POULTRY PRODUCTION

NTQF Level -II

Learning Guide -23

Unit of Competence: - Apply Safety Measures in farm Operation

Module Title: - Applying Safety Measures in farm Operation

LG Code: AGR PLP2 M07 LO1-LG-23

TTLM Code: AGR PLP2 TTLM 1219v1

LO 1: Determine areas of concern for safety measures

Instruction Sheet	Learning Guide # 23

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

- Identifying work tasks
- Determining place for safety measures
- Determining time for safety measures
- Preparing appropriate tools, materials and outfits.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- Identify work tasks in line with farm operations
- Determine place for safety measures in line with farm operations
- Determine time for safety measures are in line with farm operations
- Prepare appropriate tools, materials and outfits in line with job requirements

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, - 4”.
4. Accomplish the “Self-check 1 - 4” **in page -2, 6, 18 and 20** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1 in **page -21.**
6. Do the “LAP test” **in page – 22** (if you are ready).

Information Sheet-1	Identifying work tasks

1. Introduction

Poultry farming is the raising of domesticated birds such as chickens, turkeys, ducks, and geese, for the purpose of farming meat or eggs for food.

The majority of poultry farms form part of the production chain for chicken eggs or for chicken broiler meat. Other species, e.g. duck, goose and quail only form a very small proportion of activities in comparison.

Poultry production relies on a network of enterprises including different work tasks such as: -

- ✓ Feed milling, mixing and feeding
- ✓ Feed storage and delivery
- ✓ Managing chicken health like bio security
- ✓ Following breeding programs to produce new chicken
- ✓ Egg collecting, handling and storage
- ✓ Downstream marketing of final product.

Self-Check -1	Written Test

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

1. Define poultry farming. (3pts).
2. Modern poultry production relies on a sophisticated network of enterprises including----------, ----------, and----------. (3pts)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-2	Determining place for safety measures

2.1. Concept of safety measures

Safety means the provision and control of work environment systems and human behavior which together give relative freedom from those conditions and circumstances which can cause personal injury, disease or death, or property damage.

The law protects the health and safety of everyone in the workplace, and to ensure that adequate welfare facilities are provided for people at work. It sets out precautions that must be taken before work in a confined space, and requires a safety sign where there is significant risk to health and safety not controlled by other methods.

2.2. Safety measures for poultry farms and hatcheries.

a) A suitably isolated geographical location is recommended.

b) Poultry establishments should be located and constructed to provide adequate drainage for the site.

c) Poultry houses and hatcheries should be designed and constructed (preferably of smooth impervious materials) so that cleaning and disinfection can be carried out effectively.

d) The establishment should be surrounded by a security fence to prevent the entry of unwanted animals and people.

e) A sign indicating restricted entry should be posted at the entrance to the establishment.

☞ **Additional safety measures for poultry farms**

a) Establishments should be designed to house a single species and a single production type. The design should also consider the ‘all-in all-out’ single age group principle.

b) Poultry houses, and buildings used to store feed, eggs or other material, should be constructed and maintained to prevent the entry of wild birds, rodents and arthropods.

c) Where feasible, feed should be delivered into the farm from outside the security fence.

Visitors entering the poultry buildings should wear disposable overalls or clean overalls provided by the farm, that are capable of being laundered and boots which can be cleaned and disinfected.

All visitors must use the same high hygiene standards as farm staff e.g. hand washing on entering and leaving the poultry house.

A footbath is a very simple form of safety measures that helps prevent the potential spread of disease. Organisms have the potential to survive for several days or weeks in the dirt stuck to the bottom of your shoes. Footbaths can eliminate these organisms. Depending on the amount of traffic on your farm, it may be necessary to have more than one footbath. Be sure that materials are provided at every footbath. Do not share scrub brushes between separate footbaths.

☞ **Manage human contact with birds**

- ✓ Always start work with the younger stock and finish with the oldest.
- ✓ Check where your visitors have been - have they been in contact with poultry in the last 3 days or have they recently been overseas?
- ✓ Prevent anyone who has had recent contact with other poultry from working with your flock until they have followed strict biosecurity measures as required for your property.

Table 1. Safety measures check list for poultry farm location, site and buildings.

SAFETY MEASURES CHECK LIST		
1.	**FARM LOCATION**	✓
	Is the farm located away from other livestock and contaminating sources?	
2	**POULTRY SITE**	
	Is there a site plan?	
	Is access to the site controlled?	
	Is the perimeter of the site clearly indicated?	
	Is the perimeter of the site fenced?	
	Is there a specified entry point to the farm?	
	Is the visitor parking adjacent to the site entrance and easy to clean?	
	Do the farm roads have a hard surface that is easy to clean?	
	Is other poultry housed on the site?	
	Is a room for changing clothes, footwear and washing hands at the entrance available?	
3	**BULDINGS**	
	Are buildings durably constructed and can they easily be cleaned?	
	Is access by wild birds and vermin prevented?	
	Are the exteriors kept clean and tidy and not used for storing miscellaneous materials?	
	Are the entries kept closed and locked?	
	Is the site equipped with a clean changing room where staff and visitors can wash, sanitise hands and change clothes and footwear before and after leaving house?	
	Are the standards of ancillary rooms similar to those of the poultry houses?	
4	**SITE AND HOUSE ENTRANCE**	
	Is it possible to change into coveralls and boot before entering and leaving the site and each poultry house for both staff and visitors?	
	Is there at least a double foot dip barrier and room for changing clothes/boots for visitors and staff?	
	Are the foot dips or changing of boots used consistently by all visitors and staff?	
	Is there a clear demarcation?	

Self-Check -2	Written Test

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

1. List at least five Safety measures of Poultry farms. (5pts)
2. Define safety? (3pts)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-3	Determining time for safety measures

3.1. Safety measures during vaccination and medication period

Use of personal protective equipment (PPE), which is equipment or clothing worn by veterinarian to prevent the transmission of infection from poultry to man or vice versa. All PPE must be applied and removed in a specific order to ensure the skin, nose, mouth, and eyes are covered to prevent transmission of infection to health care providers. Depending on the type of additional precaution or risk assessment, a gown, goggles, face shield, and mask are used during vaccination and medicating chickens.

☞ **Vaccination**

Disease prevention through vaccination is one of the aspects of bio-security. Disease causing organisms can be classified as smallest to largest - viruses, mycoplasma, bacteria, fungi, protozoa and parasites. All these organisms are susceptible to chemotherapy, except viruses. Bacterial infections are controlled through antibiotics but not much medication is available to fight viral infections thus vaccines are used.

For poultry, when vaccinating:

- ✓ always follow the instructions on the label, including storage conditions
- ✓ use disposable syringes and needles
- ✓ discard all unused vaccines, syringes and needles in a proper manner
- ✓ be clean, but never use detergents or disinfectants near vaccination equipment. Do not disinfect skin before vaccinating with fowl pox or Marek's HVT vaccine, as this will kill the vaccine virus.

Handling vaccines on the farm

Vaccines are fragile in many respects and require very careful handling to ensure they retain their potency. Poor handling procedures will, in most cases, result in a rapid decline of potency.

The important safety handling requirements on the farm are:

On receipt of the vaccine on the farm, check and record:

- ✓ That the vaccine has been transported in the recommended manner which is usually in the chilled or frozen state. Prolonged exposure to atmospheric temperature will result in rapid loss of potency.

- ✓ Type of vaccine - is it the vaccine ordered.
- ✓ The number of doses - has the correct amount been delivered.
- ✓ The expiry date of the vaccine – vaccines have a date by when there is a significant risk that they will no longer retain their potency and will not produce the immunity required. The expiry date is based on the vaccine being handled and stored in the recommended manner.

As soon as possible place the vaccine into recommended storage conditions. Read the instructions to find out what these are. However, freeze dried material should be kept at a temperature below freezing and its diluent at a temperature just above freezing. Liquid vaccines are generally kept at temperatures just above freezing.

Remove the vaccines from storage immediately prior to their being used.

- ✓ Protect the vaccines after mixing by holding them in an ice bath. Place ice in a small esky or similar container and place the container of mixed vaccine in the ice. Some vaccines have a very short life once mixed. For example, Marek's Disease has a life of about 1.5 hours after mixing IF HELD IN AN ICE BATH. It is much shorter if held in higher temperatures.
- ✓ Use the recommended administration techniques and do not vary these without veterinary advice.
- ✓ Always clean and sterilise the vaccinating equipment thoroughly after use.
- ✓ Always destroy unused mixed vaccines after the task has been completed. Some vaccines have the potential to cause harm if not destroyed properly.
- ✓ Do not vaccinate birds that are showing signs of disease or stress.

When giving vaccine and drug via IM or IV care must be taken to ensure that the needle does not pass through into a key organ and that other unwanted organisms are not administered to the bird at the same time by contaminated vaccine or equipment. Contamination can be prevented by good hygiene and vaccine handling procedures.

When vaccinating by using drinking water

- ✓ vaccine is added to the drinking water and, as a consequence, is less time consuming and is significantly less stressful on the birds and operator. Take care to ensure the vaccine is administered correctly as there is much scope for error.

The recommended technique observes the following:

- ✓ All equipment used for vaccination is carefully cleaned and free of detergents and disinfectants
- ✓ Only cold, clean water of drinking quality should be used
- ✓ The water present in the drinking trough should be consumed before vaccination

☞ **During medication of chicken.**

Veterinary medicines are to be stored at the correct temperature in a locked store, away from animals and unauthorized persons.

- ✓ Used containers, packaging etc., must be disposed of according to national legislation, avoiding possible contamination of feed, water, soil etc.

In addition, many medications need to be administered orally using an eyedropper, but you need to be very careful not to let the liquid go down the windpipe which can cause the hen to aspirate and possibly die. That means pushing the eyedropper further down the throat which isn't pleasant for the patient.

When setting withdrawal periods under the prescribing cascade, the minimum withdrawal period for eggs is 7 days and for meat is 28 days. However, the Veterinary Medicines Directorate (VMD) guidelines also state that consideration must be given to the withdrawal periods set for other species. For example, a milk withdrawal period may be used as a guide when setting an egg withdrawal period. Additionally, consideration must be given to avian physiology; laying hens and ducks tend to have at least 14 days' worth of eggs developing in their ovary.

In practice, the meat withdrawal set for products used under the cascade should either be 28 days or identical to the meat withdrawal period for the authorized (food-producing) species (whichever is longer).

With regard to egg withdrawal periods, they should be a minimum of 7 days, but if there is a milk withdrawal period, this should be used as a guide, with 15 days added on to take into account the developing egg yolks.

Remove sick birds: - Regularly observe your birds for any signs of ill health or problems within the flock such as feather pecking. Remove sick chickens and other poultry from the main flock and obtain a diagnosis from a qualified person. Sick birds usually appear different to healthy birds. You can give the correct treatment once you identify the disease or problem. Keep ill birds quarantined from the flock until completely recovered. If medication is given, it is important to adhere to any withholding periods.

3.2. Safety measures during feed mixing and feeding

It is very important to keep feed free from contamination. When pelletized feed is processed properly, the heat treatment helps eliminate certain bacteria such as Salmonella. It is preferred that producers use feed of this standard. If you are mixing your own feed, you should take steps to minimize the risk of contamination.

- ✓ Movement of feed out of infected premises is prohibited, if considered as a potential source of pathogen.
- ✓ Contaminated feed (or feed suspect for contamination) will be destroyed, preferably on site.
- ✓ Feed may be delivered to infected premises under license, subject to strict quarantine and decontamination procedures on entry/exit from poultry premises.
- ✓ Feed mills that are epidemiologically linked (contaminated) will be considered separate infected premises.

A) If you buy from feed mills

Buy your feed from a mill that has a quality and food safety control program in place similar to the Feed Assure program. Ask the mill to provide you with written confirmation on the invoice or in a separate letter.

If you mix feed on-farm

Develop a control program for your feed mixing operation. Special measures are needed to prevent bacterial contamination and to control the risk associated with handling medicated products (i.e. contamination of non-medicated feed with

medicated feed) and in proper mixing of medicated products. The focus must primarily be on the following four critical control points:

(1) weighing the correct quantity of the appropriate medication

(2) proper mixing of medications in the feed

(3) prevention of cross contamination (e.g. flushing, sequencing, etc.)

(4) adherence to withdrawal times if required

3.3. Safety measures during collecting egg

Which came first, the safe work practices or the healthy egg and poultry worker? Either way you crack it, attention to safety is the answer. Working around animals and their wastes can expose you to zoonotic diseases, transmissible from animals to humans.

To help prevent exposure:

- ✓ Learn about the potential diseases that could affect pullets and hen flocks so you can monitor them for signs and symptoms.
- ✓ Remove sick animals and dispose of dead animals promptly.
- ✓ Wear personal protective equipment (PPE) such as coveralls, gloves, and hair coverings.
- ✓ Work in well ventilated and filtered areas.
- ✓ Wear an approved respirator if there is exposure to dusts and airborne contaminants from the animals or their wastes.
- ✓ Equipment used for the collection, handling and storage of eggs should be kept clean and properly maintained.

Personnel involved in egg handling should not smoke, eat or drink during this operation, and in any case not in the rooms where eggs are handled or stored.

- ✓ Collect eggs daily at a minimum and more frequently in warmer or extreme weather. As most hens lay the majority of eggs by 10:00 am, it is best to collect them as soon as possible after they are laid to reduce the opportunity for bacterial growth.
- ✓ Collect eggs in clean trays, baskets or containers. If trays are made of cardboard and cannot be cleaned, they should be used only once and then discarded. If they are made of metal wire and plastic coating, and are reused, make sure to wash and clean them properly with appropriate sanitizers.

- ✓ Handle eggs carefully to prevent cracking. If collecting eggs in baskets, remove them from baskets evenly.
- ✓ Remove all eggs that are cracked, leaking or extremely dirty (fecally contaminated) as they are likely to be contaminated with bacteria. Dispose of them appropriately or send them to a breaker plant for further processing.

Safety during Cleaning eggs

- ✓ Do not cool eggs rapidly before they are cleaned, as the shell will contract and pull any dirt or bacteria on the surface into the pores of the egg.
- ✓ Clean the eggs as soon as you collect them. This eliminates sources of contamination and loss of interior quality. Wash eggs with potable water 10 degrees warmer than the egg. This will make the egg contents swell and push the dirt away from the pores of the egg. If the eggs are extremely dirty a mild detergent approved for egg washing can be used. NEVER let eggs sit in water, as once the temperature equalizes the egg can absorb contaminants from the water.
- ✓ Dry and cool eggs quickly after washing, store in a refrigerator at <10°C.
- ✓ Separate floor eggs from nest/cage eggs.

Safety during Storing eggs.

- ✓ Sort un cracked, undamaged eggs on clean surfaces, and store them in clean containers.
- ✓ Store eggs in a refrigerator (<10°C and 70-75% relative humidity) as soon as possible after collecting and cleaning.
- ✓ Store cleaned eggs with the small end down to keep the air cell stable during storage.
- ✓ Label cartons with the farm name and address so you can identify your eggs.
- ✓ Date the tray/carton so you can use or sell the oldest eggs first. Try to use or sell all eggs before they are three weeks old.
- ✓ Never store eggs with odorous materials, as eggs absorb odours from other foods (e.g. fish, onions) or from chemicals.
- ✓ Never leave eggs at room temperatures as warm, dry environments will cause decreased interior quality and increases food safety risks.
- ✓ Store empty egg trays off the floor.

3.4. Safety measures during transporting poultry.

- ✓ **Preparing delivery trucks for transport**

Clean and disinfect delivery trucks thoroughly before each use. Clean the inside of the truck as well as the cab.

- ✓ **Heat or cool the truck environment to a temperature range of 21° to** 35°C/70° to 95°F before chicks are loaded.

Relative humidity of the truck environment should be between 50% and 65%.

- ✓ **Preparing the Chicks for Transport**

Drivers must follow the hatchery's biosecurity procedures before entering the hatchery. This could include: showering and wearing freshly laundered clothing, coveralls, boots, and hair nets.

- ✓ The birds are counted and placed in new cardboard boxes or in cleaned and disinfected plastic boxes. Ensure the plastic boxes are not damaged.
- ✓ Both plastic boxes and birds should be completely dry before transport. Birds should not have any wet or crusty feathers.
- ✓ Provide no less than 24.5 cm^2 (3.8 in^2) box floor space per chick and 27.1 cm^2 (4.2 in^2) box floor space per poult.
- ✓ If chick paper is used in the boxes, it must be new, clean and dry.
- ✓ Chicks and poults must be able to stand erect during transport.
- ✓ Maintain holding areas for boxes of chicks or poults at a temperature range of 21° to 27°C/70° to 80°F and a relative humidity of 40% to 60%.
- ✓ The time from hatching to farm delivery should be kept as short as possible. Ideally, transport time should not be longer than 24 hours and cannot exceed 72 hours from time of hatching.

3.5. Safety measures during Cleaning, sanitizing and disinfecting

Cleaning and disinfection are key components of Cleaning and disinfection are main components of routine biosecurity in poultry farming.

To raise clean, quality chickens, you have to have a clean environment. Cleaning, disinfecting and downtime are the keys to breaking the cycle of contamination.

Disinfectants do not work well unless the barn is clean first. You should have effective cleaning procedures. You should follow cleaning with your disinfecting program. If you do not, you will not break the contamination cycle.

You must:

- ☞ Clean and disinfect your barn thoroughly (complete washing) after a disease outbreak (e.g. ILT-infectious laryngotracheitis) or a disease outbreak that required depopulation (e.g. Avian Influenza or Newcastle Disease).

If you suspect a disease has infected your flock, for example a problem that required veterinary consultation, you should clean and disinfect your barn thoroughly.

Barn Exteriors and Equipment cleaning and disinfecting

You must clean (remove build-up), wash and disinfect the fans regularly, when this is practical. Plan for the ease of cleaning when you are thinking about replacing fans or about beginning new construction.

You must:

- ✓ Keep the barn exterior and equipment clean; use any method suitable to remove dust build-up as necessary. Pay attention around the windows, doors, feed bin areas and air intakes.
- ✓ Empty and thoroughly clean the feed bin boots and feeding systems (augers and lines) between flocks.
- ✓ Inspect the feed bin for leaks after each flock.
- ✓ The inside and outside of the feed bin and parts of the feeding system outside the barn should be inspected for feed caking and rust after each flock.

Barn Interiors and Equipment

You should routinely clean (remove dust/debris, etc.) workrooms and entryways. This reduces the risk of contamination and gives staff a safe working environment.

At a minimum, you must:

- ✓ Clean each barn thoroughly after each flock. Do this as soon as possible after the flock is shipped.
- ✓ You must plan to have the barn empty, but ready for the new flock for the longest possible time.

- ✓ Don't share equipment between flocks or properties. If this is unavoidable, only share essential equipment and make sure it is thoroughly cleaned and disinfected before use.
- ✓ Routinely clean and fumigate poultry incubators.

Disinfecting

- ☞ You must disinfect the barn at least once per year and this must be after the barn has

been washed with water. This includes all walls, feeders, drinkers, walls, ceilings and all other equipment (e.g. hoppers, feeding chains, etc). You can do this either with a disinfectant wash or by fumigating.

- ☞ Water lines must be cleaned or disinfected with a cleaning or disinfecting product between flocks if a cleaning or disinfection program has not been used during the cycle of the flock. Avoid recontamination.

All of the equipment (e.g. shovels, pails, bobcats, etc) used in the barn clean-out must undergo the same cleaning and disinfection procedures that are performed on the barn.

Table 2. Safety check list for disinfection

	CHECKLIST	
No	**DISINFECTION**	✓
1	Is the site always disinfected between flocks?	
2	Does the disinfection also include feed pipes and pan feed systems?	
3	Are feeders and drinkers empty until disinfection is completed?	
4	Are only approved disinfectants used and in amounts prescribed by the manufacturer?	
5	Do you make sure that removed equipment does not re contaminate the disinfected house?	
6	Is a power washer with sufficient capacity used to apply disinfectants at high pressure to saturation point?	
7	Is the solution applied evenly to all washed surfaces to achieve thorough wetting?	
8	Is it made sure to spray into the apex of the roof and work down the walls to the floor?	
9	Is it made sure that the air inlets and outlet vents are included in the cleaning and disinfection and that they are not left closed during disinfection?	
10	Is it made sure to close all doors and place foot dips at entrances after disinfection?	
11	If insect problems arise are the floors and walls sprayed with insecticide after disinfection and drying.	
12	Are vermin, flies and other anthropoid's controlled adequately?	

Litter- A variety of litter types may be used to bed the poultry, but it should be free from contamination by livestock, wild birds and rodents. New litter can be treated with proprietary organic/blends of acids/acid products or other antibacterial products such as formaldehyde or certain disinfectants to reduce the risk of bacterial contamination.

Table 3. Safety check list for litter

	SAFETY CHECK LIST	✓
	LITTER SUPPLY AND DISPOSAL	
1	Is litter coming from a reliable source and not contaminated?	
2	Is litter stored at all times on pallets and covered with clean water/bird/vermin proof protection?	
3	Are damaged bales and old litter removed and disposed of appropriately?	

Downtime

A rest period optimizes the cleaning and disinfection protocol. The rest period allows for the destruction of micro-organisms which could have survived the disinfection/ fumigation process, but are susceptible to natural dehydration/desiccation.

The best practice is to allow for a minimum of 14 days between when the flock has been shipped and prior to placement of the new chicks. To be effective, cleaning (and disinfection) of the barn needs to take place as soon as the birds are shipped to break the cycle of contamination.

- ✓ All manure should be targeted to be removed from the barn within 48 hours of the birds being shipped to maximize the effectiveness of the downtime period.
- ✓ Barn cleaning (and disinfecting) should take place as soon as the flock has been shipped in order to maximize the rest period.
- ✓ All access to the barn should be minimized after cleaning to avoid recontamination.
- ✓ If a period less than 14 days in between shipping and placement is unavoidable, washing and disinfection should be performed.

3.6. Safety measures for workers during work.

- ✓ Wear safety shoes with non-skid soles
- ✓ Wear appropriate eye protection; consult a safety supervisor or a supplier
- ✓ Protect hands with chemical-resistant gloves; if impractical, use a barrier cream
- ✓ Install effective exhaust ventilation and air conditioning to prevent air contamination and heat or cold stress
- ✓ Wear a respirator to avoid inhalation of dust or aerosols
- ✓ Replace formaldehyde as a disinfectant with less harmful substitutes available on the market
- ✓ Maintain a high level of personal hygiene. At the end of work, shower and change clothes. Do not take work-soiled clothing home
- ✓ Learn and use safe lifting and moving techniques for heavy or awkward loads; use mechanical aids to assist in lifting

✓ Before using any disinfectant, the label must be red and understood.

Self-Check –3	Written Test

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

1. List major safety measures during
   - ✓ Vaccination and medication. (2pts)
   - ✓ Poultry transportation. (2pts)
   - ✓ Cleaning and disinfecting. (2pts)
   - ✓ Visiting farm. (1pt)
2. _____is a rest period optimizes the cleaning and disinfection protocol. (1pts)
3. What is appropriate T^{o} and humidity to store eggs in a refrigerator as soon as collecting and cleaning. (1pts)

Note: **Satisfactory rating - 9 points** **Unsatisfactory - below 9points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-4	Prepare appropriate tools, materials and outfits

A number of tools, material and outfit are used in our day-to-day work. In the same way, many types of equipments are required for normal functioning of a poultry farm, for instance, crates, Candler, automatic syringe, wrenches, screw driver, pliers, shovel and raking tools and Outfit such as masks, gloves, boots, overall coats, hat and eye goggles. Therefore, it is necessary to know about the materials, tools and equipments which are needed in poultry farms. The knowledge about the equipments also helps you to look for locally available cheaper alternatives so that the business becomes more profitable. So the detail information of those material will be discussed in the next learning guide.

Self-Check -4	Written Test

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

1. List at least three material and equipment used in poultry operation. (3pts)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Operation Sheet 1	Decontamination Procedures

Procedures to clean equipment, PPE, vehicle tires, and other items that become contaminated.

Step 1. Select disinfectant that will be active across a wide spectrum of germs under the conditions in which it will usually be used.

Step 2. When on-site, consult the owner or operator to select a location for later decontamination. Where possible, use an existing decontamination area on-site.

Step 3. If there is no designated decontamination area already on-site, select an area onsite, but in an area that will minimize recontamination when leaving the site. The area should allow for proper management of the rinsate (e.g., rinsate will not runoff the property).

Step 4. Place clean clothing to change into, as appropriate, in a closed bag at the decontamination site.

Step 5. Place all needed decontamination supplies including sufficient water or access to running water at the decontamination site.

Step 6. Mix the disinfectant (if not ready-to-use) according to label directions and use appropriate PPE e.g., gloves, eye protection.

Step 7. Brush or rinse the contaminated item to remove all visible manure and other debris.

Step 8. Apply disinfectant to the item or place item in a container of disinfectant, according to label directions being careful to allow the disinfectant to remain in contact with the item for the required length of time if listed on the label.

Step 9. Rinse with water if and as directed on the disinfectant label.

Step 10. Place the decontaminated item in a clean location or in a clean bag or other container.

Step 11. Manage or contain rinsate if needed, and as appropriate.

Step 12. Dispose of used disinfectant according to label directions.

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LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 2 hours.

Task 1. Clean equipment

Task 2. Clean PPE

List of Reference Materials

1- Gernat, A. 2004. Poultry Farm Biosecurity Field Manual. NC State University. Publication AG-651. Jeffrey, J.S. 1997. Biosecurity for Poultry Flocks. University of California, Davis, School of Veterinary Medicine

2- OIE. 2019. *Terrestrial Animal Health Code* - 28/06/2019

3- Susan Fitzgerald, 2017. Poultry Handling and Transportation Manual, Al Dam, Provincial Poultry Specialist, Ontario Ministry of Agriculture, Food and Rural Affairs.

4- Web Addresses

- ✓ https://www2.gov.bc.ca
- ✓ https://www.chickenfarmers.ca
- ✓ https://www.fresheggsdaily.com
- ✓ https://www.bsava.com
- ✓ https://www.business.qld.gov.au

POULTRY PRODUCTION

NTQF Level –II

Learning Guide -24

Unit of Competence: - Apply Safety Measures in farm Operation

Module Title: - Applying Safety Measures in farm Operation

LG Code: AGR PLP2 M07 LO2-LG-24

TTLM Code: AGR PLP2 TTLM 1219v1

LO 2: Apply appropriate safety measures

Instruction Sheet	Learning Guide #24

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

- Using tools and materials
- Wearing outfits.
- Observing effectively/shelf life/expiration of materials
- knowing and following emergency procedures
- Identifying and reporting hazards in the workplace.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- use tools and materials according to specifications and procedures
- wear outfits according to farm requirements
- observe effectivity/shelf life/expiration of materials are strictly
- know and follow emergency procedures to ensure a safe work requirement
- Identified and reported hazards in the workplace in line with farm guidelines

Learning Instructions:

7. Read the specific objectives of this Learning Guide.
8. Follow the instructions described below 3 to 6.
9. Read the information written in the information “Sheet 1 - 5”.
10. Accomplish the “Self-check 1 - 5” **in page -7, 10, 12,15 and 19** respectively.
11. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1 in **page -19. And operation sheet 2- on page 21.**
12. Do the “LAP test” **in page – 22** (if you are ready).

Information Sheet-1	Using tools and materials

1. Introduction

Poultry production in the world are reared is either cage system, deep litter system and extensive system. Hence, some of equipments required in a poultry farm such as crates, Candler, shovel and raking tool, sprayer and weighing scale are discussed below:

1.1. Crates

Crates are box-like structures made of meshwork used for transportation of birds. Recently, impact resistant plastic is used for crates so that it will be light in weight, durable, easy to handle, clean and disinfect. There is possibility of injury to the birds while loading birds into the crates, transportation and unloading. The base of the crates will be of meshwork 2.5 cm × 2.5 cm so that the birds can be comfortable while on it. All sides will be of meshwork 7.5 cm × 7.5 cm so that good ventilation is possible. An opening (30 cm × 30 cm) with a lid is provided on the top to help loading and unloading. A crate of dimensions 90 cm × 45 cm and of height 30 cm can easily accommodate 10 to 15 broilers depending on body weight.

Fig.1. poultry crates

1.2. Shovel and Raking Tool

Shovel used in agricultural operations is used in poultry farms for removal of manure. Raking tool helps in mixing the litter so that cake formation of the litter is prevented. If raking is not done regularly, droppings (faeces) from the bird will mix with the litter material resulting in cake formation. Hence, raking is done with a raking tool in order to keep the litter dry.

Fig.2. shovel and raking tools

1.3. Sprayers

Sprayers are used for disinfection of building, birds, men, material and surrounding areas, as and when required. Several types of sprayers are available in the market. But, sprayers which are hand-operated and can be carried on the back while in use is most ideal for a poultry farm. The desired disinfectant or sanitizer can be mixed and loaded on to the tank and sprayed as required.

Fig.3. Sprayer

1.4. Vaccinating Syringe

Unlike broilers, laying-type birds have to be given several vaccinations and some of them by injections. Therefore, automatic vaccinating equipment which loads a set volume of vaccine into the syringe is required to carry-out vaccination within a reasonable time.

Fig.4. Automatic syringe

1.5. Weighing Balance

A balance is a necessary requirement for weighing feed, birds at market etc. Now a day, balance with a digital display to the nearest gram is available at reasonable rates. If a farmer wishes to sell broilers on retail, a 5 kg or 1 kg balance is sufficient. If birds are sold wholesale, a spring balance with a sensitivity of 100 or 25 g is desirable.

Fig.7. Weighing Balance

1.6. Candler

This equipment produces a beam of light which is used to get an idea about the internal quality of eggs without breaking.

Fig.8. Candler

1.7. Egg filler flats

By now, you are familiar with rectangular trays with depressions to suit eggs in the market place where you buy eggs. They are called “Egg filler flats”. Each of them can hold 30 eggs. It can be made of plastic or paper pulp. Plastic ones are common because they are durable and easy to clean and disinfect. However, pulp trays reduce breakage of eggs during transportation and are environment-friendly. Eggs are directly collected in such filler flats.

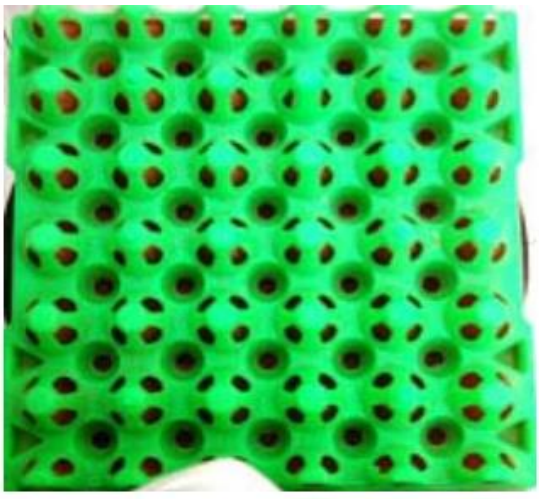


Fig:7a. Plastic egg filler flat

Fig. 8b. Paper pulp filler flats

1.8. A screwdriver

Is a tool, manual or powered, for screwing (installing) and unscrewing (removing) screws. A typical simple screwdriver has a handle and a shaft, ending in a tip the user puts into the screw head before turning the handle. The shaft is usually made of tough steel to resist bending or twisting.

Fig.8. A screwdriver

1.9. Pliers

Is a hand tool used hold objects firmly. They also useful for bedding and compressing a wide range of materials. Generally, pliers consist of a pair of metal first-class levers joined at a fulcrum positioned closer to one end of the levers, creating short jaws on one side of the fulcrum, and longer handles on the other side. This arrangement creates a mechanical advantage, allowing the force of the hand's grip to be amplified and focused on an object with precision. The jaws can also be used to manipulate objects too small or unwieldy to be manipulated with the fingers.

Fig.9. **Pliers**

1.10. wrenches

A wrench or spanner is a tool used to provide grip and mechanical advantage in applying torque to turn objects—usually rotary fasteners, such as nuts and bolts—or keep them from turning.

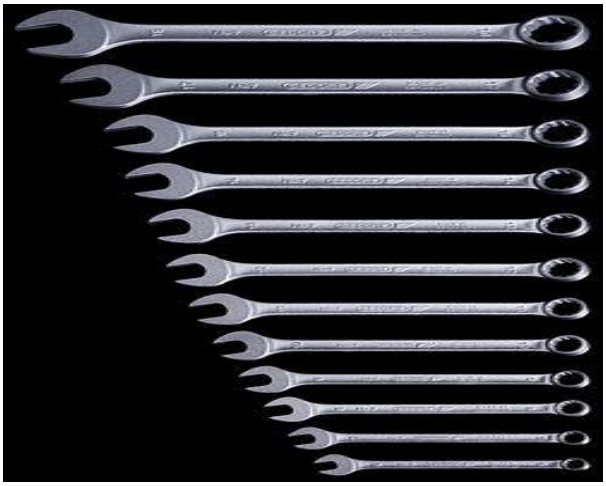


Fig. 10. Wrenches

Self-Check -1	Written Test

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

1. List at least four materials with their use. (4pts)
2. Write the name of material illustrated below. (4pts)

a) ----------

b) ----------

(C) ----------

Note: **Satisfactory rating – 8 points** **Unsatisfactory - below 8 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-2	Wearing outfits

2.1. Selecting and Maintaining of suitable personal protective equipment

The range of actions are both systemic and at an operational level. These are listed below:

Systems should be in place to ensure the safe operation and maintenance of machinery and equipment. Precautions should also be in place to minimize exposure to noise, gases and organic dusts.

Fixtures should be in place in all storage sheds including appropriate access ladders, hand rails and ladder cages *Personal protective equipment* should be selected, used and maintained.

Suitable personal protective equipments should be selected and maintained so as to develop convenient working environments which protect workers from different occupational hazards.

Those personal protective equipments which are needed by intensive poultry production are: boots, hat/hard hat, overalls, gloves, protective eyewear, hearing protection, respirator or face mask, and sun protection (sun hat, sun screen).

Appropriate personal protective equipments and their usage are listed below:

Safety Gear	Description	Function
Coverall 	This is a loose fitting garment worn over ordinary clothes. Coveralls can have long or short sleeves	Coveralls are worn over all of a person's clothing to ensure that they are not soiled and that the skin is covered for added protection against harmful substances such as pesticides When a coverall is not available a long sleeve shirt and long pants are worn.
Goggles 	This is a close fitting protective glasses with side shields. It has an elastic band to fit around the head to hold it in place.	It protects the eyes from dust particles, fumes and harmful chemicals. Safety glasses or goggles should be worn when spraying chemicals or carrying out any job where the eyes should be protected.
Respirator 	Dust mask /Respirator is an apparatus worn over the face to cover the nostrils. They also contain elastic bands to hold them in place.	The dust mask is used to prevent inhalation of dust or smoke. The respirator can also protect against dust or smoke but it is used primarily when spraying pesticides to prevent the inhalation of poisonous fumes from the chemicals. It has a filter so when worn on the face you are able to breathe clean air. The dust mask is disposable while the

Rubber boots 	Rubber-boots cover the feet, ankles and the lower legs.	Rubber boots are waterproof, that is, the feet are protected from getting wet. Checks should be made to ensure that there are no holes in them. The feet are also protected when using sharp tools and damage from obstacles such as nails or broken glass on the ground which may cause injury to bare feet.
Gloves  Rubber glove  Cloth glove	Gloves are coverings for the hands. There are separate parts for each finger and thumb. There are also long (elbow length) and short gloves.	It is used when handling fertilizers and other corrosive chemicals. Gloves are necessary to protect the skin from exposure to toxic materials. It is important to wear the right type glove for proper protection according to the job that must be carried out. Rubber/ plastic gloves can be used when spraying. If they get wet the hands are still protected. Cloth gloves are used to protect the hand from bruises when using tools. Gloves should be checked often for rips or holes.

Self-Check -2	Written Test

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

1. List all outfit used in poultry operation in respective to their function. (5pts)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-3	Observing effectively/shelf life/expiration of materials

3.1. Shelf life expiration date of material

The shelf life expiration date (SLED) for warehouse stock is established when goods are received. This date is updated in the quantity, where it can be viewed and changed if necessary.

For materials that are managed in batches, the shelf life expiration date is kept in the batch and cannot be changed in Warehouse Management (WM).

When shelf life management is active for a particular material, you must enter the expiration date on the stock placement preparation screen when you create a transfer order. The system can then print the shelf life expiration date on pallet documents.

You enter the shelf life data into the **storage view** of the material master record. This data includes:

- ✓ Maximum time a material can be stored
- ✓ Minimum shelf life a material must have available to be accepted by the system
- ✓ Percentage of the total shelf life that must still be available if the goods are to be sent to another distribution point
- ✓ Time unit used for the shelf life data (days, weeks or years)
- ✓ Total number of days that the goods can be kept – from production to the shelf life expiration date.

Self-Check -3	Written Test

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

1. What are the shelf life data you enter into the storage view of the material master record? (6pts)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-4	knowing and following emergency procedures

4. Concept of emergency

An emergency is an event, outside the scope of normal farm operations, that requires prompt action. Farm staff may need to quickly coordinate resources to protect the health, safety and welfare of the people and animals, to limit the damage to property and the environment, and to manage the risk of animals or products that may leave the farm.

4.1. Draw up an emergency plan

An emergency plan is vital. Some suggestions include:

- ✓ Make sure there is easy access to a suitable and well-stocked first aid kit.
- ✓ Make sure at least one person on the farm is trained in first aid.
- ✓ Keep emergency numbers and correct addresses next to the telephone.
- ✓ Plan routes to the nearest hospital – make sure it has an emergency department.
- ✓ Regularly talk through your emergency plan with your family and other workers.
- ✓ Make sure your children understand what to do in an emergency.

The focus is on widespread emergencies, but completing a farm emergency plan will help you prepare for emergencies specific to your operation.

4.2. Emergency Management Phases

The ultimate purpose of emergency management is to save lives, preserve the environment and protect property and the economy. Emergency management is comprised of four interdependent components:

- ☞ **Prevention and Mitigation** - to eliminate or reduce the risks of an emergency before it occurs in order to protect lives, property, the environment, and reduce economic disruption.
- ☞ **Preparedness** - to be ready to respond to an emergency and manage disaster consequences through steps taken prior to an event, such as developing plans, agreements, and training.
- ☞ **Emergency Response** - to act immediately before, during or after an emergency to manage its consequences.
- ☞ **Disaster Recovery** - to repair or restore conditions to an acceptable level after a disaster.

Self-Check -4	Written Test

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

1. Define emergency. (2pts)
2. What are the components of emergency management? (4pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-5	Identified and reported hazards in the workplace in line with farm guidelines

5.1. Identifying & assessing OHS hazards and risk & managing

Occupational Health and Safety hazards related to the daily operations of the poultry sector can be grouped into five categories:

1. Physical hazards
2. Confined spaces
3. Exposure to chemical hazards
4. Exposure to organic dust
5. Exposure to biological agents

1. Exposure to Physical Hazards

Workers in poultry production facilities may become exposed to a series of physical hazards related to equipment and vehicle operation and repair, trip and fall hazards, and lifting heavy weights, which are common to other industries.

Recommendations applicable to poultry production include:

- ☞ Prevention of falls into openings for water supply systems, underground manure storage tanks, and other confined spaces through installation of covers, fences, and other fall prevention methods;
- ☞ Training on correct bird handling techniques and provision of appropriate personal protective equipment (PPE), such as gloves and aprons, to prevent scratches.

2. Confined Spaces

Occupational health and safety hazards associated with confined spaces on farms (e.g. manure pits, silos, grain bins, water tanks, or inadequately ventilated buildings) include the risk of asphyxiation, primarily due to the accumulation of methane. Entry to all confined spaces should be restricted and should be subject to permitted supervision by properly trained persons.

3. Chemical Hazards

Potentially hazardous substances used in poultry production activities may include pesticides, disinfecting agents, minerals, antibiotic and hormonal products.

Potential exposures to pesticides include dermal contact and inhalation during their preparation and application as well as ingestion due to consumption of contaminated water. The effect of such impacts may be increased by climatic conditions, such as wind, which may increase the chance of unintended drift, or high temperatures, which may be a deterrent to the use of personal protective equipment (PPE) by the operator. Recommended management practices include the following:

- ☞ Train personnel on how to apply chemicals and use PPE and ensure that personnel have received the necessary certifications,
- ☞ Ensure hygiene practices are followed (in accordance to FAO) to avoid exposure of family members to the general chemical hazards.

4. Exposure to organic dust

Source of dust in poultry production operations include handling and storage of feed ingredients which may include particles from grain, mites, fungi, and bacteria, as well as inorganic material such as limestone. Other sources of dust include bird manure and associated bio-aerosols.

Job functions with a potentially higher incidence of exposure to dust include cleaning of silos and grain hoppers, milling of feed grain, and handling of poultry waste. Some dusts may contain antigens that can cause severe irritation to the respiratory tract. Acute toxic alveolitis, otherwise known as organic dust toxic syndrome, can accompany brief, occasional exposures to heavy concentrations of organic dust and moldy feed materials in agricultural environment.

Recommendations for dust control specific to poultry production include:

- ☞ Use local air extraction devices at dust generating equipment, such as silos and grinders;
- ☞ Ensure that workers potentially exposed to dust and bio-aerosols, such as catching gangs, are provided with adequate respiratory protection including properly fitted masks equipped with filters especially designed to capture dust and micro-organisms;
- ☞ Store only dry feed and grain to minimize microorganism growth.

5. Exposure to Biological Agents

Workers may be exposed to a range of pathogens such as bacteria, fungi, mites and viruses (including “bird flu”) transmitted from live birds, excreta, carcasses and parasites and ticks.

Workers may also be exposed to skin sensitizers, such as dander from bird feathers. If antibiotics are used in feed, antibiotic resistant micro-organisms might develop in the gastrointestinal tract of birds. Resistant bacteria can potentially infect humans on or in the vicinity of the farm.

Management measures that should be taken to avoid the negative consequences of worker exposure to biological agents include the following.

- ☞ Inform workers of potential risks of exposure to biological agents and provide training in recognizing and mitigating those risks;
- ☞ Provide personal protective equipment to minimize all forms of exposure to materials potentially containing pathogens;
- ☞ Ensure that those that have developed allergic reactions to biological agents are not working with these substances.

Self-Check - 5	Written Test

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

1. Occupational Health and Safety hazards related to the daily operations of the poultry sector can be grouped into ---------- categories. (1pt)
2. List all OHS hazards which occur in poultry operation. (5pts)
3. What are recommendations for dust control specific to poultry production? (1pt)
4. Write the management measures taken to avoid the negative consequences of worker exposure to biological agents. (1pt)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Operation Sheet 1	Safely wear and remove PPE in sequence

1.1. Wear PPE in sequence to reduce exposure to pathogenic while visiting affected farm.

Step 1. Always put on essential required PPE when handling either a suspected, probable or confirmed case of pathogenic.

Step 2. The dressing and undressing of PPE should be supervised by another trained Member of the team.

Step 3. Gather all the necessary items of PPE beforehand. Put on the scrub suit in the changing room.

Step 4. Put on rubber boots. If not available, make sure you have closed, puncture and fluid resistant shoes and put on overshoes.

Step 5. Put on face protection:

Step 5. 5a Put on a medical mask. 5b Put on goggles or a face shield.

Step 6. Put a head cover on at this time.

Step 7. Perform hand hygiene.

Step. Put on gloves* (over cuff).

1.2. Remove PPE in sequence to reduce exposure to pathogenic while visiting affected farm.

Step 1. Remove and dispose of the apron, if worn

Step 2. Clean and disinfect boots

Step 3. Remove boots

Step 4. Remove and dispose of the coverall

Step 5. Remove and dispose of gloves

Step 6. Wash hands with soap and water

Step 7. Remove goggles and respirator

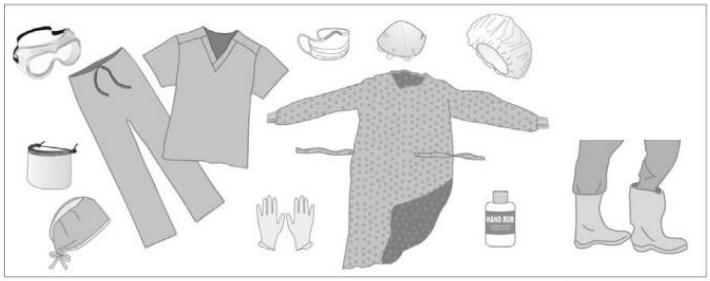
Step 8. Clean and disinfect reusable goggles and respirator

Step 9. Wash hands with soap and water again.

1 Always put on essential required PPE when handling either a suspected, probable or confirmed case of viral haemorragic fever.

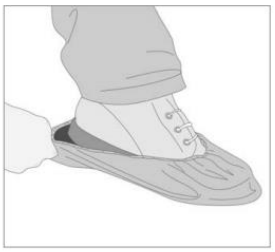
2 The dressing and undressing of PPE should be supervised by another trained member of the team.

3 Gather all the necessary items of PPE beforehand. Put on the scrub suit in the changing room.

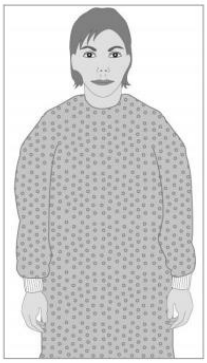


4 Put on rubber boots. If not available, make sure you have closed, puncture and fluid resistant shoes and put on overshoes.

OR, IF BOOTS UNAVAILABLE



5 Place the impermeable gown over the scrubs.

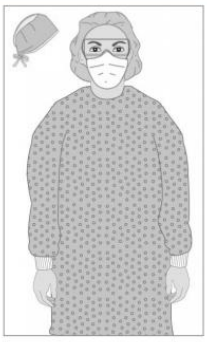


6 Put on face protection:

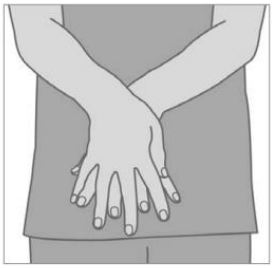
6a Put on a medical mask.

6b Put on goggles or a face shield.

7 If available, put a head cover on at this time.



8 Perform hand hygiene.



9 Put on gloves* (over cuff).

10 If an impermeable gown is not available, place waterproof apron over gown.

Fig 1. Steps to put on personal protective equipment (PPE)

Operation Sheet 2	Make safety and health emergency planning kit at farm

STEP 1:

- ✓ Fill out Farm Critical Information Sheet.
- ✓ Fill out Family Members/Workers Emergency Contact Information Sheet.

STEP 2:

- ✓ Fill out Emergency Contact Sheets. Place copies in areas that are easily accessible by all family members/ workers, including near telephones and in farm vehicles/equipment.
- ✓ Fill out In Case of Emergency Sheets for family members/workers performing tasks in isolated locations such as fields and pastures.

STEP 3: Complete Farm Site Map(s).

STEP 4: Fill out Location of Personal Protective Equipment and Emergency Clean-Up Supplies Sheet.

STEP 5: Place items from **STEPS 1, 3 and 4** in waterproof emergency tube/container. Mount waterproof emergency tube/container in a highly visible location near the farm entrance (e.g., attached to a hydro pole, yard sign, side of building, etc.).

STEP 6: Train family members/workers/visitors on the farm safety and health emergency plan. Update and review the plan regularly with family members/workers.

STEP 7: Contact your local fire department to make them aware of your farm safety and health emergency plan and the location of the emergency tube/container.

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

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

Task 1. Putting on the PPE safely before Visiting the poultry farm

Task 2. Remove the PPE safely after Visiting the poultry farm

Task 3. Make safety and health emergency planning kit at farm

List of Reference Materials

Web Addresses

1. https://help.sap.com.
2. https://www2.gov.bc.ca
3. https://en.wikipedia.org/
4. **https://www.who.int/csr/disease/ebola/put_on_ppequipment.pdf**
5. https://www.safemanitoba.com/Page%20Related%20Documents/resources/Farm%20Safety%20and%20Health%20Emergency%20Planning%20Kit.pdf.

POULTRY PRODUCTION

NTQF Level -II

Learning Guide -25

Unit of Competence: - Apply Safety Measures in farm Operation

Module Title: - Applying Safety Measures in farm Operation

LG Code: AGR PLP2 M07 LO3-LG 25

TTLM Code: AGR PLP2 TTLM 1219v1

LO 3: Safe keep/dispose tools, materials and outfit

Instruction Sheet	Learning Guide # 25

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

- Cleaning and storing used tools and outfit after use.
- Labelling and storing unused materials.
- Disposing Waste materials.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- Clean used tools and outfit after use and store in designated areas
- Label and store unused materials properly according to manufacturer's recommendation and farm requirements
- Dispose waste materials according to manufacturers, government and farm requirements

Learning Instructions:

13. Read the specific objectives of this Learning Guide.
14. Follow the instructions described below .
15. Read the information written in the information "Sheet 1- 3".
16. Accomplish the "Self-check 1 - 3" **in page -3, 5 and 9** respectively.

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Information Sheet-1	Cleaning and storing used tools and outfit after use.

1. Introduction

Cleaning- the removal of gross contamination, organic material, and debris from the premises or respective structures, via mechanical means like sweeping (dry cleaning) and/or the use of water and soap or detergent (wet cleaning).

Disinfection- Methods used on surfaces to destroy or eliminate a specific species of infectious microorganism through physical (e.g., heat) or chemical (e.g., disinfectant) means. A combination of methods may be required.

Good tools can be quite an investment, but if you take good care of them, they'll return the favor. Keeping your tools properly stored, cleaned, and maintained will save you time and money.

- **Clean your tools, equipment and outfit after every use**

Cleaning your tools may be the last thing you want to do after a day of work, but it's essential for keeping your tools in good shape. And it really only takes a few seconds per tool unless you've got something really nasty on your hands. It's well-worth the time spent doing a little cleaning to save the time spent repairing a tool (or the money spent replacing it) later. Cleaning your tools, equipment and outfit doesn't have to be difficult at all if you're prepared.

The cleaning and disinfection (C&D) of used equipment, materials, outfit and premises is done to prevent or mitigate the spread of foreign animal diseases (FADs) during an outbreak. As part of a wider response, this helps to stabilize animal agriculture, the food supply, the economy, and to protect public health and the environment.

- **Inspect (and repair) your tools, equipment and outfit every time you use them**

☞ Evaluation of the tools, equipment, outfit and premises after cleaning and disinfection procedures

Following the cleaning and disinfection an inspection should be conducted (by individual as designated by the unified Incident command) to ensure that appropriate cleaning and disinfection has been completed successfully. If there is any doubt or sign of inadequate procedures, additional measures may be required.

The evaluation assesses and confirms that the following have taken place:

- ✓ All grossly contaminated material, equipment, outfit and areas have been identified and properly cleaned disinfected with an appropriate disinfectant.
- ✓ All personnel are aware of cleaning and disinfection measures and implement them for themselves and their equipment (e.g., PPE, tools, and instruments).
- ✓ Any contaminated wood or items difficult to disinfect have been appraised, removed, and disposed of in a manner that minimizes spread of pathogens (e.g., burned, composted, or buried).
- ✓ All fixtures and fittings have been cleaned and disinfected.
- ✓ The necessary contact time of the disinfectant was permitted.
- ✓ Effluent from the cleaning and disinfection procedures has been handled in a manner to minimize or avoid environmental impact.

☞ Store your tools, equipment and outfit properly

Keep your tools, equipment and outfit in a dry place. It seems obvious, but garages and basements and other enclosed spaces can have humidity issues, especially if they are not heated or air-conditioned. If you keep your tools in a location like this, especially if you keep them out on shelves or pegboards, consider investing in a dehumidifier to keep the dampness down. They're not terribly expensive, especially compared to your investment in your tools, and most let you set a humidity level so the dehumidifier turns on only when it needs to.

Self-Check -1	Written Test

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

1. What is the benefit of cleaning the material and equipment after used? (2pts)
2. Define cleaning. (1pt)
3. Define disinfection. (1pt)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-2	Labelling and storing unused materials.

Proper material labeling and storage of used and unused is essential for a safe work environment. Inappropriate storage of incompatible or unknown material can lead to different hazards. To minimize these hazards, materials in the workshop must be segregated properly. The sorting and storage procedures listed below are not intended to be all-inclusive but should serve instead to supplement more specific procedures and recommendations obtained from supervisor, and Safety Data Sheets (SDSs).

☞ **Red tagging procedure**

- ✓ Sort necessary and unnecessary items.
- ✓ Decide red tag holding areas.
- ✓ Attach red tag to unnecessary items.
- ✓ Taking unnecessary things to “red tag holding areas”.
- ✓ Decision making
- ✓ List all unnecessary things using the unused article list.
- ✓ Listing all necessary things in the shop stock list.

When unnecessary items are collected from various departments/sections, the followings must be recorded and filed for smooth discarding procedures:

- ✓ Name of items
- ✓ Inventory number
- ✓ Where it was
- ✓ Where it will be stored

Practice of Set emphasizes on proper orderliness of things in the work place. Items are placed to facilitate easy access and to optimize workflow.

For example; - Signboards are set at the entrance to access easily for various services locations in the work area.

- ✓ All locations are named or numbered.
- ✓ Every item has to be labelled with an inventory number (discretely) and assigned a location. The assigned location is marked on the item and at the location.
- ✓ Visual controls including color coding are practiced.

Self-Check -2	Written Test

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

1. Describe red tag method of sorting materials. (3pts)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-3	Disposing Waste materials.

3. Concept of waste

Waste is defined as: ‘any gas, liquid, solid or energy or a combination of wastes that is surplus to, or unwanted from, any industrial, commercial, domestic or other activity, whether or not of value’.

Wastes can be considered, as those materials no longer required by an individual, institution or industry. Wastes are thus regarded as by-products or end products of the production and consumption process respectively

3.1. Checking for storage and disposal systems

Where possible, any unwanted material should be considered as a potential by-product rather than a waste without value. This applies to feathers, blood, fat or carcass tissues. Profit margins are small and, if there is a way of selling a by-product, rather than paying for its disposal, this is clearly worth exploring.

Examples are feathers to be used for pillows, and hens' feet and heads, which, if collected hygienically, can be exported to regions such as West Africa. Like the rest of the poultry industry, the by-product business is volatile, possibly even more so, and plant operators should consider how to handle by-products as waste, in case an existing market collapse. Also, possible opportunities for turning waste materials into by-products should be under constant review.

waste management options for litter including land application of litter as an organic fertilizer.

The planning, construction and operation of poultry installations of any size should consider the issues involved in storing, managing and utilizing waste by-products. Many systems and approaches, including land application as fertilizer, recycling as animal feed components, and recovery for fuel energy, are available and can be successful if properly operated and managed.

The following management measures are recommended to minimize the amount of manure produced, to facilitate handling of animal wastes, and to minimize migration of contaminants to surface water, groundwater, and air.

- ✓ Match feed content to the specific nutritional requirements of the birds in their different production / growth stages;
- ✓ Use quality, uncontaminated feed materials (e.g. where concentrations of pesticides and dioxins are known and do not exceed acceptable levels) that contain no more copper, zinc, and other additives than is necessary for animal health
- ✓ Ensure production and manure storage facilities are constructed to prevent manure contamination of surface water and ground water (e.g. use of concrete floors, use of roof gutters on buildings to collect and divert clean storm water, and covering manure storage areas with a fixed roof or plastic sheeting)
- ✓ Keep waste as dry as possible by scraping wastes instead of or in addition to flushing with water to remove waste, minimize amount of water used during cleaning (for example, by using high-pressure, low-flow nozzles)
- ✓ Use hot water or steam in cleaning activities instead of cold water, as this can reduce the amount of water used by 50 percent.

West disposal

The site-specific disposal plan describes disposal options suitable for the specific site. Not all disposal options are appropriate for every type of waste generated. Cleaning & disinfection personnel should coordinate with the Disposal Group on the proper way to dispose of disinfectant solutions, pesticides, and other waste items resulting from the Cleaning & disinfection process and from Cleaning & disinfection supplies to bedding, feed, and manure. Solid waste rules must be used to classify these materials.

Disposal of Disinfectants (Concentrate and Waste)

Any small amount of unused waste disinfectant concentrate should be disposed of according to the label instructions. Consult a qualified waste disposal professional for the disposal of larger quantities of disinfectant concentrate. No special procedures of

disposal are required for small quantities of waste disinfectant solution resulting from excess spray and runoff. Large amounts of waste disinfectant must be collected, tested, characterized, and disposed of by the appropriate jurisdiction. If possible, it can be filtered and reused.

Disposal of Solid Waste

Treat cleaning &disinfection supplies (e.g., towels and mops) as debris and properly disinfect them before removal from premises. Rendering is generally not applicable for manure, bedding, or feed; however, onsite composting can meet the needs of disposal for these materials as long as the site is suitable. If not, these materials will have to be securely transported to a permitted landfill, or disposed by one of the following options: regional composting, fixed incineration, open burning, unlined burial.

Self-Check -3	Written Test

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

1. What are management measures recommended to minimize the amount of manure produced? (3pts).
2. Define waste. (1pt).
3. Write the use of poultry feathers. (1pt)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

List of Reference Materials

2. USDA. 2018. Standard Operating Procedures: Cleaning and Disinfection manual.
3. **Web Addresses**
    - ✓ https://lifehacker.com
    - ✓ https://extension.umd.edu
    - ✓ http://www.fao.org/poultry-production

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