Republic of the Philippines
DEPARTMENT OF EDUCATION

K to 12 Basic Education Curriculum

Technology and Livelihood Education

Learning Module

ANIMAL PRODUCTION

EXPLORATORY COURSE
Grade 7 and Grade 8

TABLE OF CONTENTS

What Is This Module About?

Welcome to the world of ***Animal Production!***

This Module is an exploratory course which leads you to **Animal Production** National Certificate Level II (NC II)[1]. It covers **4** common competencies that a Grade 7 / Grade 8 Technology and Livelihood Education (TLE) student like you ought to possess, namely:

1) Use farm tools and equipment;
2) Perform estimation and basic workplace calculation;
3) Interpret plans and drawings; and
4) Apply safety measures in farm operations.

These **4** common competencies are covered separately in 4 Lessons. As shown below, each Lesson is directed to the attainment of one or two learning outcomes:

Lesson 1 – Use Farm Tools and Equipment
- LO 1. Select and Use Farm Tools.
- LO 2. Select and Operate Farm Equipment
- LO 3. Perform Preventive Maintenance

Lesson 2 – Perform Estimation and Basic Calculation
- LO 1. Perform Estimation
- LO 2. Perform Basic Workplace Calculations

Lesson 3 – Interpret Plans and Drawings
- LO 1. Draw Layout Plan of Different Types of Housing
- LO 2. Enumerate the Building Codes in Constructing Poultry and Livestock Houses

Lesson 4 – Apply Safety Measures on Farm Operations
- LO 1. Apply Appropriate Safety Measures
- LO 2. Safely Keep / Dispose Materials and Outfit

Your success in this exploratory course on **Animal Production** is shown in your ability to perform the performance standards found in each learning outcome.

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[1]***NATIONAL CERTIFICATE (NC) is*** *a certification issued to individuals who achieved all the required units of competency for a national qualification as defined under the Training Regulations. NCs are aligned to specific levels within the PTQF.* ***(TESDA Board Resolution No. 2004-13, Training Regulations Framework)***

NATIONAL CERTIFICATE LEVEL *refers to the four (4) qualification levels defined in the Philippine TVET Qualifications Framework (PTQF) where the worker with:*

a. ***NC I*** *performs a routine and predictable tasks; has little judgment; and, works under supervision;*

b. ***NC II*** *performs prescribe range of functions involving known routines and procedures; has limited choice and complexity of functions, and has little accountability;*

How Do You Use This Module?

This Module has 4 Lessons. Each Lesson has the following parts.

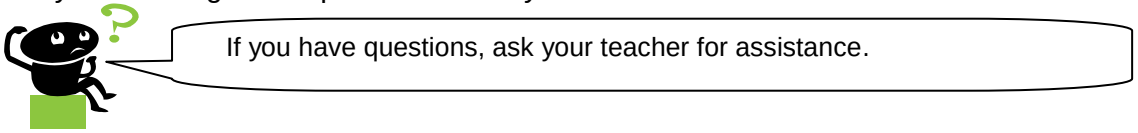
- Learning Outcomes
- Performance Standards
- Materials
- References
- Definition of Terms
- What Do You Already Know?
- What Do You Need to Know?
- How Much Have You Learned?
- How Do You Apply What You Learned?
- How Well Did You Perform?
- How Do You Extend Your Learning?

To get the most from this Module, you need to do the following:

1. Begin by reading and understanding the Learning Outcome/s and Performance Standards. These tell you what you should know and be able to do at the end of this Module.
2. Find out what you already know by taking the Pretest then check your answer against the Answer Key. If you get 99 to 100% of the items correctly, you may proceed to the next Lesson. This means that you need not go through the Lesson because you already know what it is about. If you failed to get 99 to 100% correctly, go through the Lesson again and review especially those items which you failed to get.
3. Do the required Learning Activities. They begin with one or more Information Sheets. An Information Sheet contains important notes or basic information that you need to know.

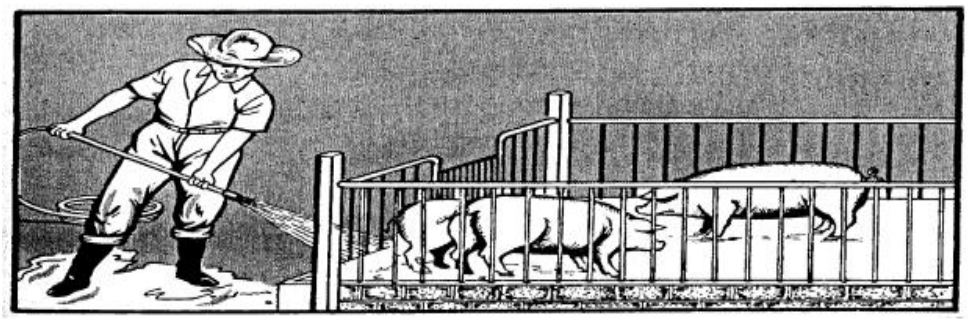
   After reading the Information Sheet, test yourself on how much you learned by means of the Self-check. Refer to the Answer Key for correction. Do not hesitate to go back to the Information Sheet when you do not get all test items correctly. This will ensure your mastery of basic information.
4. Demonstrate what you learned by doing what the Activity / Operation /Job Sheet directs you to do.
5. You must be able to apply what you have learned in another activity or in real life situation.
6. Accomplish the Scoring Rubrics for you to know how well you performed.

Each Lesson also provides you with references and definition of key terms for your guide. They can be of great help. Use them fully.



LESSON 1

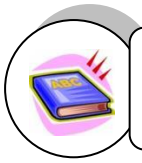
Use Farm Tools and Equipment



LEARNING OUTCOMES:

At the end of this Lesson you are expected to do the following:

LO 1. select and use farm tools;
LO 2. select and operate farm equipment; and
LO 3. perform preventive maintenance.



Definition of Terms

Brooding – natural or artificial means of supplying heat to newly hatched chick from day old to two weeks

Castration (also referred to as gelding, spaying, neutering, fixing, orchiectomy, and oophorectomy) is any action, surgical, chemical, or otherwise, by which a male loses the functions of the testicles or a female loses the functions of the ovaries

Equipment - power tool machines used in animal production

Fencing tool – devices for fence construction and layout of animal houses

Flammable - easily ignited and capable of burning rapidly

Hand tools – used for conducting simple repair and maintenance operation

Handheld tool – are tools compact enough to be used or operated while being held in the hand or hands

Incubation - the process of subjecting egg to an incubator until the egg hatches

Livestock - refers to one or more domesticated animals raised in an agricultural setting to produce commodities such as food, fiber and labor; usually four legged animals

Poultry – feathered animals such as chickens, ducks, geese, etc

Power tool - a tool powered by electricity or driven by a motor

Shovel – used in digging and moving soil and other granular materials; used for cleaning ditches; also used for leveling a base for sill rocks and steps

Spade - used to collect animal droppings and manures

Tools – devices that make the work of mans easier and faster

LEARNING OUTCOME 1

Select and use farm tools

PERFORMANCE STANDARDS

- Appropriate farm tools are identified according to requirements/use.
- Farm tool are checked for faults and defective tools are reported in accordance with farm procedures.
- Appropriate tools are safely used according to job requirements and manufacturers' conditions.

Materials/Resources

- Bolo
- Shovel
- Spade
- Electric tools
- Fencing tools
- Flashlight
- LCD projector
- White screen
- Garden tools
- Rake
- Spading fork
- Hand tools
- Hoses

What Do You Already Know?

Pretest LO 1

Let us determine how much you already know about the use of farm tools. Take this test.

I. Identify the following tools.

_____1. This is a large cutting tool of Filipino origin similar to the machete.
_____2. Used for digging and moving soil and other granular material.
_____3. It is used to clean and level the ground.
_____4. It is used for loosening the soil, digging out root crops and turning over the materials in a compost heap.
_____5. These are devices that make work easier and faster.

II. Choose the letter of the correct answer.

____1. It refers to domesticated birds or fowls.
A. poultry
B. livestock
C. amphibians
D. mammals

___2. These are devices that make the work of man easier and faster.
A. bolo
B. shovel
C. spade
D. tools

___3. It refers to one or more domesticated animals raised in an agricultural setting to produce commodities such as food, fiber and labor. They are usually four legged animals. _____.
A. livestock
B. poultry
C. mammals
D. amphibians

___4. This is a large cutting tool of Filipino origin similar to machete, used particularly in the jungles.
A. shovel
B. spading fork
C. bolo
D. pruning shears

___5. It is a hand tool used for digging and moving soil and granular materials.
A. bolo
B. spading fork
C. rake
D. shovel

___6. This is a hand tool used for loosening the soil and turning over the materials in a compost heap.
A. spading fork
B. shovel
C. rake
D. bolo

___7. Refers to a two-wheeled transport tool pushed or pulled by one or more people or animals.
A. hand cart
B. wheel barrow
C. spading fork
D. hoe

____8. It is a tool used to clean and level the ground.
A. rake
B. hoe
C. bolo
D. spading fork

____9. Which of the following tools is used to collect animal manure from the ground?
A. bolo
B. hoe
C. rake
D. shovel

____10. Which of the following tools is the most appropriate tool in cutting branches of trees?
A. hammer
B. bolo
C. rake
D. spading Fork

What Do You Need To Know?

Read the Information Sheet 1.1 very well then find out how much you can remember and how much you learned by doing the Self-check 1.1.

Information Sheet 1.1

COMMON POULTRY AND LIVESTOCK FARM TOOLS

I. INTRODUCTION

Farmers provide us with foods through domesticated animals. Farmers work in rigorously day in and day out: they wake up early in the morning and go home late in the afternoon; work during sunny and rainy days. Despite these working conditions, farming is one of the many needed skills in our country and the world. There are a lot of opportunities for farmers here and abroad. In other countries, Filipino farmers earn higher than what ordinary employees receive in the Philippines.

Farmers know the tools and equipment in the farm and how to use them properly. Before you perform some farm activities, determine the areas of concern for safety. This lesson will help you to identify various tasks on the farm, determine the places for application of safety measure, determine the appropriate time for employing safety measures and identify appropriate tools and equipment in animal production.

II. GARDEN TOOLS

Every small farm needs a flat spade and a pointed spade for digging. A good digging fork is a multipurpose tool, used for breaking up and turning soil in the garden, harvesting, and for manure cleanup around the barn.

A. Spade. This the step by step guide in using a spade.

1. Place the spade vertically onto the ground.
2. Place your foot onto the spade edge and apply pressure evenly.
3. Make sure to hold the grip with both hands tightly.
4. Once the spade enters the ground vertically, the grip should move away from the body a little bit which enforces the leverage effect.
5. Now pull the grip towards your body.
6. Slide down one hand until you reach the edge of the blade and hold it.
7. Keep one hand on the grip while bending your knees and slowly dig out the earth.
8. Make sure to move calmly and continuously.
9. Slowly straighten your knees and move the soil onto the spade blade.

B. Shovel

1. ***Uses:*** Shovels are used for cleaning ditches, digging and moving soil and other granular material. They are also used for leveling a base for sill rocks, steps,

2. ***Tips***

- Keeps the blade sharp, including most of the blade's sides.
- Bend at the knees and rest the elbow of the hand holding the forward end of the handle on the inside of his/her knee. This is the power hand. The other hand holds the end of the handle and serves as the guide hand.
- Swing from side to side, keeping the elbow on the knee, cutting the soil with the side of the shovel that is opposite the power hand and moving it laterally with the continuation of the swing. For the right handed, the power hand is the right hand and the right elbow rests on the right knee. Cutting is done with the left edge of the shovel and material is moved to the left. This technique does not work when digging a deep hole or ditch. The advantage is that the power comes mostly from the leg muscles—not the back muscles.
- Bend from the knees instead of the waist to prevent back injuries.
- Use leather globes to prevent blisters.

Do's and Don'ts in Using a Shovel

- *Make sure that the terrain you are digging is free of cables and pipes*
- If you are not sure, contact authorities for location of cables and pipes prior to digging.
- Wear the proper protective clothing; safety footwear, gloves, long pants if necessary.
- Allow for safe distance between people if you are working with other people.

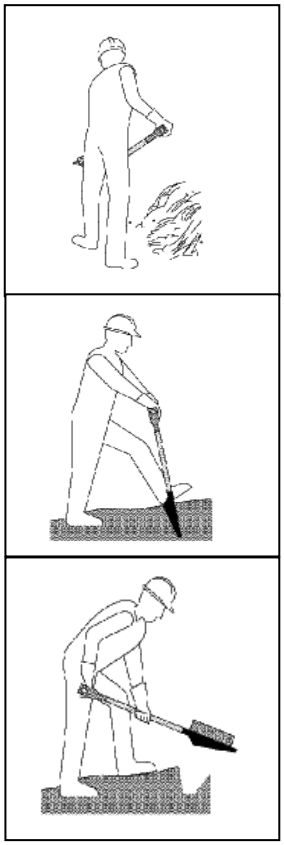
STEPS IN USING A SHOVEL

1. Keep feet wide apart. Place front foot close to shovel.

2. Put weight on front foot. Use leg to push shovel.

3. Shift weight to rear foot. Keep load close to body.

4. Turn feet in direction of throw



DIGGING PROCEDURES:

1. Push spade down using leg muscle.

2. Slide load close to body. Ensure load is loose from ground before lifting.

C. Rake. This correct use of the rake.

1. Determine the destination area where the leaves will go after collection, whether it's in a bag or a curb, back into the garden as mulch, or in a backyard compost pile.

2. Decide how much time you can spend raking each day or get help and divide up the task.

3. Get a rake and big plastic sheet around 6 feet (2m) square. A large sheet of burlap or an old drop cloth or other sturdy fabric will also work.

4. Moving your feet, rake leaves straight back and move with the rake as you walk toward the back.

5. Spread the plastic sheet on the ground near the raking area. Pull the leaves over to the plastic sheet with the help of the rake. When it covers the whole sheet, take one corner of the sheet and join it with the corner diagonally across from it. Then do the same with the other diagonal. Carry the leaves to the destination area or dump them into bags.

6. Alternately, use a grass catcher from a push mower or a large dustpan designed for outdoor collection. You'll make more, smaller trips to wherever you're collecting the leaves, but each trip will be lighter to carry.

D. Bolo

A **bolo** is a large cutting tool of Filipino origin similar to the machete, used particularly in the jungles of Indonesia, the Philippines, and in the sugar fields of Cuba. The primary use for the *bolo* is clearing vegetation, whether for agriculture or during trail blazing.

The bolo is called an *itak* in Tagalog while in Hiligaynon, the blade is referred to as either a *binangon* or a *talibong*.

Types of Bolo

Various types of bolos are employed. An assortment of bolos and related implements include:

1. ***All-purpose bolo***. Used for all sorts of odd jobs, including breaking open coconuts.
2. ***Haras***. Similar to a small scythe, it is used for cutting tall grass.
3. ***Kutsilyo***. The term comes from the Spanish word cuchillo, meaning knife. Generally used to kill and bleed pigs during slaughter.
4. ***Bolo-guna***. A bolo specifically shaped for digging out roots and weeding.
5. ***Garab***. Used to harvest rice.
6. ***Pinuti***. Traditionally it is tipped in snake, spider or scorpion venom and used for self-defense.
7. ***Sundang***. Supposedly used mainly to open coconuts. The sundang, also called "tip bolo" or itak, was a popular weapon of choice in the revolution against the Spanish colonial government and during the Philippine–American War.

E. Spading fork is used for loosening the soil, digging out root crops and turning over the materials in a compost heap.

How to Use Spading Forks

1. Use a cultivating fork to turn compacted soil. The tines dig into the soil, and the broad top is easy to stand on with your foot to provide additional motivation for the soil to open.
2. Incorporate organic compost, manure or other amendments into the soil with a cultivating fork. Once compacted soil has been opened, use the fork to stir in the additives.

3. Turn the compost pile with a cultivating fork. The short handle makes lifting heavy plant material much easier.

4. Dig bulbs from a garden bed with a cultivating fork. After bulbs have finished blooming and the foliage dies back, dig them from the bed with the fork. Unlike a shovel, which may slice and damage the bulbs, a cultivating fork will loosen the soil so that the bulbs seem to pop to the surface.

III. ELECTRIC TOOLS

There are dozens of electric power tools available at hardware and home stores, but there are two must-haves for any type of around-the-farm construction project:

1. a circular saw; and
2. a drill/driver (preferably the rechargeable battery operated type).

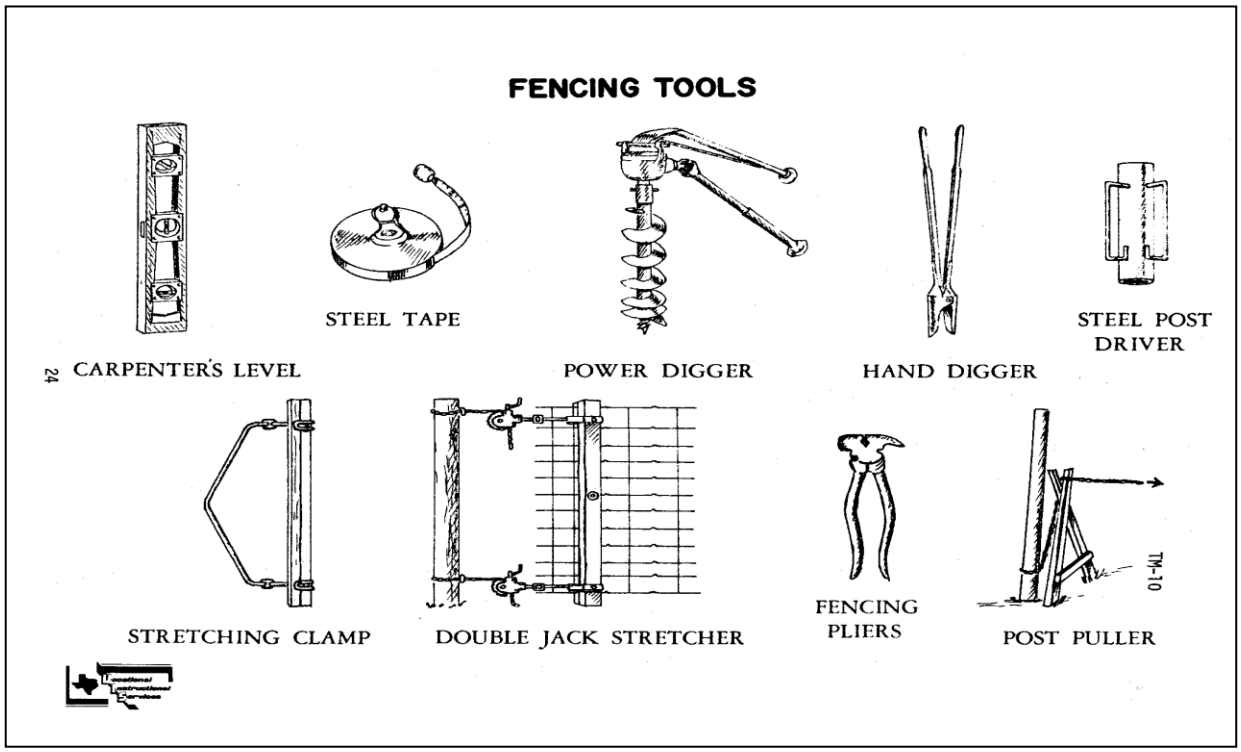
IV. HAND TOOLS

Every farm needs a variety of hand tools. Companies like Sears (with its line of Craftsman tools) and Snap-On (available at many auto parts stores) make hand tools that will last for generations, and that come with a lifetime warranty to prove it. First on the list of items to purchase:

1. 25-foot and a 100-foot tape measure;
2. a good claw hammer with a comfortable grip;
3. electrician's pliers;
4. a socket and driver set; and
5. adjustable wrenches in several sizes;
6. a screwdriver set with both regular and Phillips head drivers.

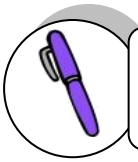
V. FENCING TOOLS

Farms and fences go hand-in-hand. Plan on purchasing fence-post driver. A driver is a heavy iron tube that goes over the top of a T-post, and that has handles on the side. You use it to pound the post into the ground. A pair of fence pliers is a great, and fairly inexpensive, specialty tool to have. We are fans of electric fences—they are economical, efficient and safe—but when you have an electric fence, you need a fence tester.



VI. MISCELLANEOUS

1. We always carry pocketknives when out working, and a "Leatherman" type is a handy all-in-one tool.
2. Heavy-duty flashlights are a must when the lights go out during a heavy storm, or when you need to tend to a livestock emergency in the pasture at 2 am.
3. Garden hoses are a must, but when buying, purchase the longest and strongest available (fall is a great time to find really good buys on garden hoses).
4. The last miscellaneous tool on the list is a digging bar. It is for digging large rocks out of the garden, construction sites, or fence holes.



How Much Have You Learned?

Self-Check 1.1

Directions: Give the importance of using the following tool and material for the small farm.

1. Bolo
2. Shovel
3. Electric tools
4. Hand tools
5. Fencing tool
6. Garden tool
7. Spading fork
8. Rake
9. Shovel
10. Bolo

Refer to the Answer Key. What is your score?

How Do You Extend What You Have Learned?

Show that you learned something by doing this activity

Activity Sheet 1.1

Directions: To be familiar with farm tools in poultry and livestock production you will make a pictorial report.

1. Group yourselves into three. Your teacher will brief of what to do. He/She will also make arrangement for your farm visit.

2. Ask your teacher on the schedule of your farm visit to conduct your survey on farm tools of school poultry and livestock project.

3. During the visit, talk among yourselves for division of the following activities:
   - List the existing tools observed
   - Take pictures of all these tools

4. After the visit, make a compilation of your photos and listing, including the major function and safety measures in using them.

5. Make a research on how to conduct the checking of tools for possible defects and faults, including the reporting procedures of these findings. This should include the pictures of defective tools.

6. This compilation will be your pictorial report. Submit this to your teacher and be prepared for questioning.

7. If you have queries or questions, approach your teacher.

How Well Did You Perform?

Find out by accomplishing the Performance Criteria Checklist honestly and sincerely. Remember it is your learning at stake!

Performance Criteria Checklist for
Activity Sheet 1.1

Do the student/s…	YES	NO	N/A
1. identified the appropriate farm tools according to requirements/use?			
2. described the use of appropriate tools according to job requirements and manufacturing condition.?			
3. visited school poultry and livestock farm for photo shoots of tools?			
4. conducted research on checking defective tools and reporting procedures on the findings?			
5. submitted the pictorial report, together with those information from research on defective tools?			
6. able to answer the questions relating to the output of the activity?			

Student's Name_____ Date _____

Comments/Suggestions:

How Do You Apply What You Have Learned?

Show that you learned something by doing this activity

Activity Sheet 1.2

Demonstrating the use of spade, shovel and rake

Procedures:

1. Read on the information sheet 1.1, particularly the step by step procedures of using the spade, shovel, rake and spading fork.
2. Practice on using these tools.
3. Approach your teacher if you are ready to perform the tasks.
4. Your teacher will choose among the four suggested tools for your demonstration. Be prepared for questioning also.
5. You will be rated by using the given scoring rubrics.

How Well Did You Perform?

Find out by accomplishing the Scoring Rubric honestly and sincerely. Remember it is your learning at stake!

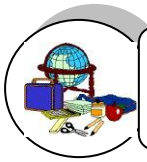
ACTIVITY	POOR (1)	SATISFACTORY (2)	VERY SATISFACTORY (3)
The student can demonstrate how to use:			
1. Spade			
2. Shovel			
3. Rake			
4. Spading fork			

LEARNING OUTCOME 2

Select and operate farm equipment

PERFORMANCE STANDARDS

- Appropriate farm equipment and facilities are identified.
- Instructional manual of farm equipment are carefully read prior to operation.
- Pre-operation check-up is conducted in line with manufacturers' manual.
- Faults in farm equipment and facilities are identified and reported in line with farm procedures.
- Farm equipment are used according to its function.
- Safety procedures are followed.



Materials / Resources

- Drooping board
- Feeding trough
- Incubator
- Nest
- Livestock trailer
- Castration rack
- Breeding crate
- Waterer
- Feed cart
- Water system
- Brooder
- Water trough
- Feed bin
- Perches
- Manure spreader
- Farrowing crate
- Heat Lamps
- Shipping crate
- Self-feeders
- Projector

What Do You Already Know?

Pretest LO 2

Let us determine how much you already know about select and operate farm equipment. Take this test.

Directions: Match Column A with Column B. Write your answer on your answer sheet.

Column A	Column B
1. This structure is designed to meet the special needs of newly weaned pigs.	A. Brooder
2. These are containers where feeds are stored for future use.	B. Feed bins
3. These fixtures should be provided in the laying house to facilitate collection of manure.	C. Nursery facilities
4. The device for maintaining the eggs of birds to allow them to hatch.	D. Pickup truck
5. These are horizontal poles where birds can sit and rest especially during night time.	E. Dropping board
6. These are light motor vehicle with an open-top rear cargo area (bed).	F. Compact utility tractor
7. This V- shaped equipment is used during castration.	G. Castration rack
8. A vehicle specifically designed to deliver a high tractive effort (or torque) at slow speeds, for the purposes of hauling a trailer or machinery used in agriculture or construction.	H. Incubator
9. A heated container that can have its temperature controlled in at least one area.	I. Manure spreader
10. An agricultural machine used to distribute manure over a field as a fertilizer.	J. Perches

What Do You Need To Know?

Read the Information Sheet 2.1 very well then find out how much you can remember and how much you learned by doing the Self-check 2.1.

Information Sheet 2.1

EQUIPMENT AND FACILITIES IN POULTRY PRODUCTION

1. ***Dropping board***. These fixtures should be provided in the laying house to facilitate collection of manure.

2. ***Perches.*** These are horizontal poles where birds can sit and rest especially during night time. Sufficient perches should be constructed to prevent the birds from crowding at night.

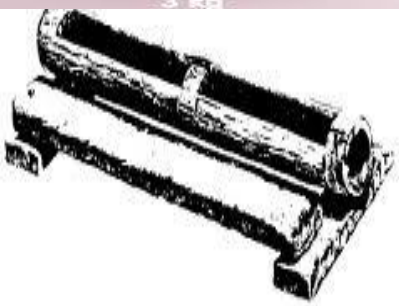
3. ***Nest.*** Hens or layers lay their eggs in a nest. A nest could be either open or close. The nest should be built on a partition or end walls. It should be high enough above the floor so that the hens can work under them. Each nest should be from 10 to 14 inches square or more depending upon the size of the breed; about 4 inches(20 centimeters high and with a strip about 4 inches 10 centimeters) high in the open side to retain the nesting materials. It is advisable to have dark nest.

   The hens with darkened nest are less likely to break and eat their eggs. One trap nest should be provided for every 4 hens kept in flocks of 50 or more, and 1 for every 3 hens in smaller flocks.

   Broody coop is necessary for the confinement of hens that are not desired for hatching eggs.

4. ***Feeding troughs.*** These should be constructed so as to keep the hens from scratching the feeds and wasting it especially when the birds are laying eggs.

Feeders are of various types and designs. For birds in confinement or elevated floor feeders, they make use of long V- type feeder, the lip of which is about 8 inches of the floor. The 1"x 6" boards that make up the sides of the feeder are set at an angle of one half by two inches board is nailed perpendicular to the side to act as lid and prevent the feeds from being beaked out.



5. ***Drinking troughs.*** Drinking jars should be large and sufficient enough to supply the water needs of the birds for the whole day. It is estimated that one kerosene can of water approximately 29 litters is enough for 100 layers the whole day.

6. ***Feed bins.*** These are containers where feeds are stored for future use. Feeds can also be kept in petroleum cans which are cheap, rat proof, and if painted, will last longer.

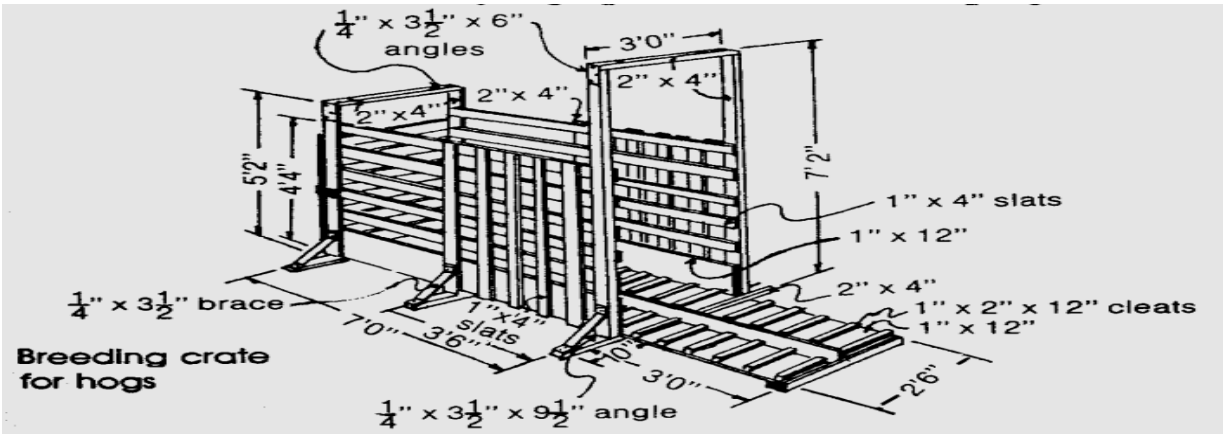
7. ***Incubator*** - a device for maintaining the eggs of birds to allow them to hatch.

8. Brooder - A brooder is a heated container that can have its temperature controlled in at least one area. It is used to confine chicks with their feed and water until they are 2 weeks old and ready to go outside.

EQUIPMENT IN SWINE PRODUCTION

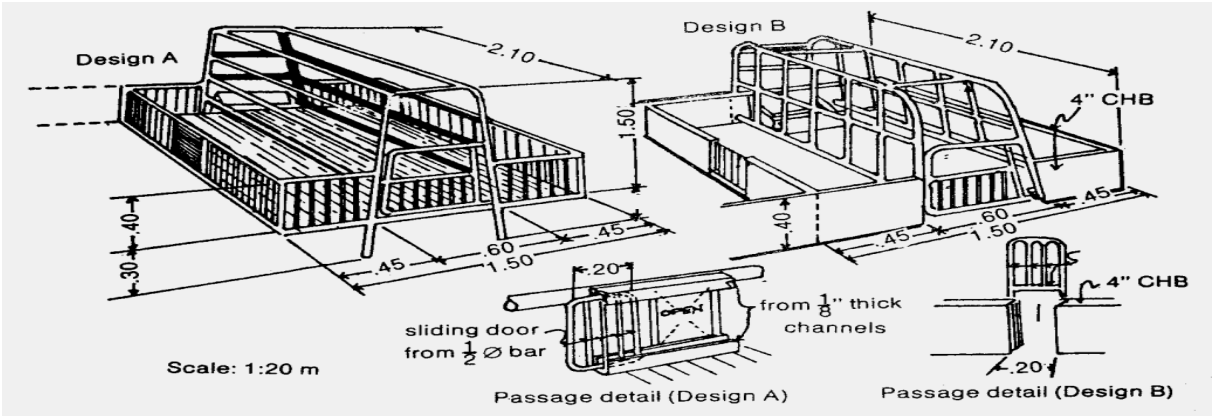
Here are some necessary equipment in a swine production.

1. **Breeding crate**. This is used when breeding gilt to a large boar or a large sow to a junior boar. The construction of the breeding crate should be durable enough to support the additional weight of a boar. The gilt or sow in heat is confined inside the crate before the boar is allowed to enter for mating.



Breeding Crate

2. **Farrowing crate or stall.** Due to its limited space, this equipment minimizes the movement of the sow and reduces the possibility of death of piglets due to crushing.

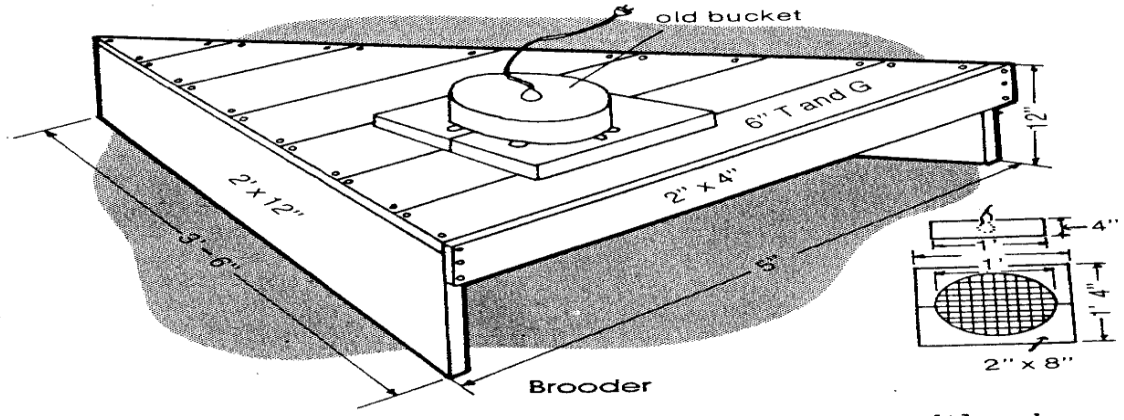


A detachable farrowing crate or stall

3. The farrowing crate also prevents the sow from eating feeds given to piglets before weaning time. There are two types of farrowing stalls: the *detachable* and the *permanent* types. In the detachable type, six pieces of galvanized iron pipes, three inches in diameter, are needed. Three pipes are installed on both sides of the pen to form rails. The distance of the first rail above the flooring should be 20 cm. while each of the two rails must be 40 cm. high. All the six rails must pass through the two sides of the wall. To prevent the rails from being removed when the sow rubs on the rails, drill a hole on both ends and place a lock. After weaning the piglets, the rails can be removed from the pen.

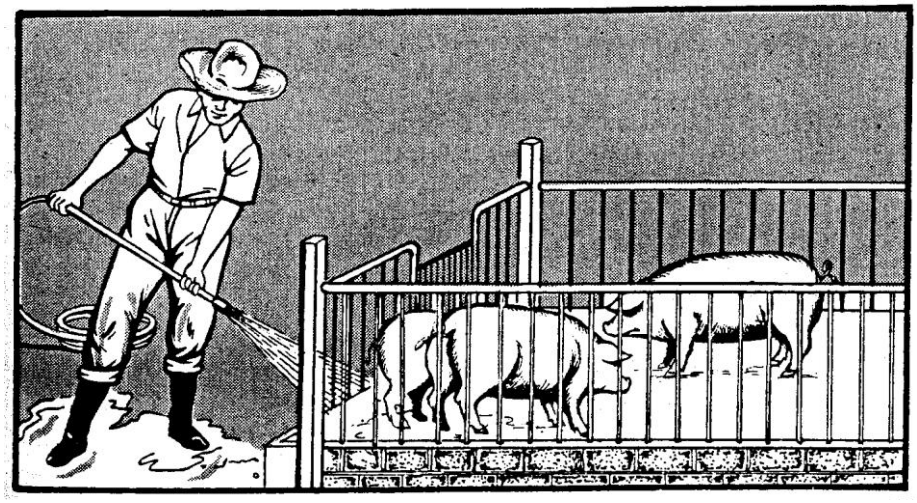
   Piglets usually pile themselves against the base of the wall and in the corner of the pen. To avoid the sow from crushing the piglets, guard rails placed around the pen about eight to ten inches from the wall and floor may serve as farrowing crate. This is an improvised farrowing crate.

4. **Heat lamps and brooders**. Baby pigs can be kept comfortable by providing them with brooders with a 50 to 100 watt bulb especially during rainy or cold days. Brooders and heat lamps must be located on any side of the farrowing stall. Be sure that the sow will not touch the brooder. Also make sure that it is not electrically grounded.



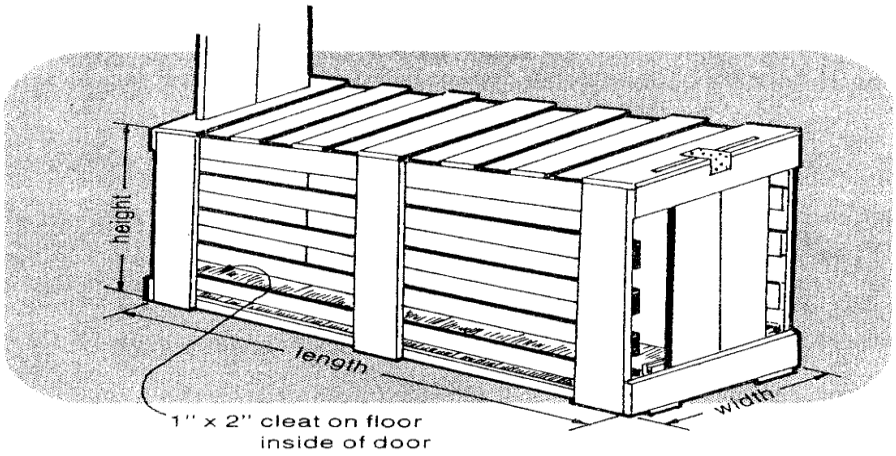
Brooder

5. **Water system**. A pressurized water system with pipes extending to the hog houses is the most desirable type. A minimum pressure of five (5) kg per sq cm and 500 gallons an hour is necessary. This will eliminate labor in fetching water.



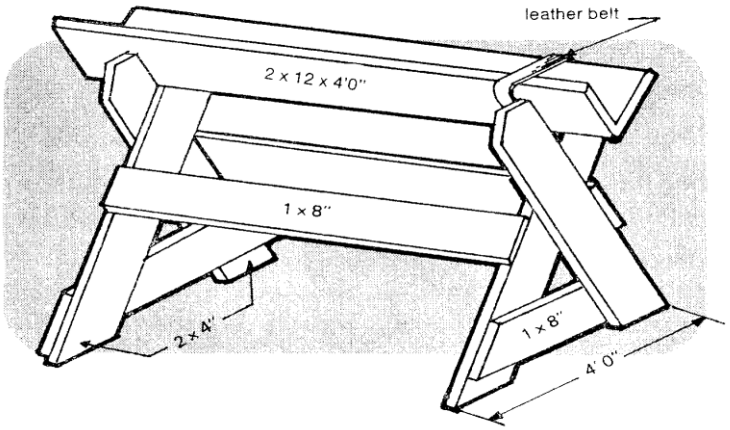
Pressurized water system

6. **Shipping crate**. This handy piece of equipment is ideal to use when transporting pigs.



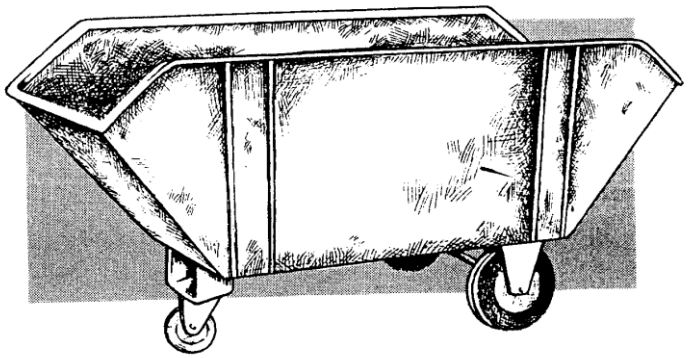
Shipping crate

7. **Castration rack**. This is V- shaped equipment used during castration. The piglets are laid down with its back on the rack.



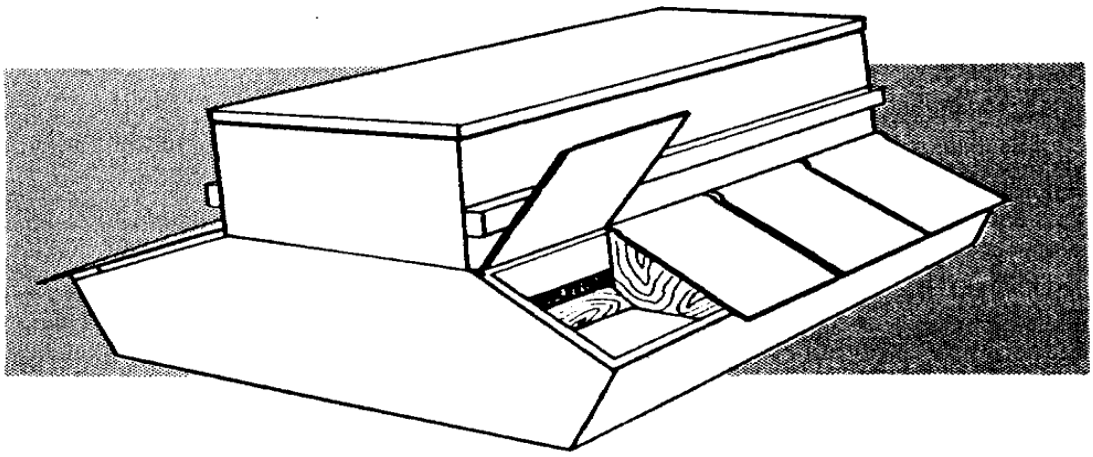
Castration rack

8. **Feed cart.** This equipment is used to transport feeds during feeding time. It can accommodate 100 kg of feed.



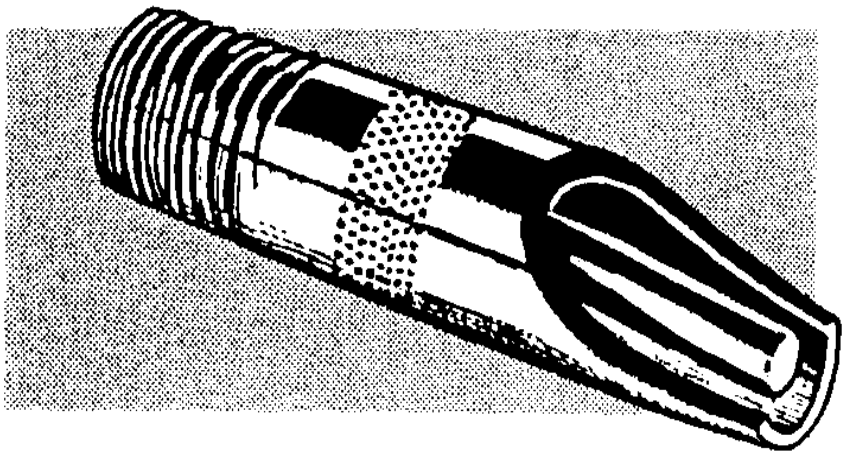
Feed cart

9. **Self-feeders.** Self feeders come in various types but the built-in concrete feeder is preferred. A self –feeder should be designed and constructed so that feed wastage is minimized and the rate of flow of the feed can be regulated. Durability and ease in cleaning should also be taken into consideration. Make sure that it can hold sufficient feeds to last for several days. A good feeding trough should be constructed in such a way that a pig cannot lie inside. It should be strong, durable, and easy to clean. Cemented feeding trough should have circular bottoms. A circular-bottomed trough is easier to clean than a flat- bottomed one.



Self-feeder

10. **Waterers.** Pigs will consume 2.0 to 2.5 pounds of water per kg of dry feed. Automatic waterers are advantageous .If the nozzle type waterers are used, they must be placed 24 to 30 inches above the floor for sows and growing pigs, one automatic cup or nozzle for each pig pen is normally sufficient to supply the water needs of the animals. Waterers should not be placed beside the self-feeder or feeding trough. This practice will keep the feeding area dry and clean.



Automatic nozzle type waterer

11. **Livestock trailer**. There are a number of different styles

of trailers used to haul livestock such as cattle and horses. The most common is the **stock trailer** - a trailer that is enclosed at the bottom, but has openings at approximately the eye level of the animals to allow ventilation. The horse trailer is a more elaborate form of stock trailer. Because horses are usually hauled for the purpose of competition or work, where they must be in peak physical condition, horse trailers are designed for the comfort and safety of the animals. They usually have adjustable vents and windows as well as suspension designed to provide a smooth ride and less stress on the animals.

In addition, horse trailers have internal partitions that assist the animal in staying upright during travel and protect horses from injuring each other in transit. Larger horse trailers may incorporate additional storage areas for horse tack and may even include elaborate living quarters with sleeping areas, bathroom and cooking facilities, and other comforts.

12. **Pickup truck.** It is a light motor vehicle with an open-top rear cargo area (bed).

How Much Have You Learned?

Self-Check 2.1

A. Assess your personal knowledge in various farm tools and equipment by giving a simple definition or function using the table below. Put an answer on the space provided.

FACILITIES AND EQUIPMENT IN POULTRY PRODUCTION	*Defined as….*
1. Drooping board	
2. Brooder	
3. Feeding trough	
4. Water trough	
5. Incubator	
6. Feed bin	
7. Nest	
8. Perches	
9. Livestock trailer	
10. Manure spreader	

B. Assess your personal knowledge in various farm tools and equipment by giving a simple definition or function using the table below. Put an answer on the space provided.

FACILITIES ANDEQUIPMENT IN LIVESTOCK PRODUCTION	*Defined as….*
1. Castration rack	
2. Farrowing crate	
3. Breeding crate	
4. Heat Lamps and Brooders	
5. Waterer	
6. Shipping crate	
7. Feed cart	
8. Self-feeders	
9. Water system	

Refer to the Answer Key. What is your score?

How Do You Extend What You Have Learned?

Show that you learned something by doing this activity

Activity Sheet 2.1

Directions: To be familiar with farm equipment and facilities in poultry and livestock production you will make a pictorial report.

1. Group yourselves into three. Your teacher will brief you what to do. He/she will also make arrangement for your farm visit.

2. Ask your teacher on the schedule of your farm visit to conduct your survey on farm equipment and facilities of school poultry and livestock project.

3. During the visit, talk among yourselves for division of the following activities:
    - List the existing equipment and facilities observed
    - Take pictures of all these equipment and facilities

4. Research on how to conduct pre-operation check-up, including identifying and reporting of faults and defects of farm facilities and equipment.

5. After the visit, make a compilation of your photos and listing, including the major function and safety measures in using them and the topics on identifying faults and defects on farm facilities and equipment. This will be your pictorial report.

6. If you have queries or questions, approach your teacher.

How Well Did You Perform?

Find out by accomplishing the Performance Criteria Checklist honestly and sincerely. Remember it is your learning at stake!

Performance Criteria Checklist for
Activity Sheet 2.1

Do the student/s…	YES	NO	N/A
1. identified the appropriate farm equipment and facilities ?			
2. read carefully the instructional manual of farm equipment prior to operation.			
3. described the pre-operation check-up in line with manufacturers' manual.			
4. described the used of farm equipment according to its function.			
5. followed safety procedures.			
6. visited school poultry and livestock farm for photo shoots of equipment and facilities?			
7. conducted research on checking defective tools and reporting procedures on the findings?			
8. submitted the pictorial report, together with those information from research on defective tools?			
9. able to answer the questions relating to the output of the activity?			

Student's Name_____ Date _____

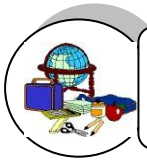
Comments/Suggestions:

LEARNING OUTCOME 3

Perform preventive maintenance

PERFORMANCE STANDARDS

- Tools and equipment are cleaned immediately after use in line with farm procedures.
- Routine check-up and maintenance are performed.
- Tools and equipment are stored in designated areas in line farm procedures.



Materials / Resources

- Personal protective equipment (PPE)
- Projector
- Tools from the schools storage area
- Schools farm working area
- Bamboo
- Cutting tools
- Electric drill
- Screw driver
- Claw hammer
- Nails
- Screws
- Protective materials
- Plastic sealant

What Do You Already Know?

Pretest LO 3

Let us determine how much you already know about performing preventive performance. Take this test.

Directions: Write the word **True** if the statement performs preventive maintenance and the word **False** if it is not.

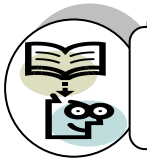
_____1. In mixing feed ingredients, wear safety glasses to protect your eyes from irritation.

_____2. In doing farming activities, right tools for the right task should be observed.

_____3. Extra care should be taken while using nail guns and power belt sanders.

_____4. While handling a tool connected to a power source, fingers should be kept away from the on/off switch.

_____5. Power tools should be returned to their cabinets after use to prevent them from being used by an unauthorized and incapable person.



What Do You Need To Know?

Read the Information Sheet 3.1 very well then find out how much you can remember and how much you learned by doing the Self-check 3.1.

Information Sheet 3.1

SAFETY PRACTICES DURING OPERATIONS OF FARM TOOLS

INTRODUCTION

Farmers are the living heroes in our society; they provide us with foods through domesticated animals. It is not easy to become a farmer. You need to wake up early in the morning and go home late in the afternoon. You also need to work during sunny and rainy days. With this working conditions majority of the Filipino farmers are still experiencing poor living conditions. Agriculture students should not be discouraged because this is their

opportunity to professionalize farming in our country. There are a lot of opportunities for farmers here and abroad. In other countries, Filipino farmers are earning higher than the ordinary employees received in the Philippines.

Farming activities are exposed to a lot of hazards, before you try to perform some activities on the farm. Determine the areas of concern for safety. This lesson will help you to identify various work tasks in the farm; determine the places for application of safety measures; determine the appropriate time for employing safety measures and identifying appropriate tools and equipment in animal production.

Power and handheld tools are indispensable for professionals and those who are engaged in farm operation activities. They are favored as they help users to save time and they also make the job easier. However, they need to be handled carefully otherwise they can lead to injury. Mishaps usually occur due to negligence, boredom, and overconfidence.
By keeping the following 10 safety issues in mind, it is possible to work satisfactorily and safely with power tools.

Safety -is the state of being "safe" (from French *sauf*), the condition of being protected against physical, social, spiritual, financial, political, emotional, occupational, psychological, educational or other types or consequences of failure, damage, error, accidents, harm or any other event which could be considered non-desirable. Safety can also be defined to be the control of recognized hazards to achieve an acceptable level of risk. This can take the form of being protected from the event or from exposure to something that causes health or economical losses. It can include protection of people or of possessions.

1. ***Safety glasses:*** These prevent dust, debris, wood shavings, shards from fiberglass, etc. from getting into the eyes. Safety glasses are one of the most basic pieces of safety equipment that must be used when working with power tools.

2. ***Protection for the ears:*** Power tools can generate a lot of noise, which may sound louder in the cloistered environment of a workshop; in order to minimize damage to the ears, it is advisable to wear earplugs.

3. ***Knowing the right tools for the job:*** It is important to know the right tools for the job in order to avoid injury to oneself and damage to the materials. To this end, it is advisable to thoroughly read the instruction manuals provided with the equipment and get familiar with the recommended safety precautions.

4. ***Correct method of using tools:*** Tools should not be carried by their cords; tools that are not in use should be disconnected; and while handling a tool connected to a power source, fingers should be kept away from the on/off switch.

5. ***The right clothes:*** Long hair should be tied and loose clothing should be avoided. Ideally, clothing that covers the entire body should be worn and heavy gloves should be used in order to avoid sharp implements and splinters from hurting the hands. Masks prevent inhalation of harmful minute particles of the material that are being worked upon. Steel-toed work boots and hard hats can also be worn.

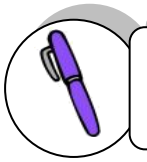
6. ***Tool inspection:*** Power tools should not be employed in wet environments and should never be dipped in water; they should be checked periodically for exposed wiring, damaged plugs, and loose plug pins. Nickel cords can be taped but if a cut appears to be deep, a cord should be replaced. Tools that are damaged or those that sound and feel different when used should be checked and repaired.

7. ***Cleanliness in the work area:*** This should be maintained because accumulated dust particles in the air can ignite with a spark. Of course, flammable liquids should be kept covered and away from the place where power tools are being used. An uncluttered work area also makes it easy to maneuver the power tool; often distractions caused by a tangled cord can result in an accident.

8. ***Care with particular tools:*** Miter saws and table saws should be used with a quick-release clamp and a wood push-through, respectively. Extra care should be taken while using nail guns and power belt sanders.

9. ***Keep tools in place:*** Power tools should be returned to their cabinets after use to prevent them from being used by an unauthorized and incapable person.

10. ***Lighting:*** It is important to use proper lighting while working with power tools, particularly when working in the basement and garage where lighting may not be satisfactory.



How Much Have You Learned?

Self-Check 3.1

Directions: Construct a particular scenario done during farm operations using the following safety situations.

Safety situation…	***Scenario***
1. Wearing glasses	
2. Protection for the ears	
3. Right tool for the job	
4. Method of using tool	
5. Using right clothes	
6. Inspection of tools	
7. Cleanliness of working area	
8. Caring for particular tool	
9. Keeping tool in place	
10. Lighting	

Refer to the Answer Key. What is your score?

How Do You Apply What You Have Learned?

Show that you learned something by doing this activity

Activity Sheet 3.1

Making feeding and drinking trough

Directions: After learning about using farm tools, equipment and facilities being used in animal production, you will be constructing a simple feeding and drinking trough using indigenous materials.

1. Group yourself into three. Inform your teacher that you are ready to construct the simple feeding and drinking trough for poultry.

2. Your teacher will provide you with the following:
    1. Bamboo
    2. Cutting tools
    3. Electric drill
    4. Screw driver
    5. Claw Hammer
    6. Nails
    7. Screws
    8. Protective materials
    9. Plastic sealant

3. Your teacher will also demonstrate the construction procedures. Take note of the following while he/she performs this activity:
    - Checking the tools
    - Wearing appropriate personal protective equipment
    - Safety precautionary measures practiced during the construction
    - Using the tools correctly
    - Cleaning and storing of farm tools
    - Proper disposal of waste materials

4. After the demonstration, construct your own simple feeding and drinking trough. Ensure that you follow the procedures done by your teacher. If you have queries or questions, approach your teacher.

How Well Did You Perform?

Find out by accomplishing the Scoring Rubric honestly and sincerely. Remember it is your learning at stake!

CRITERIA	5 points	3 points	1 point
1. Accuracy	The output is accurately done.	The output is almost accurately done	The output has many errors.
2. Craftsmanship / Quality	The output id very good.	It is good but still needs improvement.	It is very crude and needs much improvement.
3. Originality	Design is very unique, innovative and indigenous.	Design is unique and indigenous.	Design is very common and it not indigenous.
4. Functionality	It is very functional.	It is functional.	It is not at all functional.

Interpretation of Scores:

16 – 20 – Excellent output
11 – 15 – Very good
6 – 10 – Fair output
5 and below – Poor output

Congratulations! You did a great job! Rest and relax a while then move on to the next lesson. Good luck!

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LO 3

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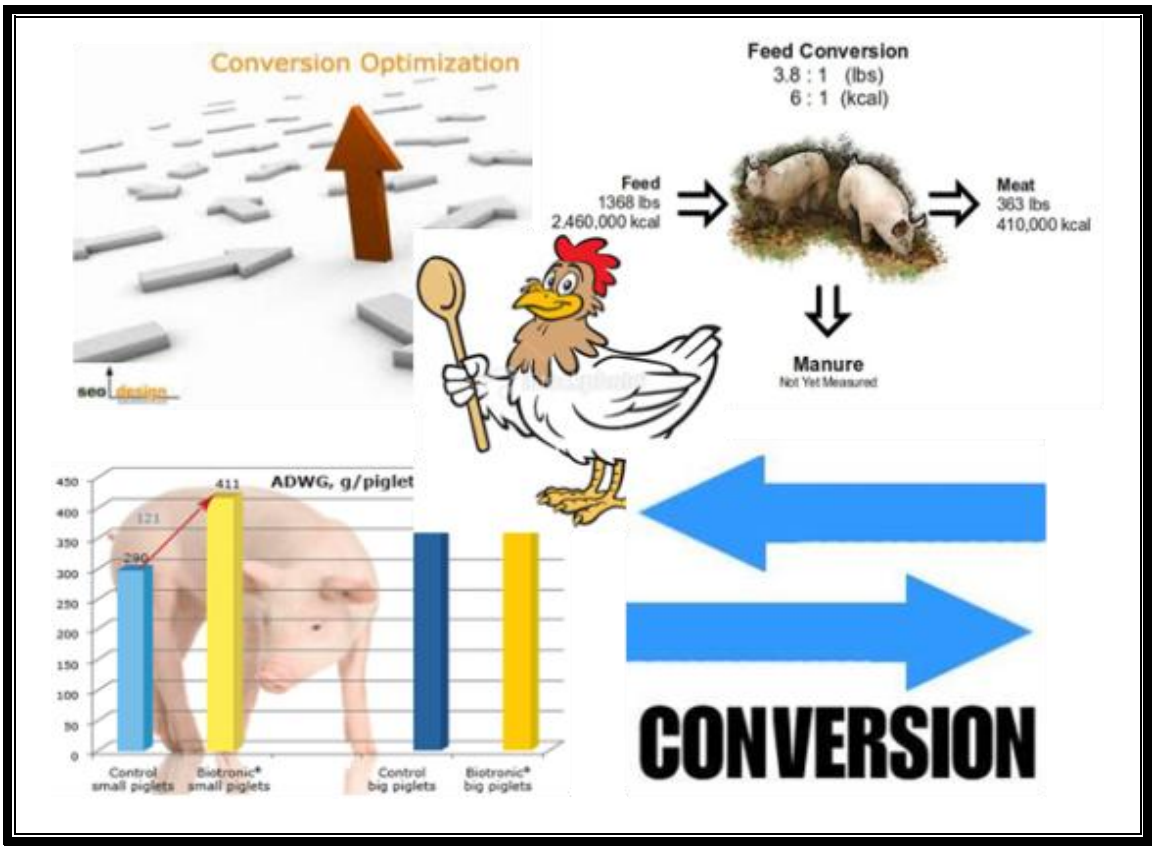
LESSON 2

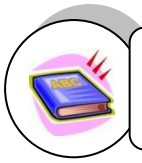
Perform Estimation and Calculation



LEARNING OUTCOMES:

At the end of this Lesson you are expected to do the following:

LO 1.perform estimation; and
LO 2.perform basic workplace calculations.



Definition of Terms

Broiler- chicken intended for meat purposes

Cost - the value of money that has been used up to produce something and hence is not available for use anymore

Enterprise - (also known as business or firm) an organization engaged in the trade of goods, services, or both to consumers.

Feed Conversion Ratio- the amount of feed consumed in order to produce a kilo of meat.

Input - is the term denoting either an entrance or changes which are inserted into a system and which activate/modify a process

Mortality rate- referring to percent of dead animals

Records - an item or collection of data

Starter Feed – A starter feed is given to 10 to 20 kgs. weaners until the pigs are about three months old and weigh 30 to 35 kgs

Swine- collective term used to denote hog or pig

System - a set of elements (often called *'components'* instead) and relationships which are different from relationships of the set or its elements to other elements or sets

Temperature- refers to the degree of hotness and coldness

LEARNING OUTCOME 1

Perform estimation

PERFORMANCE STANDARDS

- Job requirements are identified from written or oral communications.
- Quantities of materials and resources required to complete a task are estimated.
- Time needed to complete a work activity is estimated.
- Accurate estimate for work completion is made.
- Estimate of materials and resources are reported to appropriate person.

Materials / Resources

- Weighing scale
- Pictures of poultry and livestock house plans and blue prints
- Chicken feeds
- Brooder
- Schools water system
- Schools poultry and livestock project

What Do You Already Know?

Pretest LO 1

Let us determine how much you already know about perform estimation. Take this test.

Directions. Fill up the following spaces with the correct answer.

A. Which is the recommended space requirement for broilers?

1. Day-old to three weeks _____
2. 3 weeks to 4 weeks _____
3. 5 weeks to market age _____

B. Which is the recommended minimum feeding space requirement for broilers?

A. Day old to 4 weeks _____
B. 4 weeks to 8 weeks _____
C. 9 weeks to near laying age _____

C. Determine the brooding temperature requirement per different age of broiler in ^{0}C:

1. 0 to 1 week _____
2. 1 to 2 weeks _____
3. 2 to 4 weeks _____

What Do You Need To Know?

Read the Information Sheet 1.1 very well then find out how much you can remember and how much you learned by doing the Self-check 1.1.

Information Sheet 1.1

ESTIMATION AND CALCULATION IN POULTRY PRODUCTION

The farming system as a whole and animal production in particular, is influenced by external factors (including government policy on rural development, livestock development programs and marketing), which must be considered in any analysis or evaluation.

Feeding has been essential in the poultry production in determining the value of ration given to animals by estimation or calculation.

A. Types of Feed

There are three types of feed available in the market. Each type differs in the proportion of nutrients in the feed. The change in nutrient proportion is important to address the needs of the pig at different stages of growth. The shift from one ration to another should be done gradually in order not to upset the normal feeding behavior of the pigs. Always allow a transition period of at least one week.

1. **Starter Feed** – A starter feed is given to 10 to 20 kgs. weaners until the pigs are about three months old and weigh 30 to 35 kgs. A starter feed contains 18 percent crude protein (CP) and 3,250 kilocalories (Kca/j) of digestible energy (DE).

2. **Grower Feed** – Next to starter feed is the grower feed. This is given until the pigs reach a weight of 60 kgs. Grower ration contains 16 percent CP and 3,200 Kcal DE.

3. **Finisher Feed** – At 60 kgs, the pigs' ration is shifted to finisher feed. It is given to finisher pig up to 80 to 90 kgs ready for the market. The ration contains 14 percent CP with 3,200 Kcal DE.

B. Feeding Methods

The growth performance of the pigs is not only affected by the quantity and quality of feed given but also by the methods of feeding. The three basic feeding methods for finishers are restricted feeding, ad libitum, and combination of ad libitum and restricted. The level of feeding can vary from restricted feeding (about 80% satisfaction) to ad libutum level (100% satisfaction).

1. **Restricted Feeding.** In restricted feeding, the amount of feed given is controlled or limited to a certain amount just to satisfy the appetite of the pig.

   Advantages:
   - better feed conversion ratio (FCR) (lower feed cost and better performance)
   - good carcass quality
   - better health control
   - less digestive problems

   Disadvantages:
   - lower Average Daily Gain
   - unequal growth especially if feed trough is not long enough to accommodate all pigs
   - more laborious
   - less chance of coping with higher market price

   Restricted feeding is done through the use of a long feeding trough where all pigs eat at the same time. However, the length of the trough should be long enough to accommodate each fattener during feeding time.

   A good criterion for restricted feeding is that the trough should be empty after 15 or 20 minutes if given as slop. For dry mash or pelletized feeds, it is normally consumed in 20 to 30 minutes.

   The level of feeding is based on the growth rate of the pigs.

2. **Ad Libitum Feeding.** Ad libitum feeding is feeding without restrictions and feed is made available anytime. This feeding method should be practiced if pigs finished have high growth potentials and they are in good health.

   Dry feed should always be used for this feeding method. Fresh feed improves the feed intake and feed efficiency, thus self-feeders should be emptied and cleaned at least once a week to prevent microbial spoilage. Pigs find infested feed unpalatable thus, wastage of feed is high. Continuous supply of fresh and clean water is important in ad libitum feeding because water intake increases when this method is practiced.

Advantages:

- higher ADG is achieved
- less feed competition
- less laborious
- Disadvantages:
- thicker backfat
- higher feed conversion ration (higher feed cost)
- more digestive problems in younger pigs
- less control on health problems

C. Combination of Ad Libitum and Restricted Feeding

Pigs are fed ad libitum until they reach the weight of 50 kgs. and fed restricted until they are marketed. With this feeding method, the growth potential of the animal can be maximized during its first 50 kgs. of growth. Restriction is practiced to reduce backfat thickness with a corresponding increase in lean cut yield.

Advantages:

- higher ADG with good carcass qualify
- lower feed cost
- better use of good feed (better FCR)

Disadvantages:

- higher possibility of digestive problems if shifting is not properly done
- less control of health problems and feed intake at the start
- To determine the FCR or Feed Conversion Ration we must use the formula below:

$$\text{Feed Conversion Ratio} = \frac{\text{Feed consumed (kg)}}{\text{Gain in Weight (kg)}}$$

Broilers Requirements:

A. The following space requirements may serve as guide

1. Day-old to three weeks 0.3 sq.ft./chick
2. 3 weeks to 4 weeks 0.5 sq.ft/chick
3. 5 weeks to market age 1.0 sq.ft./bird

B. Recommended Minimum Feeding Space Requirements

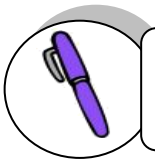
1. Day-old to 4 weeks 2.5 to 5 cm./bird
2. 4 weeks to 8 weeks 5 to 6.5 cm./bird
3. 9 weeks to near laying age 7.5 to 9 cm./bird

C. Recommended Minimum Watering Space Requirements

1. Day-old to 4 weeks 0.5 cm./bird or two 1-gal. drinking fountains/100 birds
2. 4 weeks to 8 weeks 0.6 to 1 cm./bird or two 2-gal drinking fountains/l00 birds
3. 9 weeks to near laying age 1 to 2 cm./bird or four 2-gal drinking fountains/100 birds

Recommended Brooding Temperature for Broilers

Age of Chicks (weeks)	Brooding Temperature (^{0}C)
0-1	32.2 – 35.0 (90-95 F)
1-2	29.4 – 32.2 (85-90 F)
2-4	26.7 – 29.4 (85-90 F)
Above 4 weeks	Remove the supply of heat



How Much Have You Learned?

Self-Check 1.1

A. Define the following concept:

1. Ad libitum feeding
2. Feed Conversion Ratio (FCR)
3. Restricted feeding
4. Feeding
5. Ration

B. The price of a broiler per kilo is 120 pesos. Compute for the amount of the following heads of

Broiler if it weighs…

1. 1 kilo _____
2. 1.3 kilos _____
3. 1.5 kilos _____
4. 1.7 kilos_____
5. 1.9 kilos _____
6. 0.75 kilo _____
7. 0.5 kilo _____
8. 2.65 kilo _____
9. 9.75 kilo _____
10. 26.5 kilo _____

Refer to the Answer Key. What is your score?

How Do You Extend What You Have Learned?

Show that you learned something by doing this activity

Directions: Assess your understanding by giving the advantages and disadvantages of restricted feeding and ad libitum feeding using the chart below.

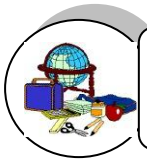
Level of Feeding	ADVANTAGES	DISADVANTAGES
Restricted Feeding		
Ad libitum Feeding		

LEARNING OUTCOME 2

Perform basic workplace calculations

PERFORMANCE STANDARDS

- Calculations to be made are identified according to job requirements.
- Correct method of calculation is determined.
- Systems and unit s of measurement to be followed are ascertained.
- Calculations needed to complete tasks are performed using the four basic mathemetical operations.
- Appropriate operations are used to comply with the instruction.
- Result obtained is reviewed and thoroughly checked.



Materials / Resources

- schools farm workplace area
- schools poultry and livestock project
- sample production records of poultry and livestock
- calculator
- projector
- ear notcher
- ear tagger
- coloring materials
- scratch paper
- internet source

What Do You Already Know?

Pretest LO 2

Let us determine how much you already know about perform basic workplace calculation. Take this test.

A. Identify what is referred to in the statement.

_____1. Cutting of small pieces of skin out of the edges of the ears.

_____2. An essential part of any record-keeping system in animal production.

_____3. It summarizes records of important aspects of herd production on weekly or monthly basis.

_____4. It records the number of pigs born alive and number born dead.

_____5. It helps compare the production or growth of different animals.

B. Enumerate the given statement.

1. Systems of Identifying Animals (5)
2. Inputs of Cost in Production (10)

What Do You Need To Know?

Read the Information Sheet 2.1 very well then find out how much you can remember and how much you learned by doing the Self-check 2.1.

Information Sheet 2.1

ANALYZE RECORDS KEPT IN POULTRY PRODUCTION ENTERPRISE

The analysis of production should be simple to suit the needs of backyard and small-scale poultry raisers. Expenses such as depreciation cost and the use of poultry house and interest on capital are not included in the following sample analysis.

This exercise is designed for you to acquire first-hand information on the basic requirements and financial gains in raising poultry.

A. INPUTS IN PRODUCTION

In broiler production prospective investors should consider the following consideration before going into the business venture.

1. **Costs**
   - Housing and brooder facilities
   - Day-old broiler chicks
   - Broiler feeds
   - Veterinary vaccines, medicines and supplements
   - Water
   - Heat and light
   - Labor
   - Depreciation
   - Interest on capital invested

2. **Returns**
   - Sales of broilers
   - Sale of chicken manure to vegetable growers or fishpond owners
   - Sale of good-condition empty feed bags

Computing a Sample Gathered Data in Broiler Production

Mr. Lucas has the following data in his broiler project:

_ Total production cost

- cost of chick per head @P20.00 (P 2,000.00)
- cost of feeds P 8,000.00
- medicine and antibiotics P 1,000.00
- miscellaneous(electricity, water, labor) P2,000.00

Total P 13.000.00

- ✓ _ Ninety five broilers are ready for market
- ✓ _ Average weight per broiler is 1.5 kg.
- ✓ _ Cost of live weight per kg. is P 120.00
- ✓ _ The total cost of production is P 13, 000.00
- ✓ _ Mortality rate of 5% (95 heads)

95 X 1.5 = 142.5 kilograms X 120.00 = 17,100.00

Total Gross sales ---------- P 17,100
Less Cost of Production --------- P 13,000

Net Income ---------- P4,100.00

To get ROI or Return on Investment:

$$ROI = \frac{\text{NET INCOME}}{\text{COST OF PRODUCTION}} \times 100$$

$$ROI = \frac{P\ 4{,}100}{P\ 13{,}000} \times 100$$

ROI = P 0. 31.54 X 100

ROI = 31.54%

Note: *to get the mortality rate consider the formula below;*

$$\text{Mortality rate} = \frac{\text{No. of dead birds}}{\text{Total no. of birds}} \times 100$$

RECORD KEEPING IN SWINE PRODUCTION

Keeping accurate and up-to-date record is very important in swine raising operations. It serves as future reference for improving the business. It also helps you identify animals to be culled and animals to be retained. It also tells whether the project is gaining or losing.

Prices of feeds and hogs are unstable. The demand for pork also penetrates. Determining the best time of the year to produce more hogs can be accurately done through experience and this can easily be predicted by keeping records.

The prime objective of a pig farmer is to manage his farm in such a way that it is a continuing source of income. In order to achieve this he needs to implement a set of good management measures and technical skills through good record keeping and administration. This makes it possible to control and monitor production and reproduction activities and to identify the results both technical and financial.

A. Identification Systems

A means of animal identification is an essential part of any record-keeping system. The most common identification systems are ear notching, tattooing and ear tagging. Other identification systems include, naming, color differences, ear shapes, however this is only applicable for small number of sows.

Being able to identify the pigs is essential if records are to be kept and for managing the pigs accordingly. As long as you do not have large numbers of pigs there is no problem recognizing them and no need to worry about marking them. However, when you have more pigs it is necessary to introduce an identification system. All the animals should be marked when they still are young.

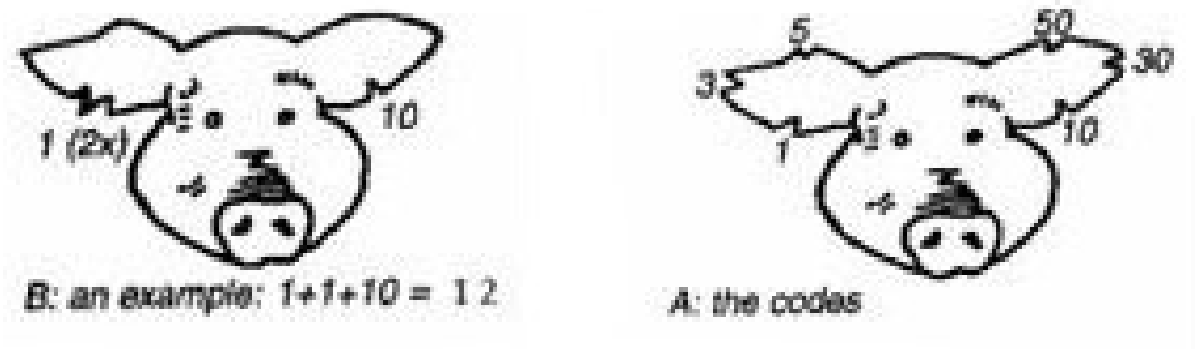
1. Notching

Notching involves cutting small pieces of skin out of the edges of the ears. This is a very cheap method of marking using only a very sharp knife. The wounds made by the cutting should be disinfected with iodine. By having different patterns of the cuts, these can be used for the identification of pigs.

Notching step-by-step:

a. Catch the pig and secure it well.
b. Clean the ears with methylated spirit.
c. Clean the knife or pliers to be used for cutting with methylated spirit.
d. Cut off the edge of the ear flap on the part of the ear that correspond to the number you want to give the pig
e. Apply some disinfectant like iodine, healing oil or wound spray to the cuts in the ear flap.

The picture on the left shows the right ear of an adult pig with notches, which were made when the pig was very young.



Example of ear notching codes

The disadvantages of the method are that it takes time 'to read' the patterns (or codes), and that problems can arise if the ears are damaged.

What does record keeping involve?

Good record keeping means noting down all important details and events, in a simple and clear manner. It can also be used to provide and record information for future activities. To keep records, use a notebook or exercise book. Dedicate a few pages for each pig, and a few pages for what you buy and what you sell. Other information should also be marked on a calendar (sow calendar), so that any necessary preparation can start well in advance (for example preparing the farrowing pen for the sow).

Records will help when comparing the production or growth of different animals. Records will indeed make it easier for you to carry out day to day activities on and for the pigs. When pigs are sick, you may note down the symptoms, the treatment, and whether the pig recovered or not. This will improve your knowledge on how to treat your animals successfully. It will also help you to keep track of expenses and incomes from sales. This information will tell you whether you are running a profitable business or not.

Records

1. **Litter records**
   - Birth weight (1.5.kg is good)
   - Weaning weight (18kg is good)

2. **Dams record**
   - Number of piglets weaned per year (18 is good)

3. **Marketing**
   - Age and weight

4. **Conversion rate**
   - Pigs that gain more weight from a given amount of food.
   - A satisfactory conversion ratio should be 1 kg live weight gain for 3 to 5 kg of feed.

NB: Simple and necessary record should be kept for all piglets e.g. date of birth, dam and sire record, and weaning weight, feed type and feed consumption, decrease etc.

A good record keeping system will permit constant surveillance and monitoring of animal health and performance. It will assist the farmer in maintaining a steady flow of pigs through his enterprise and in identification of problem areas in the production program.

Considerations to be made while designing a record keeping system

- The records should be as simple as possible
- Records should be kept in a place where they are readily accessible
- Transferring of information from one record sheet to another should be minimized
- The information that should be included in the records varies with the type of operation being run. A swine operation that is engaged in an expensive breeding stock improvement program will require more detailed individual pig records than in a commercial operation
- Individual records are of value in culling non-productive breeding stock and in selecting replacement animals

Individual records

- Sow identification
- Reproduction Records
  Date of first Estrus/heat, Breeding dates, Farrowing dates, Number of pigs born alive and number born dead, Average birth weight (comments on evenness of litter should be included) ,Abnormalities
- Weaning Records
  Weaning date, weaning weight
- Litter management records
  Dates of routine management practices e.g. Iron treatment, castration.
- Herd Records

A record sheet summarizing important aspects of herd production on weekly or monthly basis should be kept. The farmer can compare these records which are a good measure of production efficiency with previous figures as well as with production goals he has set for his production.

Herd records should include:

- Reproduction Records
- Females serviced (categorize as to the first and repeat breeders).
- Litters farrowed
- Pigs born alive and number born dead
- Feed Consumed
- Either herd total or by ration i.e. dry sow, starter finisher etc.
- Pigs marketed (sows, boars, market or breeding stock)
- Pigs added (breeding stock from outside the herd)
- Market Information
- Age at marketing of at least a sample number of pigs and their weight
- Carcass indices of pigs marketed.

The data above can be used to compute the following parameters:

- Average litter size born and weight
- Average litter size weaned and weight
- Percentage of pigs born dead
- Percentage death loss in any category

- Repeat breeding as a percentage of the total breeding
- Feed conversion ratio (FCR), - Average daily gain (ADG)
- Average market index

NB:

- The above indicators tell how well the production programme is managed.
- The secret to the success of any record keeping system is not the particular design of the system but rather regular manner in which the records are kept.

How Much Have You Learned?

Self-Check 2.1

Instructions:

I. It is time for you to have a practice on calculations of the different parameters on poultry and livestock productions.

II. Using the knowledge and skill gained from this module, answer the following questions. For those with problem solving, show your solution.

III. For items with computations, do this manually using scratch paper.

IV. Choose the letter of the correct answer for the following questions:

Questions

1. Calculate the amount of feed needed for 100 broilers at 38 days of maturity if the amount of feed consumed is 3 kilos per bird.

   A. 100 kls
   B. 200 kls
   C. 300 kls.
   D. 400 kls.

2. What is the percent of mortality if 10 birds out of the 100 broilers died due to severe heat?

   A. 25 percent
   B. 100 percent
   C. 2 percent
   D. 10 percent

3. You have given 2 liters of water to your 2 heads sow per day. How many liters of water must be needed for 2 weeks?

   A. 14 liters
   B. 28 liters
   C. 7 liters
   D. 42 liters

4. Juan wants to raise 100 broilers. He has available money allotted for the birds, but for the housing, he tap his father to finance the housing for that number of broilers. If the allocated budget for housing is 100 pesos per bird, how much money does his father need for the construction of the broiler house?

   A. 1,000 pesos
   B. 5,000 pesos
   C. 10,000 pesos
   D. 7,000 pesos

5. An area of 1 square meter per hog fattener is recommended, if you have an available space of 3 by 5 meters, how many fatteners can be accommodated in the said figure?

A. 5 heads
B. 10 heads
C. 13 heads
D. 15 heads

6. You have an average of 1 square foot per bird space requirement. You want to raise 250 heads of broiler. How many square ft. are needed for that number of heads?

A. 100 square feet
B. 150 square feet
C. 200 square feet
D. 250 square feet

7. The price of 1 kilo of chicken meat is 120 pesos. How much is the cost of 1.5 kilos of chicken meat?

A. 180 pesos
B. 150 pesos
C. 120 pesos
D. none of the above

8. You have an available 100 chicken meat at the average of 1.2 kilos each. What is the total number of kilos to be sold in the market?

A. 100 kilos
B. 120 kilos
C. 150 kilos
D. 125 kilos

9. Determine the number of swine with an area of 30 square meters. One square meter is provided per each swine.

A. 10
B. 20
C. 30
D. 40

10. A day old chick in the brooder house is said to be in normal condition if the temperature at brooding stage is:

A. 32.2 degree centigrade
B. 29.4 degree centigrade
C. 26.6 degree centigrade
D. 24.0 degree centigrade

Refer to the Answer Key. What is your score?

How Do You Apply What You Have Learned?

Show that you learned something by doing this activity

Activity Sheet 2.1

PROJECT PROPOSAL ON BROILER PRODUCTION

Instructions:

1. Prepare a simple project proposal with cost estimate of materials needed, cost of labor including schedule of activity to complete the project by computing gathered Data in Broiler Production**.**
2. Please take note that you will use the current price prevailing in the locality, compute the expected outputs and gain. See and be guided by the listed items below for your computation
3. Assuming that the duration of the construction is 5 days, and you need to hire two (2) laborers, make a computation of the total labor cost, including the detailed scope of works using the schedule of activity below.
4. Submit your project proposal to your teacher for checking and recording purposes.

ITEMS FOR COMPUTATION

I. EXPENSES

1. Cost of 105 heads of “day-old chicks” at P---------- each P-----
2. Cost of feeds
   - 2.1--------- kilograms of booster at P-------- per kg. ---------
   - 2.2 -------- kilograms of starter at P ------- per kg. ---------
   - 2.3 ------- kilograms of finisher at P -------- per kg. ----------
3. Cost of vaccines and supplements ---------P ----------
4. Cost of light and heat ---------- P----------
5. Cost of water ---------- P ----------
6. Others ---------- P ---------- (this include labor cost = P300/day)

II. RECEIPTS FROM SALES

1. Total sale of ____ kg. (live weight) at ____ per kg. ____P _____
2. Sale of ___ empty bags of feeds at P __per bag _____ P_____
3. Sale of bags of manure at P _____per bag _____ P_____

III. STATEMENT OF PROFIT OR LOSS

Average live weight of broiler is 1.75 kg.

Broiler Cost per kilogram (live weight) is P 98.00

TOTAL SALES _____

LESS EXPENSE _____

RETURN ON INVESTMENTS **(ROI)** _____

How Well Did You Perform?

Find out by accomplishing the Performance Criteria Checklist honestly and sincerely. Remember it is your learning at stake!

Performance Criteria Checklist for
Activity Sheet 2.1

Do the student/s…	YES	NO	N/A
The submitted proposal has.:			
1. identified calculations to be made according to job requirements.			
2. determined correct method of calculation.			
3. ascertained systems and units of measurement to be followed.			
4. performed calculations needed to complete work task using the four basic mathematical operations.			
5. used appropriate operations to comply with the instructions.			
6. reviewed and thoroughly checked results obtained.			
7. submitted the project proposal.			

Student's Name_____ Date _____

Comments/Suggestions:

Congratulations! You did a great job! Rest and relax a while then move on to the next lesson. Good luck!

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LO 2

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- Ear Tagging Video: http://www.youtube.com/watch?v=9XMFdFUG2N0

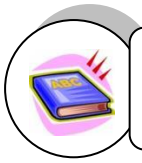
LESSON 3

Interpret plans and drawings

LEARNING OUTCOMES:

At the end of this Lesson you are expected to do the following:

LO 1. draw layout plan of different types of housing; and
LO 2. enumerate the building codes in constructing poultry and livestock houses.



Definition of Terms

Breeder- an animal selected for the purpose of propagating breed

Building codes - a set of rules that must be followed to satisfy the minimum acceptable levels of safety for buildings and non-building structures

Cage- a place where birds are confined

Collateral - a borrower's pledge of specific property to a lender, to secure repayment of a loan

Colony cage- layers are confined in group in a cage

Concrete – a mixture of aggregate, cement and water

Confinement- the state of being confined, with restricted movement

Contract - an agreement entered into voluntarily by two parties or more with the intention of creating a legal obligation, which may have elements in writing

Convenience- ease of moving

Domesticated- tamed animals that can live and reproduce freely under the care of man

Durability- the resistance to decay

Flock- a group of chickens, ducks, geese, turkey respectively

Floor plan – a plan that shows the size and outline of the building and provides considerable additional information

Government agencies - may be established by either a national government or a state government within a federal system. (The term is not normally used for an organization created by the powers of a local government body). Agencies can be established by legislation or by executive powers. The autonomy, independence and accountability of government agencies also vary widely

Housing – provision of accommodation

Industry - the production of an economic good or service within an economy

Layer- mature egg-laying species of poultry, especially chickens

Litter- materials used to cover floor space

Mortality- death rate among the birds

Portable- can be transferred from one place to another

Thrive- survive, live with ease

LEARNING OUTCOME 1

Draw layout plan of different types of housing

PERFORMANCE STANDARDS

- Types of housing and its components used in poultry and livestock are identified.
- Design of different housing used in poultry and livestock are drawn.

Materials / Resources

- Instructional video
- Poultry house pictures
- Livestock house pictures
- Miniature poultry house or coop
- Projector
- Construction/bond paper
- Pencil
- Ruler
- Eraser

What Do You Already Know?

Pretest LO 1

Let us determine how much you already know about drawing layout plan of different types of housing. Take this test.

Directions: Choose the letter of the correct answer. Write your answer on your answer sheet.

1. It is the oldest system and has been used for centuries by general farmers, where there is no shortage of land.
   A. Free – range or extensive system
   B. Semi - intensive system
   C. Folding unit system
   D. Intensive system

2. This system of housing is an innovation of recent years. In portable folding units birds being confined to one small run, the position is changed each day, giving them fresh ground and the birds finding a considerable proportion of food from the herbage are healthier and harder.
   A. Free – range or extensive system
   B. Semi - intensive system
   C. Folding unit system
   D. Intensive system

3. Where the amount of free space available is limited this system is adopted, but it is necessary to allow the birds 20-30 square yards per bird of outside run. Wherever possible this space should be divided giving a run on either side of the house of 10-15 square yards per bird, thus enabling the birds to move onto fresh ground.
   A. Free – range or extensive system
   B. Semi - intensive system
   C. Folding unit system
   D. Intensive system

4. This system is usually adopted where land is limited and expensive. In this system the birds are confined to the house entirely, with no access to land outside.
   A. Free – range or extensive system
   B. Semi - intensive system
   C. Folding unit system
   D. Intensive system

5. Which is not a design for ventilation system
   A. Natural ventilation
   B. Artificial ventilation
   C. Automatically controlled natural ventilation system
   D. Fan ventilation system

6. This type of roof is used in small construction which makes use of the simplest materials.
   A. Shed
   B. Gable
   C. Monitor
   D. Semi-monitor

7. This type of roof is ideal for big establishment especially in commercial farms. It is actually double span with an outlet of air at the top of the roof.
   A. Shed
   B. Gable
   C. Monitor
   D. Semi-monitor

8. Poultry Houses May Be Classified According to:
   A. The number of rooms or pens they contain
   B. Their portability or permanence
   c. The style of roof
   d. All of the above

9. This type of roof is similar to the monitor type except that the outlet of air is made on one side only.
   A. Shed
   B. Gable
   C. Monitor
   D. Semi-monitor

10. Space requirement of mature sow per square meter.
   A. 1
   B. 2
   C. 2.5
   D. 3

Directions: Enumerate your answers on the following questions provided:

1. What are the three (3) considerations before constructing a hog house in order to minimize diseases?

2. Enumerate the nine (9) factors to consider in planning farm buildings?

3. What are the four (4) factors to consider in constructing a pig farm?

What Do You Need To Know?

Read the Information Sheet 1.1 very well then find out how much you can remember and how much you learned by doing the Self-check 1.1.

Information Sheet 1.1

POULTRY HOUSING SYSTEM

Generally, four systems of poultry housing are followed among the poultry keepers. The type of housing adopted depends to a large extent on the amount of ground and the capital available.

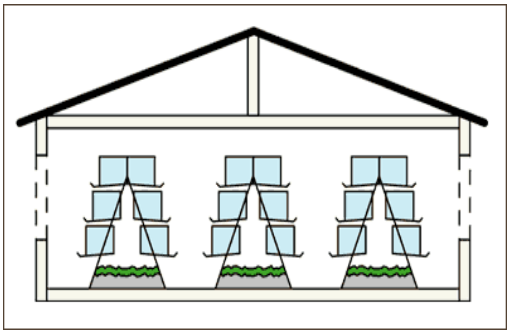
Types of poultry housing:

1. Free – range or extensive system
2. Semi - intensive system
3. Folding unit system
4. Intensive system
    a. Battery system
    b. Deep litter system

A. Free-range system

It is the oldest one and has been used for centuries by general farmers where there is no shortage of land. This system allows great but not unlimited, space to the birds on land where they can find an appreciable amount of food in the form of herbage, seeds and insects. Birds are protected from predatory animals and infectious diseases including parasitic infestation. At present due to advantages of intensive methods the system is almost obsolete.

B. Semi-intensive system



Where the amount of free space available is limited this system is adopted, but it is necessary to allow the birds 20-30 square yards per bird of outside run. Wherever possible this space should be divided giving a run on either side of the house of 10-15 square yards per bird, thus enabling the birds to move onto fresh ground.

C. Folding-unit system:

This system of housing is an innovation of recent years. In portable folding units birds being confined to one small run, the position is changed each day, giving them fresh ground and the birds find a considerable proportion of food from the herbage are healthier and harder. For the farmer the beneficial effect of scratching and manuring on the land is another side effect.

The most convenient folding unit to handle is that which is made for 25 hens. A floor space of 1 square foot should be allowed for each bird in the house, and 3 square feet in the run, so that a total floor space for the whole unit is 4 square feet per bird, as with the intensive system.

A suitable measurement for a folding house to take 25 birds is 5 feet wide and 20 feet long, the house being 5' x 5', one-third of the run. The part nearest the house is covered in and the remaining 10' open with wire netting sides and top.

Disadvantages

- The food and water must be carried back and forth out to the birds and eggs.
- There is some extra labor involved in the regular moving of the fold units.

D. Intensive System

This system is usually adopted where land is limited and expensive. In this system the birds are confined to the house entirely, with no access to land outside. This has only been made possible by admitting the direct rays of the sun on to the floor of the house so that part of the windows are removable, or either fold or slide down to permit the ultraviolet rays to reach the birds. Under the intensive system, Battery (cage system) and Deep litter methods are most common.

1. Battery system.

This is the most intensive type of poultry production and is useful to those with only a small quantity of floor space at their disposal. In the battery system each hen is confined to a cage just large enough to permit very limited movement and allow her to stand and sit comfortably. The usual floor space is 14 x 16 inches and the height, 17 inches. The floor is of standard strong galvanized wire set at a slope from back to the front, so that the eggs as they are laid roll out of the cage to a receiving gutter. Underneath is a tray for droppings. Both food and water receptacles are outside the cage.

Many small cages can be assembled together; if necessary it may be multistoried. The whole structure should be of metal so that no parasites will be harbored and thorough disinfection can be carried out as often as required. Provided the batteries of cages are set up in a place which is well ventilated and lighted, is not too hot and is vermin proof and that the food meets all nutritional needs, this system has proved to be advantageous.

Advantages:

- Remarkably successful in the tropical countries.
- It requires a minimum expenditure of energy from the birds as they spend all time in the shade.
- It lessens the load of excess body heat.
- The performance of each bird can be noted and culling easily carried out.

2. Deep litter system:

In this system the poultry birds are kept in large pens up to 250 birds each, on floor covered with litters like straw, saw dust or leaves up to depth of 8-12 inches. Deep litter resembles to dry compost. In other words, we can define deep litter, as the accumulation of the material used for litter with poultry manure until it reaches a depth of 8 to 12 inches. The build-up has to be carried out correctly to give desired results, which takes very little attention.

Suitable dry organic materials like straw (needs to be cut into 2 or 3 inch lengths), saw dust, leaves, dry grasses, groundnut shells, broken up maize stalks and cobs, bark of trees in sufficient quantity to give a depth of about 6 inches in the pen should be used.

The droppings of the birds gradually combine with the materials used to build up the litter. In about 2 months, it has usually become deep litter, and by 6 months it has become built-up deep litter. At about 12 months of old stage it is fully built up. Extra litter materials can be added to maintain sufficient depth.

The deep litter pen should be started when the weather is dry, and is likely to remain so for about 2 months for the operation of the bacterial action, which alters the composition of the litters. Start new litter with each year's pullets and continue with it for their laying period.

Advantages

- Birds and eggs are safely enclosed in deep litter intensive pen, which has strong wire netting or expanded metal.
- Built-up deep litter also supplies some of the food requirements of the birds. They obtain "Animal Protein Factor" from deep litter.
- The level of coccidiosis and worm infestation is much lower with poultry kept on good deep litter than with birds (or chicken) in bare yards. Well managed deep litter kept in dry condition with no wet spots around waterer has a sterilizing action.
- With correct conditions observed with well managed litter there is no need to clean a pen out for a whole year; the only attention is the regular stirring and adding of some material as needed.
- Generally 35 laying birds can produce in one year about 1 tone of deep litter fertilizer. The level of nitrogen in fresh manure is about 1%, but on well built-up deep litter it

may be around 3% nitrogen (nearly 20% protein). It also contains about 2% phosphorus and 2% potash. Its value is about 3 times that of cattle manure.
- It is a valuable insulating agent; the litter maintains its own constant temperature, so birds burrow into it when the air temperature is high and thereby cool themselves. Conversely, they can warm themselves in the same way when the weather is very cool.

Basic Rules for deep litter system

- Do not have too many birds in the pen – one bird for every 3 ½ to 4 and preferably 5 square feet of floor space.
- Provide sufficient ventilation to enable the litter to keep in correct condition.
- Keep the litter dry. This is probably the master work in a deep litter system. If the litter gets soaked by leaking from roofs or from water vessels, it upsets the whole process and would have to start over again. All probable precautions should be taken to maintain the litters completely dry.
- Stir the litter regularly. Turning the litter (just like digging in a garden) at least once weekly is very important in maintaining a correct build-up of deep litter.

Poultry Houses May Be Classified According to:

1. The number of rooms or pens they contain (e.g. continuous and colony houses.)
2. Their portability or permanence (e.g. portable colony houses and permanent colony houses.)
3. The style of roof
4. It has been observed that a greater number of layers thrive well and produce more in the open type of laying house. The layer eats less and lay more eggs than those layers housed in a closed type.

Orientation and Construction of a Poultry House

The orientation and construction of a poultry house should be in conformity with the system of managing birds. They may be adopted by the poultry raiser to minimize housing cost. When building a poultry house, make sure that the cage does not face towards the prevailing winds and heavy rains. Although the house should allow free circulation of air. It should not be so open that rain will blow in and wet the interior of the poultry house. The house should be built in a way that is penetrated by sunshine which will keep the poultry house dry.

A good poultry house can be made out of bamboo as sidings, pieces of wood for post, and rafters with either nipa or cogon for roofings. These materials provide convenience and comfort to the birds and expenses for housing can be minimized.

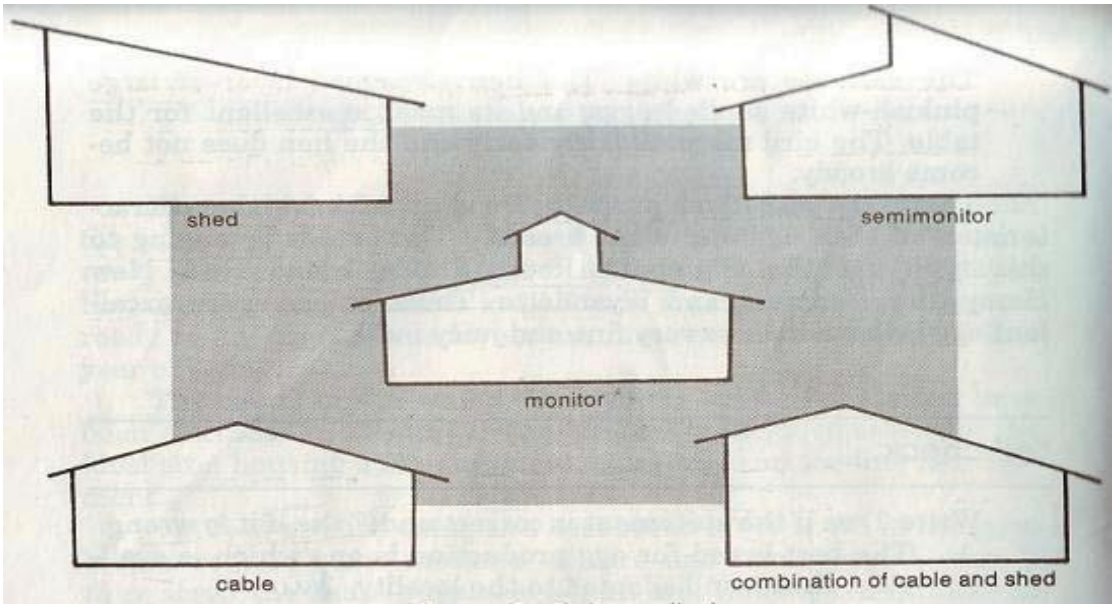
Types of Roofs for Poultry Houses

There are various types of construction. The construction may be determined by the following factors:

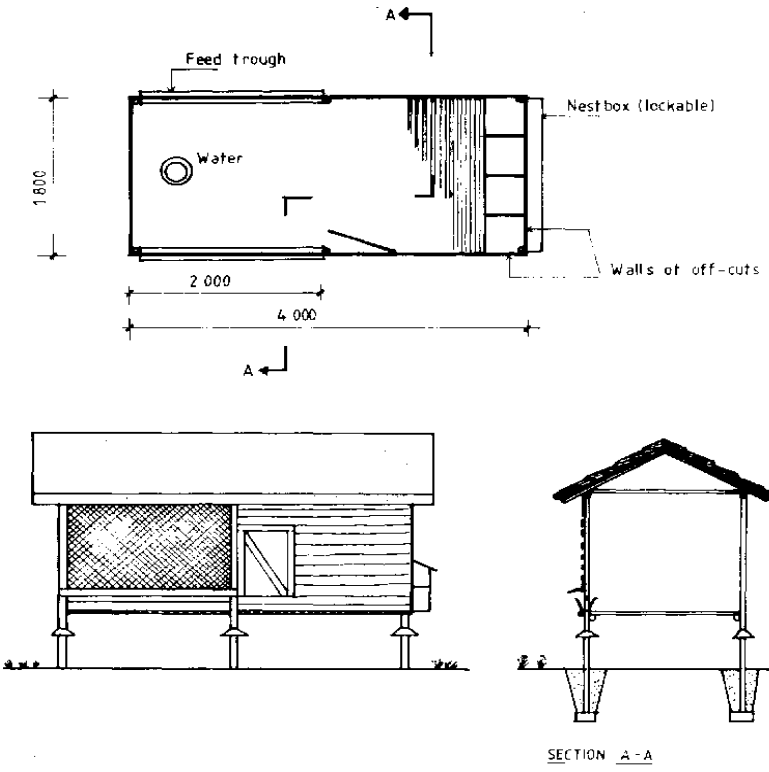
1. availability of materials
2. amount of investment
3. size of operations

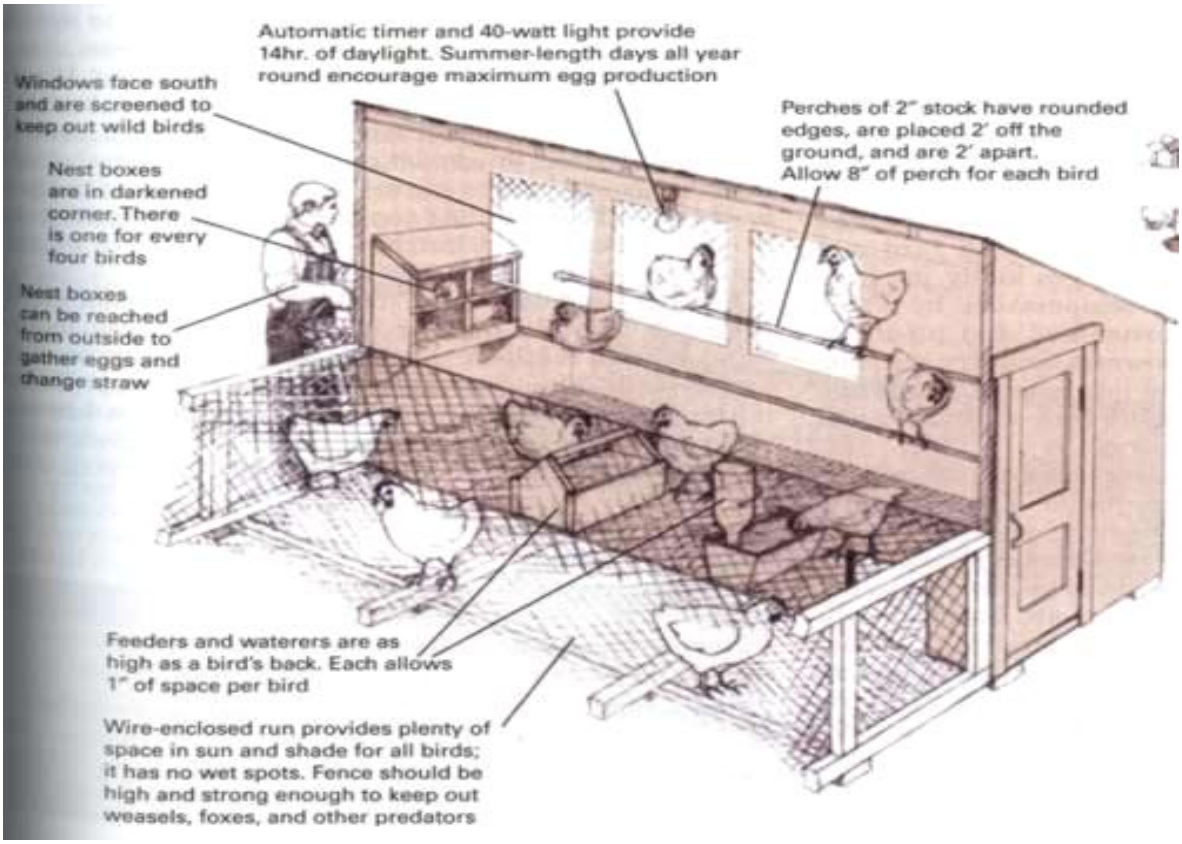
Types of Roofs used in Poultry Houses

- Shed or single span type. This type of roof is used in small construction which makes use of the simplest materials.
- Cable or double span. This type of roof is the most common type of roof system.
- Monitor type. This type of roof is ideal for big establishment especially in commercial farms. It is actually double span with an outlet of air at the top of the roof.
- Semi-monitor type. This type of roof is similar to the monitor type except that the outlet of air is made on one side only.



A SAMPLE PLAN AND HOUSE DESIGN OF A POULTRY HOUSE





HOUSING SYSTEM FOR LIVESTOCK (PIGERY)

Pig houses must be designed and constructed properly for good health and well-being of the pigs to obtain maximum performance and savings in labor costs. Bear in mind that a good building may not improve the health condition of the pigs, but a poor one will certainly increase the risk of incurring diseases. If the environment is uncomfortable, the pig is subjected to stress, making them prone to infection.

Factors to Consider in Constructing a Pig Farm

a. Site selection

The first step in putting up or expanding a piggery project is the selection of the site. It is important to consider the following during selection:

1. Availability and accessibility of essential services such as feed suppliers or stores, water and electricity sources.
2. The surroundings should be suitable for construction of drainage and manure disposal, thus there should be ample distance from neighbors and other farms. The site should comply with local policies like-zoning and environmental considerations.
3. The possibility of expansion should also be considered.

b. Zoning and Permits

Check out local zoning laws and regulations for a proposed location. If it is zoned on another other man's agricultural property, study the situation carefully before building the pig pen or pig house. Secure all required permits such as building, environmental and other permits required by the government before constructing.

c. Accessibility

Check the availability and cost of feeds, water and electricity. Water source should be able to supply for the peak demands and for future expansion. Keep in mind that water demand is thrice the weight of feed consumed plus wastage (15%) and water for cleaning (30%). If high electricity demand is anticipated, a standby generator can also be considered. A farm to market road should also be accessible to facilitate the transport of feeds and pigs throughout the year.

d. Distance from other farms

Ideal distance from other farms and neighbors is about one kilometer. This will serve as a natural screen in the prevention of diseases- Distance from the neighbors will prevent complaints regarding pig odors, flies, noise and pollution.

Factors to Consider In Planning Farm Buildings

a. Environmental control
b. Future expansion
c. Proper ventilation
d. Minimum labor requirement
e. Durability of building materials
f. Dryness
g. Sanitation
h. Rodent and Bird control
i. Safety

Building Orientation and Ventilation

The front side of the building should be facing EAST and the rear side should be facing WEST. This would prevent the animals from too much exposure to the sunlight. This orientation would ensure equal distribution of sunlight throughout the day.

Areas regularly visited by outsiders should be situated near the gate. These areas are offices, feed bodega or storage, market area and finishers pen. The farm road should be near the pig houses with alleys connecting them.

The health condition of the pigs can be affected by the specific swine house climate. Any disturbance in this climate can cause respiratory and intestinal diseases. The pigs in the Philippines are not expected to perform as efficiently as the pigs in the temperate region since the prevailing environmental temperature in the country is 24 – 35°C. The comfort zone of the pigs in the temperate region is between 18.5 – 20 °C. Thus, it is very important to make the animals comfortable by designing a pig house with high roofing and proper ventilation.

Ventilation serves the following purposes:

1. Replacement of foul air with fresh air or removal of odors
2. Removal of moisture
3. Removal of excess heat

Pig houses should be well-ventilated, however, avoid direct drafts and coldness.

To achieve proper ventilation, consider the following factors:

1. Inlets to serve as passageway of fresh air into the pig house.
2. Insulation should be available to keep house warm when necessary.
3. Supplemental heat during cold weather.
4. Presence of vapor barriers.
5. Removal of moist air through the outlets.

Different Designs of Ventilation System

a. **Natural ventilation** is mainly a ventilation system which depends on wind effect and convection effect. Ventilation in wind effect is created by the windblown against one side of the building creating suction pressure. In the convection effect, ventilation is caused by a still or slowly moving air. One example of natural ventilation is the monitor type building.

b. **Automatically controlled natural ventilation system** - is a system where curtains or flaps are installed/ constructed on the sides installed / constructed on the sides of the building, and adjusted when the temperature inside the pen is high or low. Curtains can be used to prevent draft and as a protection for the rapid change of temperature in the evening during inclement weather.

c. **Fan ventilation system** uses a fan to maintain the normal temperature inside the pen. Ventilating or oscillating fans/blowers are the most commonly used equipment for putting air where it is needed. One problem with this system is that it entails additional cost for running the fan

Normal air movement inside the house is very important. Thus, pig houses should not be constructed too close to each other. A distance of 10 – 15 meters between houses should be maintained for proper ventilation. However, this practice is too expensive. To make full use of the land, trees should be planted between buildings or buildings can be constructed near the rice fields, vegetable gardens, biogas lagoon, or fish ponds. This set-up is suitable for ecological balance to keep the surroundings cooler. As much as possible, the walls should have holes or G. I. pipes or steel bars or railings to ensure air flow. Although high perimeter walls are needed for security reasons, it is wiser to use barbed wire or posts with barbed wire.

Construction of very wide houses does not prevent ventilation problems. On the other hand, wide houses are not very efficient in heat exchange since accumulation of body heat by the pigs increases the temperature inside the house. To be efficient, the width of the house should not be more than 10 meters.

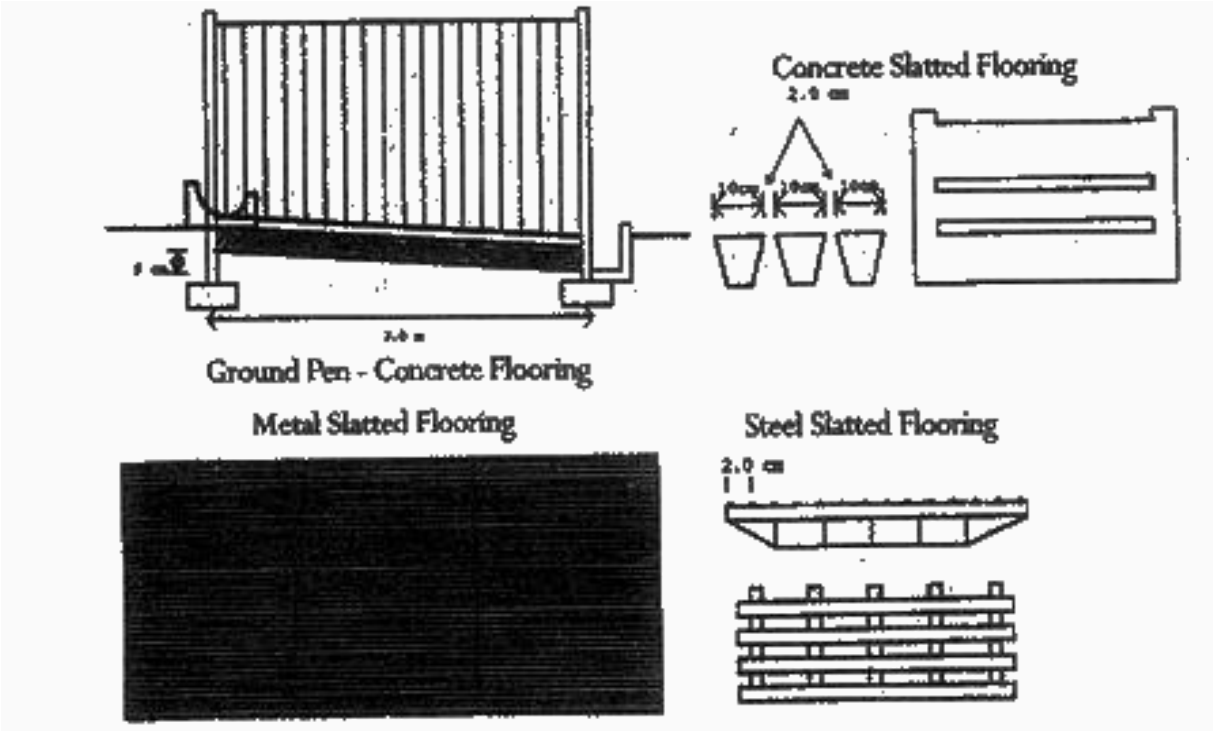
Building Pig Houses

In constructing pig houses, give close attention on the different parts of the building and the materials to be used. Building pig houses involved costs, however, don't sacrifice the quality of the materials or its lifespan should be a major consideration.

a. **Floor construction**. There is a direct and unavoidable contact between the pig and the flooring. Thus, the texture and the slope of the floor are two main considerations during the construction.

b. **Ground Pen**. In ground pen, the flooring should be set firmly on the earth free from organic matters or on well tramped gravel or crush rock fills. The floor should not be too rough to avoid foot and leg problems. On the other hand, a very smooth floor becomes slippery which can also cause leg problems. It is recommended that the flooring should be finished with the use of a wooden trowel. The slope should be two to three percent, which means a two to three cm depth per meter length towards the canal.

c. **Slatted flooring**. Slatted floors allow the pig manure to drop or to be forced through the slats. This lessens direct contact of the pig with the wastes possibly carrying pathogenic organisms and/or parasites. Recommended slat spacing for fatteners is two centimeters.



Before constructing a hog house, careful consideration must be given to sanitation, ventilation and temperature. The kind of diseases occurring in certain piggeries is sometimes the consequence of poor building layout. Poorly designed and constructed building increases the incidence of diseases and parasites among swine.

The first step in constructing a hog house is to determine the number and type of pigs to raise. Pen size depends on the number and type of pigs that will be housed. Decide also what system of rearing to adapt, whether individual or group. Use Table 1 to determine the size of the pen.

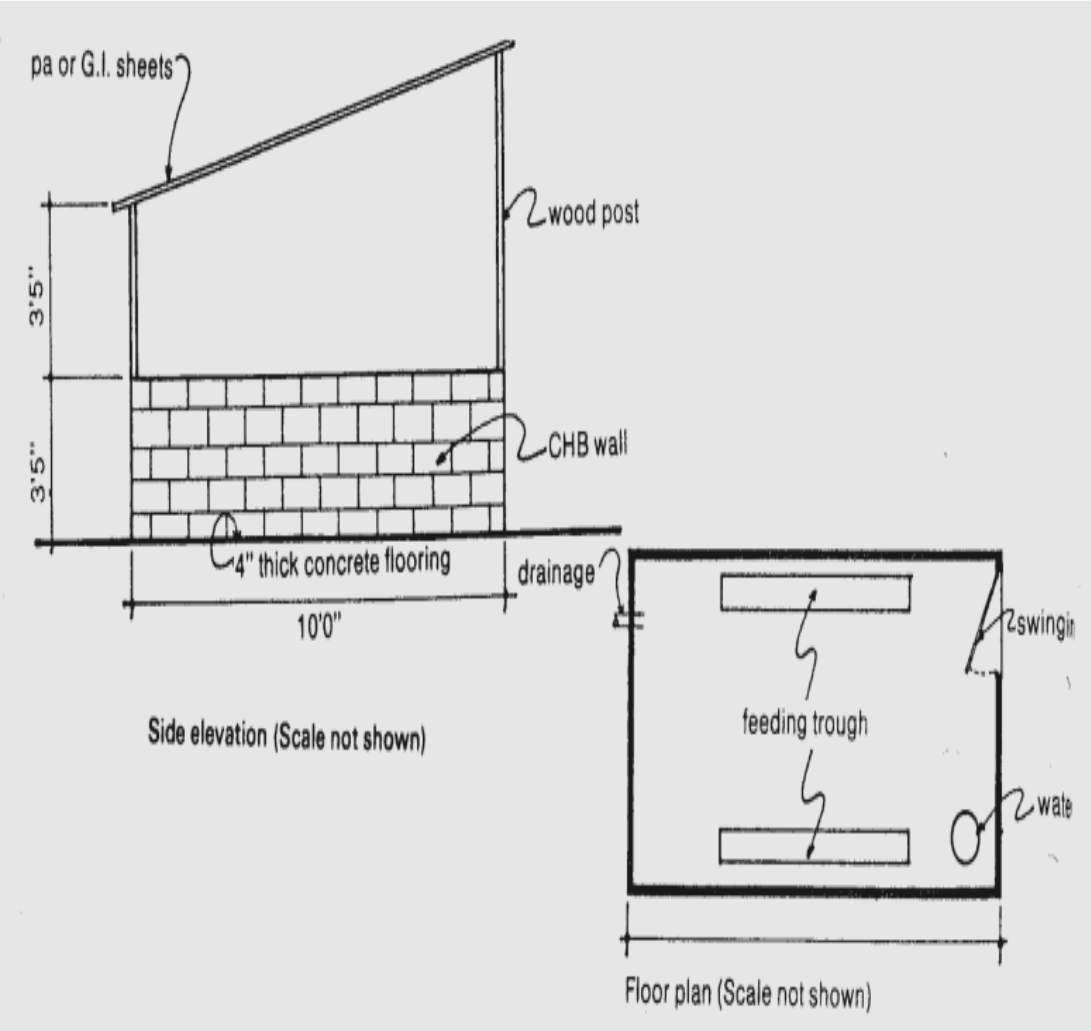
Table 1. Space Requirements of Buildings and Equipment for Swine

Age and size of animal	Pen size per animal (sq m)	Height of Pen Partitions (m)	Height of Doors (cm)	With of Doors (cm)	Self feeder Space (No. of animals linear)	Feed Trough Space per animal for Hand Processing (Linear m/animal
Sow before farrowing Gilts	1.5	2-2.5	100	100	7	0.5
Mature sows	2	2-2.5	100	100	9	0.6
Sow with pigs Young sows	4	2-2.5	100	100	3	0.5
Mature sows	6	2-2.5	100	100	3	0.5
Herd boars	2	2-2.5	120	100	3	0.6
Growing/finishing swine Weanling to 35 kgs.	0.5	2-2.5	75	75	13	0.2
35 to 60 kgs.	0.7	2-2.5	85	85	9	0.3
60 to 80 kgs.	0.1	2-2.5	100	100	9	0.4

Source: Supnet, M.G. Housing and Manure Management SEARCA Swine Production Training Manual

Suppose you want to raise six pigs which will be kept until they reach the marketable weight of 90 kilograms. In computing the size of the pen, use the pen size of pigs from 60 to 90 kilograms*. (Refer to the table of space requirement of building and equipment for swine.)*

Multiply the figure from the table by the number of pigs to be raised to get the total floor area of the pen. Next decide the form of the pen. A pen can either be rectangular or square but make sure that the required size is strictly followed.



Typical Backyard Hog House

How Much Have You Learned?

Self-Check 1.1

I. Enumerate the following:

1. Types of roofs used in poultry house.
2. Classification of poultry house.
3. Types of poultry housing

Direction: II. Write True if the statement is correct and False if is wrong. Write the answer in your activity notebook.

_____1. The heights of pen partitions in all classes of hogs are the same.
_____2. Under normal conditions, the bigger the animal the wider the pen size.
_____3. The size of a hog house to be constructed is dependent on the number and kind of hogs to be raised and the system of rearing them.
_____4. A tri-square can be used to test the accuracy of the perimeter layout of a hog house.
_____5. Straightness of a post or a pen wall can be checked with the use of a plumb bob or spirit level.

Refer to the Answer Key. What is your score?

How Do You Apply What You Have Learned?

Show that you learned something by doing this activity

Activity Sheet 1.1

Drawing typical house of poultry and livestock (pig)

1. In this activity you will need the following:

    - Construction/Bond paper
    - Pencil
    - Ruler
    - Eraser

2. Using the information given, draw typical house for poultry and livestock(pig). Include the different parts/compartments of the housing and label them.
3. Submit your output to your teacher. Be prepared for a presentation of your work
4. If in case you have questions, ask your teacher.

How Well Did You Perform?

Find out by accomplishing the Scoring Rubric honestly and sincerely. Remember it is your learning at stake!

DIMENSION	3	2	1
1. Plan / drawing	highly acceptable; it is well thought out	somewhat acceptable; thought out	not at all acceptable; not thought out
2. Justification	every part of the drawing makes sense	some parts of the drawing makes sense	no part makes sense
3. Appropriate material choices	all materials are appropriate	some materials are appropriate	no material is appropriate

LEARNING OUTCOME 2

Enumerate the building codes in constructing poultry and livestock houses

PERFORMANCE STANDARDS

- Building codes in constructing poultry and livestock houses are discussed.
- Signs and symbols of building codes are interpreted.

Materials / Resources

- Audio / visual presentation
- Projector
- Internet source
- Model codes of practice for the welfare of poultry and livestock manual
- Schools animal raising projects

What Do You Already Know?

Pretest LO 2

Let us determine how much you already know about enumerating building codes in constructing poultry and livestock house. Take this test.

Write True if the statement is correct and False if is wrong. Write the answer in your activity notebook.

_____1. The heights of pen partitions in all classes of hogs are the same.

_____2. Under normal conditions, the bigger the animal the wider the pen size.

_____3. The size of a hog house to be constructed is dependent on the number and kind of hogs to be raised and the system of rearing them.

_____4. A tri-square can be used to test the accuracy of the perimeter layout of a hog house.

_____5. Straightness of a post or a pen wall can be checked with the use of a plumb bob or spirit level.

_____6. An ideal site guarantees good hog performance.

_____7. Fertile and level land that easily drains is ideal for raising swine.

_____8. Rolling ground is good for hog raising.

_____9. To avoid the problem of relocation, the swine raiser must consider the zoning rules and regulations of the locality.

_____10. The site must be accessible to transportation facilities.

_____11. Piggeries must be located near residential houses to minimize the problem of stealing.

_____12. The prevailing wind direction must blow away from residential areas to prevent complaints of air pollution.

_____13. The cost of electricity must be the deciding factor when choosing the power source.

_____14. It is more economical to install a pump well in commercial piggeries.

_____15. Constructing buildings or houses at ground level can solve the problem of `drainage.

What Do You Need To Know?

Read the Information Sheet 2.1 very well then find out how much you can remember and how much you learned by doing the Self-check 2.1.

Information Sheet 2.1

BUILDING AND CONSTRUCTION CODE

Building codes are a set of rules that must be followed to satisfy the minimum acceptable levels of safety for buildings and non-building structures. The objective of building codes is to ensure the health, safety and protection of the public when it comes to the construction and occupancy of buildings. Building codes are determined by appropriate authorities in different areas and may vary widely from country to country.

Building codes stipulate details of the construction and maintenance of a building or construction. These include the following.

1. *Fire safety Rules*. Safety exits in buildings, limitations regarding how far a fire should spread and the provision of adequate firefighting equipment.

2. *Structural Rules*. Buildings need to be strong enough to resist internal and external forces without collapsing.

3. *Health Stipulations*. Buildings should have health stipulations such as adequate air circulation, washrooms and plumbing facilities.

4. *Others*. Building codes can makes sure that *proper noise limitations* are set in place to protect occupants from noise pollution through walls and windows. There may also be special provisions to *ensure that disabled people have proper access to and throughout the property*.

Anyone who builds a construction and fails to adhere to the proper building codes is liable to very severe penalties. For the complete ruling in building and construction codes in the Philippines, you can visit the site *www.filippijnen.org.*

SIGNS, SIGNALS AND BARRICADES USED IN BUILDING CONSTRUCTION

Signs, signals and barricades are important, if not critical, to the safety of the construction workers.

Accident Prevention Signs and Tags

General

Signs and symbols required shall be visible at all times when work is being performed, and shall be removed or covered promptly when the hazard does not exist anymore.

Danger Signs

Danger signs shall be used only where an immediate hazard exists.

Danger signs should be read as the predominating color for the upper panel; outline on the borders; and a white lower panel for additional sign wording .

Caution Signs

Caution signs shall be used only to warn against or caution against practices. Caution sign shall have yellow as the predominating color; black upper panel and borders; yellow lettering of “caution” on the black panel; and the lower yellow panel for the additional sign wording. Black lettering shall be used for additional wording.

Standard color of the background shall be yellow; and the panel, black with yellow letters. Any letter used against the yellow background shall be black. The colors shall be those of opaque glossy samples.

Exit Signs

Exit signs, when required, shall be lettered in legible red letters, not less than 6 inches high, on a white field and the principal stroke of the letters shall be at least three-fourths in width.

Safety Instructions Signs

Safety instruction signs, when used, shall be with green upper panel with white letters to convey the principal message. Any additional wording on the sign shall be black letters on the white background.

Directional Signs

Directional signs, other than automotive traffic signs specified in the paragraph below, shall be white with a black panel and white directional symbol. Any wording on the sign shall be black letters on the white background.



Traffic Signs

Construction areas shall be posted with legible traffic signs at point hazard. All traffic control signs or devices used for protection of construction workers shall conform to Occupational Safety and Health Administration (OSHA) standards.

Accident Prevention Tags

Accident prevention tags shall be used as temporary means of warning of an existing hazard such as defected tools, equipments, etc. They shall not be used in place of, or as a substitute for, accident prevention signs. Specifications for accident prevention tags similar as shown below shall apply.

Signaling

Flagmen

When operationing such signs, symbols, and barricades do not provide the necessary protection on or adjacent to highway or street, flagmen or other appropriate traffic controls shall be provided. Hand signaling by flagmen shall use red flags, at least 18 inches square or sign paddles,and in periods of darkness, red lights. Flagmen shall be provided with and shall wear a red or orange garment while flagging. Warning garments worn at night shall be of reflectorized material.

Barricades

Barricades for protection of employees shall conform to the OSHA standards.

Codes in constructing poultry and livestock houses

Codes are very useful documents for informing the general community about agreed standard, in pparticular we are referring to codes relating in constructing farm animal houses. These codes are included in the so called animal welfare codes. It covers the main areas that must be considered to achieve a desired standard of animal welfare. For codes about a particular type of livestock these areas will include feed and water, health, management practices, breeding, emergency slaughter and as mentioned, housing.

Cage and pen dimensions for the housing of animals

Cage areas and heights are the internal cage dimensions and not the overall size of the cages. They include all floor area available for use by the animal(s). Areas means the product of cage length and cage width measured internally and horizontally, not the product of the floor length and floor width which may be sloping

The cage floor are for animals housed in groups must be not less than that specified for an animal housed singly. Where large mature animals are to be housed, the minimum cage floor area required may be larger than those specified.

For the purpose of calculating the minimum floor area, the shelf area may be included, where there is adequate height for the animal above the shelf.

Below is the table showing the ideal measurements of houses of farm animals.

5.7. Farm animals and equidae

Species and weights	Minimum floor area sq m per animal When housed in groups	When housed singly	Minimum length of feed rack or trough per head m
Pigs			
up to 30kg	1.0	2.0	0.20
30 to 50kg	1.3	2.0	0.25
50 to 100kg	2.0	3.0	0.30
100 to 150kg	2.7	4.0	0.35
over 150kg	3.75	5.0	0.40
Adult boar	—	7.5	0.50
Sheep and goats			
up to 35kg	1.3	2.0	0.35
over 35kg	1.9	2.8	0.35
Cattle			
up to 60kg	1.5	2.2	0.30
60 to 100kg	1.6	2.4	0.30
100 to 150kg	1.9	2.8	0.35
150 to 200kg	2.4	3.6	0.40
200 to 400kg	3.8	5.7	0.55
over 400kg	5.3	8.0	0.65
Adult bull	—	16.0	0.65
Horses, donkeys and crossbreds			
Height at withers			
up to 147cm	—	12	—
148 to 160cm	—	17	—
Over 160cm	—	20	—

5.8. Birds

Species and weights	Minimum floor area sq cm per bird When housed in groups	When housed singly	Minimum height cm	Minimum length of feed trough per bird cm
Chickens and ducks				
up to 300g	250	350	30	3
300 to 600g	470	700	40	7
600 to 1200g	830	1250	50	10
1200 to 1800g	950	1450	50	12
1800 to 2400g	1200	1700	55	12
over 2400g	1900	2800	75	15
Quail				
up to 150g	250	350	20	4
150 to 250g	250	400	25	4
Pigeons	800	1225	35	5

The following are the criteria and considerations in constructing poultry houses:

1. Space requirements
2. Litter
3. Perches
4. Food and water
5. Shelter Nesting boxes
6. Vermin/predator proof

Self-Check 2.1

Draw the following signs, signals, symbols and barricades used in building construction:

1. Under Construction
2. Exit
3. Slippery When Wet
4. Directional signs
5. Danger Keep Out

Refer to the Answer Key. What is your score?

How Do You Extend What You Have Learned?

Show that you learned something by doing this activity

Assignment Sheet 2.1

MODEL CODES OF PRACTICE FOR THE WELFARE OF POULTRY AND LIVESTOCK HOUSING

1. You will need to conduct some research works to describe the assessment criteria for poultry housing. Some guide questions are given below to help you in your discussions or answers.

TABLE 1: ASSESSMENT CRITERIA FOR POULTRY HOUSING

Criteria	Answers
Spacing requirements Calculate the weight of birds per square meter of shed area. Is a minimum space requirement of 30 kg of birds per square meter provided (year round)?	
Litter What type of litter is used on the floor, e.g. rice hulls, wood shavings, straw? Is all the litter clean and dry? (The litter should not be caked, wet or excessively dusty.) Estimate the depth of the litter.	
Perches What is the average width of a mature bird of the breed your school keeps? Is there enough perch space to accommodate all the birds simultaneously? Is there 30 cm of space between perches that are parallel to one another? Are the perches set up in a way to minimize fouling	

on the bird below? Do the perches have sharp edges?	
Food and water Is water and food readily accessible to all of the birds? Is the water clean? Are the food containers clean?	
Shelter Are the birds protected from the weather, can they avoid the rain and excessive temperatures? Is the housing well ventilated? (If you can smell ammonia, this means ventilation is poor.)	
Nesting boxes Is there one nest box per three hens? Do the nest boxes have lids or roofs so that nesting hens cannot be fouled on? Is nesting material provided in the nest boxes, e.g. wood shavings, straw, rice hulls?	
Vermin and predator control How does the design/construction of the housing attempt to stop the entry of vermin/predators? List any features that help control the entry of vermin/predators.	

2. The next task is to visit the school poultry housing and write comments about the standards of housing provided for the poultry.

Table 2: Poultry housing criteria

CRITERIA	**COMMENTS**
Spacing	
Litter	
Perches	
Food and water	
Shelter	
Nesting boxes	
Vermin/predator proof	

DISCUSSION QUESTIONS

a. Why are the criteria listed above so important in designing suitable housing for poultry?

_____

_____

_____

e. Why do unsuitable or poorly designed chicken housing affect the poultry themselves?

_____

_____

_____

3. In this activity you should discuss how your class might improve the poultry housing at your school. These improvements should improve the welfare of the chickens.

4. You then need to make a list of any changes that your class has decided to be made to the school's poultry housing. You should prioritize the changes that you have listed with a ranking of 1, 2, 3, etc.

Congratulations! You did a great job! Rest and relax a while then move on to the next lesson. Good luck!

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LO1

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LO 2

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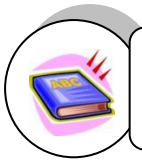
LESSON 4

Apply safety measures on farm operations

LEARNING OUTCOMES:

At the end of this Lesson you are expected to do the following:

LO 1. apply appropriate safety measures; and
LO 2. safely keep / dispose materials and outfit.



Definition of Terms

Chemical Substance - is a form of matter that has constant chemical composition and characteristic properties. It cannot be separated into components by physical separation methods, i.e. without breaking chemical bonds. They can be solids, liquids or gases.

Ecology (from Greek: οἶκος, "house"; -λογία, "study of") is the scientific study of the relations that living organisms have with respect to each other and their natural environment.

First aid is the provision of initial care for an illness or injury. It is usually performed by non-expert, but trained personnel to a sick or injured person until definitive medical treatment can be accessed. Certain self-limiting illnesses or minor injuries may not require further medical care past the first aid intervention. It generally consists of a series of simple and in some cases, potentially life-saving techniques that an individual can be trained to perform with minimal equipment.

Personal protective equipment (**PPE**) refers to protective clothing, helmets, goggles, or other garment or equipment designed to protect the wearer's body from injury by blunt impacts, electrical hazards, heat, chemicals, and infection, for job-related occupational safety and health purposes, and in sports, martial arts, combat, etc. Personal armor is combat-specialized protective gear.

Pollution - is the introduction of contaminants into a natural environment that causes instability, disorder, harm or discomfort to the ecosystem i.e. physical systems or living organisms.

Waste management is the collection, transport, processing or disposal, managing and monitoring of waste materials. The term usually relates to materials produced by human activity, and the process is generally undertaken to reduce their effect on health, the environment or aesthetics. Waste management is a distinct practice from resource recovery which focuses on delaying the rate of consumption of natural resources. The management of wastes treats all materials as a single class, whether solid, liquid, gaseous or radioactive substances, and tried to reduce the harmful environmental impacts of each through different methods.

Wastes – are unwanted or useless materials.

LEARNING OUTCOME 1

Apply appropriate safety measures

PERFORMANCE STANDARDS

- Safety Measures are applied best on work equipment and farm procedures.
- Tools and materials are utilized in accordance with specification and procedures.
- Outfit is worn in accordance with farm requirements.
- Shelf life and / or expiration of materials are effectively checked against manufacturers' specifications.
- Hazard in the workplace are identified and reported in line with farm guidelines.

Materials / Resources

- Personal protective equipment (PPE)
- Wet weather clothing
- Coveralls
- Eye protection
- Footwear
- Gloves
- Hearing protection
- Respiratory protective equipment (RPE)
- Safety helmets
- First aid kit and materials
  - Acetaminophen
  - Adhesive bandages
  - Adhesive tape
  - Alcohol prep pads
  - Alcohol-based hand sanitizing gel
  - Antibiotic ointment
  - Assorted adhesive bandages
  - Chemical heat packs
  - Elastic bandages, 3-inch-wide
  - Gauze bandage, 3-inch roll
  - Ibuprofen
  - Non-latex disposable gloves
  - Oral antihistamine
  - Over-the-counter diarrhea medication
  - Self-adhesive bandage, 2-inch roll

- Soap
- Sterile gauze pads, 3-x-3-inch
- Sterile gauze pads, 4-x-4-inch
- Sunscreen

What Do You Already Know?

Pretest LO 1

Let us determine how much you already know about apply safety measures while working in the farm. Take this test.

I. Enumerate your answers based on the following.

1-5 Common hazards to most farms

1-4 High risk factors to farm

1-6 Examples of personal protective equipment (PPE)

What Do You Need To Know?

Read the Information Sheet 1.1 very well then find out how much you can remember and how much you learned by doing the Self-check 1.1.

Information Sheet 1.1

AREAS OF CONCERN FOR FARM SAFETY

Every farm is different, but hazards common to most farms include:

1. **Animals** – injuries inflicted by animals can include bites, kicks, crushing, ramming, trampling, and transmission of certain infectious diseases such as giardia, salmonella, ringworm and leptospirosis.
2. **Chemicals** – pesticides and herbicides can cause injuries such as burns, respiratory illness or poisoning.
3. **Confined spaces** – such as silos, water tanks, milk vats and manure pits may contain unsafe atmospheres, which can cause poisoning or suffocation.
4. **Electricity** – dangers include faulty switches, cords, machinery or overhead power lines.
5. **Heights** – falls from ladders, rooftops, silos and windmills are a major cause of injury.
6. **Machinery** – hazards include tractors without roll-over protection structures (ROPS), power take-off (PTO) shafts, chainsaws, augers, motorbikes and machinery with unguarded moving parts.
7. **Noise pollution** – noise from livestock, machinery and guns can affect your hearing.
8. **Vehicles** – crashes or falls from motorbikes, two-wheel and quad bikes, tractors.
9. **Water** – drowning can occur in as little as five centimeters of water. Dams, lakes, ponds, rivers, channels, tanks, drums and creeks are all hazards. Young children are particularly at risk.
10. **Weather** – hazards include sunburn, heat stroke, dehydration and hypothermia.

Health and Safety Hazards on Farms

Farm workers—including farm families and migrant workers—are exposed to hazards such as the following:

- Chemicals/ Pesticides
- Livestock handling
- Slips/Trips/Falls
- Machinery/ Equipment
- Sun/Heat
- Highway traffic
- Electricity
- Lifting
- Cold
- Hand tools
- Noise
- Dust
- Ponds
- Silos
- Wells
- Toxic gases
- Grain bins
- Manure pits
- Tractors
- Mud

High Risk Factors on Farms

The following factors may increase risk of injury or illness for farm workers:

- Age – Injury rates are highest among children age 15 and under and adults over 65.
- Equipment and Machinery – Most farm accidents and fatalities involve machinery. Proper machine guarding and doing equipment maintenance according to manufacturers' recommendations can help prevent accidents.
- Protective Equipment – Using protective equipment, such as seat belts on tractors, and personal protective equipment (such as safety gloves, coveralls, boots, hats, aprons, goggles, and face shields) could significantly reduce farming injuries.
- Medical Care – Hospitals and emergency medical care are typically not readily accessible in rural areas near farms.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

The law requires that personal protective equipment be provided for use at work and must meet an appropriate standard and must be CE marked. The key issues are:

- Personal protective equipment (PPE)
- Respiratory protective equipment (RPE)
- Gases and vapours

Personal protective equipment (PPE) includes the following

- coveralls
- eye protection
- footwear
- gloves
- hearing protection
- respiratory protective equipment (RPE)
- safety helmets
- wet weather clothing

***Your health and safety and that of your workers can depend on it.

When selecting PPE, remember the following

- You need to consider and introduce other means of protection first. Provide PPE **only as a last resort** after taking all other reasonably practicable measures.
- Engineering controls provide long-term solutions and are often cheaper than providing, replacing, maintaining and storing PPE.
- Controls at source protect all workers in the area, while PPE only protects the wearer.
- It is essential to involve your workers in the selection process, as they often have detailed knowledge of the way things work or the way they do tasks, which can help you.
-

Note: *Also make sure that PPE:  *CE mark*

- is effective and gives adequate protection against the hazards in the workplace;
- is suitable and matches the wearer, the task and the working environment, so it does not get in the way of the job being done or cause any discomfort;
- does not introduce any additional risks, eg limits visibility;
- is CE marked to confirm that it has been made to an appropriate standard;
- is compatible with any other PPE that has to be worn. Safety spectacles may interfere with the fit of some respirators.

To use the equipment effectively, workers need suitable information, instruction and training. Make sure all equipment is checked before use and cleaned, maintained and stored in accordance with the manufacturer's instructions.

Remember that employers are not permitted to charge their employees for personal protective equipment provided for use only at work.

Respiratory protective equipment (RPE)

Suitable RPE can be used to provide protection against two broad types of substance:

- dusts
- fibers
- mists
- fumes
- micro-organisms (bioaerosols)
- gases and vapors

Respirators come in various forms including disposable half-mask respirators, full-face mask respirators with filters, or powered respirators.

A well-fitting and well-fitted disposable respirator conforming to BS EN 149:2001 will protect against dusts, fibers etc. A powered helmet to BS EN 12941:1999 with the correct filter may be more appropriate in many work situations if a disposable respirator is unsuitable, e.g. for people with beards.

RPE with a high level of protection is necessary for very dusty jobs or where there is a high risk of occupational asthma or farmer's lung, e.g. cleaning grain stores or poultry houses.

Face-fit testing (as described in HSG53) must be done for all respirators that rely on a good face seal to be effective, i.e. disposable, half- and full-face masks. This ensures the respirator can fit properly, but the fit still needs to be checked before each use. If in doubt, ask advice from a reputable supplier or manufacturer.

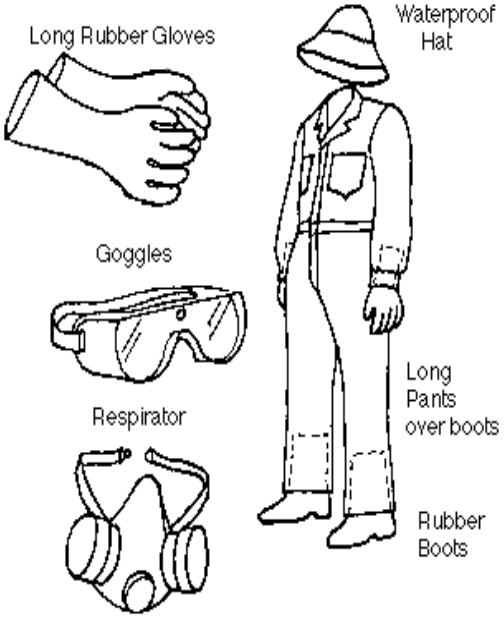
Gases and Vapors

This website cannot give accurate guidance to allow you to select protection against gases and vapors. You need to get information about:

- the substances present;
- the work to be done;
- the environmental conditions;
- how long the respirator is to be worn; and
- and then seek advice from a competent supplier or manufacturer.

This is because, among other reasons, gas and vapor filters rely on adsorbing the contaminant and different adsorbents (and filters) are used for different gases. It is also difficult to know when filters need changing – when the absorbent is saturated, the gas will pass through the filter.

Respirators relying on filtration for their efficiency should **never** be used to provide protection in oxygen-deficient atmospheres.



Personal Protective Equipment (PPE)

BASIC FIRST AID IN FARMING OPERATION

First aid is an important part of our preparedness planning. Of course, we rely on medical professionals, but we also know how to handle basic first aid in an emergency too. We feel it's important to be able to respond to immediate crises a.s.a.p., since it can make the difference between life and death.

What's more, we realize that in a major disaster, emergency services may be overloaded. For instance, in a major weather event (snow storm, hurricane, etc.) the authorities may be occupied are centralized care centers, so help at our home may be unavailable, or long in coming.

Therefore, we've realized that we must have both first aid supplies and the skills/knowledge to use them.

We keep multiple first aid kits. We have our main supplies in one central location in our house. However, we also maintain some first-aid supplies in our cars and a portable kit in our evacuation supplies.

Our portable kits are customized for our needs, and have a bit more than the most low-cost prepackaged kits you'll find in stores:

- Acetaminophen
- Adhesive bandages
- Adhesive tape
- Alcohol prep pads
- Alcohol-based hand sanitizing gel
- Antibiotic ointment
- Assorted adhesive bandages
- Chemical heat packs
- Elastic bandages, 3-inch-wide
- Gauze bandage, 3-inch roll
- Ibuprofen
- Non-latex disposable gloves
- Oral antihistamine
- Over-the-counter diarrhea
- medication
- Self-adhesive bandage, 2-inch roll
- Soap
- Sterile gauze pads, 3-x-3-inch
- Sterile gauze pads, 4-x-4-inch
- Sunscreen

BASIC FIRST AID PROCEDURES

A. Injury treatment

1. *Nose bleeds***-** pinch nose and tilt head forward.
2. *Animal bites* -wash wound, identify animal, and report the bite.
3. *Serious falls*- do not move the victim; call emergency hotline
4. *Severe wounds*- have the victim sit or lie down, apply direct pressure to stop the Bleeding, Call Emergency Hotline.
5. *Small wounds*- wash the wound, apply dressing and bandage
6. *Bruises*- apply a cold compress.

B. Burns

1. *1st and 2nd degree:* Put burn in cold water, pat dry and cover with clean bandage. Do not break blisters

    a. A *1st degree burn* is red, sore, and covers a small area.

    b. A *2nd degree burn* is blistered and painful.

2. *3rd degree:* Do not put water on an open wound, do not remove burned on clothing. Cover the burn lightly and get medical help!

    a. A *3rd degree burn* causes the skin to be white or charred and there is a loss of skin layers.

How Much Have You Learned?

Self-Check 1.1

A. Answer the following questions briefly.

1. What are the possible emergencies in the farm?
2. How do you react in case of chemical spills or a fire in a farm shed?
3. How do you minimize risk of personal injury or property damage in the event of emergency?

B. Using the chart below, identify the possible treatment for the following injuries:

1. Injury : Burns ***Treatment:*** _____ _____ _____ _____.	***2.Injury*** : Falls ***Treatment:*** _____ _____ _____ _____.	***3.Injury*** : Nose Bleeding ***Treatment:*** _____ _____ _____ _____.
4.Injury : Small Wounds ***Treatment:*** _____ _____ _____ _____.	***5.Injury :*** Bruises ***Treatment:*** _____ _____ _____ _____.	***6.Injury :*** Animal bite ***Treatment:*** _____ _____ _____ _____.

Refer to the Answer Key. What is your score?

How Do You Extend What You Have Learned?

Show that you learned something by doing this activity

HAZARDS IN THE FARM

Directions: Answer the following questions briefly.

1. What is a hazard?
2. Give at least 3 examples of common farm hazards and explain how particular hazard affects the farmers? Follow the chart below.
3. How can farmers protect themselves from these hazards?
4. Enumerate the different hazards in farm operations.

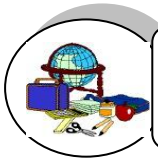
Common Form of Hazards	How The Hazard Affects Farmers
1.	
2.	
3.	

LEARNING OUTCOME 2

Safety keep/dispose materials and outfit

PERFORMANCE STANDARDS

- Used tolls and outfit are cleaned in line with farm procedures.
- Unused materials are labeled and stored according to manufacturers' recommendation and farm requirements.
- Waste materials are disposed according to manufacturers, government and farm requirements.



Materials /e Resources

- Farm tools and equipments
- Farm storage area
- Cleaning materials
- Projector
- Instructional videos

What Do You Already Know?

Pretest LO 2

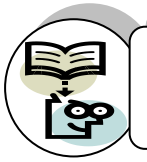
Let us determine how much you already know about safely keep / dispose materials and outfit. Take this test.

IDENTIFICATION. Identify the following environmental law on animal production.

_____1. Pollution Control Law of the Philippines.
_____2. An Act Creating the Laguna Lake Development Authority (**LLDA**) Prescribing Its Powers, Functions and Duties, Providing Funds Thereof, and For Other Purposes.
_____ 3. Provides a basis for an integrated waste management regulation starting from waste source to methods of disposal.
_____4. An Act Providing for a Comprehensive Water Quality Management.
_____5. Establishing an **Environmental Impact Statement** (EIS) System Including Other Environmental Management Related Measures and For Other Purposes

ENUMERATION: Enumerate the given statement.

- Safety practices during operation on farm tools (10)



What Do You Need To Know?

Read the Information Sheet 2.1 very well then find out how much you can remember and how much you learned by doing the Self-check 2.1.

Information Sheet 2.1

TECHNIQUE IN STORING MATERIALS AND CHEMICALS

A. Protect Tools from the Elements

Blades such as electric hedge, trimmer blades, hoe, shovel, and other metal surfaces can be sprayed with lubricant oil. Spray the blades then turn them on to make sure oil works

into all areas. All electrical and petrol gardening equipment need to be covered with a blanket or sheet if kept in the shed. This will prevent dust and dirt from getting to them.

B. General cleaning procedures

The farmer and/or farm workers responsible for cleaning must adhere as much as possible to the following procedures:

- Be properly trained on the cleaning procedures
- Develop a cleaning program and schedule according to the recommended frequency and the cleaning program should be monitored to ensure its effectiveness.
- Cleaning must not take place while fresh vegetables are being harvested, packed, handled and stored.
- Water that is used for cleaning must be safe.
- The cleaning of equipments, tools and containers must take place in a designated area away from the field and the storage of agricultural inputs and fresh vegetables.
- When using cleaning and disinfecting chemicals, the farmer and/or farm workers must become familiar with the instructional use of these products.
- Strictly adhere to all precautionary statements and mixing instructions.
- Protect equipments, tools, containers and fresh vegetables when working with any chemicals.

C. Cleaning re-usable containers

The farmer and/or farm workers responsible for cleaning re-usable containers must adhere as much as possible to the following procedures:

- Remove as much as possible plant debris, soil and residues of any kind, use a brush or appropriate tool when necessary.
- Inspect containers for physical damage which might injure, spoil and contaminate fresh vegetables, if found, repair them.
- Inspect containers for any missed plant debris, soil and residues, if found, re-clean.
- If cleaning and/or disinfecting chemicals are used, follow label instructions for mixing.
- Rinse containers with clean water.
- When possible, containers should be placed in the full sun for rapid drying.
- Store re-usable containers properly to avoid contamination.

D. Cleaning equipments, tools and garbage cans

The farmer and/or farm workers responsible for cleaning the equipment (e.g. tables, racks, plastic sheet, etc.), tools (e.g. secateurs, knifes, brushes, etc.) and garbage cans must adhere as much as possible to the following procedures:

- Remove as much as possible plant debris, soil and residues of any kind, use a brush or another appropriate tool when necessary.
- Inspect equipments for physical damage which might injure, spoil and contaminate fresh vegetables, if found, repair them.
- Inspect equipments, tools and garbage cans for any missed plant debris, soil and residues, if found, clean again.
- If cleaning and/or disinfecting chemicals are used, follow label instructions for mixing.
- As required, apply cleaning materials such as detergent and/or disinfecting chemicals, and ensure that no spots are missed.
- Rinse with safe water, if there are parts of the equipment that cannot be rinsed with water, use a clean wet towel and follow the same procedures for cleaning.
- Ensure that small equipments and tools do not touch the ground floor after the cleaning procedures.

- When possible place under the sun for rapid drying.
- Store equipments and tools properly to avoid contamination.

E. Cleaning areas for handling and storing fresh produce

The farmer and/or farm workers responsible for cleaning these areas must adhere as much as possible to the following procedures:

- Unplug any electrical equipments and if possible, cover with plastic electrical motors, electrical boxes, connections, light fixtures, etc. do not use packaging materials for this task.
- Remove trash and any accumulated plant debris from the floors.
- Using low pressured water,
    - rinse the entire ceiling infrastructure and light fixtures to remove any dust and soil build up;
    - rinse walls, windows and doors from the top downward; and
    - rinse the entire floor surface to remove any soil build up, be careful of not splashing water onto equipments.
- If necessary, scrub areas with brush and cleaning materials such as detergent, and ensure that no spots are missed.
- After scrubbing areas with cleaning materials, rinse surface areas as described previously, wash out drains; be careful of not splashing water onto equipments.
- If cleaning and/or disinfecting chemicals are used, follow label instructions for mixing.

F. Cleaning hygienic facilities

The farmer and/or farm workers responsible for cleaning hygienic facilities must adhere as much as possible to the following procedures:

- Pick up trash from the floors and throw into garbage bins.
- By using the proper detergent, clean toilets, sinks and other fixtures.
- Using low pressured water, rinse the entire floor surface to remove any soil build up.
- If cleaning and/or disinfecting chemicals are used, follow label instructions for mixing.
- As required, apply cleaning materials or disinfecting chemicals to entire floor surface area, scrub areas with brush if needed, and ensure that no spots are missed.
- Rinse floor and drains.
- Remove excess water and allow drying out at room temperature.
- Ensure that hygienic facilities have enough toilet paper, soap and disposable towel.

G. Technique in storing chemicals

Chemicals are used on farms for a variety of purposes. The safe management of chemicals requires access to information and responsible action. Manufacturers, suppliers and users of farm chemicals all have an important role to play. Chemical substances present different types of risks to people's health, safety and the environment. For this reason there are different laws controlling them. The purpose of these laws is to ensure that chemicals are used safely and efficiently so that risks to human health, the environment and damage to property are minimized.

H. Safe Management of chemicals involves

- correct labeling and packaging;
- provision of material safety data sheets (MSDS);
- safe transport, storage, use and disposal of substances.

I. Labeling and Packaging of Chemicals

Chemicals must be supplied in packages that are correctly labeled and suitable for the substance. Information provided on the label will depend on the type of substance and the risks associated with it. Items to look for are:

1. Signal words such as 'CAUTION', 'POISON' or 'DANGEROUS POISON',– a signal that word alerts users to the possibility of poisoning if the substance is swallowed, inhaled or absorbed through the skin.
2. The Dangerous Goods (ADG) if there is an immediate risk to health or safety e.g. flammable liquids.
3. Risk phrases describing the type of health effects e.g. 'irritating the skin', and safety phrases stating precautions for safe handling, storage, spills, disposal and fire e.g. 'keep away from combustible material'

J. Ensure that containers remain labeled

Farmers must ensure that the original labels remain on containers of substances. If a substance is poured into a second container such as a spray tank then that container must be labeled with the product name and appropriate risk and safety phrases. These can generally be copied from the parent container. Labeling is not necessary if a substance is used immediately and its container is thoroughly cleaned.

There are good reasons for ensuring that proper containers and appropriate labels are used, including:

- Using food containers to store poisons can result in poisoning due to accidental swallowing.
- Insurance companies may question liability if something goes wrong and an unlabelled container has been the cause of an incident.
- Produce cannot be exported if maximum residue limits are exceeded labels provide advice on permitted use and withholding periods for agricultural and veterinary chemicals.

K. Material Safety Data Sheets

Material safety data sheets (MSDS) must be produced by the manufacturer or importer of hazardous substance.

The MSDS is not just a piece of paper. It provides important and useful advice about what is in the product, its health effects, safe use and handling, storage, disposal, first aid and emergency operation. Farmers must obtain the MSDS from their supplier and keep them in a register where they are available to people who could be exposed to the hazardous substance.

The register is a collection of the MSDS and other information which can be kept in a folder, filing cabinet or other practical system.

The register can be kept in the house, workplace or the chemical store, so long as it remains accessible to emergency service personnel and any employees who may be exposed to hazardous substances.

L. Storage and Transport of Chemicals

Safe storage of farm chemicals is needed to protect them from the elements, restrict access to them, prevent contamination of the environment, food or livestock and ensure separation from other incompatible chemicals. Arrangements must be in place to contain any spillage of the chemical.

After considering the potential risk to people's health or to the environment, a farmer might decide that a locked shed with a roof and concrete floor, which is bounded to contain any spills, is the best way to provide safe storage.

Remember, you should never store oxidizing agents with fuels. That is – never store substances labeled yellow diamond with a red diamond.

Safe transport of farm chemicals depends on what the substance is, how much there is, where it is to be transported and what else is to be transported with it. In general, small quantities (less than 250 liters) can be transported on vehicle provided that the container is properly secured and safe from spillage.

M. Disposal of Farm Chemicals

Empty farm chemical containers and unwanted chemicals need to be disposed of properly. Prior to disposal of empty containers, wash the container out three times and use the rinse water to dilute further batches of the chemical to working strength.

To wash a container you do not need to fill it each time. If you only have six liters of water, it is more efficient to use three washes of two liters each, than it is to rinse once with the full six liters.

FARM WASTE MANAGEMENT SYSTEM AND THE GOVERNMENT REQUIREMENT

A. Legal Bases

Presidential Decree (PD) 1152, "the Philippine Environmental Code," which took effect in 1977, provides a basis for an integrated waste management regulation starting from waste source to methods of disposal. PD 1152 has further mandated specific guidelines to manage municipal wastes (solid and liquid), sanitary landfill and incineration, and disposal sites in the Philippines. In 1990, the Philippine Congress enacted the Toxic Substances, Hazardous and Nuclear Wastes Control Act, commonly known as Republic Act (RA) 6969, a law designed to respond to increasing problems associated with toxic chemicals and hazardous and nuclear wastes. RA 6969 mandates control and management of import, manufacture, process, distribution, use, transport, treatment, and disposal of toxic substances and hazardous and nuclear wastes in the country. The Act seeks to protect public health and the environment from unreasonable risks posed by these substances in the Philippines. Apart from the basic policy rules and regulations of RA 6969, hazardous waste management must also comply with the requirements of other specific environmental laws, such as PD 984 (Pollution Control Law), PD 1586 (Environmental Impact Assessment System Law), RA 8749 (Clean Air Act) and RA 9003 (Ecological Solid Waste Management Act) and their implementing rules and regulations.

B. Farm Waste Management

Farm waste management covers the responsible storage , collection and disposal of all farm waste and the preparation and implementation of a farm waste management plan.

The Farm Waste Management Plan

The Farm Waste Management Plan must take into account the collection, storage and disposal of all farm wastes. Implementation of the plan will reduce the risk of pollution and prevent the loss of valuable nutrients in slurry and farmyard manure. The plan consists of two parts:

- **Part 1** – a completed Farm Waste Checklist for the farm. The purpose of the checklist is to identify remedial works and changes in management practice that are required to ensure a high standard of farm waste management.

- **Part 2** – a completed Farm Waste Location Plan. This plan is a copy of your farm map showing areas of the farm that are suitable and unsuitable for spreading agricultural wastes.

Farm Waste Checklist with identified remedial works/changes in management practice This is a record of the condition of farm waste facilities and management practices as observed at the date of completion. Completion of the checklist will enable you to audit your farmyard and farm to ensure that farm waste management standards, including disposal of manures, silage effluent, waste plastics, fallen animals and veterinary wastes are managed to a standard beyond current legislation and Good Farming Practice. The checklist must be continually kept under review and updated annually. Keep the whole farm free of rubbish, litter and anything that would detract from the appearance of the countryside.

Farm Waste Location Plan. A farm waste location plan is a copy of your farm map color coded as follows:

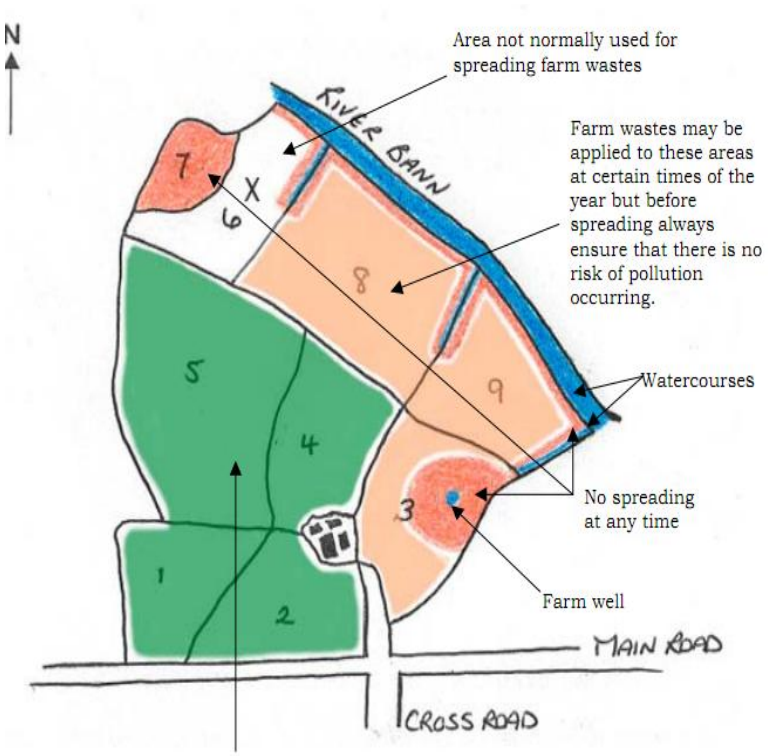
- **BLUE** – waterways including any on the farm boundary.

- **RED** – areas where organic wastes should never be applied.

- **ORANGE** – areas from which there is a high risk of pollution occurring (may be part or whole fields). Farm wastes may be applied to these areas at certain times of the year, but before spreading always ensures that there is no risk of pollution occurring.

- **GREEN** – all remaining areas. These can be used for spreading at any time of the year when land and weather conditions are suitable.

- **WHITE** – areas not normally used for spreading organic wastes and mark them with an X.


N
Area not normally used for spreading farm wastes
RIVER BANN
Farm wastes may be applied to these areas at certain times of the year but before spreading always ensure that there is no risk of pollution occurring.
7
X
6
8
5
9
Watercourses
4
No spreading at any time
3
1
2
Farm well
MAIN ROAD
CROSS ROAD
Subject to closed period restrictions these areas can be used for spreading when land and weather conditions are suitable

How Much Have You Learned?

Self-Check 2.1

Directions: Match Column A with Column B.

Column B	Column A
A. "The Philippine Environmental Code,"	_____1. RA 9003
B. Mandated specific guidelines to manage municipal wastes (solid and liquid), sanitary landfill and incineration, and disposal sites in the Philippines	_____2. BLUE
C. Toxic Substances, Hazardous and Nuclear Wastes Control Act	_____3. RED
D. Pollution Control Law	_____4. PD 984
E. Clean Air Act	_____5. RA 8749
F. Ecological Solid Waste Management Act	_____6. Presidential Decree (PD) 1152
G. Waterways including any on the farm boundary	_____7. PD 1152
H. Areas where organic wastes should never be applied	_____8. Republic Act (RA) 6969
I. Areas not normally used for spreading organic wastes and mark them with an X.	_____9. WHITE
J. All remaining areas. These can be used for spreading at any time of the year when land and weather conditions are suitable.	_____10. GREEN

Refer to the Answer Key. What is your score?

How Do You Apply What You Have Learned?

Show that you learned something by doing this activity

Activity Sheet 2.1

Directions:

1. Visit your tool room in your school and identify tools, containers which are not thoroughly cleaned and record using the table below.

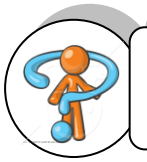
Record of Cleaning Equipments, Tools, Containers and Handling and Storage Areas

Date and time	What has been cleaned?	Name of chemicals being used	Corrective actions	Name of the cleaner	Signature

2. While doing the activity above, demonstrate the following techniques:

    a. Cleaning re-usable container
    b. Cleaning equipment, tools and garbage cans
    c. Cleaning areas of handling and storing fresh produce
    d. Cleaning hygienic facilities
    e. Techniques in storing chemicals

3. You will be rated using the scoring rubric below



How Well Did You Perform?

Find out by accomplishing the Scoring Rubric honestly and sincerely. Remember it is your learning at stake!

Dimension	Highly skilled 4	Skilled 3	Moderately skilled 2	Poorly skilled 1
1. Use of tools, equipment and materials	Appropriate and skilled use of tool, equipment and materials all the time	Appropriate and skilled use of tool, equipment and materials most of the time	Appropriate and skilled use of tool, equipment and materials sometimes	Appropriate and skilled use of tool, equipment and materials very rarely
2. Application of procedure	Systematic application of procedures on his/her own	Systematic application of procedures with minimal assistance	Systematic application of procedures with much supervision	Systematic application of procedures with supervision all the time
3. Speed and Accuracy	Works very fast and yet always accurate	Works fast but with 1 or 2 inaccuracies	Works slow with some inaccuracies	Works very slowly and commits many errors

Interpretation of Scores:

10 – 12 - Highly Skilled
7 – 9 - Skilled
4 – 6 - Moderately Skilled
3 and below - Poorly Skilled

Congratulations! You did a great job!

REFERENCES

LO1

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- First Aid Nose Bleed http://www.youtube.com/watch?v=cakw-IVVyhE
- First Aid Animal Bite http://www.youtube.com/watch?v=QHEWzHFDvGw
- First Aid Bruises http://www.youtube.com/watch?v=8v_SpfDHHHE
- First Aid Wounds http://www.youtube.com/watch?v=nVEop8tqKRo&feature=relmfu
- PPE for Pesticide Applicators http://www.youtube.com/watch?v=2Tyla5ZJ56E&feature=results_video&playnext=1&list=PL013DBC3172C787B3
- Waste Management for Small Livestock Farms http://www.youtube.com/watch?v=C17ASZ9CaeE&feature=results_video&playnext=1&list=PLF1AB1A1B0DEE427D

LO 2

- http://www.farm-dreams.com/profiles/blogs/how-s-your-first-aid-preparedness?xg_source=activity
- http://www.thucphamantoanviet.vn/a-aproducers-and-traders/a-egetables-fruits-tea/a-quality-assurance-systems/1200_-_ffv_-_gap_-_sop_for_cleaning_equipments_tools_containers_handling_and_storage_areas_for_fresh_vegetables_-_version_3.0.pdf
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- http://www.emb.gov.ph/

Answer Key

LESSON 1: USE FARM TOOLS AND EQUIPMENT

<table>
<tr><td colspan="2">LO1. Select and Use Farm Tools</td></tr>
<tr><td>What Do You Already Know?</td><td>How Much Have You Learned?</td></tr>
<tr><td></td><td>Self-check 1.1</td></tr>
<tr><td>I. Identification:
1. Bolo
2. Shovel
3. Rake
4. Spading fork
5. Tool
II. Multiple Choice:
1. A
2. D
3. A
4. C
5. D
6. A
7. A
8. D
9. A
10. B</td><td>1. It is a cutting tool used in clearing vegetation, breaking open coconuts, kill and bleed pigs, digging out roots and weeding, harvesting rice, and for self-defense
2. It is used in digging and moving soil and other granular material. Shovels are used for cleaning ditches. They are also used for leveling a base for sill rocks, steps,
3. It is important during construction of animal facilities
4. It is important in conducting simple repair and maintenance operation
5. It is important in fence construction and layout.
6. This can be used to collect animal manure example spade.
7. It is used for loosening the soil, digging out root crops and turning over the materials in a compost heap.
8. It is used to clean and level the ground.
9. Used for digging and moving soil and other granular material.
10. This is a large cutting tool of Filipino origin similar to the machete.</td></tr>
<tr><td colspan="2">LO 2. Select and Operate Farm Tools</td></tr>
<tr><td>What Do You Already Know?</td><td>How Much Have You Learned?</td></tr>
<tr><td></td><td>Self-check 2.1</td></tr>
<tr><td>Matching Type:
1. C
2. B
3. E
4. H
5. J
6. D
7. G
8. F
9. A
10. I</td><td>A.
1. Dropping board. These fixtures should be provided in the laying house to facilitate collection of manure.
2. Brooder - A brooder is a heated container that can have it's temperature controlled in at least one area. It is used to confine chicks with their feed and water until they are 2 weeks old and ready to go outside.
3. Feeding troughs. These should be constructed so as to keep the hens from scratching the feeds and wasting it especially when the birds are laying eggs.
4. Drinking troughs. Drinking jars should be large and sufficient enough to supply the water needs of the birds for the whole day. It is estimated that one kerosene can of water</td></tr>
</table>

	approximately 29 litters is enough for 100 layers the whole day ***5. Incubator*** - a device for maintaining the eggs of birds to allow them to hatch **6**. ***Feed bins.*** These are containers where feeds are stored for future use. Feeds can also be kept in petroleum cans which are cheap, rat proof, and if painted, will last longer **7**. ***Nest.*** Hens or layers lay their eggs in a nest. A nest could be either open or close. The nest should be built on a partition or end walls. It should be high enough above the floor so that the hens can work under them. Each nest should be from 10 to 14 inches square or more depending upon the size of the breed; about 4 inches(20 centimeters high and with a strip about 4 inches 10 centimeters) high in the open side to retain the nesting materials. It is advisable to have dark nest. **8**. ***Perches.*** These are horizontal poles where birds can sit and rest especially during night time. Sufficient perches should be constructed to prevent the birds from crowding at night. ***9. Livestock trailer*** There are a number of different styles of trailers used to haul livestock such as cattle and horses. ***10. Manure spreader*** or **muck spreader** or **honey wagon** is an agricultural machine used to distribute manure over a field as a fertilizer**.** **B.** 1. **Castration rack**. This is V- shaped equipment used during castration. The piglets are laid down with its back on the rack 2. **Farrowing crate or stall.** Due to its limited space, this equipment minimizes the movement of the sow and reduces the possibility of death of piglets due to crushing. The farrowing crate also prevents the sow from eating feeds given to piglets before weaning time. There are two types of farrowing stalls: the detachable and the permanent types. In the detachable type, six pieces of galvanized iron pipes, three inches in diameter, are needed. Three pipes are installed on both sides of the pen to form rails. The distance of the first rail above the flooring should be 20 cm. while each of the two rails must be 40 cm. high. All the six rails must pass

	through the two sides of the wall. To prevent the rails from being removed when the sow rubs on the rails, drill a hole on both ends and place a lock. After weaning the piglets, the rails can be removed from the pen. 3. **Breeding crate**. This is used when breeding a gilt to a large boar or a large sow to a junior boar. The construction of the breeding crate should be durable enough to support the additional weight of a boar. The gilt or sow in heat is confined inside the crate before the boar is allowed to enter for mating. 4. **Heat lamps and brooders**. Baby pigs can be kept comfortable by providing them with brooders with a 50 to 100 watt bulb especially during rainy or cold days. Brooders and heat lamps must be located on any side of the farrowing stall. Be sure that the sow will not touch the brooder. Also make sure that it is not electrically grounded. 5. **Waterers .**Pigs will consume 2.0 to 2.5 pounds of water per kg of dry feed. Automatic waterers are advantageous .If the nozzle type waterers are used, they must be placed 24 to 30 inches above the floor for sows and growing pigs, one automatic cup or nozzle for each pig pen is normally sufficient to supply the water needs of the animals. Waterers should not be placed beside the self-feeder or feeding trough. This practice will keep the feeding area dry and clean. 6. **Shipping crate**. This handy piece of equipment is ideal to use when transporting pigs. 7. **Feed cart.** This equipment is used to transport feeds during feeding time. It can accommodate 100 kg of feed. 8. **Self-feeders.** Self feeders come in various types but the built-in concrete feeder is preferred. A self –feeder should be designed and constructed so that feed wastage is minimized and the rate of flow of the feed can be regulated. Durability and ease in cleaning should also be taken into consideration. Make sure that it can hold sufficient feeds to last for several days. A good feeding trough should be constructed in such a way that a pig cannot lie inside. It should be strong, durable, and easy to clean.

	Cemented feeding trough should have circular bottoms. A circular-bottomed trough is easier to clean than a flat-bottomed one. 9. **Water system**. A pressurized water system with pipes extending to the hog houses is the most desirable type. A minimum pressure of five (5) kg per sq. cm and 500 gallons an hour is necessary. This will eliminate labor in fetching water.
LO 3. Perform Preventive Maintenance	
What Do You Already Know?	**How Much Have You Learned?**
	Self-check 3.1
True or False: 1. True 2. True 3. True 4. True 5. True	***1. Safety glasses:*** Activities involving dust, debris, wood shavings, shards from fiberglass, etc from getting into the eyes. Example mixing feed ingredients. ***2. Protection for the ears:*** Activities or operations involving loud noise such as during tractor operation. ***3. Knowing the right tools for the job:*** It is important to know the right tools for the job in order to avoid injury to oneself and damage to the materials. To this end, it is advisable to thoroughly read the instruction manuals provided with the equipment and get familiar with the recommended safety precautions. ***4. Correct method of using tools:*** Tools should not be carried by their cords; tools that are not in use should be disconnected; and while handling a tool connected to a power source, fingers should be kept away from the on/off switch. ***5. The right clothes:*** Long hair should be tied and loose clothing should be avoided. Ideally, clothing that covers the entire body should be worn and heavy gloves should be used in order to avoid sharp implements and splinters from hurting the hands. Masks prevent inhalation of harmful minute particles of the material that is being worked upon. Steel-toed work boots and hard hats can also be worn. ***6. Tool inspection:*** Power tools should not be employed in wet environments and should never be dipped in water; they should be checked periodically for exposed wiring, damaged plugs, and loose plug pins. Nicked cords can be taped but if a cut appears to be deep, a cord should be replaced. Tools that are damaged or those that sound and feel different when used should be checked and

	repaired. ***7. Cleanliness in the work area:*** This should be maintained because accumulated dust particles in the air can ignite with a spark. Of course, flammable liquids should be kept covered and away from the place where power tools are being used. An uncluttered work area also makes it easy to maneuver the power tool; often distractions caused by a tangled cord can result in an accident. ***8. Care with particular tools:*** Miter saws and table saws should be used with a quick-release clamp and a wood push-through, respectively. Extra care should be taken while using nail guns and power belt sanders. ***9. Keep tools in place:*** Power tools should be returned to their cabinets after use to prevent them from being used by an unauthorized and incapable person. ***10. Lighting:*** It is important to use proper lighting while working with power tools, particularly when working in the basement and garage where lighting may not be satisfactory.

LESSON 2:PERFORM ESTIMATION AND BASIC CALCULATION

LO 1. Perform Estimation	
What Do You Already Know?	**How Much Have You Learned?**
	Self-check 1.1
Fill in the Blanks: A. 1. 0.3 sq.ft./chick 2. 0.5 sq.ft/chick 3. 1.0 sq.ft./bird B. 1. 2.5 to 5 cm./bird 2. 5 to 6.5 cm./bird 3. 7.5 to 9 cm./bird C. 1. 32.2 – 35.0 2. 29.4 – 32.2 3. 26.7 – 29.4	**A.** **1.** Ad libitum feeding - is feeding without restrictions and feed is mode available anytime. **2.** Feed Conversion Ratio - the amount of feed consumed in order to produce a kilo of meat. **3.** Restricted feeding - is done through the use of a long feeding trough where all pigs eat at the same time. **4.** Feeding – is the act of giving feeds to the animal. **5.** Ration – amount of the feeds given to the animal for a given period of time. **B.**

	1. P 120.00 2. P 156. 00 3. P 180.00 4. P 204.00 5. P 228.00 6. P 90.00 7. P 60.00 8. P 318.00 9. P 1170.00 10. P 3180.00
LO 2. Perform Basic Workplace Calculations	
What Do You Already Know?	**How Much Have You Learned?**
	Self-check 2.1
IDENTIFICATION: 1. Ear Notching 2. Identification system 3. Herd records 4. Reproduction record 5. Records **ENUMERATION:** 1. Systems of Identifying Animals a. ear notching b. tattooing c. ear tagging d. naming e. colour differences 2. Inputs of cost production a. Housing and brooder facilities b. Day-old broiler chicks c. Broiler feeds d. Veterinary vaccines, medicines and supplements e. Water f. Heat and light g. Labour h. Depreciation i. Interest on capital invested **j.** Returns	**Multiple Choice:** 1. c 2. d 3. b 4. a 5. d 6. d 7. a 8. b 9. c 10. a

LESSON 3: INTERPRET PLANS AND DRAWINGS

LO 1. Draw Layout Plan of Different Types of Housing	
What Do You Already Know?	**How Much Have You Learned?**
	Self-check 1.1
I. 1. A 2. C 3. B 4. D 5. B	**A.** ○ Types of roof used in poultry house. • Shed or single span type • Cable or double span type • Semi-monitor type • Monitor type

6. A
7. C
8. D
9. D
10. B

II.

1.
   a. Sanitation of the building
   b. Ventilation of the hog house
   c. Temperature of the building

2.
   a. Environmental control
   b. Proper ventilation
   c. Minimum labor requirement
   d. Durability of the building materials
   e. Dryness
   f. Sanitation
   g. Rodents and bird control
   h. Safety
   i. Future expansion

3.
   a. Site Selection
   b. Zoning and permit
   c. Accessibility
   d. Distance from other farm

- Combination of cable and shed type

○ Classification of poultry house
- Classified according to the number of rooms or pens they contain
- Classified according to their portability or permanence
- Classified according to the type of roofing.

○ Types of poultry housing.
- Free range or extensive system
- Semi-intensive system
- Folding unit system
- Intensive system
  - Battery system
  - Deep litter system

II.
1. False
2. True
3. True
4. True
5. True

LO 2. Enumerate the Building Codes in Constructing Poultry and Livestock houses

What Do You Already Know?	**How Much Have You Learned?**
	Self-check 2.1
Livestock production 1. False 2. True 3. True 4. True 5. True 6. True 7. True 8. True 9. True 10. True 11. False 12. True 13. False 14. False 15. True	1. Under Construction  2. Exit  3. Slippery When Wet

	 4. Directional signs  5. Danger Keep Out 

LESSON 4: APPLY SAFETY MEASURES ON FARM OPERATIONS

LO 1. Apply appropriate safety measures	
What Do You Already Know?	**How Much Have You Learned?**
	Self-check 1.1
1-5 1. Animals 2. Chemicals 3. Electricity 4. Machinery 5. Water **1-4** 1. Age 2. Equipment and Machinery 3. Protective Equipment 4. Medical Care **1-6** 1. Coveralls 2. eye protection 3. footwear 4. gloves 5. hearing protection 6. safety helmet	**A.** **For number 1.** 1. Know what's in the kit and how to use it. 2. Check kit every three months. 3. Pack Red Cross manual or first aid chart. 4. Label all kits. 5. You'll need more than one kit. 6. Be selective. 7. Pack items for individual needs. 8. Always include emergency numbers. 9. Remember communication and heat. **For number 2.** Empty farm chemical containers and unwanted chemicals need to be disposed of properly. Prior to disposal of empty containers, wash the container out three times and use the rinse water to dilute further batches of the chemical to working

	strength. To wash a container you do not need to fill it each time. If you only have six liters of water, it is more efficient to use three washes of two liters each, than it is to rinse once with the full six liters. **For number 3.** • correct labeling and packaging; • provision of material safety data sheets (MSDS); • safe transport, storage, use and disposal of substances.

Self-check 1.1
B.

1. Injury : Burns ***Treatment:*** Put burn in cold water, pat dry and cover with clean bandage. Do not break blisters.	***2.Injury*** : Falls ***Treatment:*** Do not move the victim; call emergency hotline.	***3.Injury*** : Nose Bleeding ***Treatment:*** Pinch nose and tilt head forward.
4.Injury : Small Wounds ***Treatment:*** Wash the wound, apply dressing and bandage.	***5.Injury :*** Bruises ***Treatment:*** Apply a cold compress.	***6.Injury :*** Animal bite ***Treatment:*** Wash wound, identify animal, and report the bite.

LO 2. Safely keep/ dispose materials and outfit.	
What Do You Already Know?	**How Much Have You Learned?**
	Self-check 1.1
Identification: 1. Presidential Decree 984 2. Republic Act 4850 3. Executive Order No. 927 (1983) 4. Clean Water Act of 2004 or Republic Act 9275 5. Presidential Decree 1586 **ENUMERATION:** 1. Safety glasses 2. Protection for the ears 3. Knowing the right tools for the job	1. F 2. G 3. H 4. D 5. E 6. A 7. B 8. C 9. I 10. M

4. Correct method of using tools 5. The right clothes 6. Tool inspection 7. Cleanliness in the work area 8. Care with particular tools 9. Keep tools in place 10. Lighting	

Acknowledgement

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