, and anthos flower.

Basically a temperate-zone plant, the main commercial production of sunflower is in the warm-temperate regions but breeding and selection have produced varieties adapted to a wide range of environments. Optimal conditions are short, hot (around 27ºc) summers with not too much rain (around 250 mm) during flowering and fructification. Greatest production is between latitudes of 200 to 500 north and 200 to 400 in the southern hemisphere, usually below altitudes of 1 500 m.

The oil content of sunflower seed is between 25 and 48 %, but can reach 65 % under experimental conditions. Important for developing countries is the fact that high temperatures during seed development can reduce the total oil content to below 25 %, which would make small-scale processing less rewarding. Sunflower oil, which is pressed in a cold stage, is a very highly valued salad oil; lower qualities are also used for technical purposes (paints).

2.2.3 Sesame

Sesame, Sesamum indicum L, member of the family Pedaliaceae, is probably the most ancient oilseed used by man and originates from the Ethiopian area. It occurs as numerous species and is locally known under a variety of names.

Sesame is considered a crop of the tropics and subtropics and normally requires fairly hot conditions, with temperatures around 26°C encouraging rapid germination, initial growth and flower formation. In altitudes below 1250 m, sesame's main distribution is between 250 north and south of the equator, but it can be found further north in China, Russia and the USA and further south in Australia and South America. Optimal rainfall is 500 to 650 mm per year, but since the crop is reasonably drought resistant it can also be planted in relatively arid zones with annual rainfalls as low as 300 mm.

The average seed composition is 45 to 50 % (highly valued) oil and between 19 to 25 % protein. Sesame seed is relatively sensitive to mechanical damage, and even minor damage at threshing can result in an immediate loss of the viability of the oil extraction process.

2.2.4 Rape and mustardseed

Rapeseed and mustardseed are both obtained from species of Brassica in the family of the Cruciferae which includes some 160 species, mainly annual and biannual herbs. Of

rapeseed, the two most important oilseed producers are B. Campestris L., which has a fairly wide world distribution, and B. Napus L., which is basically restricted to Europe and North Africa. Of mustardseed, B. Juncea is the most common and known as Chinese or Indian mustard. Oilseed rape and mustard are basically temperate crops which prefer moderate temperatures below 25°C during growth. Breeding and selection has considerably increased the geographic range of cultivation with hardy varieties being able to withstand long periods of snow cover and very low temperatures and others able to withstand more than 40°C for a limited period during the vegetative phase. Optimal rainfall is considered to be 700 mm per year. Rape will still produce a good crop using mainly residual soil moisture, provided some rain falls between planting and the seedling stage and at main flowering. These characteristics are of particular advantage in tropical regions of high altitude with significant temperature variations-and low rainfall.

The protein content of the seeds varies from 10% to 45%, the oil content is normally in the range of 30 % to 50 %, but can reach up to 60%.Rapeseed oil is dark, but after refining becomes light yellow and resembles sunflower oil. The colour is influenced by the seed chlorophyll level. A low value produces alight coloured oil which is commercially desirable. In the past, oil produced from the higher yielding varieties contained high levels of erucic acid, which constitutes a health risk for human consumption. Breeding has led to varieties without this acid. Oil from older varieties is mainly used for technical purposes.

2.2.5 Other oil yielding plants suitable for small-scale processing

- Physic Nut (Purgier), Jatropha curcas, the oil of which is mostly used for soap and might be economically used as a fuel on the Cape Verde islands,
- Niger Seed, Guizotia abyssinica, which is produced in India and Ethiopia and gives a good edible oil,
- Babassu, Orbignya oliefera, originating from Brazil with nuts containing 2to 8 kernels with 60 % oil similar to coconut oil,
- Cohune, Orbignya cohune, growing in Central America, the nuts containing a kernel with 60 % oil comparable to coconut oil,
- Neem, Melia azadirachta L. (A-adirachta indica), growing in Africa, SE-Asia and India, with seeds containing 45 % oil, which is mainly used for soap and medical purposes,
- A large number of wild growing oil yielding plants of local importance.

2.2 Oil Cake/by product/

Table 1 Important Oil crops and their By-Products

Oil crop	By product	Use
Soyabean oil	Soyabean cake	Human consumption
Groundnut oil	Groundnut cake	Human consumption or animal feed
Sunflower oil	Sunflower cake	Animal feed
Sesame oil	Sesame oil cake	Human consumption or animal feed
Rape/Mustard oil	Rape cake	Animal feed
Cotton seed oil	Cake	Animal feed

Self-Check 2	Choose the best Answer

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

1. How Mach oleic content of soyabean (5 point)

   A.50%B.55% C.10% D25%

2. Write three types of feeder (5 point)

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

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

Information Sheet- 3 Confirming Services

3.1 Introduction

Within oil process, four main utilities are considered essential to operations: electricity, natural gas, water and compressed air. If a process to lose access to any of these utilities, it would be forced to shut down

3.2 Power

The overall system power factor, inclusive of reactive power losses in transformers and other distribution system equipment shall not be less than 0.85 lagging at rated design throughout of the plant. The power factor shall be determined at the terminals of the generator(s).

3.3 Water

Significant volumes of water in the form of process water, steam, and cooling water are required for edible oil (EO) production. In addition, water is used to clean the equipment and floors. Open steam is used for some processes, while condensing steam and/or hot water in heat exchangers is used to heat the oil to the required process, storage and transfer temperatures. Conversely, cool water in heat exchangers is used to decrease the temperature of the oil (Figure1 A). Typically, the oil and water is compartmentalized in the heat exchangers, and the water can therefore be recycled. Heat can be re-captured in heat exchangers, and latent heat from steam can be captured in condensers, but excess warm water needs to be cooled for re-use. This is achieved in cooling towers, where evaporation provides the mechanism for cooling (Figure 1 B). However, some water is lost via evaporation or drifts into the atmosphere from the cooling towers. In addition, the water eventually becomes contaminated and must be wasted. This is known as blow down water. The water used to make up the deficit is known as make-up water**.**

3.4 Compressed air

Compressed air is an important element for many processes within the petrochemical and oil processing industries. First, compressed air acts as a medium for the transfer of

energy, which is critical to power equipment such as drills, jack hammers and air-powered tools, among others.

Compressed air is also used elsewhere in refineries to move material such as paint, oils, cylinders for industrial and automation, and brakes on large equipment.

Compressed air is also utilized in a refinery for breathing gas when operations face confined space requirements. Additionally, it controls precise measurements and calibration in the production of gases and liquids during operation of specific machinery and instrumentation. For more than 140 yr, compressed air has been a critical tool used to help drive the industry. Due to its nature, compressed air is a stable process for process equipment needed for drilling, pneumatic tools, power machinery and generators that produce light without combustible fuels. Types of compressors found in refinery and petrochemical facilities include:

- Rotary screw compressors
- Compressors
- Scroll compressors
- Turbo compressors
- Reciprocating compressors
- Centrifugal compressors
- Rotary vane Compound compressors

Self-Check 3	Choose the best Answer

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

1 Which one is not oil industry facility (5 point)

A. Water B. Power C. Utility D. compressors air E. none

2 ---------is an important element for many processes within the petrochemical and oil processing industries (5 point)

A. Water B. Power C. Utility D. compressors air E. all

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

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

Information Sheet- 4 Checking equipment

4.1 Introduction

Maintaining your equipment is critical to your Rotary Feeder or Centrifugal Feeder system's long term performance**.** Checking equipment's are**:**

- Feeder
- Conveyer
- Rollers
- Flakers
- Hammer mills

4.2 Checking feeder

Before Starting Operation*:

- Make sure the product is free of flanges, excess plastic, short shots, or noticeable gates.
- Check if any tools or materials are left in the equipment.
- Check that all power (utility) supplies have been turned ON.
- Check that air and speed settings correspond to the specified values.
- Check that product has been supplied to the pre feeder hopper.
- Check that all sensors are clean and free of smudges and/or condensation.
- Check that there is no leakage (oil, grease, water, fluids, etc.)
- Remove any dirt, debris from output track.

During Warm Up of the System:

- Check if there is any abnormal noise or vibration in the equipment.
- Wipe off any excess oil or grease after warm up
- Check for air leaks throughout the system.
- Run the machine slowly to check for any problems with the flow of products through the system.

After the Shift is finished:

- Remove any broken parts or fragments.
- Check that all sensors are clean and free of smudges and/or condensation.
- Check to see if the speed reducer/motors are running abnormally hot.
- Lubrication any sections of the equipment called out in the Maintenance Charts under the “Daily” interval.

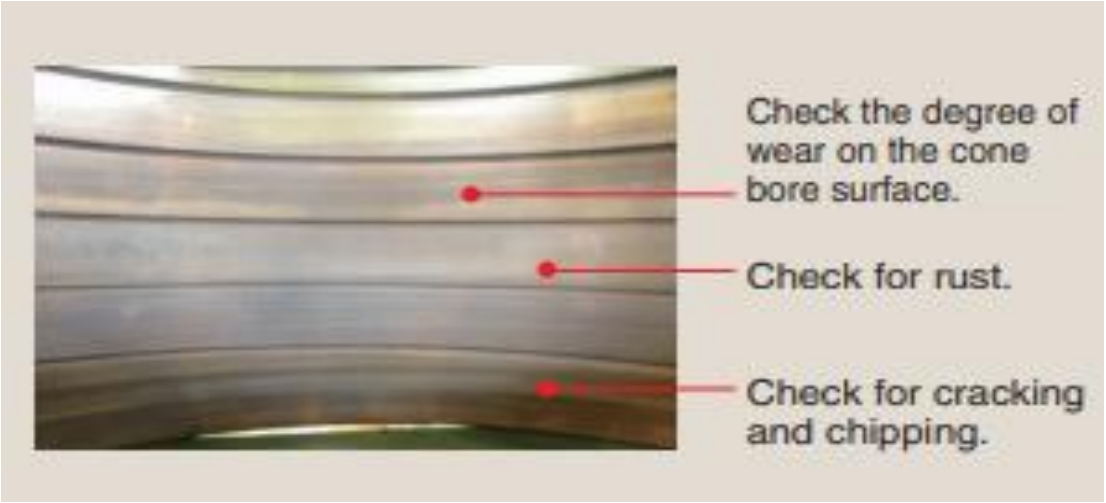
4.3 Checking conveyer

The conveyor belt industry is a huge and highly competitive global market. To describe it as being ‘cut-throat’ would not be an exaggeration. However, such a high level of competition does not always benefit the end-user, especially when the pursuit of winning orders can so easily compromise safety, quality of performance and operational lifetime.

Checking conveyer equipment

- Abrasion (wear) resistant;
- Heat resistant;
- Oil resistant; and
- Fire.

4.4 Checking roller mill



A.

B

C.

Figure 3 Checking roller (A, B and c)

4.5 Checking flakers

- Checking plant condition the final approval operation
- Checking for uniform and proper flake thickness will help minimize the risk of fir due to dust accumulation

4.6 Checking hammer mill

- Check airflow

Self-Check 4	Choose the best Answer

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

1. Which one is Checking conveyer equipment (5 point)
   A. Abrasion B. C. Heat resistant D. Fire E. all
2. ---------is critical to your Rotary Feeder or Centrifugal Feeder system's long term performance. (5 point)

B. Maintenance B. inspection C. checking D. all E. none

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

Information Sheet- 5 confirming equipment status

5.1 Terminology

For the purpose of this Code, the following expressions have the meaning stated:

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

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

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

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

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

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

Hazard - a biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect.

HACCP - a system which identifies, evaluates, and controls hazards which are significant for food safety.

Food handler - any person who directly handles packaged or unpackaged food, food equipment and utensils, or food contact surfaces and is therefore expected to comply with food hygiene requirements

Food safety - Assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use.

Food suitability - Assurance that food is acceptable for human consumption according to its intended use.

5.2 Checking equipment hygiene and sanitation standards

- Equipment should be located so that it:
  - ✓ Permits adequate maintenance and cleaning;

- ✓ Functions in accordance with its intended use; and
- ✓ Facilitates good hygiene practices, including monitoring.

5.3 Safety standards and pre-start requirements are met

- Equipment and containers that come in direct contact with food (including food contact surfaces) and used for food handling, storage, processing, packing shall be:
  - ✓ Made of impervious, corrosion free material which do not impart any toxicity to the food material and shall be easy to clean.
  - ✓ Located, designed and fabricated so that it permits necessary maintenance and periodic cleaning.
  - ✓ Kept in good order, repair and condition as to minimize any risk of contamination. These include free from cracks, crevices, open seams etc.
  - ✓ Shall be placed to achieve easy and effective cleaning of adjacent areas like floors, walls, ceilings and other surfaces.
- All openings such as manholes, inlets, outlets, draining out of points, etc. should be made such that they can be locked and/or effectively sealed.
- The use of metal vessel, metal container or other equipment made up of metal, which is likely to cause metallic contamination and is injurious to health should not be used in the preparation, packing or storage of food products. E.g. Copper, copper alloys, iron etc. should be avoided as they have catalytic effects for oxidation.
- They shall be located, designed and fabricated so that it permits necessary maintenance and periodic cleaning. For e.g. the preferred design of tanks should be:
  - ✓ Tall, narrow tanks to minimize contact surface area of oil and tank. This will avoid air and oxygen contact, if any.
  - ✓ Suitable shape is vertical circular cross section tank with self-supporting fixed roof.
  - ✓ Tank bottoms should be conical or sloped (with a sump) to facilitate draining.

5.4 Checking the operation and calibration status of measuring instrumentation

The calibration of instruments or measurement systems is customarily carried out by comparing them against one or more measurement standards. These standards are classified according to their quality. Their definitions may be summarized as follows:

Primary standard: A measurement standard established using a primary reference measurement procedure, or created as an artifact, chosen by convention.

Secondary standard: A measurement standard established through calibration with respect to a primary measurement standard for a quantity of the same kind.

International standard: A measurement standard recognized by signatories to an international agreement and intended to serve worldwide.

National standard: A measurement standard recognized by national authorities to serve in a State or economy as the basis for assigning quantity values to other measurement standards for the kind of quantity concerned.

Reference standard: A measurement standard designated for the calibration of other measurement standards for quantities of a given kind in a given organization or at a given location.

Working standard: A measurement standard that is used routinely to calibrate or verify measuring instruments or measuring systems.

Transfer device: A device used as an intermediary to compare measurement standards.

Travelling standard: A measurement standard, sometimes of special construction, intended for transport between different locations.

Self-Check 5	Written Test

Name_____ **ID**_____ **Date**_____

Directions: Answer the questions listed below.

TEST I. Say true or false (5 points each)

1 Contamination is the introduction or occurrence of a contaminant in food or food environment.(5 point)

2 The calibration of instruments or measurement systems is customarily carried out by comparing them against one or more measurement standards.

3 HACCP is a biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect (5 point)

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

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

Information Sheet- 6 setting process

6.1 Introduction

Most oil seeds are reduced in size to facilitate hull removal, heating, drying and flaking prior to oil extraction. Canola, rapeseed and corn germ do not require size reduction as they are already sufficiently small. Cracking mills are used for seed size reduction. A cracking mill consists of two sets of cylindrical corrugated rolls in series. The rolls rotate at differential speeds to break apart seed cells containing oil. High capacity cracking mills can process up to 1,000 tons per day of oil seeds.

6.2 Setting process

The extraction of oil from oilseeds, either by mechanical expression or by means of solvents, is facilitated by reduction of the seed in small particles by grinding or rolling. Although a large proportion of oil bearing cells are disrupted, many oil cells remain intact even after the most careful size reduction and the walls of these cells are made permeable to the oil only by the action of heat and moisture in the subsequent cooking operation. However, the cells will are more readily acted upon by heat and moisture if the seed particles are small. Hence the size reduction of oilseeds is important for efficient recovery of oils.

Hammer mills/attrition mills are used for the preliminary reduction of size of large oilseeds while milling rolls are used for final reduction .The flake particle size of 0.13 - 0.25 mm obtained by rolling is satisfactory for hydraulic pressing of groundnut, cotton and linseed than irregular shape obtained by grinding. The process of cracking (or sizing) is used for larger seeds, the main purpose of which is to reduce the size of the seeds. Cracking also assists with dehulling. The cracking machinery typically consists of horizontal rollers through which the seeds are passed.

Self-Check 6	Written test

Directions: say true or false

1) Hammer mills are used for the preliminary reduction of size of large oilseeds while milling rolls are used for final reduction.
2) Most oil seeds are reduced in size to facilitate hull removal, heating, drying and flaking prior to oil extraction.

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

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

LG #26	Lo2 Operate and monitor the size reduction process

Instruction sheet

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

- Starting crushing, flaking, cracking and milling process
- Monitoring control points
- Monitoring operating condition
- Producing product that meet specification
- Identifying out-of-specification of product, process and equipment

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:

- Starting crushing, flaking, cracking and milling process
- Monitoring control points
- Monitoring operating condition
- Producing product that meet specification
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Learning Instructions:

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Information Sheet- 1 starting crushing, flaking, cracking and milling process

1.1 Introduction

The extraction of oil from oil seeds, either by mechanical expres-sion or by means of solvents, is facilitated by reduction of the seed in small particles by grinding or rolling. Although a large proportion of oil bearing cells are disrupted, many oil cells remain intact even after the most careful size reduction and the walls of these cells are made permeable to the oil only by the action of heat and moisture in the subsequent cooking operation. However, the cell wells are more readily acted upon by heat and moisture if the seed particles are small. Hence the size reduction of oil seeds is important for efficient recovery of oils. Hammer mills/attrition mills are used for the preliminary reduction of size of large oilseeds while milling rolls are used for final reduction. The flake particle size of 0.13 - 0.25 mm obtained by rolling is satisfactory for hydraulic pressing of groundnut, cotton and linseed than irregular shape obtained by grinding. In the preparation of oilseed for expression in expellers or screw presses, the production of thin particles or flakes is not essential as heat is generated and seed particles are broken by shearing stress developed in the barrel of the expeller during oil expression. Small oilseed like sesame, rapeseed/mustard arid linseed as well as muddier, size oil seeds such as cotton seeds are usually rolled before expeller processing in large scale commercial plants. Soybeans however are usually cracked by corrugated cracking rolls into particles averaging 10-16 merh in size and are then expressed without rolling or turther reduction. Groundnuts are expelled after or before rolling.

1.2 Oil Seed Cracking (Crushing) Process

The oil seeds are crushed into 6-8 parts twice by the Teeth-roller Crackers for downstream hull-kernel separation and flaking. Max. Powder Ratio: 4%. Space between the teeth rollers can be adjusted easily. There is no material when the Teel-roller Crackers stopped. Avoid safety fault as overcurrent.

The process of cracking (or sizing) is used for larger seeds, the main purpose of which is to reduce the size of the seeds. Cracking also assists with dehulling. The cracking machinery typically consists of horizontal rollers through which the seeds are passed. The purpose of

soybean crushing is to crack the soybeans into many small parts, so that to meet the conditions of further processing including peeling and flaking.

1.3 Flaking /size reduction/ Process

Flaking (flattening) Flaking involves crushing the material under particular time, temperature and moisture conditions. This process partially breaks the seeds and increases the surface area. The permeability of the oil cake is improved, thereby promoting solvent extraction. However, unless the pressing temperature is high (100ɔC), flaking can result in increased residual oil in the oilcake after pressing. 0.3mm thick flakes require more extraction as compared to 0.15mm tuck flakes. The flakes should be very fine and preferably thinner than 0.1 mm.

1.4 Milling process

This oil mill can process a number of oilseeds like peanut, soyabean, cotton seeds sunflower seeds, corn germ, rape seeds, sesame and palm kernel. The most important equipment in the entire milling / pressing process is oil expellers which are used for high oil content seeds and also used for smaller capacity oil production plant.

In former times, oil extraction was done exclusively with presses. In most oil milling plant, oil extraction is done with expellers as pre extraction before solvent extraction or as direct press extraction.

Figure 4 Oil milling plant

1.5 Effect of crushing, flaking, cracking and milling stages on end product

The flaking of discrete particles is a three-dimensional and non-steady state process. This type of process is difficult to model. Properties of cracked soybeans that affect the thickness of flakes are physical (size and shape, distribution of particle sizes, moisture content), thermal (temperature, conductivity, specific heat, diffusion coefficients), and viscoelastic (stress relaxation and creep compliance behaviors; the relationships between elasticity, temperature, moisture, and time).

Self-Check 1	Written Test

Directions: say true or false

1) Cracking involves crushing the material under particular time, temperature and moisture conditions.
2) Cracking is used for reduce the size of the seeds..

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

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

Information Sheet- 2 Monitoring control points

2.1 Food safety (critical)

Food safety involves the protection of food from accidental contamination such as chemical, biological, or physical hazards. Food safety is

I. Assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use.

II. Assurance that food is free from harmful hazards (physical, chemical and Biological hazards)

- **Benefits of food safety**
  - ✓ It focuses on those critical points in food processing and handling required for safe food production
  - ✓ Requires the implementation of measures to control hazards where significant
  - ✓ Employs the principle of risk assessment allowing prevention to be based on the control program rather than inspection and testing
  - ✓ Better use of resources
  - ✓ Standardization of hazard management allowing for easier auditing and inspection by second and third parties
  - ✓ Proactive approach to food safety which is internationally recognized
  - ✓ Increases customer and consumer confidence
  - ✓ Maintaining or increasing market access
  - ✓ Reduce costs through reduction of product losses and rework
  - ✓ Reduce risks of recalls and product withdrawals thus reducing costs associated with insurance and business liability protection
  - ✓ Increase focus and ownership of food safety
  - ✓ Simplify inspections primarily because of record keeping and documentation
  - ✓ Provide consistent quality product
  - ✓ Demonstrates conformance to the product requirements and regulations

2.2 Quality and regulatory control points

Documented process specifications and work instructions shall be available for the key processes in the production of products to ensure product safety, legality and quality. The specifications include**:**

- Recipes – including identification of any allergens
- Mixing instructions, speed, time equipment process settings, cooking times and temperatures
- Cooling times and temperatures , labelling instructions
- Coding and shelf-life marking
- Any additional critical control points identified in the HACCP plan**.**

2.3 Inspection points

The company shall undertake inspection and analyses which are critical to confirm product safety, legality and quality, using appropriate procedures, facilities and standards. There shall be a scheduled programme of testing which may include microbiological, chemical, physical and organoleptic testing according to risk. The methods, frequency and specified limits shall be documented.

Test and inspection results shall be recorded and reviewed regularly to identify trends.

The significance of external laboratory results shall be understood and acted upon accordingly. Appropriate actions shall be implemented promptly to address any unsatisfactory results or trends. Re that product is produced within the required process specification

Self-Check 2	Written Test

Directions: say true or false

1) Food safety involves the protection of food from accidental contamination such as chemical, biological, or physical hazards.
2) Test and inspection results shall be recorded and reviewed regularly to identify trends.

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

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

Information Sheet- 3 Monitoring operating condition

3.1 Introduction

Monitoring operation is a systematic process of observing, tracking, and recording activities or data for the purpose of measuring program or project implementation and its progress towards achieving objectives. Information gathered through monitoring is used to analyze, evaluate the all of the components of a project or a department in order to measure its effectiveness and adjust inputs where necessary. In any processing industry there must equipment and process monitoring and controlling system. So in oil seed industry there is equipment that needs monitoring and control of its processing parameters like temperature, pressure, and flow meters and different sensors. Monitoring equipment and process in an industry helps to obtain expected out puts like oil colour, flavour, density, and clarity. Without monitoring and controlling the equipment and process; it was impossible to get quality products.

Table 2 Monitoring operating condition of flaking

Condition	Cause	Solution
• Raceway surface is flaked. • Surface after flaking is very rough.	• Rolling fatigue. • Flaking may be caused early by over-load, excessive load due to improper handling, poor shaft or housing accuracy, installation error, ingress of foreign objects, rusting, etc.	1. Find the cause of the heavy load. 2. Examine operating conditions and adopt bearings with larger capacity as necessary. 3. Increase viscosity of oil and improve lubrication system to form an adequate lubricating oil film. 4. Eliminate installation errors.

Self-Check 3	Written Test

Directions: say true or false

1) Monitoring operation is a systematic process of observing, tracking, and recording activities or data.
2) Monitoring equipment and process in an industry helps to obtain expected out puts like oil colour, flavour, density, and clarity.

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

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

Information Sheet- 4 Producing product that meet specification

4.1 Introduction

A specification is defined as a list of tests, references to analytical procedures, and appropriate acceptance criteria which are numerical limits, ranges, or other criteria for the tests described. It establishes the set of criteria to which a processing substance, processing product or materials at other stages of its manufacture should conform to be considered acceptable for its intended use. “Conformance to specification” means that the process substance and process product, when tested according to the listed analytical procedures, will meet the acceptance criteria. Specifications are critical quality standards that are proposed and justified by the manufacturer and approved by regulatory authorities as conditions of approval. Regulatory approved specifications for release testing.

4.2 Producing product that meet specification

Oil seeds mature at a slight different rate between the top and lower parts of the plant. This tends to be more pronounced in case of cottonseed. Similarly the soybean pods can have different degree of maturity on the same plant and not all the seeds on the same sunflower would be identical in maturity. Therefore, a lot of oil seeds shipment may contain some seeds that are somewhat less mature.

Processed oil should be consistent in all aspects such as colour, taste and viscosity. In addition, the oil seed should be free of impurities and meet the demands placed upon it for use in cooking. Before being filled, the bottles that hold the oil are cleaned and electronically inspected for foreign material. The size of oil seed not very large and also not very small there should be optimum.

Self-Check 4	Written Test

Directions: say true or false

1) Specification is defined as a list of tests, references to analytical procedures, and appropriate acceptance criteria
2) Monitoring equipment and process in an industry helps to obtain expected out puts like oil colour, flavour, density, and clarity.

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

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

Information Sheet- 5 identifying out-of-specification of product, process and equipment

5.1 Introduction

The out-of-specification (OOS) process is not applicable for In-process testing while trying to achieve a manufacturing process end-point i.e. adjustment of the manufacturing process. (e.g. pH, viscosity), and for studies conducted at variable parameters to check the impact of drift (e.g. process validation at variable parameters).

- Out-of-Specification (OOS) Result: Test result that does not comply with the predetermined acceptance criteria (i.e. for example, filed applications, Food master files, approved marketing submissions, or official compendia or internal acceptance criteria).
- Test results that fall outside of established acceptance criteria which have been established in official compendia and/or by company documentation (i.e., Raw Material Specifications, In-Process/Final Product Testing, etc.).
- Out of Trend (OOT) Result is generally a stability result that does not follow the expected trend, either in comparison with other stability batches or with respect to previous results collected during a stability study. However the trends of starting materials and in process samples may also yield out of trend data.

5.2 out-of-specification of product

The oil seeds in a lot will always have some damaged (broken) seeds, some with lesser degree of maturity and lesser seed size. However, the various grades of seeds that are sold under specification seem to perform in a uniform manner in producing the crude oil of undesired quality.

5.3 Out-of-specification of process

An irregularity of the measurement process and an aberration of the manufacturing process.

5.1 Out-of-specification of equipment

Calibration failure; calibration frequency inadequate; old equipment; wrong equipment used for processing

Self-Check 5	Written Test

Name_____ **ID**_____ **Date**_____

Directions: Answer the questions listed below.

TEST I. Say true or false (5 points each)

1. Out-of-specification of process is an irregularity of the measurement process and an aberration of the manufacturing process.(5 point)
2. Out-of-specification of equipment calibration failure; calibration frequency inadequate; old equipment; wrong equipment used for processing. (5 point)

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

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

Operation sheet	1. Procedure of operate and monitor size reduction process.

Steps of operation sheet

1. Select, fit and use personal protective clothing and equipment
2. Identify crushing, flaking, cracking and milling requirements
3. Confirm supply of necessary product, materials and services
4. Prepare product and materials as required.
5. Confirm equipment status and condition.
6. Operate crushing, flaking, cracking and milling process of soyabean
7. Monitor the process and equipment operation to identify out-of-specification
8. Monitor supply and flow of product and materials to and from the process
9. Take correction in response to out-of-specification results or non-compliance
10. Report and/or record corrective action as required
11. Sort, collect, treat, recycle or dispose of waste
12. Shut down equipment in response to an emergency situation
13. Record workplace information

LAP TEST	Operate and monitor size reduction process.

Name……ID……..Date……

Time started: _____ Time finished: _____

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

Task-1 Conduct size reduction process.

LG #27	LO 3- Shut down the crushing process

Instruction sheet

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

- Shutting down crushing, flaking, cracking and milling process
- Dismantling and preparing equipment for cleaning.
- Collecting, treating and disposing of recycling waste
- Conducting workplace environmental guidelines

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:

- Shut down crushing, flaking, cracking and milling process
- Dismount and preparing equipment for cleaning.
- Collect, treating and disposing of recycling waste
- Conduct workplace environmental guidelines

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the information Sheets
4. Accomplish the Self-checks

Information Sheet- 1 Shutting down crushing, flaking, cracking and milling process

1.1 Introduction

Shut down is a term used to describe the process of closing all systems of process control systems. Normal shutdown includes steps to render the systems safe, such as removal of hazardous process materials and inert (asphyxiating) gases. The systems might be cleaned as part of the shutdown; cleaning is often a machine shutdown is a temporary closure of a building to perform maintenance. The main activities should be preventative in nature with the focus on equipment inspections. This is the best time to replace worn-out or broken process materials and equipment at their useful end-of-life process unto itself requiring its own set of startup, operation, and shutdown procedures.

1.2 Uses of Shutdown Processes

- Safely shut down of the equipment.
- To locate emergency stop functions on the equipment.

1.3 Shut down the flaking process includes.

Shutdown procedure may include but not limited to:

- The appropriate shutdown procedure is identified.
- The process is shut down according to shutdown procedures.
- Maintenance requirements are identified and reported according to workplace reporting requirements

1.4 Advantage of appropriate shut down procedure

- Reduced unplanned downtime
- Reduced overtime and
- Reater operational efficiencies

Self-Check 1	Written Test

Name_____ **ID**_____ **Date**_____

Directions: Answer the questions listed below.

TEST I. Say true or false (5 points each)

1. Shut down is a term used to describe the process of closing all systems of process control systems.(5 point)
2. One of advantage of appropriate shut down procedure is reduced overtime (5 point)

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

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

Information Sheet- 2 Dismantling and preparing equipment for cleaning

2.1 Introduction

Cleaning and sanitizing may be the most important aspects of a sanitation program, sufficient time should be given to outline proper procedures and parameters. Detailed procedures must be developed for all food-product contact surfaces (equipment, instruments, etc.) as well as for non-product surfaces such as non-product portions of equipment, overhead structures, shields, walls, ceilings, lighting devices, refrigeration units and heating, ventilation and air conditioning (HVAC) systems, and anything else which could impact food safety.

Cleaning frequency must be clearly defined for each process line (i.e., daily, after production runs, or more often if necessary). The type of cleaning required must also be identified. The objective of cleaning and sanitizing food contact surfaces is:

- To remove food (nutrients) that bacteria need to grow, and
- To kill those bacteria those are present.

It is important that the clean, sanitized equipment and surfaces drain dry and are stored dry so as to prevent bacteria growth. Necessary equipment (brushes, etc.) must also be clean and stored in a clean, sanitary manner.

Cleaning/sanitizing procedures must be evaluated for adequacy through evaluation and inspection procedures. Adherence to prescribed written procedures (inspection, swab testing, direct observation of personnel) should be continuously monitored, and records maintained to evaluate long-term compliance.

The correct order of events for cleaning/sanitizing of food product contact surfaces is as follows:

1. Rinse
2. Clean
3. Rinse
4. Sanitize.

2.2 Definitions

Cleaning is the complete removal of food soil using appropriate detergent chemicals under recommended conditions.

- Mechanical Cleaning. Often referred to as clean-in-place (CIP). Requires no disassembly or partial disassembly.
- Clean-out-of-Place (COP). Can be partially disassembled and cleaned in specialized COP pressure tanks.
- Manual Cleaning. Requires total disassembly for cleaning and inspection.

Sterilize refers to the statistical destruction and removal of all living organisms.

Disinfect refers to inanimate objects and the destruction of all vegetative cells (not spores).

Sanitize refers to the reduction of microorganisms to levels considered safe from a public health viewpoint.

2.3 Cleaning of equipment

It is essential that personnel involved have an understanding of the nature of the dirt to be removed before selecting a detergent or cleaning regime. Acid cleaners dissolve alkaline soils (minerals) and alkaline cleaners dissolve acid dirt and food wastes. Improper use of detergents can actually "set" dirt, making them more difficult to remove (e.g., acid cleaners can precipitate protein). Many films and biofilms require more sophisticated cleaners that are amended with oxidizing agents (such as chlorinated detergents) for removal. Dirt may be classified as the following:

- Soluble in water (sugars, some starches, most salts);
- Soluble in acid (limestone and most mineral deposits);
- Soluble in alkali (protein, fat emulsions);
- Soluble in water, alkali, or acid.

The physical condition of the dirt deposits also affects its solubility. Freshly precipitated dirt in a cool or cold solution is usually more easily dissolved than an old, dried, or baked-on deposit, or a complex film. Food dirt’s are complex in that they contain mixtures of several components.

2.4 Sanitizing of equipment

Thermal Sanitizing

As with any heat treatment, the effectiveness of thermal sanitizing is dependant upon a number of factors including initial contamination load, humidity, pH, temperature, and time.

2.4.1 Steam

The use of steam as a sanitizing process has limited application. It is generally expensive compared to alternatives, and it is difficult to regulate and monitor contact temperature and time. Further, the byproducts of steam condensation can complicate cleaning operations.

2.4.2 Hot Water

Hot-water sanitizing—through immersion (small parts, knives, etc.), spray (dishwashers), or circulating systems—is commonly used. The time required is determined by the temperature of the water.

Many state regulations require an instrument surface temperature of 71°C (160°F), as measured by an irreversibly registering temperature indicator in ware washing machines. Recommendations and requirements for hot-water sanitizing in food processing may vary. The Grade A Pasteurized Milk Ordinance specifies a minimum of 77°C (170°F) for 5 min. Other recommendations for processing operations are 85°C (185°F) for 15 min., or 80°C (176°F) for 20 min.

The primary advantages of hot-water sanitization are relatively inexpensive, easy to apply, and readily available, generally effective over a broad range of microorganisms, relatively non-corrosive, and penetrates into cracks and crevices.

Hot-water sanitization is a slow process that requires come-up and cool-down time; can have high energy costs; and has certain safety concerns for employees. The process also has the disadvantages of forming or contributing to film formations and shortening the life of certain equipment or parts thereof (gaskets, etc.).

2.4.3 Chemical Sanitizing

The ideal chemical sanitizer should:

- Be approved for food contact surface application.
- Have a wide range or scope of activity.
- Destroy microorganisms rapidly.
- Be stable under all types of conditions.
- Be tolerant of a broad range of environmental conditions.
- Be readily solubilized and possess some detergency.
- Be low in toxicity and corrosivity.
- Be inexpensive.

Self-Check 2	Written Test

Name_____ **ID**_____ **Date**_____

Directions: Answer the questions listed below.

TEST I. Say true or false (5 points each)

1. Disinfectant refers to the statistical destruction and removal of all living organisms.(5 point)
2. Sterilize inanimate objects and the destruction of all vegetative cells (not spores). (5 point)

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

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

Information Sheet- 3 Collecting, treating and disposing of recycling waste

3.1 Introduction

Edible oil wastes that are made of plant residues and oils and discarded after use pose a significant disposal problem in many parts of the world. Several plants provide oil from nutritional needs (olive, palm, soybean, rapeseed, sunflower seed, and peanut), but, in particular, olive oil extraction produces a large quantity of wastes as residues. Such wastes are characterized by high salinity, low pH values, high contents in phenol derivates and organic matter, and nutrients.

3.2 Collecting, treating and disposing of waste

Oil processing (from cleaning/sorting to packaging) generates huge amounts of solid waste that are either disposed in landfills or rivers, causing environmental hazards or at a lower extent they are recycled through livestock as feed resources. The industrial oil solid waste includes the leaves, the spoiled pules, the unused peels, tissue, or fibrous material along with the inedible part of the seed (husks, kernels, seeds). This latter part of the solid waste from oil processing industries may reach up to 80% depending on the size of the pits and the type of processing. Valorization of the agro-industrial solid waste is challenging for the global food industry given the diversity in the type of oil, heterogeneity among cultivars but also seasonality of production and various ways of end-use that require different ways of processing.

3.3 Recycling waste

Recycling: means using again or to reuse waste material by converting it into something new. An example of recycle is when you return bottles, which are then processed into new glass products. It can be done;

- On-site Recovery and Reuse
- Production of Useful by-product

Self-Check -3	Written Test

Name_____ **ID**_____ **Date**_____

Directions: Answer the questions listed below.

TEST I. Say true or false (5 points each)

1. Edible oil wastes that are made of plant residues and oils and discarded after use pose a significant disposal problem in many parts of the world. (5 point)
2. Recycling means using again or to reuse waste material by converting it into something new (5 point).

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

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

Information Sheet- 4 conducting workplace environmental guidelines

4.1 Introduction

The environmental health and safety (EHS) Guidelines for Oil Production and Processing are applicable to facilities that extract and process oils and fats from a variety of seeds, grains, and nuts; these include canola, cottonseed, mustard, olive, palm, palm-kernel, peanut (groundnut), rapeseed, safflower, sesame, soybean and sunflower. Additionally covered are oil seed size reduction production and refining processes, from the preparation of raw materials to the bottling and packaging of final products for human or animal consumption.

4.2 Work place environmental guidelines

Checking of work environment should include

- Ventilations
- Lighting
- Noise
- Heat

Ventilation: - From the worker should expect to report to his/her supervisor if any occurrence which related to ventilations such as Odors, Dusts, Gases, Vapors, Fumes and Smoke. And ensure that ventilation system conforms to the National Building Code and the Local Fire and Public Health Regulations.

Lighting: - Make sure that your eyes have time to adapt to changes in lighting level as you move from one area to another. We cannot see properly when we first move from a brightly illuminated area to a darker area. The eyes need a few minutes to adjust to the dark area.

Noise: - The best method of protection is to use quieter equipment, enclosures, and noise reducing materials. Using hearing protection is recommended as required. Need to keep mixer, blender and trolleys in good running condition.

Heat: - the most serious illness is heat stroke, which may be fatal. Heat stroke occurs as a result of working in very hot environments. The symptoms include poor coordination and

abnormal behavior which the person may not be aware of, hot and dry skin, and loss of consciousness.

4.3 Occupational Health and Safety Monitoring

The working environment and workers' health should be monitored for occupational hazards and diseases relevant to the specific project. Monitoring should be designed and implemented by accredited professionals, as well as applicable prevention or protection measures, as part of an occupational health and safety monitoring and prevention program. Facilities should also maintain a record of occupational accidents, diseases, and dangerous occurrences and other accidents. The General EHS Guidelines provide additional guidance on occupational health and safety monitoring programs.

4.4 Personal Protective Equipment

- Clothing
- Aprons
- Footwear
- Hand Protection
- Eye Protection
- Respirations

Self-Check -4	Written Test

Name_____ **ID**_____ **Date**_____

Directions: Answer the questions listed below.

TEST I. Say true or false (5 points each)

1. Ventilation is the exchange of air between the lungs and the atmosphere so that oxygen can be exchanged for carbon dioxide in the alveoli (the tiny air sacs in the lungs (5 point)
2. Occupational Health and Safety is a multidisciplinary practice dealing with all aspects of health and safety in the workplace, with a strong focus on preventing workplace hazards. (5 point).

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

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

LG #28	LO 4- Record information

Instruction sheet
This learning guide is developed to provide you the necessary information regarding the following content coverage and topics: • Recording workplace information • Documenting workplace information • Signing all records • Communicating record 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: • Record workplace information • Document workplace information • Sign all records • Communicate record 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 4. Accomplish the Self-checks

1.1 Recording workplace information is:

- Standard Operating Procedures (sops)
- Specifications
- Materials Safety Data Sheets (MSDS
- Production schedules and instructions
- Routine maintenance schedules
- Work notes

1.2 Standard Operating Procedures (sops)

An SOP, in fact, defines expected practices in all businesses where quality standards exist. SOPs play an important role in your small business. SOPs are policies, procedures and standards you need in the operations, marketing and administration disciplines within your business to ensure success. These can create:

- Efficiencies, and therefore profitability
- Consistency and reliability in production and service
- Fewer errors in all areas
- A way to resolve conflicts between partners
- A healthy and safe environment
- Protection of employers in areas of potential liability and personnel matters
- A roadmap for how to resolve issues – and the removal of emotion from
- Troubleshooting – allowing needed focus on solving the problem
- A first line of defense in any inspection, whether it be by a regulatory body, a partner
- Potential partner, a client, or a firm conducting due diligence for a possible
- Purchase
- Value added to your business should you ever wish to sell it

Developing an SOP is about systemizing all of your processes and documenting them. Every business has a unique market, every entrepreneur has his/her own leadership style, and every industry has its own best practices. No two businesses will have an identical

collection of SOPs. Below is a listing of just a few typical SOPs, which you will want to consider writing for your own small business.

Production/Operations

- Production line steps
- Equipment maintenance, inspection procedures
- New employee training

1.3 Specifications

A specification is exact statement of the particular need to be satisfied, or essential characteristics that customer requires (in a good, material, methods, process, service, or work).

1.4 Materials Safety Data Sheets (MSDS)

A material safety data sheet is a technical document which provides detailed and comprehensive information on a controlled product related to:

- Health effects of exposure to the product
- Hazard evaluation related to the product's handling, storage or use
- Measure to protect workers at risk of exposure
- Emergency procedures.

The data sheet may be written, printed or otherwise expressed, and must meet the availability, design and content requirements of WHMIS legislation. The legislation provides for flexibility of design and wording but requires that a minimum number of categories of information be completed and that all hazardous ingredients meeting certain criteria be listed subject to exemptions granted under the Hazardous Materials Information Review Act.

1.5 Production schedules and instructions

Oil seed schedules may be announced for next 10 years with monitoring through a National Commission for productivity enhancement, self-reliance through

- Strengthening of National Agriculture Research System (NARS) for Extension service
- Establishment of Endowment fund for edible oil production from farm to fork

- Rejuvenation of Ethiopian Oilseeds Development Board to plan, coordinate and to provide secretarial support to the commission

1.6 Routine maintenance schedules

1Routine scheduled maintenance is any task that is given a deadline and assigned to a technician. It can either be a recurring task done at regular intervals or a one-time task. Scheduled maintenance includes inspections, adjustments, regular service, and planned shutdowns. Routine Scheduled maintenance has the following general attributes that distinguish it from other forms of maintenance:

- The routine is most commonly based on fixed intervals of time, such as “every x hours of machine time”, “every x days”.
- It usually occurs quite regularly, since as daily, weekly, monthly or quarterly.
- The routine activities are funded from the annual operating budget.
- Depending on the type of building, it represents anywhere from 10-30% of the operating.
- Many of the tasks are performed by contractors under a service agreement and is therefore a form of planned maintenance.
- The majority the routine maintenance tasks are performed as time-based maintenance (TbM).
- It is proactive in nature

1.7 Work notes

Work notes are an important part of the state flow process and are used to communicate information about state transitions. The state flow adds these work notes to the Work notes field of any task making this transition.

These rules apply to state flow work notes:

- For a state flow with no Starting state, the work note is added every time the task transitions to the Ending state.
- For a state flow with a Starting state and an Ending state, the work note is added only when the task transitions from that starting state to that ending state.

- If two state flows with work notes have the same Ending state, but only one has a Starting state, the system adds the work notes from the state flow with the starting state. This better matches the state flow work note to the more important transition between specific starting and ending states.

Self-Check 1	Written Test

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

1 Specification is exact statement of the particular need to be satisfied, or essential characteristics (5 point)
2 Work notes are an important part of the state flow process and are used to communicate information about state transitions. (5 point)

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

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

Information Sheet- 2 documenting workplace information

2.1 Introduction

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

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

2.2 Importance of documentation

Documentation provides information on when, who, and how to complete the task. The document provides the evidence providing that the tasks has been completed as they should be.

2.3 List of documents

List of documents which was recorded in processing industry are provided below

- Batch manufacturing records.
- Bill of materials
- Specification
- Sops
- Protocols
- Test methods

2.4 Check lists

- Forms/Log sheets
- Training assessments
- Certificate of Analysis
- Technology transfer documents
- Maintenance records
- Calibration records

2.5 Basic requirements of good documentation practices (GDP)

- Always record the entries at the time of activity simultaneously.
- Always record date with the signature in GDP records.
- Never use a pencil or erasable or water-soluble ink in the records.
- Never sign for someone else on any documents. Only sign on the work that you have performed yourself.
- Never use white ink or correction fluid to correct the entry in GDP records.
- Never backdate GMP records.
- Never discard original raw data of any kind.
- Documentation and records used throughout the manufacturing process, as well as supporting must meet the basic requirements of GDP.

2.6 Preparation of documents

- Clear and concise titles should be used for headings, tables, graphs' and etc.
- All documents should have the signature and date of the person who prepared the document, review the document and approved the document.
- All master documents should have an effective date, and current version number.
- Words that everyone can understand should be used. Unfamiliar words reduce the reader's understanding of what is written.
- Definition of abbreviations should always be included in the document for reference.

Self-Check -2	Written Test

Name_____ **ID**_____ **Date**_____

Directions: Answer the questions listed below.

TEST I. Say true or false (5 points each)

1. Documentation provides information on when, who, and how to complete the task. (5 point)
2. Records are important for their content and as evidence of communication, decisions, actions, and history (5 point).

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

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

Information Sheet- 3 Signing all records

3.1 Signing all records

All Activities being recorded Sign has effective messages to address security policy and protection concerns. All activities being recorded sign are a helpful tool to help protect the health and safety of personnel, and are not a replacement for required protective measures for lessening or removing hazards. All activities which are undertaken starting from setting up of the oil seed size reduction to oil refining should be recorded and signed by the concerned personnel.

The activities which may be recorded and signed by concerned personal are:

- Amount of seed size reduction
- Faulty equipment
- Maintenance of equipment required
- Accident happened
- Corrective action may be taken
- Different control point measurements like temperature, gauge records,
- Work area maintenance
- Performance of different Pipe, fittings, valve, storage tank etc.

Workplace information is recorded clearly and accurately in the format and at the time required by the organization. Records provide the industry manager with data, information and knowledge.

Self-Check -3	Written Test

Name_____ **ID**_____ **Date**_____

Directions: Answer the questions listed below.

TEST I. Say true or false (5 points each)

1. All activities which are undertaken starting from preparation of storage area to storing the raw materials should be recorded and signed by the concerned personnel.

   (5 point)

2. Workplace information is recorded clearly and accurately in the format and at the time required by the organization

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

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

Information Sheet- 4 Communicating record information

4.1 Introduction

Communication is the exchange of information/message between two or more people through a transmission medium/channel so as to reach a common understanding. Oral communication skills are:

- Questioning,
- Active listening, asking for clarification
- Seeking advice from supervisor

It involves the sender (who transmits a message) over a selected channel to the receiver (who receives the message) as presented in Figure 6

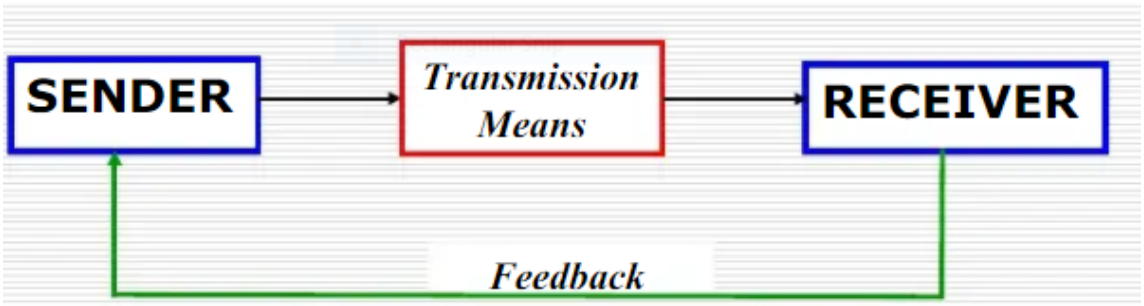

Figure 5 A simplified communication process model

4.2 Communicating record information

A telecommunications (telephone, radio, television, satellites and e-mails) process that produces an electronic message that is transmitted, received, stored or archived, and may be retrieved. Noun A telecommunications process, that produces a hard copy record of the transmission, such as a teletypewriter printout or a facsimile printout.

4.3 Records information Important

Records are important for their content and as evidence of communication, decisions, actions, and history. As public institutions, school boards/authorities are accountable to the public and to government. Records support openness and transparency by documenting and providing evidence of work activities and by making them available to the public. Records support quality program and services, inform decision making, and help meet organizational goals.

Self-Check -4	Written Test

Name_____ **ID**_____ **Date**_____

Directions: Answer the questions listed below.

TEST I. Say true or false (5 points each)

1. Communication is the exchange of information between two or more people through a transmission medium. (5 point)
2. Records are important for their content and as evidence of communication, decisions, actions, and history (5 point).

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

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

References

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