Poultry production

LTQF Level III

Learning Guide # 57

Unit of Competence: Apply and maintain litter management program

Module Title: Applying and maintaining litter management program

LG Code: AGR PLP3 M14 LO1 LG-57

TTLM Code: AGR APR 3 TTLM 0120v1

LO1. Prepare for applying and maintain litter material

Instruction Sheet	Learning Guide # 57

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

- Checking materials and equipment for applying and maintaining litter and litter by-products
- Preparing work site and facilities to industry standards
- Preparing litter applying and maintaining activities
- Recognizing Potential and existing *OHS 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 –

- Check materials and equipment for applying and maintaining litter and litter by-products
- Prepare work site and facilities to industry standards
- Prepare litter applying and maintaining activities
- Recognize Potential and existing *OHS hazards* in the workplace

Learning Instructions:

1. Read the specific objectives of this Learning Guide .
2. Follow the instructions described in number 1 to 4.
3. Read the information written in the “Information Sheet (**1, 2, 3 and 4**) in page 3**,7,11** and 12 respectively
4. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
5. Accomplish the “Self-check 1, Self-check 2, Self-check 3, and Self-check 4” in page 3, 7,11, and 12 respectively.
6. If you earned a satisfactory evaluation proceed to “the next topic”. However, if your rating is unsatisfactory, see your teacher for further instructions or read back the Learning guide information sheets **1-4**. Submit your accomplished Self-check. This will form part of your training .

Information sheet -1	Checking materials and equipment for applying and maintaining litter and litter by-products

Any activates in poultry work should required check materials and equipment for applying and maintaining litter and litter by-products. All materials and equipment has to check whether it has faulty or not. If the equipment have a problem to confirm the operation it has to maintain properly .**Before** confirming the work preconditions has to be taken this are .

- Putting on all necessarily PPE
- Check the materials and equipment properly
- Repair if there is a faulty items
- Work under the procedure and guide line of enterprises

These materials are important during applying and maintaining litter material

Sacks: - Uses as a container for used and fresh litter

Litter: - it is useful for absorbing moisture from dropping/ poultry feces/, it includes properly chopped old newspaper, saw dust, rice hulls, and coffee pulp and so on

Other Equipment includes

Spade:- uses to collect litter from floor during applying , handling and storing

Dirt pit:- uses as a temporarily storage container for dirt materials , non litter materials

Rake:- uses to collect litter into one place during storing and also to make the litter optimum depth, 15 cm during applying

litter pit:- it is useful to deposit used litter material

Weighing Scale:- it is necessary to weigh litter materials

Semi-trailers use to transport litter material during applying and storing

Self-Check -1	Written Test

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

1. List down equipment and materials for applying litter . (5pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1.

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Information sheet-2	Preparing work site and facilities to industry standards

Ventilation and wast disposal facilities should maintain in such a way that Poultry houses must be designed differently from other farm animals' shelters. If the warm moisture laden air given off by a poultry flock is not removed from the house before cooling, the moisture condenses to cause moisture, ammonia, and litter problems in the house. Litter cannot absorb all the moisture that occurs in the house.

Because of the development of high density housing system it is economically feasible to use high velocity electricity powered fans for ventilation.

The ultimate is the environmental controlled house. However, most poultry houses in different countries are still constructed with open sides and curtains that can be adjusted according to climate conditions. Other houses use a combination of fans and natural ventilation.

Production of high ammonia is dangerous and should be avoided from poultry house. Level of up to 15 to 20ppm (parts per million) is tolerance but if it goes above 40 ppm it reduces the food intake, and above 50 ppm the respiratory tract membrane is affected and respiration disease and blindness occur.

Self-Check # 2	**Written Test**

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

1. why ventilation and waste disposal facilities are important

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

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Information sheet-3	Preparing litter applying and maintaining activities

Poultry litter is used in confinement buildings used for raising chickens. Common bedding materials include wood shavings, sawdust, peanut hulls, shredded sugar cane, straw, and other dry, absorbent, low-cost organic materials.

Sand is also occasionally used as bedding. Litter material should be spread evenly to a depth of ***8-10cm***. Where floor temperature is adequate (28-30°C) litter depth can be reduced

Litter type Minimum Depth or Volume

- 2.5 cm (1 in.) Wood shavings
- 2.5 cm (1 in.) Dry sawdust
- 1 kg/m2 (0.2 lb/ft.2) Chopped straw
- 5 cm (2 in.) Rice hulls
- 5 cm (2 in.) Sunflower Husks

Litter floor :

- ✓ Floor must be flat and smooth - easy to clean and disinfect
- ✓ Have a good depth of litter cover

Fig 2. Moisture content of litter

The moisture content of the litter should be maintained to a temperature of 35 O^c if it exceeds it should be replaced . in ordered to maintain the exact levels of moisture we have to do the followings :

- ✓ Good ventilation's of the house
- ✓ Good watering facilitate
- ✓ Good litter utilization
- ✓ Even distributions of the litters

There are no regulations governing the land application of poultry litter. It is suggested that a farmstead nutrient or waste management plan be developed through the assistance.

Self-Check -3	Written Test

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

1. Wow we can maintain good moisture content of the litters (8pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1. _____

2._____

Information sheet-4	**Recognizing Potential and existing *OHS hazards* in the workplace**

There might be different hazards will in counter during applying and removing poultry litter In poultry house litter material is so important to avoid bad smell and to absorb moisture from poultry's dropping. However, if the quality and the amount of litter are low and without the available of ventilation it will increases the accumulation of the following gases

- **Ammonia**
- **Carbon dioxide**
- **Methane and hydrogen sulphide gases in poultry house.**

These gases affect the health of poultry and workers in poultry's farm , specially hydrogen sulphide will cause sudden shock to the worker , the worker will paralyzes due to the inhalations of this gas . the gas is produced in case of broken and rotten egg is available in the shade so care should be taken before confirming the jobs this gas is also dangerous to the chickens too.

Other hazards like :

- ❖ Disturbance of service
- ❖ Dusty
- ❖ Noise
- ❖ Even surfaces and holes
- ❖ Moving machinery and machinery parts
- ❖ Power equipment and tools
- ❖ Poor house design
- ❖ Suffocation
- ❖ Zoonotic disease

❖ Unsuitable environment for litter disposals

Self-Check -4	Written Test

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

1. Mention some possible OHS hazardous during cleaning litters . (5pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1. _____

References

Ezelle, A. 2012. Personal communication.

Kristensen, H.H. and C.M. Wathes. 2000. Ammonia and poultry welfare: A Review. World's Poult. Sci. J. 56:235-245.

Malone, B. 2006. Managing built-up litter. Proc. Midwest Poultry Federation Conf. March 21-23. St.Paul, MN.

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Payne, J. 2012. Litter management strategies impact nutrient content. Poultry Practices. 2(1):1-3. Okla. Coop. Ext. Ser.

Reece, F.N., B.D. Lott and J.W. Deaton. 1980. Ammonia in the atmosphere during brooding affects performance of broiler chickens. Poult Sci. 59:486-488.

Poultry production

NTQF Level III

Learning Guide # 58

Unit of Competence: Apply and maintain litter management program

Module Title:Applying and maintaining litter management program

LG Code: AGR PLP3 M14 LO1 LG-58

TTLM Code: AGR APR 3 TTLM 0120v1

LO2. Handle poultry litter and litter by-products

Instruction Sheet	Learning Guide #58

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

- Identifying and implementing **OHS** hazards
- Selecting, using and maintaining suitable personal protective clothing and equipment
- Identifying environmental implications of undertaking work
- Cleaning *litter materials* laid-out and regularly

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 and implement **OHS** hazards
- Select, use and maintain suitable personal protective clothing and equipment
- Identify environmental implications of undertaking work
- Clean litter materials laid-out and regularly

Learning Instructions:

1.Read the specific objectives of this Learning Guide .

2.Follow the instructions described in number 1 to 4.

3.Read the information written in the “Information Sheet (**1, 2, 3, and 4**) in page 3**,7,14,**and 19 respectively

4.Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.

5.Accomplish the “Self-check 1, Self-check 2, Self-check 3, and Self-check 4” in page 3, 7, 14 and 19 respectively.

6.If you earned a satisfactory evaluation proceed to “the next topic”. However, if your rating is unsatisfactory, see your teacher for further instructions or read back the Learning guide information sheets 1-4. Submit your accomplished Self-check. This will form part of your training .

7. Do operation sheet and LAP test

Information sheet -1	Identifying and implementing OHS hazards

OHS Hazards in POULTRY litter management

According to the **International** Labor Organization (ILO), health hazards in poultry working environments are categorized in to three major groups this are, **physical, chemical,** and **biological.** Here are some examples for each category mentioned above in relation to litter management

Physical

- Slippery ground .
- Holes , poor design of the walls and ventilation systems
- Skeletal problems resulting from lifting and moving of litter materials
- Dusty particles produced from litter

Chemical

- Respiratory problems resulting from exposure to dust, which is composed of feathers, dander, litters, micro-organisms, etc.
- Respiratory, skin, and eye diseases due to exposure to gaseous chemicals.(e.g. NH3, H2S, CO2, CO, and CH4.
- Exposure to disinfectants, detergents, formaldehyde and pesticides.
- Foul smell produced by bacteria

Biological

- Zoonotic infections. These diseases are transmitted between birds and humans & they also are transmitted from animals to humans and include bacterial, viral, fungal, and parasitic diseases.

- Salmonella, and avian influenza are among the most common zoonotic diseases transmitted from poultry to humans. Poultry workers are at a greater risk of being affected by these diseases.

Implement control majors

Implementation measure where set depending of rules and regulation of poultry farm Many farm could be prevented or their impacts reduced by wore proper personal protective equipment (PPE) and following OHS requirements among this **OHS requirements are:**

- Using of relevant protective clothing and equipment,
- Use of tooling and equipment,
- Workplace environment and safety handling of material,
- First aid kit
- Hazard control and hazardous materials and substances.
- Using gowns, rubber boots of appropriate size, goggles, gloves etc,
- Following OHS procedure designated for the task
- Checking and fulfilling required safety devices before starting operation

Self-Check -1	Written Test

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

2. List down some of the hazardous . (5pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

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Information sheet-2	Selecting, using and maintaining suitable personal protective clothing and equipment

Personal protective equipment (PPE) refers to any specialized equipment or clothing worn by farmers and ranchers for protection against health and safety hazards. PPE does not prevent accidents, but it does prevent or reduce injury and even fatalities when used. The protective clothing and equipment must always be:

- appropriate for the particular hazards
- maintained in good condition
- properly stored when not in use, to prevent damage or loss
- Kept clean, fully functional, and sanitary.

There are different types of materials, tools and equipment and supplies to perform different activities in poultry raising activity. Therefore, identifying, selecting, using and maintaining to the working activity are very important aspect in poultry work.

Personal Protective Equipment (PPE) The equipment designed to protect handlers from injury. This equipment should be selected based on the procedures to be accomplished, referring to manuals or supervisors if in doubt of its appropriateness.

PPE commonly includes

- Aprons
- Gloves rubber or latex to protect from caustic or toxic substances, leather or canvas to protect from abrasion, disposable plastic to maintain bio-security

- Boots [heavy leather or rubber for protection and disposable plastic for bio-security
- Eye and face protections - goggles
- Ear protection
- Mouth mask

The selection of PPE and devices to protect workers in any given hazard situation should be based on consideration of at least three factors:

- Information (yielded by the hazard assessment) on the nature and magnitude of the hazard.
- Performance data on the PPE and/or device under consideration.
- The estimated level of residual risk to which the worker will be exposed.

Use of PPE is trained to the worker in form of training program

Training programs should seek to orient learners to correct use of PPE via an optimal mix of cognitive (information-based), affective (attitudinal), and applied (laboratory practice) approaches.

Self-Check # 2	Written Test

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

1. Write the at least three factors in selecting PPE ? (2pts)
2. Write the advantages of PPE? (5pts)

Note: **Satisfactory rating - 7 points** **Unsatisfactory - below 7 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

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3._____

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Information sheet-3	Identifying environmental implications of undertaking work

During removing poultry litter the shad there are different waste material or product which will be produced and could affect the environment directly or indirectly if not properly handled. Main waste material and other things which will produced during removing of litter are

- Feathers
- Dusty particles
- Foul smell
- Dead chickens
- Poultry litter
- Chicken Drops
- Gases like ammonia ,methane,hydrogen sulphide and carbon dioxide

These waste materials which are produced in poultry have to be removed from the site on regular manure properly;

Disposable materials properly buried in deep enough trench and should be covered with quicklime and then with soil or use Burning. Sometimes Burning is the most difficult because the Fumes and smoke may be a problem to the surrounding environment. Mud holes should be frequently filled or exclude the animals away from it quickly.

We can re- use poultry litter as feed for animal,for compost making, feed for fish in the pond and as bio -fuel this methods where highly appreciated in avoidance of environmental pollution and recycling of resources Improper handling and storage of poultry litter can result in:

- Loss of fertilizer nutrients
- Contamination of surface and/or ground water
- Potential for spread of poultry diseases
- Odor and aesthetic problems

Self-Check -3	Written Test

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

1. Write some re-uses of poultry litters (8pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1. _____
2. _____
3. _____
4. _____
5. _____

Information sheet-4	Cleaning litter materials laid-out and regularly

Before cleaning all tools ,escapements and material where assembled and the person who clean the site should wear PPE then after arranging all this he/ she can start cleaning operation procedural manner based on rules and regulations of enterprises .

Litter should me clear ;

When the litter is too dry (<30%), dust conditions may persist in the pen as birds move about. In active flocks this can be a problem of introducing microorganisms into the air that the birds breathe. This will overload the birds' respiratory and digestive system with pathogens. On the other hand, the litter material should not exceed 70% moisture in the poultry pen.

High litter moisture provides an ideal environment for microorganisms to grow and multiply, increasing the possibility of pathogen exposure to the birds. High moisture also decreases the bird comfort in their environment as they seek comfortable dry bedding areas.

Higher moisture means higher ammonia production and that can lead to problems with bird health as increased intake of ammonia will increase stress on the birds. High ammonia levels can affect the bird physically as well in their upper respiratory tract, eye lesions from ammonia burn and the possibility of carcass quality being compromised as birds succumb to ammonia burn on exposed skin as they lay on the ammonia producing manure/litter mix.

The stress from increased levels of ammonia exposure decreases the bird's ability to handle other infectious agents. Ammonia burn on affected bird carcasses will lead to increased trim as birds are processed.

Self-Check -4	Written Test

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

2. Why we should clean litters in poultry farm. (5pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1. _____
2. _____
3. _____
4. _____

Operation sheet-1	Cleaning poultry litter

Objective :

- ❖ To produce conducive environment for the chickens
- ❖ To control disease transmissions

Procedures :

- ✓ Put on PPE
- ✓ Assemble all necessary material tools and equipment
- ✓ Remove all equipment from the shade before the operation
- ✓ Remove chickens from the cleaning site
- ✓ Spray water if the litter is too dry before removing it
- ✓ Start cleaning from far corner gently
- ✓ Remove or clear all the drops ,litters from the shade throughout
- ✓ Check if any litter is left in the floor holes or adhere , remove it gently if not microorganisms might remain their
- ✓ Check every corners if any thing left their
- ✓ Ventilate the shade for removes of dust particles
- ✓ Replace equipment
- ✓ Replace chickens
- ✓ Do this activity every week
- ✓ Excessive litter moisture **(>35%)** may cause health challenges

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 6 hours.

Task 1. Cleaning poultry litter

References

Ezelle, A. 2012. Personal communication.

Kristensen, H.H. and C.M. Wathes. 2000. Ammonia and poultry welfare: A Review. World's Poult. Sci. J. 56:235-245.

Malone, B. 2006. Managing built-up litter. Proc. Midwest Poultry Federation Conf. March 21-23. St.Paul, MN.

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Payne, J. 2012. Litter management strategies impact nutrient content. Poultry Practices. 2(1):1-3. Okla. Coop. Ext. Ser.

Reece, F.N., B.D. Lott and J.W. Deaton. 1980. Ammonia in the atmosphere during brooding affects performance of broiler chickens. Poult Sci. 59:486-488.

Poultry production

NTQF Level III

Learning Guide # 59

Unit of Competence: Apply and maintain litter management program

Module Title:Applying and maintaining litter management program

LG Code: AGR PLP3 M14 LO1 LG-59

TTLM Code: AGR APR 3 TTLM 0120v1

LO3. Store and replenish Poultry litter by product

Instruction Sheet	Learning Guide #59

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

- Organizing transportation to move litter by product
- Receiving litter by products according to contractual agreement
- Storing and received litter by products following storage procedures
- Ensuring stock balance control for safe processing activities based on guideline

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 –

- Organize transportation to move litter by product
- Receive litter by products according to contractual agreement.
- Store and receive litter by products following storage procedures.
- Ensure stock balance control for safe processing activities based on guideline.

Learning Instructions:

1. Read the specific objectives of this Learning Guide .
2. Follow the instructions described in number 1 to 4.
3. Read the information written in the “Information Sheet (**1, 2, 3,and 4**) in page 3**,7,11,** and 21respectively
4.Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
5. Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check and Self-check 4” in page 3, 7,11 and 21 respectively.
6.If you earned a satisfactory evaluation proceed to “the next topic”. However, if your rating is unsatisfactory, see your teacher for further instructions or read back the Learning guide information sheets 1-4. Submit your accomplished Self-check. This will form part of your training .

Information sheet -1	Organizing transportation to move litter by product

With the available equipment and vehicles the litter should be transported into pit or storage rooms or into crop land .To transport the litter semitrailers have a great benefit or any vehicles can also use to transport the litter material into crop land or storage room.

Fig. 1 litter splashing

The following guidelines are recommended for inclusion in the plan and for voluntary implementation by the farmstead owner:

- Poultry litter should be evenly distributed over application sites at a rate not to exceed 5 tons per acre per year, or according to a site-specific *land management plan*, with no more than 2.5 tons/acre in each application.
- Surface land application of poultry waste should not be undertaken when soil is saturated, frozen or covered with snow, during rainy weather, or when precipitation is in the immediate forecast.
- Poultry waste should not be applied on slopes with a grade of more than 15 percent or in any manner that will allow waste to enter the waters of the state.

Follow a site-specific land management plan, especially if there are unique features to consider.

- Surface and subsurface application of poultry waste should not be made within 25 feet of rock outcrops; 100 feet of streams, ponds, lakes, springs, sinkholes, wells, water supplies, and dwellings, or according to a site-specific land management plan.
- Records should be kept by the farmer of the dates, quantity, and specific sites where litter is applied. If the litter is sold, a record should be kept of who buys the litter, the dates, the quantities, and the farm sites where litter is applied or utilized.

- Vehicles should be covered or trapped if used for transporting poultry litter on state or federally maintained roads or any public road for more than 1 mile.

The best application rate depends on the crop and on the nutrient content of the soil before the application is made, as well as on the nutrient content of the waste material. Soil testing and manure nutrient analyses are recommended procedures for best determining poultry litter application amounts. Litter application equipment should be calibrated to better achieve accurate and even distribution of the litter.

Self-Check -1	Written Test

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

3. List down the activates before confirming your job . (5pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

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Information sheet-2	**Receiving litter by products according to contractual agreement**

Different Enterprise will produce different kinds of litter depending of their activates for examples during furniture production a saw dust will the by products so this by product will sold to poultry farm for bedding purposes . depending of the sectors different by products are produced among this :

- Shavings - excellent absorptive qualities.
- Sawdust - often high in moisture, prone to mold growth and chicks may Consume it, which may cause aspergillosis.
- Chopped straw - wheat straw is preferred to barley straw for absorptive qualities.
- Coarse chopped straw has a tendency to cake in the first few weeks.
- Paper - difficult to manage when wet, may have a slight tendency to cake and glossy paper does not work well.
- Rice Hulls - an inexpensive option in some areas, rice hulls are a good litter alternative.
- Peanut Hulls - tend to cake and crust but are manageable.

Self-Check -2	Written Test

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

1. Write sources of litter by products 5 points

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

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Information sheet-3	Storing and received litter by products following storage procedures

When litter is to be stored, there are several acceptable methods to consider. An easy, but unacceptable, method is simply just to pile it outside the house. These exposed piles can result in

runoff, which causes nutrient loss and environmental problems. These problems can be prevented with just a little thought and effort, considering the following points. Stacking: Proper stacking of poultry litter will minimize problems with nutrient loss and potential environmental contamination. Choose a well-drained site that will be convenient to get to, but will not drain directly into streams or other areas such as sinkholes where it might cause problems. Position the

length of the stack up and down the slope to prevent water from collecting behind it. Stacks should be uniformly shaped with steep sides and a well-rounded top. Stacks formed in this manner will shed water and be less likely to lose nutrients and will provide sufficient heating to reduce potential disease causing organisms.Plastic Covers: Stacked litter can be further protected by covering it with plastic. It is not as important to compact the litter; however, the rounded top and steep sides of the stack are important. A wind break of some sort near the stack could help prevent damage to the plastic. Use heavy-gauge (6mil) plastic sheeting, anchor it to prevent wind damage and take care not to tear holes during application. Anchor the plastic at the edge of the stack by placing it in a small trench and back filling with soil. Old tires and rope placed over the plastic can be used to reduce wind damage. Concrete Slab Stack Pad Some producers may already have or wish to construct a concrete slab for use in stacking poultry litter.

This can further reduce the chances of nutrient loss and water contamination. However, its greatest advantage may be in convenience to the producer. In constructing a concrete slab, plan on using six inches of concrete on top of a compacted layer of gravel or crushed rock that is at least six inches deep. Footers should be formed along the edges that are at least 12 inches deep to add strength. Wire mesh reinforcement will also add strength to the pad. A good gravel or crushed rock roadway leading to the pad will allow access when the ground is wet and soft. The litter should be stacked as discussed previously. More litter can be stacked on the pad if it is well compacted as the stack is built. If a plastic cover is to be used, heavy wooden boards or concrete

blocks can be used to hold down the edges.Concrete Bunkers Above- or below-ground concrete bunkers such as those used for making silage can be used for storage of poultry litter. The walls will allow a higher and more compact stack than can be achieved on a concrete slab. This results in a smaller surface of the litter being exposed to the air and weather, thus reducing the chance of nutrient losses. As with the other types of stacks, a plastic cover can be used to keep water out.

Roofed Structures:

Structures with permanent roofs can be used for storing poultry litter and are very effective in protecting it from the elements. However, they have several disadvantages. First, they are more expensive to build and maintain as compared to the other alternatives. Any metal parts, such as roofs, are subject to rapid corrosion. The roof may limit access by equipment and limit compaction of the litter as it is stacked. A covered structure will likely be used by wild birds that may transmit avian diseases. In building a roofed structure, the floor and walls that will be in contact with poultry litter should be constructed of concrete. When litter comes in contact with wood or other combustible material, a fire is possible as the litter heats soon after stacking. Be sure the roof is high enough to allow access by equipment for stacking and loading. If the roof is 12 feet or higher, walls may be needed to prevent rain from blowing in. Caution

Poultry litter heats through microbial activity during the first few weeks after it is stacked. Temperatures of 150°/ to 200°/F are not unusual. When manure or litter from different sources and/or moisture contents is stored together, or if the moisture content is over 25 to 30%, temperatures can go higher,and spontaneous combustion may occur. Do not stack wet litter in contact with dry litter.

Self-Check -3	Written Test

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

1. Write basic requirements of storage rooms (8pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Information sheet-4	Ensuring stock balance control for safe processing activities based on guideline

Poultry litter can be reused by processing among the methods of reusing of litters are

Litter Re-Utilization:

Some broiler producers are simply removing cake and excess litter after house washing and then placing broilers on old litter for an extended number of flocks. Their expectation is that total clean out is not needed unless there some disease or other bio-security issues. However, producers doing this should be aware that total dis-infection under these conditions is probably not possible.Re-utilization of at least some fraction of used litter as a supplement for fresh wood shavings bedding in broiler houses has been found to not significantly increase pathogens and indicator microorganisms in litter compared to using fresh wood shavings. No consistent significant differences have been found regarding flock performance when comparing houses using fresh litter with houses re-utilizing litter.A major issue with re-utilization of previously used litter is the generation of ammonia. Ammonia is produced by microbial breakdown of fecal material in the litter. It is well documented in the literature that higher moisture levels result in higher ammonia production. The caked portion of the litter is very high in moisture and nitrogen and should be removed from the house to reduce ammonia generation and provide optimal air quality for chicks during the brooding period. Add litter treatments to reduced ammonia generation. Controlling ammonia with a litter treatment can save money on energy costs by reducing the amount of air exchange required to maintain adequate air quality.

Use as Fertilizer:

Poultry litter's traditional use is as fertilizer. As with other manures, the fertilizing value of poultry litter is excellent, but it is less concentrated than chemical fertilizers, giving it a

relatively low value per ton. This makes it uneconomical to ship long distances, and it tends to lose its nitrogen value fairly quickly. Extracting its value requires that it be used on nearby farms. This limits its resale value in regions where there are more poultry farms than suitable nearby farmland.

Poultry litter composition:

Nearly all broiler, pullet, and breeder operations and some of the smaller laying hen facilities grow the birds on concrete, wooden, or earthen floors. A 2- to 6-inch layer of wood shavings, rice hulls, or other bedding material is used as a base before the birds are placed in the house. The manure and bedding mixture is commonly called litter, and it is removed one or more times a year and replaced with fresh bedding material. Most broiler operations produce 1.2 to 1.7 tons of litter per 1,000 birds. For a flock of 18,000 to 20,000 birds, this amounts to between 22 and 34 tons of litter per flock. The total nitrogen content of fresh poultry litter is usually 3 percent or more by weight on a moist weight basis (20 to 30 percent water). This results in the litter containing two-thirds to one ton of total nitrogen for each flock of 18,000 to 20,000 birds. As much as 25 percent of the total nitrogen contained in fresh litter can be fairly *mobile* and subject to leaching.

N.B. Composition of poultry manure will vary because of several factors:

1) Source of manure;
2) Feed of animals;
3) Age of animals;
4) Condition of animals;
5) Manner of storage and handling; and
6) Litter used.

Use as Cattle Feed:

Traditionally used as fertilizer, it is now also used as a livestock feed as a cost-saving measure compared with other feed stock materials, particularly for beef animals. The use of poultry litter as cattle feed was unregulated but that year the FDA issued a policy statement that poultry litter offered in interstate commerce as animal feed was adulterated, effectively banning the practice. FDA reversed this policy and passed regulation of litter to the states. In December 2003, in response to a detection of BSE (mad cow disease) in a cow in the state of Washington, the FDA announced plans to put in place a poultry litter ban. Because poultry litter can contain recycled cattle proteins as either spilled feed or feed that has passed through the avian gut, the FDA was concerned that feeding litter would be a pathway for spreading mad cow disease. In 2004, FDA decided to take a more comprehensive approach to BSE that would remove the most infectious proteins from all animal feeds.

Use as Fuel:

There are currently several electrical generating plants in the UK, and recently in the US that are utilizing poultry and turkey litter as their primary fuel. Most of these plants were developed by Energy Power Resources (in the UK). On a smaller scale, poultry litter is used in Ireland as a bio mass energy source.

Self-Check -4	Written Test

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

3. Mention some re-utilization of litters . (5pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1. _____
2. _____
3. _____
4. _____
5. _____

References

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Kristensen, H.H. and C.M. Wathes. 2000. Ammonia and poultry welfare: A Review. World's Poult. Sci. J. 56:235-245.

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Poultry production

NTQF Level III

Learning Guide # 60

Unit of Competence: Apply and maintain litter management program

Module Title: Applying and maintaining litter management program

LG Code: AGR PLP3 M14 LO4 LG-60

TTLM Code: AGR APR 3 TTLM 0120v1

LO4. Perform cleaning work area

Instruction Sheet	Learning Guide # 60

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

- Arranging appropriate cleaning materials according to work area condition.
- Cleaning and performed using relevant cleaning 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 –

- Arrange appropriate cleaning materials according to work area condition
- Clean and perform using relevant cleaning materials.

Learning Instructions:

1.Read the specific objectives of this Learning Guide .

2.Follow the instructions described in number **1 to 2**.

3.Read the information written in the “Information Sheet (**1, and 2**) in page **3** and **8** respectively

4.Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.

5.Accomplish the “Self-check 1, Self-check and Self-check 2” in page 3 and 8 respectively.

6.If you earned a satisfactory evaluation proceed to “the next topic”. However, if your rating is unsatisfactory, see your teacher for further instructions or read back the Learning guide information sheets 1-2. Submit your accomplished Self-check. This will form part of your training .

Information sheet -1	**Arrange appropriate cleaning materials according to work area condition**

There are different materials used to clean the used litter properly from the shad. litters are removed from the shade during every week interval,when new batches are coming and if it is moist and dusty according to work area conditions . There are material used to clean the litters among this :

Broom: - uses to clean dust and unwanted particles of materials from floor

Cleaning and washing brushes: - uses to avoid dirt from floor and equipment

Sacks: - Uses as a container for used and fresh litter

Detergents: - are very important to avoid dirt when mixing with water from surfaces of floor, cloths, equipment, and hand

Disinfectants: - use to kill pathogens /disease causing microorganisms/ by spraying, fumigating, dusting the equipment, materials and inside part of poultry houses

Self-Check -1	Written Test

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

1. List do materials used for cleanings . (5pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date _____

1.

- _____
- _____
- _____
- _____
- _____

Information sheet-2	Clean and perform using relevant cleaning materials

Cleaning is the process of removing unwanted substances, such as dirt, infectious agents, and other impurities, from an object or environment. Cleaning occurs in many different contexts, and uses many different methods. Several occupations are devoted to cleaning.

Cleaning -is a two-step process

step 1. Dry cleaning

Using a broom, brush, shovel, rag or compressed air to remove dust, soil and dry organic material

Remember! Dry cleaning should not be used for cleaning poultry houses infected with air-born diseases such as:Avian houses infected with air born diseases such as: Avian Influenza or Newcastle it may cause aerosolization of the virus and increase the risk of spreading the disease

step2 Wet cleaning step

- Using detergent/soap and water soak the area and scrub to remove
- remaining and scrub to remove remaining organic material as well as dirt and grease

Disinfectants are chemicals that Slow disease agents activity multiplication and their growth Slow disease agents activity, multiplication and their growth or -Kill disease agents

Disinfection is the least reliable step of bio security, depends on many factors such as:

- the quality of cleaning
- the hardness of water
- quality and suitability of disinfectant
- correct dilution and application

Common types of disinfectants

Disinfectants are divided into several groups based on their chemical structure

Like:

- ✓ Halogens (iodophors and chlorines, halamid®, dettol®)
- ✓ Alcohols
- ✓ Oxidizing agents (hydrogen-peroxide, hyperox®,virkon®)
- ✓ Phenols (fenix®, Prophyl 75®) eos(e®,opy5®
- ✓ Aldehydes (glutheraldhyde –TH4®, formalin)
- ✓ Quaternary ammonium compound (Timsen®Medisep®)

Self-Check # 2	Written Test

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

1. write some cleaning materials

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

_____

2._____

_____

_____

3._____

_____

_____

_____

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