

## **CHAPTER 3: PRODUCE CONVECTIONAL AND NON- CONVECTIONAL LIVESTOCK/PRODUCING CONVECTIONAL AND NON- CONVECTIONAL LIVESTOCK**

### **3.1 Introduction**

This unit specifies competencies required to produce convectional and non-convectional livestock. It involves selection of breeding stock, designing animal structures, constructing animal structures, installing and maintaining livestock tools, equipment and machines, breeding convectional and non - convectional livestock, practicing livestock husbandry and managing young growing stock. The significance of this unit helps in development of new livestock breeds which can perform well in various ecological conditions. It also constitute important source of family income and food security and contribute to country's gross domestic income.

The critical aspects of competency to be covered include: ability to choose breeds select breeding stock, and understand breeding methods, design and construct animal structures, install and maintain animal tools and equipment, carry out livestock routine management practices and understand bio-security measures. The basic resources require in this unit include; materials tools and equipment, assesment location, personal protective equipment and various types of livestock.

The unit of competency has six learning outcomes. Each of the learning outcome presents; learning activities that covers performance criteria statements, thus creating trainee's an opportunity to demonstrate knowledge and skills in the occupational standards and content in curriculum. Information sheet provides; definition of key terms, content and illustration to guide in training. The competency may be assessed through written test, demonstration, practical assignment, interview/oral questioning and case study. Self assessment is provided at the end of each learning outcome. Holistic assessment with other units relevant to the industry sector workplace and job role is recommended.

### **3.2 Performance Standard**

The competency of this unit is to install and maintain livestock tools equipment and machines. Select breeding stock and breed the farm animals as per the animal breeder manual. Practice livestock husbandry and manage young and growing stocks based on LPM.


### 3.3 Learning Outcomes

#### 3.3.1 List of Learning Outcome

- a) Select breeding stock
- b) Design and construct farm structures
- c) Install and maintain livestock tools, equipment and machines
- d) Breed farm animals
- e) Practice livestock husbandry
- f) Manage young and growing stocks

#### 3.3.2 Learning outcome No 1: Select breeding stock

##### 3.3.2.1 Learning Activities

Learning Outcome No 1: Select breeding livestock.	
 <b>Learning Activities</b>	<b>Special Instructions</b>
1.1. Choose breeding stocks according to breeding standards. 1.2. Identify breeding methods according to intended breeder outcome. 1.3. Choose tools and equipment according to the requirement of the breeding operation. 1.4. Select breeds according to standard selection method. 1.5. Breed livestock according to the set criteria.	Facilitate learners to visit the farm Ask students to identify the types of cattle in the farm. Demonstrate selection of breeds.

##### 3.3.2.2 Information Sheet No3/LO1: Select breeding stock.



#### Introduction

This learning outcome covers; breeding stocks, identification of breeding methods, selection of breeds and ways of how to breed livestock according to the set criteria.

#### Definition of key terms

**Livestock:** These are animals domesticated in agricultural setting to produce labor and products which are traded as a source of income (e.g.) meat, milk, fur leather and wool.

**Reproduction:** It is the biological process by both sexual and asexual means though which the off springs are produced from their parents

**Genetics:** It is the branch of biology which deals with the scientific study of genes, genetic variation and heredity in organisms. Example phenotypic

**Equipment:** It is the set of necessary tool, articles, clothing and physical resources used for a particular and heredity in organism, example farm machines.

**Breeding:** It is the sexual reproduction which involves bearing or generating off springs from the parent organisms that is either plants or animals

**Breeding Standards:** These are set guidelines in animal husbandry used to ensure the animals produced by a breeder or breeding facility conform to the specifics of the standardized breed. Example, in the American poultry Association, breed standards for poultry (e.g.) ducks and geese are divided by weight and chicken by size.

### **Content/procedures/methods/illustrations**

#### **1.1. Breeding stocks are chosen according to breeding standards.**

**Breeding stock:** It is a group of animals specifically kept and used for the purpose of planned breeding. Example, bull kept for semen production and cow for calf's production. The breeding stocks are mainly chosen with care because they are purposely meant for upgrading the herd. The animals are chosen at different ages depending on the breed of the animal, example, the gilts are usually selected for breeding at five or six months of age, height at 15 cm of age.

#### **How selection affect characters**

- Heritability of the character
- The intensity with which the selection is done
- The interval between generations
- Type of selection being practiced

#### **Factors to consider when choosing the breeding stock**

##### **Cattle stock**

- Level of performance e.g. milk yield butter content, length of lactation period and calving intervals
- Age of the animal
- Fertility
- Physical fitness
- Health of the animal
- Body conformation
- Suitability of the enterprise-milk or beef

##### **Sheep**

- Level of performance e.g. maturing ability, growth rates, wool quality, carcass quality and twinning rate age
- Suitability to the enterprise- wool or mutton
- Health
- Flocking instinct
- Inheritable defects
- Fertility

## Goats

- Fertility
- Maturing ability
- Growth rate
- Twining rate
- Carcass quality/ dressing percentage
- Health
- Age
- Suitability to the enterprise e.g. milk/ mutton

## Camels

- Health
- Age
- Temperament
- Foraging ability
- Fertility
- Level of performance, (e.g.) meat, milk, fur and transport

## Pigs

- Carcass quality
- Maturing ability
- Prolificacy
- Number of teats
- Body formation
- Heredity defects
- Growth rate
- Temperament
- Age

### 1.2. Breeding methods are identified according to intended breeder outcome

- Inbreeding:** Mating of related animals up to 4-6 generations
- Line breeding:** In line breeding, two parents are crossed whose desired characteristics complement each other as much as possible. The parents are more distantly related but can be traced back to common ancestor e.g. cousins.

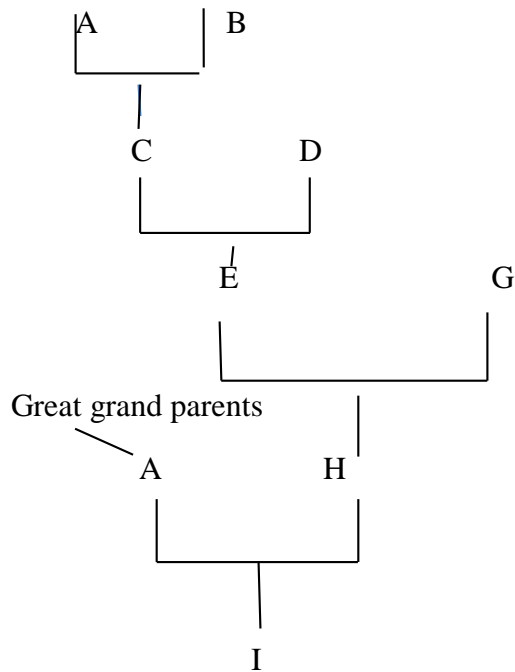


Figure 6: Line Breeding

#### Advantages of line breeding

- Genetically pure breeds are produced
- There are lower heredity defects experienced in the off springs

#### Disadvantages

- Reduced gene pool
- Decreased hybrid vigor
- Appearance of genetic faults

c) **Close breeding:** Mating between very close related animals (e.g.) sib mating and parents sib mating

d) **Out breeding:** Involves crossing between different breeds no common ancestors. Out breeding is relevant in introducing unrelated genetic material into a breeding line.

#### Reasons for out breeding

- To introduce new genes in an existing breeding heard
- To exploit heterosis resulting from a cross between two breeds
- To develop a new breed or a grade animal

#### System of out breeding

##### a) Cross breeding

Mating of animals from two different pure breeds to attain hybrid vigor/ heterosis e.g. higher production rate, high growth, disease resistance and heat tolerance.

### **b) Out breeding**

Mating of unrelated animals from the same breed e.g. Fresian cow in Kenya with semen of Fresian bull from Britain

### **c) Upgrading/Grading up/ Back crossing**

A female of a local grade is mated with a pure breed sire, to produce a high grade. If the same sire mates with the filial generation of its heritors, it will attain a pure breed character

**Advantage of out breeding:** Hybrid vigor/ heterosis is increased.

## **1.3. Tools and equipment are chosen and prepared according to the requirement of the breeding operation.**

**Tool:** It is a device or implement especially one hold in the hand, used to carry out a particular function.

**Equipment:** Set of particular tool and resources for a particular operation or purpose.

### **Examples of breeding tools and Equipment**

- Thermometer
- Syringes
- Burdizzo
- Elastrator and rubber ring
- Bull ejaculator
- Mate insemination gun

### **Factors considered when selecting breeding tools and equipment**

- **Efficiency of the equipment:** The equipment must conform and be relevant with task required
- **Availability of the equipment:** The equipment chosen should be within the area of the operation
- **Cost of the equipment:** The equipment should be cheap enough not to cause extra costs
- **Relevant skills and knowledge required:** The equipment should be chosen depending on the skill of the personnel
- **Ease of transport:** The selected tools should be flexible in terms of transport

### **Preparation of the breeding tools and equipment**

- i. Proper cleaning and disinfection of sensitive tools e.g. syringes, using anti-bacterial chemicals
- ii. Oil of the movable parts of some tool e.g. burdizzo for efficiency
- iii. Check for accurate readings like the thermometer

## **1.4. Breed selection is done according to the standard selection methods.**

**Selection:** Process of allowing certain animals to be the parents of future generation while culling others.

There are three major types of methods used in selecting animals;

1. **Mass selection:** Animals with superior characteristics (highly) heritable breed are selected from a herd and then allowed to mate among each other at random. The offspring will show higher performance than their parents.

#### **Advantage**

Increase the desirable gene in population

2. **Progeny testing:** A group of progenies (off springs) are used as an aid to increase accuracy in the selection of a breeding stock. The method is applied where the character to be selected is of low heritability and expressed by one sex only

#### **Limitation**

Time consuming (up to nine years of the results to be seen)

3. **Contemporary comparison:** Contemporaries heifers in the herd sire by the same bull. It involves comparison of average production of daughters (heifers) of each bull. The other heifers are referred to as contemporaries.

#### **Assumption**

The different between the heard of the same breed are non-genetic in origin

#### **Advantages of contemporary comparison method**

- It is possible to compare heifers of different ages in different locations world wide
- It eliminated differences brought about by the environment
- It is possible to make direct comparison of the stunt bull at different artificial insemination centers
- It is accurate because herd of animals are used

### **1.5. Breeding is done according to the set criteria in the livestock production manual.**

Breeding is the process of mating selected males and females to produce off springs with the desired characteristics

#### **Reasons for breeding**

- To expand the inherited potential of the animal
- To improve production by improving new genes
- To overcome production problems selected by the environment
- To satisfy consumers taste
- For economic reasons e.g. fast growth rate to reach market early

#### **Criteria for breeding animals**

**Age of the animal:** Young animal that have not part rated for more than 3 times should be selected. Young animals have a longer productive life and a higher breeding and production efficiency.

**Level of performance:** Animals with highest production level should be selected by show of the records e.g. high milk yield, good mothering ability and high prepotency.

**Physical fitness:** The selected animals should be free from physical defects e.g. moneyed limping yield, irregular number of teats, scrotal hernia, deficiency and weak backline.

**Health of the animal:** Animals selected should be resistant to diseases and pass the characteristic to the off springs.

**Body conformation:** Dairy cows should be wedge shaped with a large udder tuin legs and long neck.

**Temperament/ behavior:** Animals with bad behaviors should be culled e.g. cannibalism egg eating aggressiveness and kicking.

**Quality of products:** Select animals that give products of high quality e.g. meat, wood egg milk.

**Mothering ability:** Animals with good natural instincts towards their young ones should be selected so as to rear their young ones up to weaning.

**Adaptability:** Animals should be well adapted to the prevailing climate condition in the area e.g. arid and semi-arid areas.

**Prolificacy:** Animals with the ability to give birth too many off springs at a time (large litter) should be selected. E.g. in pigs and rabbits. Necessary records should be used.

## Conclusion

This learning activity has covered choosing of breeding stock, breeding methods as per the breeding standards. Choosing of tools and equipment according to breeding operation, breeding according to the set criteria in the livestock production manual among the related knowledge that is relevant and useful

## Further Reading



1. [Fao.org/3/x3840e/x3840e-line breeding](https://www.fao.org/3/x3840e/x3840e-line-breeding)
2. [https:// brainly. In 7...7-breeding methods](https://brainly.in/7...7-breeding-methods)
3. [https://peda.net-livestock selection and breeding](https://peda.net-livestock-selection-and-breeding)
4. Animal breeding the genetic basis of animal breeding economic considerations, modern methods in bio technology artificial insemination
5. Domestic animal diversity information

## Written assessment

1. The following are methods of selecting breeding stock, which one is not?
  - a) Mass selection
  - b) Random selection
  - c) Progeny testing
  - d) Contemporary comparison



2. Which one of the following is a tool for breeding animals?
  - a) Knapsack sprayer
  - b) Syringe
  - c) Ear notcher
  - d) Needle
  
3. The following are systems of out breeding which one is not?
  - a) Crossing over
  - b) Back crossing
  - c) Out crossing
  - d) Cross breeding
  
4. Which one is the odd one out?
  - a) Sheep
  - b) Goat
  - c) Cattle
  - d) Pig
  
5. Which one is not a factor to consider when selecting animal for breeding?
  - a) Prolificacy
  - b) Adaptation
  - c) Body temperature
  - d) Age
  
6. Which of the following is not a term used in breeding?
  - a) Epistasis
  - b) Hybrid vigor
  - c) Selection
  - d) Inheritance
  
7. Which of the following is a breeding system?
8. Explain the meaning of the term breeding stock
9. Give an example of breeding tool
10. Give the limitation of progeny testing as a method of selecting breeds
11. Name a product obtained from farm animals
12. State any system of in breeding

#### **Oral Assessment**

1. Differentiate between and breeding stock
2. State two criteria for breeding animals

#### **Case Study Assessment**

Visit the university farm and carry out the following activities

1. Identify the type of cattle breed kept
2. Identify the animals used as the breeding stock and note their characteristics
3. Identify the main method of breeding practiced and state its relevance and limitations as per the farm
4. Give your recommendations on what should be done to improve performance and yield in the farm through breeding

#### 3.3.2.4 Tools, Equipment, Supplies and Materials.

- Convectional and non- convectional livestock breeds
- Animal breeder' s manual
- Artificial insemination equipment
- Zero grazing unit

#### 3.3.2.5 References



Allard.R.W.(2014) Principles of Plant breeding. John and Sons.

Bondoc,O.L.(2018). Animal breeding. Philipine up press


Allard, R. W. (1999). Principles of plant breeding. John Wiley & Sons.

Fasahat, P., Rajabi, A., Rad, J. M., & Derera, J. (2016). Principles and utilization of combining ability in plant breeding. Biom Biostat Int J, 4(1), 00085.

easytvvet.com

### 3.3.3 Learning Outcome No 2: Design and construct farm structures.

#### 3.3.3.1 Learning Activities

Learning Outcome No 2: Design and construct farm structures.	
 Learning Activities	Special Instructions
<ol style="list-style-type: none"><li>2.1. Design animal structures according to animal housing plan.</li><li>2.2. Identify structures and maintenance materials gathered according to animal housing plan.</li><li>2.3. Construct animal structures according to animal housing plan in accordance to livestock production manual.</li></ol>	<p>Giving lecturer on the learning outcome.</p> <p>Discuss the structures according to animal housing plan</p>

#### 2.3.3.2 Information Sheet No3/LO2: Design and construct farm structures.



##### Introduction

The learning outcomes to be covered include: types of animal structure, animal structure designs, livestock housing plan and construction of animal structures.

##### Definition of key terms

**Livestock:** Domesticated animals raised in an agricultural setting to produce labor and commodities e.g. meat, milk, fur etc.

**Structure:** These are housings of different types of animals with different parts with different function.

**Designs:** These are structures or housing of livestock to provide the required environment, protect them from harsh weather and also attack from pests and diseases and the housing should be done for a healthy product from livestock.

##### Content/procedures/methods/illustrations

#### 2.1 Animal structures are designed according to animal housing plan.

Animal structures and farm structures are different types of physical constructions that are put in a farm for the purpose of livestock and crop production. Farm structures are existing buildings or facilities previously for non-agricultural uses but which are either converted to be used for an agricultural purpose. Farm structures are classified based on materials of construction.

These structures help increase efficiency of agricultural production. Farm production processes are carried out under a controlled environment in order to maximize the output. For example, animals must be protected from rain and dirt to avoid illness and improve better health. Farm machinery should be kept in shelters to avoid rusting, its depreciation level to a minimum. Crops harvested are protected from rain and sitting of the farm structures should be located in suitable areas for a farmer's ease.

#### **Factors considered when site selected**

- **Topography:** The land selected should be slightly sloping. Too sloppy land can cause chances of landslide while a flat land leads to poor drainage thus leading to floods.
- **Prevailing winds and rainfall:** The construction of the building should be perpendicular to the direction of wind and rain. This is to prevent the high velocity of wind from destroying the building and to reduce chances of water entering the building.
- **Soil type:** The soil should be firm and well drained. This is to determine its availability to withstand stress exerted by a building.
- **Security:** The area selected should be out of theft, vermin intruder's trespasses and even fire.
- **Accessibility:** It should be accessible by the farm and also near a public road for fast market being reached.

#### **Parts of farm building**

Parts of the animal structures should have the following:

- a) **Foundation:** The foundation is laid a depth of about 1-2m depth depending on the soil type. It should be strong enough to carry the whole building.
- b) **Walls:** These can be made of stones, bricks, timber and blocks.

The types of materials used to construct the wall is determined by the following factor:

- Availability of the materials
- The use of the building
- Weather condition of the place
- Strength of the soil in the area

c) **Roof:** It provides protection of the animals or stored crops from damage by adverse weather conditions.

#### **Features of a good roof**

- Must be leak proof
- Should be able to withstand the load of the roofing material
- It should be durable
- Should be fire proof

## **Types of farm buildings**

### **Livestock buildings and structures**

These are structures used for handling livestock during various routine management practices. They include crushes, dips, dairy shed, poultry houses, rabbit hatches, piggery/pigsty, fish ponds, silos, zero grazing unit and beehives.

#### **Crushes**

These are used for restraining an animal when carrying out certain livestock routine practices e.g. spraying and milking.

#### **Parts of a crush**

- Holding yard
- Head rail
- Horizontal split and vertical bars help in fixing the animals head during dehorning
- Top bar at the front to allow exit of the animal

#### **Examples of crushes**

- A three-post crush normally used in handling one animal
- A crush for scarce farmers, it is longer than three post crushes
- A crush for holding many animals.

#### **Dips**

This is a farm structure designed to accommodate a chemical dip wash where animals are dipped for the purpose of controlling ticks

#### **Parts of a dip**

- **Collecting yard:** Used for holding animals before dipping.
- **Foot bath:** Animal's hooves are washed to be free from mud.
- **The sump:** A narrow entrance with short steps.
- **Dip tank:** It contains acaricide solution and animals are immersed here.
- **Drainage race:** Helps in recovery of the excess dip wash back to the dipping tank.
- **Silt trap outlet:** Helps in reducing siltation of the dipping tank.
- **Soaking pit:** It is a covered, porous-walled chamber that allows water to slowly soak into the ground.

#### **Types of dips**

- Plunge dips
- The Machakos dip

#### **Advantages of plunge dip**

- Many animals can be dipped in a single time
- It can be used several because of replacement
- Requires less technical skills and labour

#### **Disadvantages**

- There is a high risk of excessive dilution of the dip wash due to evaporation.
- It cannot be used on sick heavy and even pregnant animals.
- Initial capital of construction is high

## **Dairy shed**

A dairy shed is part of the dairy unit that is used during milking

### **Parts of a dairy shed**

- A night shades
- A calf 's pen
- A feeding and watering area
- The milking sections

There are two types of milking sheds

- **Permanent milking shed:** It has milking machine permanently installed at the milking section.
- **Movable milking section:** These units are fitted with small wheels which facilitate their movement to different sites.

### **Factors to consider in the construction of a dairy shed**

#### **Resting area**

- It should be spacious enough to allow room for exercise enhancing proper physiological body functioning.
- It should have adequate feeding body functioning.
- It should separate milking area from the feeding, watering and exercise area.
- Calf pens should be near the dairy shed.
- Provision for proper waste disposal.
- The dairy shed should be built with concrete for easy cleaning.

**Calf pen:** The calf pen can be either communal or individual. The individual calf pens are, more suitable because:

- Provide better individual attention given to the calves
- There is minimization of disease spread

#### **Features of a good calf pen**

- It should provide complete separation of calf from other calves.
- It should be easy to clear
- It should be spacious
- It should be well ventilated
- It should allow the calf to have access to the mother.

**Poultry houses:** These are housing structures used for poultry production.

- These structures should be sited in free drainage areas and away from the house
- All the structures must provide warmth
- They should be damp free
- They should be well ventilated
- They should be properly lit.

They include:

- Poultry shed run
- Deep litter
- Battery cage
- Fold lark

**Poultry shed and run:** The run is enclosed with chicken wire. It has doors for use by the keeper to gain entry in the run. The shed is made of wooden walls to provide protection against bad weather and predators.

**Battery cage system:** These are structures used to house birds under the intensive systems of poultry production.

#### **Advantages**

- Less spread of parasitic diseases.
- Less feeding cost
- Culling is easy
- No broodiness in hens
- Farmers gets clean eggs.

#### **Disadvantages**

- High initial capital
- Higher maintenance cost
- Birds may get fatigue due to lack of exercise.

**Coops:** These are specialized types of cages that are used for rearing hens that are brooding, commonly used in small scale.

**Fold lark:** It has both run shelter section. It provides birds with space for exercise

#### **Rabbit hutches /rabbitry**

These are houses for keeping rabbits. The rabbit houses should be painted white to reflect much of solar radiation that might cause sunburn. A rabbitry unit is divided into two parts, the feeding and watering area and the resting and exercising area. The hutch should be in a site protected from prevailing wind direction. It is fitted on stands about 60cm above the ground.

#### **Features of a good rabbitry**

- Adequate ventilation and well-lit but protected from direct sunrays
- It should be spacious, space required 80-115cm.
- The floor of the hatch should have chicken wire mesh.
- It should be raised off the ground.

#### **Piggery /pig sty**

Pigs are very sensitive to extreme weather conditions therefore a piggery provide warmth and as well as ventilation.

#### **Features of a piggery**

- **Farrowing pen:** It is used for farrowing and ensuring the safety of the piglets. The pen is provided with a farrowing crate to prevent the sow to protect from lying on the piglets and a heat source to protect the piglets against chilliness.
- **Weaner's pen:** This is where weaned pigs are kept. It should have a feeding, watering, and resting section

### **Boar pen**

This is where breeding boars are kept. It allows room for sow to be served during the breeding season.

### **Gilts pen**

It is used for keeping young female pig's put on the age of service.

### **Fish ponds.**

These are structures that are constructed in the farm for rearing fish. Fish ponds require a large amount of water therefore it is important to construct them near a water source e.g. river. The water should come from a higher ground so that it flows downhill into the fish pond and be drained out easily.

### **Procedure of establishing a fish pond**

- i. Site selection: Select a place where water flows from a source
- ii. Site marking: After selecting the site, use pegs to mark the channel from the river, the entrance and exit of the pond and the channel to take water back into the river.
- iii. Clearing the land: All vegetation is cleared off the site of the pond area.
- iv. Digging the pond: Soil is dug out, the top soil is placed in a particular place as it will be reused. The upper side of the pond is dug 0.5m deep and lower side 1.5m.
- v. Construction of the dyke: The dyke is the wall constructed all around the pond.
- vi. Pond floor: A core is established by digging a trench 0.5m wide and lower than the dyke.

### **Parts of a fish pond**

- **Inlet**  
This is a canal that brings water into the fish pond. A screen of fine mesh is filled across the inlet to prevent entry of undesirable species into the pond.
- **Outlet**  
It is made on the deeper part of the pond. It's fitted with mesh to prevent fish from escaping out of the pond. Used to drain water back into the river during harvesting.
- **Spill way**  
It is channel that allows removal of excess water from the pond. It is made of the top of the dyke on the lower side of the pond.

### **Factor considered when sitting fish pond**

- Topography should be gently slopping
- Accessibility of the area
- Security of the area
- Free of pollutants from sewage and dumping site
- Nearness to water source
- Soil types



## **2.2 Structure and maintenance materials are identified and gathered according to animal housing plan.**

This is how the different types of animal structures are maintained. Each and every structure will be discussed under the livestock structure.

### **The crush**

#### **Maintenance of a crush**

- Repair any broken or worn out posts and rails.
- Apply old engine oil on the post made of timber to prevent destruction by termites.
- Carry out regular checks for any loose farmers.

### **The cattle dip**

#### **Maintenance of the dip**

- Regular testing of the dip wash by use of a dip-testing kit to keep the chemical strength at the correct concentration.
- Clean foot bath before and after dipping.
- Lock the entire entrance to prevent access by intruders
- Drain away the dip wash carefully to avoid the contamination of pastures and nearby water sources.
- Ensure the roof of the dip is leak proof to keep off rain water.
- Repair any cracks in collecting guards, foot baths, dipping tank.

### **Dairy shed**

#### **Maintenance of the dairy shed**

- Repair worn out or broken parts immediately they are noticed
- Clean the dairy shed regularly with detergents and disinfectants.
- Ensure proper drainage in the surrounding area.
- Ensure proper ventilation.

### **Calf pen**

#### **Maintenance of the calf pen**

- Clean the calf pen regularly
- Repair leaking roof to prevent wetness of the floor
- Repair any worn out parts
- Paint the wall white to keep off flies
- Ensure proper ventilation.

### **Under the poultry structures**

- Regular cleaning and disinfecting the poultry houses
- Ensure roofs are leak-proof.
- Minimize entry of dust into the poultry because dust is a predisposing factor to respiratory in birds.
- Dusting should be done to control external parasite.
- Repair broken parts of the structures.

### **Under rabbit hatch**

- Repair broken parts
- Repair leak roof to prevent dampness
- Paint the wooden posts to long last
- Clean regularly

### **Under piggery**

- Repair broken parts.

## **2.3 Animal structures are constructed according to animal housings plan in accordance to livestock production manual.**

Proper housing and management of animal facilitate are essential to animal well-being. A good management program provides the environment housing and care that makes animals to grow, mature and reproduce and maintain good health.

### **Factors to consider in the livestock production.**

- **Population management:** In this case identification is important. This is done by notching, putting tags, tattooing, colour staining, toe clipping, having identification cards where the different species are recorded. Record keeping is useful e.g. clinical records for individual animals. These help in identifying animals and knowing how they perform in the form, how they produce and also their health status.
- **Sanitation:** The housing should be clean to prevent attack the animals by pest that may cause diseases. This might reduce their production.
- **Husbandry Food:** Animals should be fed palatable, non-contaminated and nutritional food daily. The housing should be having a feeding trough to enable these animals have food for good product of the input products.
- **Environment:** The environment should have the best temperature and humidity not too cold or hot. There should not be noise to avoid disturbance of the animals.
- **Illumination and ventilation:** The housing plan should have light to help in physiological, morphological and behavior of the animals. The animal housing should provide sufficient illumination and ventilation to help in exhalation and inhalation.

## **Conclusion**

This learning outcome has covered various animal structures and housing plan, maintenance of materials and construction of animal structures according to livestock production manual.

### **Further Reading**



1. Agricultural information Centre, livestock development Nairobi.

### 2.3.3.3 Self-Assessment



#### Written assessment

- Below are factors to consider while selecting a site. Which one is not?
  - Soil type
  - Security
  - Type of material to use
  - Topography
- Which one is not a part of a farm structure?
  - Animal
  - Roof
  - Walls
  - Foundation
- The following are structures used for handling livestock during routine management. Which one is not?
  - Crush
  - Dip
  - Zero grazing unit
  - Fold ark
- Three except one is not a feature of a good calf pen?
  - It should be easy to clean
  - It should be spacious
  - Should be far from the mother's house
  - Should be accessible.
- Parts of a poultry house include the following. Except which one?
  - Poultry shed and run
  - Poultry deep litter
  - Chicken mesh
  - Fold lark
- Which one is not an advantage of having battery cage system?
  - There is less spread of parasite diseases
  - Less feeding cost
  - Farmers gets clean eggs
  - Higher maintenance cost
- Which is not a part of a dip?
  - Collecting yard
  - Foot bath
  - Soaking pit
  - Coop's
- List 5 parts of a dip.
- What is the meaning of farm structure?
- Discuss 5 advantages of a plunge dip.

11. Give 5 maintenance of crush in livestock structure.
12. Name out different types of animal structure.

### **Oral Assessment**

1. Give out the factors considered in animal housing influencing their production.
2. List maintenance practices in rabbitry.

### **Case Study Assessment**

1. Describe how roofing is done.  
Procedure for roofing
  - i.Positions of the post are marked
  - ii.Supports per the joints are prepared
  - iii.Firming piece to be fixed on the joints to provide the required fall
  - iv.Tongues or grooved boards are fixed on the joints covering the whole roof surface.
  - v.Fascia boards are nailed at the lower and sloping edges to the joints.
2. Parade the milking bucket, a rope, a milking jelly, part of boots and dusting coat and demonstrate how milking is done.

### **Practical Assessment**

#### **3.3.3.4 Tools, Equipment, Supplies and Materials**

- Cattle crush
- pig sty
- rabbit hutches
- battery cage
- zero grazing unit
- deep litter house
- fish pond
- fold lark
- poultry shed and run


#### **3.3.3.5 References**



- Chakroff, M., Druben, L., & Corps, P., (1976). Freshwater fish pond culture and management-Appropriate technologies for development.
- Dan, T. T., & Summers, P., M. (1996). Reproductive performance of sows in the tropics. *Tropical animal health and production*, 28(3), 247-256.
- Department of Agriculture .Rabbit keeping, Lusaka. Zambia, Rural information service, Ministry of Agriculture and water development.
- Hafez, E.S.E. 1975. The behavior of domestic animals 3<sup>rd</sup> Edition, Baltimore, The Williams and Wilkins CO.

### 3.3.4 Learning Outcome No 3: Install and maintain livestock tools, equipment and machines

#### 3.3.4.1 Learning Activities

Learning Outcome No 3: Install and maintain livestock tools, equipment and machines.	
 Learning Activities	Special Instructions
3.1. Assemble tools, equipment and machines as per manufacturers manual. 3.2. Tools, equipment and machines are fitted as per the housing plan and requirement. 3.3. Clean tools, equipment and machines as per manufacturers manual. 3.4. Sharpen tools, equipment and machines as per manufacturers manual. 3.5. Grease or oil tools, equipment and machines as per manufacturers manual. 3.6. Replace tools, machines and equipment as per work policy	Describe the process of assembling tools in groups. Discussion groups Procedure of tools and equipment in groups

#### 3.3.4.2 Information Sheet No3/LO3: Install and maintain livestock tools, equipment and machines



##### Introduction

Livestock tools and equipment are tools and equipment used for routine management practice in livestock. They are used for identification, castrations, dehorning, disease and parasite control, breeding, milking and restraining animals depending on the type of the tool. Livestock tools and equipment are maintained to manage durability of the user; there are several reasons for maintenance of farm tools and equipment which will be discussed below.

##### Definition of key terms

**Livestock:** It is commonly defined as a domestic animal which are kept in agricultural surrounding to provide labor and products.

**Livestock tools:** These are livestock items that are mainly used to achieve a particular goal.

**Livestock equipment:** Set of tools that are to achieve a particular livestock objective.

**Machines:** Mechanical structures that use power to apply forces and control movements to apply forces and control movement to perform an intended action

### Content/procedures/methods/illustrations

#### **3.1. Tools, equipment and machines are assembled as per manufacturers manual**

Assembling of tools, equipment and machines should be done by experienced crew or personnel to cut off equipment setting cost which may arise if they are wrongly assembled. For example, during cleaning of machines, some parts need to be removed so that cleaning is effectively carried out.

##### **Reasons for assembling tools**

- To carry out maintenance practices
- For salvage purposes
- To put or store them according to their specific functions

**N/B:** The equipment is put together and the intended purpose for assembling is carried out. Assembling area should be near the store

#### **3.2. Tools, equipment and machines are cleaned as per manufacturers manual.**

Cleaning tools regularly is essential to their proper functioning. After day of work, machines and equipment will be dirt and should be cleaned after use to maintain long shelf life. During cleaning it's advisable to use manufacturer's guidelines for proper cleaning and maintenance. Extremely harsh chemical should be avoided when cleaning them.

##### **To clean and maintain tools, the operator needs the following tools**

- Cleaning supplies: They include detergents sprayer, sponge, old rags or towels
- Cleaning tools: For example, steel wool, scrub brush and a rotary wire brush attachment for drill
- Sandpaper used to work on both wood and metal works
- Lubricating oil: Such as boiled in seed oil, tang oil, lane oil or cooking oil the best preferred oil are in seed and tang oils
- Safety equipment: Wearing protective devices e.g. gloves, eye protection and dust mask when cleaning.

##### **How to clean livestock tools, equipment and machines**

**Step1. Clean tools:** Start by giving tools a good scrubbing to remove mud and grit from the blades and handles, dry them with old towels and set them aside overnight so that they dry completely, e.g. milking tools and equipment. If they are machines to be cleaned the cleaning site should have the following conditions:

- Close to the working area to minimize further contamination
- Accessible in all weather
- Contained for safe disposal of waste
- A way for water sources and public drains
- Flat for safety when working and to reduce run off

- Stable surface to prevent pre-contamination access to suitable cleaning equipment
- Identifiable for monitoring and controlling any pest that may establish on the site

**Step 2. Oil or grease metal parts:** This will rust of the metal parts of the tools and equipment. Oiling the moving parts makes the easy to work with and increases the efficiency of the tool and equipment

**Step 3. Waste disposal:** Waste in the form of contaminated water, debris, dust of chemical will often be left on the cleaning site

**Step 4. Hang tools and equipment:** Tools and equipment should be hanged to prevent rusting while which may arise if placed on the floor

**Step 5: Sterilization:** Tools and equipment, machines for livestock should be sterilized especially for treating animals to control spread of diseases

**Step 6. Store in their original cases:** Tools and equipment should be in specific cases to protect them from damage. Machines should be packed or stored under shade

Reasons for cleaning tools, equipment and machines

- To last longer when maintained
- To make them work more efficiently
- To reduce the risk of injury to the people
- To reduce cost of maintenance

### **3.3. Tools, equipment and machines are sharpened as per manufacturers manual**

Sharpening is done for tools used in cutting e.g. castrating knife, hoof trimming knife and tooth clipping knife to avoid injury to the animals.

#### **Steps followed when sharpening tools and equipment**

##### **Step 1: Clean the blades**

Clean the blade with stiff brush and soapy water to remove any dirt rust or debris. Dry them and wipe the blades with light coat of motor oil e.g. hoof trimming knife

##### **Step 2: Examine the sharpness**

Check first the manufactures guidelines and instructions for specific sharpening and cautions. Examine the blade edge to determine the correct sharpening angle

##### **Step 3: Begin grinding the blades**

Place the grinding stone in either water or vegetable oil to make it wet and act as a lubricant. Press the blade against the concave side of the stone while sharpening to maintain the correct angle. Keep the stone wet by periodically applying lubricant

##### **Step 4. Smooth the edges**

Use finer grain stone and continue sharpening until you achieve a razor-sharp edge after you have achieved proper sharpness and angle in step 3 above. Do not reduce the leveled edge to prevent breakage

##### **Step 5: Test the sharpness**

Holding the cutting edge onto a light source if bits reflecting the light it's not ready. retest sharpness until it is achieved

### **Step 6: Finish sharpening**

Finish sharpening the blades by rubbing a light coat of oil on them to prevent rusting. Remove any dirt that has accumulated during the sharpening. Finally fix the tools to their store

### **Reasons for sharpening**

- To prevent injury to the animal during operation
- To increase efficiency of the tool
- To save time

### **Materials for sharpening**

- Wire brush
- Sand paper
- Oils
- Sharpening stones
- Files
- Bench vise
- Grinding wheel
- Scissor sharpeners

Tools and equipment should be sharpened when they become blunt because work will be inefficient. In case of an injury to the animal, it may predispose it to secondary infections

### **3.4. Tools, equipment and machines are greased or oiled as per manufacturers manual**

#### **Steps followed during greasing /oiling**

- i. Start by choosing the grease gun loaded with grease as per manufacturer's instructions and precautions
- ii. Locate the greasing points on the tool so that it will be easy to locate each day
- iii. Quick inspection is to ensure grease nipples are not damaged
- iv. If they are hand tools grease the blade and oil the rotating parts to prevent wear and tear
- v. Wipe down the grease points with a rag to ensure there is no dirt accumulation
- vi. Attach your grease nozzle and give a few pumps until you see grease exiting

#### **Reasons for greasing /oiling**

- To prevent wear and tear of livestock tools, equipment and machines
- To control rusting
- To reduce cost of maintenance
- To make the tool last long
- To increase efficiency
- Used to minimize power loss and heat generation



### **Tool used for greasing and oiling**

- Greasing gun
- Fluids; oil and grease

### **Type of base oils groups**

- Mineral base oils

These are derived from crude oil. They are used as lubricants in the automotive industry as well as industrial applications.

- Synthetic base oils

They are derived from the chemical reactions of several components. They are higher in viscosity components compared to mineral base oils. They require additive to improve viscosity?

### **Greases**

They consist is base oil of base oil additives which increase viscosity of the lubricants. Greases creates a water proof barrier against external elements e.g. water

### **Types of greases**

- Silicon greases
- Food grade lubricants

## **3.5. Tools, equipment and machines are replaced as per the work policy**

Replacement is done when part or whole of the equipment breaks down. The tools can be repaired if possible because the replacement cost is high. There should be a data driven decision to determine whether to repaired or replace a piece of equipment.

### **Factors to consider during repairing and replacement**

#### **Analyze the cost**

If it's new tool, consider its purchase cost, profit it will earn, salvage value, operating cost and service life. If the cost or replacement is higher than its value, the farmer should leave it.

#### **Consider the age of the equipment**

If the equipment is old, it requires a lot of maintenance, which is costly. Its effective to replace the old equipment with a newer and technology advanced model will give better efficiency and longevity.

#### **Consider the cost of repair**

The farmer should have a documenting asset repair events to provide information of repair. Its assist in making firm decisions.

#### **Consider downtime**

If the equipment takes a lot of time to repair, it will lead to low productivity? Decision should be made whether to repair or replace it

#### **Consider safety**

Old machinery may pose as hazard during operation if it malfunctions, the equipment will eventually wear out and therefore a decision should be made.

## Reasons for replacing the equipment

### i) Deterioration

It is caused by decline of performance due to wear and tear or misalignment indicated by;

- Increase in maintenance cost
- Increase in labor cost
- Loss of operating time due to breakdown

### ii) Obsolesce

Equipment become obsolete due to advancement in technology and unwanted manufacturing cost.

### iii) Inadequacy

If the equipment cannot meet, the demand it was designed for replacement is required.

### iv) Working conditions

If the machine or equipment leads to increased accidents, it should be replaced.

### V) Economy

If the existing equipment have outlived their effective life and it is not economical to continue with them.

## Parts to repair

- Old equipment and machines should be replaced to increase productivity
- Broken parts
- Bend blades should be strengthened

## Conclusion

This learning outcome covered on assembling, fitting, cleaning, sharpening greasing and replacing of tools, equipment and machines as per manufacturers manual. Failure to follow such instructions and precautions will lead to high maintenance cost and productivity will be low.

## Further Reading



[https://www.extension,issitate .edu/small/clean-and-maitain-garden-tools](https://www.extension.issitate.edu/small/clean-and-maitain-garden-tools)

<https://garden solutions .ifas.ifl.edu/care/tools-and-equipments>

Peak revision K.C.S,E AGRICULTURE Chapter 4

### 3.3.5.3 Self-Assessment



#### Written assessment

1. Which one of the following is a sharpening tool?
  - a) Burdizzo
  - b) Milking churn
  - c) Files
  - d) Stir cup
2. The following lubricants are used as equipment and machinery. Which one is more effective in lubrication?
  - a) Oil
  - b) Grease
3. Which one of the following reasons for replacement refers to the replacement of outdated equipment due to technology?
  - a) Deterioration
  - b) Obsolete
  - c) Inadequacy
  - d) Working condition
4. The following factor are considered when analyzing cost of replacement
  - a) Salvage value
  - b) Purchase cost
  - c) Operating cost
  - d) Technology
5. Which one of the following describes best the replacement of a tool or equipment?
  - a) Age of the machine
  - b) Cost of the equipment
  - c) Cost of replacing the higher than the value of the equipment
  - d) Salvage value
6. Which one of the following is not a tool of lubrication?
  - a) Oil
  - b) Grease
  - c) Petrol
  - d) Greasing gun
7. Greasing lubricants contains the following components except one. Which one is the odd one out?
  - a) Additives
  - b) Base oil
  - c) Natural oil
  - d) Gelling agent
8. What do you understand by the term lubrication?
9. Differentiate between a livestock tool and equipment.
10. Name two type of oils.

11. Give one reason for maintaining tools and equipment.
12. Give one reason for sharpening tools.
13. Name two types of livestock.

### **Oral Assessment**

1. Give two examples of lubricants.
2. Give examples of sharpening tools.

### **Case Study Assessment**

Visit the school farm store on the livestock tools, equipment and stationery section.

- a) Observe and identify each equipment state the function of the equipment.
- b) What do we mean by maintaining the tools?
- c) Give general reasons for maintain tools.

### **Practical Assessment**

1. You have been provided with the following tools after they have been used in a livestock production unit; Burdizzo, wool shear, ear tagging, tattooing machine, disbudding wire and hoof trimming knives.

#### **Questions**

- a) Perform the cleaning of each of the above tools
  - b) Store them properly
2. You have been provided with the following blunt equipment; wools shear, hoof trimming knife and teeth clipping knife and grease Grease the above tools appropriately
3. On the above tools provided in questions 2 above. For each of the above tool carry out sharpening techniques in each

### **3.3.4.4 Tools, Equipment, Supplies and Materials**

- Hoof trimming knives
- Burdizzo
- Wool shear
- Ear tagging machines
- Hammer
- Tattooing machines
- Trocar and Canulla
- Teeth clipping knife
- Pig restraining
- Equipment feeding troughs
- Disbudding iron dehorning wire
- Milking pails
- Sieve
- Ropes
- Bolus guns
- Dewormers

### 3.3.4.5 References



Peak revision K.C.S.E. agriculture (2017). Nairobi East publications

Kiswahili, E., Kenyan, D., Kenyatta, U., Ruto, W., Lusaka, K., Muturi, J., ... & Parliament, L. (2018). The Info List-Republic Of Kenya. *Ethnic groups*, 2.


Deacon, J. E., Kobetich, G., Williams, J. D., & Contreras, S. (1979). Fishes of North America endangered, threatened, or of special concern: 1979. *Fisheries*, 4(2), 29-44.

LaBarbera, P. A. (1980). Analyzing and advancing the state of the art of advertising self-regulation. *Journal of Advertising*, 9(4), 27-38.

easytvvet.com

### 3.3.5 Learning Outcome No 4: Breed farm animals

#### 3.3.5.1 Learning Activities

Learning Outcome No 4: Breed farm animals	
 Learning Activities	Special Instructions
Identify livestock routine management practices based on animal type and category. Prepare livestock for breeding as per livestock production manual. Breed livestock in accordance with livestock production manual.	Provide materials for preparation of colostrum as per the students' requests. Take learners on a field visit to the school farm.

#### 3.3.5.2 Information Sheet No4/LO4: Breed farm animals



##### Introduction

Animal breeding is aiming at the improvement of animals by changing their genetic make-up for important traits. Modern farm animals are managed as populations. Therefore, knowledge on the behaviors of genes in population is important. The learning outcomes to be covered include: Mating systems, feeding, breeding, Artificial transfer, Embryo transfer, Grading up program and Selection.

##### Definition of key terms

**Animal breeding:** The selective breeding of domestic animals with the intention to improve desirable qualities in the next generation.

**Natural selection:** The process whereby animals that are better adapted environment have a higher chance to survive and produce more offspring than less adapted animals.

**Artificial insemination:** Is the process of evaluating sperm cells from a male animal and manually depositing into reproductive tract of a female animal.

**Embryo transfer:** This is the transfer of embryo from a female to the recipient females, to achieve pregnancy.

**Mating systems:** The way in which individuals are grouped in relation to sexual characteristics of mate acquisition and mating behaviour.

## Content/procedures/methods/illustrations

### 4.1 Livestock routine management practices are identified based on animal type and category.

**Colostrum feeding:** This is the first milk after parturition

**Procedure:** Allow the calf to feed in the first 15-30 minutes after parturition. This is done by allowing the calf to stay with its mother.

**Importance of diestrum feeding:**

- Helps the calf develop a strong immunity.
- Creates a tough coating in the baby's stomach and intestines to keep germs away.
- Has a laxative effect on the calf.

**Preparation of artificial colostrum**

**Ingredients:** An egg, half liter of fresh warm water, half liter whole milk, one teaspoonful of castor oil and one teaspoonful of cod liver oil and a bucket.

Procedure

- i. Mix the ingredients in the bucket to make a paste like substance.
- ii. Feed it to the calf 3 times a day.

**Weaning**

Separation of a calf from its mother

**Process of weaning**

- i. The calf is housed separately and feeding is done artificially.
- ii. The cow is milked out and some milk is fed to the calf.
- iii. The calf is trained to feed from the pail.

**Disbudding**

This is discouraging of the growth of horns at a young age in calves.

Reason for disbudding

- To make handling of the animals easy.
- To reduce space requirement for the animals.
- To avoid inflicting injuries to another animal.
- It is less painful.

**Process of disbudding**

Removing by use of a hot iron

- i. Iron wire is heated.
- ii. The calf is restrained by tying down.
- iii. The heated iron is placed on the horn from one side.
- iv. The horn area is disinfected to avoid entry of diseases.
- v. Use of chemical method
- vi. Caustic potash is the chemical used. The hair around the horn buds and surrounding area.
- vii. The chemical is rubbed over the buds until bleeding occurs.

### **Ear tagging**

This is a method used for identification of farm animals.

#### **Reasons for ear tagging**

- Facilitates easy supervision.
- Makes record keeping easy.
- Enables easy selection for breeding.

#### **Process of ear tagging**

- i. Assemble tags and tagging forceps.
- ii. Locate the position of the tag between the base and the tip.
- iii. Puncture the ear with the forceps.
- iv. Apply the tag.

**Castration:** This is the destruction or removal of the testes, epididymis and a part of spermatic cord for a female animal.

**Castration using a Burdizzo:** A Burdizzo is held in hand and used to crush the sperm cord.

#### **Castration using an elastrator and rubber ring**

- i. A rubber is stretched by using an elastrator.
- ii. The rubber is placed just above the testicles and left until the sperm duct is cut.

### **Disinfection**

This is the destruction of pathogenic micro-organisms from the animal's environment so that the place becomes free from infections.

#### **Methods of disinfection**

- i. **Chemical disinfection:** They include the following: sodium hydroxide, calcium hydroxide, boric acid and copper sulphate.

#### **Uses of chemical disinfectants**

- Formaldehyde, is used for washing animal structures, such as floor
- Ammonium is used for washing to remove grease and all organic products from surfaces.
- Calcium oxide is used in disposing the animal's carcass during burial.
- Calcium hydroxide is used for washing white walls of farm houses.
- Chlorinated lime is used for water treatment.

- ii. **Physical disinfection:** This includes, cleaning of animal structures by sweeping floor and changing the animal's beddings. Burning of waste materials is also a disinfection practice.

- iii. **Isolation:** The process of segregation of affected animals from contact with other animals, the healthy ones. Such segregated animals should be housed differently from other animals. The person attending to the sick animals should be different from the one attending the healthy ones.



**Deworming:** This should be started from the first week of the calf

Factors to consider;

1. It should be done under the recommendation of a veterinary officer.
2. Should be done every 3 months and every month for the first months.
3. Over dose or under dose should be avoided to prevent side effects.

#### **4.2 Livestock are prepared for breeding as per livestock's production manual Selection**

This is the process of allowing certain animals to be parents of future generations and cutting others

Factors to consider in selection

- **The fertility of the animal:** This is the ability to reproduce.
- **Mothering ability:** This is the ability to produce healthy and vigorous young ones.
- **Growth rate:** The growth rate of the parents is considered.
- **Body measurements:** The animal should have a normal body size and shape according to the species.
- **Feed efficiency:** The ability to absorb nutrients in feeds and produce properly is considered.
- **Carcass merit:** The ability to produce quality beef products; this is the weight of the animals considered.

#### **Methods of selection**

##### **Methods of selection for single traits**

- i. **Individual selection:** Selection of their own performance that is selecting those characters that is shown by an animal and is desired.
- ii. **Family selection:** Selection of traits based on the known characters of that lineage. For example, if a mother was a good milk producer, then it is selected for this reason.
- iii. **Pedigree selection:** This is selection basing on the closely related ancestors. Useful when considering the same sex.
- iv. **Progeny testing:** This is observing the performance of the offspring after several mating processes.

##### **Methods of selection in Tandem selection**

This is focused on multiple traits, but observing one at a time. After the performance of one is achieved, then move to the next trait.

- i. **Independent culling:** A standard is set for more than one trait. After observation, those that do not meet the minimum standards are culled.
- ii. **Culling:** This is a process of separating some animals from a group according to desired characteristics.

### **Process of culling**

- i. Those animals that have undesirable traits for instance, poor feed conversion, are removed from the rest.
- ii. They are then either sold or kept for other purposes.
- iii. The process is repeated until the trait is lost in the population.

### **4.3 Livestock are bred in accordance with livestock production manual.**

#### **Mating systems**

**Pure breeding:** This is where parents of the same type mated to produce the same kind of offspring.

**Out breeding.** Allow those animals that are unrelated within a breed to mate and produce an offspring.

**Line breeding:** These animals that share a common ancestor and are mated. This allows desirable traits to remain in the population inbreeding. The organisms should not be more than 50% related.

**Inbreeding:** Those organisms that share a common ancestor and closely related that is more than 50% related, are mated to produce offspring.

**Cross breeding:** Those organisms which belong to different breeds are allowed to mate. This allows introduction of new traits to the breeds. This also improves performance of the offspring.

Points to note from cross breeding

- Good cross breeds are due to good pure breeds.
- Hybrid vigor does not compensate for poor genetics.

**Artificial insemination:** This is the technique in which semen with sperm is collected from the male and introduced into female reproductive tract.

#### **Methods of semen collection**

- i. Use of artificial vagina
- ii. By electro-stimulation method
- iii. By massaging the ampullae of the male

#### **Process of semen collection**

- i. Sterilize and wash properly all the instruments; the insulating bag, rubber liner and rubber bands.
- ii. Assemble the instruments to make an artificial vagina.
- iii. Fill the artificial vagina with hot water at temperature of 45 degrees c.
- iv. Lubricate the inner parts of the artificial vagina.
- v. Restrain the bull and bring in a female cow, before the bull mounts of the teaser cow, grab the penis and insert it into the artificial vagina.

#### **Methods of insemination**

- Recto vagina method
- Vagina method

- Spectrum method

### **Process of insemination**

- i. When a cow is on heat insemination is done. The inseminator gets ready by putting on an apron, gumboots, and gloves.
- ii. The semen is placed in warm water to make it liquid.
- iii. The inseminator lubricates his hands and inserts them into the vagina, handing an AI gun loaded with semen.
- iv. The inseminator deposits the semen by injecting the gun in the cervix.

### **Advantages of artificial insemination**

- It prevents spread of diseases
- It is cheap because it does not require keeping a bull
- Breeding can be controlled
- Progeny testing can be done at an early age
- Increases the rate of conception
- Heavy sires can be used
- Semen collected can be used to serve many females

### **Disadvantages of artificial insemination**

- Requires skill and proper training
- Requires more than natural services
- Improper cleaning of instruments may lead to fertility

**Embryo transfer:** This refers to a step in the process of assisted reproduction in which embryo are placed in the uterus of a female animal to achieve pregnancy.

### **Types of embryo transfer**

- Fresh embryo transfer
- Frozen embryo transfer

### **Steps in embryo transfer**

- i. Selection of a donor
- ii. Selection of a recipient
- iii. Oestrus stimulation of donor and recipient
- iv. Ovulation of the donor with high quality semen
- v. Artificial insemination of donor
- vi. Embryo collection
- vii. Evaluation of embryo
- viii. Transfer of embryo to the recipient animal

Table 3: Evaluation of the Embryo

Grade	Type	Characteristics
1	Excellent	Symmetrical, compact, distinct outline and neither light nor dark
2	Good	Granulated with distinct outline, asymmetrical.
3	Fair	Hazy outline, extruded cell, asymmetric
4	Poor	Uneven granulation, hazy outline.
5	Degenerated	Developmental stage difficult to determine

#### **Advantages of embryo transplant**

- Increases the number of offspring sired from superior females
- Increases the frequency of desired mating
- It is possible to obtain offspring from incapable animals
- Importation and exportation are easier

#### **Disadvantages of embryo transfer**

- Can be expensive compared to natural processes
- It is costly to maintain
- Requires skilled personnel

**Mutations:** This is the sudden change in the genetic makeup of the population.

#### **Why should the learner get the concept?**

Most mutations are harmful and the process of induction of improvement of animals is not realistic.

#### **Conclusion**

This learning outcome covered on routine livestock management practices identified based on animal type and category. Breeding of livestock in accordance with livestock production manual.

#### **Further Reading**



1. Bourdon, Richard, M. (2000). Understanding animal breeding, 2<sup>nd</sup> edition, prentice hall. (sf 105)
2. Nicholas F.W. (2000). Introduction to veterinary Genetics, oxford university press.
3. Van Vleck, L.D, E.J. Pollak and Oitenacu (1987). Genetics for the animal sciences.

#### 4.3.5.3 Self-Assessment



##### Written assessment

1. Which one of the following is not a type of mating?
  - a) Selective mating
  - b) Individual Mating
  - c) Tandem Selection
2. Which one of the following statements best describes cross breeding?
  - a) It is the mating between 2 closely related organisms
  - b) It is the mating between 2 unrelated organisms
  - c) It is the process of mating organisms with a common ancestor.
  - d) None of the above
3. Identify a management practice in animals.
  - a) Weaning
  - b) Mating
  - c) Weeding
4. Pick the odd one out.
  - a) Milk
  - b) One teaspoonful of castor oil
  - c) Sugar
  - d) Banana
5. Which statement describes budding?
  - a) It is the removal of teeth in young pigs
  - b) It is the removal of horns from young animals
  - c) It is the process of separating animals in population
  - d) None of the above
6. Which chemical is not used in disinfection?
  - a) Formaldehyde
  - b) Calcium oxide
  - c) Titanium paste
  - d) Lime
7. Select one practice that is used in single trait selection.
  - a) Family selection
  - b) Progeny testing
  - c) Tandem selection
  - d) Natural selection
8. State 2 methods of multiple trait section.
9. State the factors to consider in selection for breeding.
10. State 3 mating systems.
11. State the tools used in construction.
12. State 2 advantages of cross-breeding.

### **Oral Assessment**

1. Discuss the advantages of artificial insemination.
2. Comment on the success of animal breeding.

### **Case Study Assessment**

Considering the type of animal in your home or school, study the mating systems and observe the general level of breeding.

### **Practical Assessment**

1. Using locally available material, prepare artificial colostrum.
2. Visit the school farm or a nearby farm and select the animals that you would use as sires.
3. With the guidance of your tutor, collect semen from a bull to be used in artificial insemination.

### **4.3.5.4 Tools, Equipment, Supplies and Materials**

- Artificial insemination kit
- Livestock breeds


### **1.3.5.5 References**



- Albert's, G., (2001). Lezing voor de workshop breeding and feeding for animal health and welfare in organic livestock systems. NAHWOA, 24-27 marts Wagenigen.
- Bourdon, Richard, M. (192000). Understanding animal breeding, 2<sup>nd</sup> edition, prentice hall. (sf 105 B67200)
- Bras comp E.W, (1998). The development animal breeding enterprise in the next decades: Reasons to change breed programmes. Acta. Agric. Scand. Section A, animal science Suppl. 28, 61-67.

### 3.3.6 Learning Outcome No 5: Practice Livestock husbandry

#### 3.3.6.1 Learning Activities

Learning Outcome No 5: practice livestock husbandry.	
 Learning Activities	Special Instructions
<p>5.1. Adhere to livestock structures according to animal species in LPM.</p> <p>5.2. Housing of livestock based on LPM.</p> <p>5.3. Disinfection and cleaning of livestock structures as per LPM</p> <p>5.4. Adhere to personal protective equipment as per occupation safety and health standards.</p> <p>5.5. Adhere to biosecurity measure according to animal disease handbook and LPM.</p>	<p>Prepare learners to visit school farm</p> <p>Provide animal structure according to availability</p> <p>Prepare livestock and structures to carry out routine management</p>

#### 3.3.6.2 Information Sheet No3/LO5: Practice Livestock husbandry



##### Introduction

Animal husbandry deals with the feeding, shelter, health and management of domestic animals.

##### Definition of key terms

**Bio- security:** These are the procedures and measures designed to protect animal population from harmful biological or biochemical substances.

**Shelter:** This is a place where animals that have been treated badly, lost and not wanted by other animals are kept and catered for.

**Disinfection:** The process of cleaning animal structures and equipment in order to destroy bacteria.

##### Content/procedures/methods/illustrations

#### 5.1. Livestock structures requirement are adhered to according to animal species specified in LPM

##### Importance of livestock structures

- Increase efficiency in livestock production
- Protects animals from rain, wind, and sun in order to keep them healthy.
- Animal feeds and products can be kept to avoid contamination and wastage.

- Farm machinery is protected from rain and dirt to keep them durable.

### **Siting of farm structures**

This is the location of a particular area where a farm structure or building is to be established.

#### **Factors to consider when siting farm structures**

- **Type of soil:** Erect structures on firm well compacted and properly drained soils.
- **Prevailing weather condition:** Depending on the rainfall winds direction, a choice on the direction of the structure is made.
- **Topography:** Select a gently sloping land to ensure longevity of the structures
- **Security:** The site should be secured.
- **Ease of cleaning:** The area should have space for waste disposal to make cleaning easy.
- **Accessibility:** They should be located near the roads to make transportation easy. It should also be near the place of use.

### **Materials used in Construction**

#### **Factors to consider in selection of construction materials**

- Availability of materials: Materials that are available are used.
- The use of the building.
- Weather conditions prevailing in the selected area.
- Strength of the soil in the area.
- The cost of materials.
- The type of technology used.

#### **Parts of a structure construction**

- The foundation:** Dig down about 1-2m deep. Excavate the trench at least 1m wide to allow working. Trim the side to straight vertical sides.
- Walls:** Vertical parts of a building. It can be made of stones, bricks, timber or blocks. Lay out the materials in a vertical way and ensure they are strong.
- Roof:** The roof protects the animals.

### **Requirements for Management practices**

#### **i. A crush**

This is used when carrying out some routine livestock practices such as spraying and milking. During hand spraying, artificial insemination, milking and vaccination in cattle, they are held in a crush to make this practice easy.

#### **Management of animals in a crush**

Animals are arranged in a single row.

Those of the same age and size should follow one another.

Animals should move in one direction to make movement easy.

Dangerous animals should be restrained.



## **ii. Dips**

These are farm structures constructed to hold acaricides, which animals are immersed for controlling ticks.

### **Livestock management at a dip**

Animals are dipped once or twice in a week depending on the tick infestation. Provide animals with drinking water before dipping to avoid drinking acaricide. Dipping is done in the morning. Animals should enter the dip in a straight line. Sick or injured animals should not be dipped.

All cattle should be dipped on the same day.

## **iii. Dairy parlour**

This is a dairy shed used during milking.

### **Factors to consider when constructing a dairy shed**

- Space: It should be spacious to allow space for comfort of the animal.
- Feed store and milking equipment should be available.
- Calf pen should be near a dairy.
- Waste disposal: Should have space for proper waste disposal.
- Resting area: The area should have a resting place to allow the cow to rest and chew cud.

## **5.2 Livestock are housed based on LPM/ Housing Livestock based on LPM**

### **Factors to consider when choosing a livestock housing.**

- The houses should allow for proper circulation of air.
- Should be affordable to the farmer and may be constructed using locally available materials.
- The houses should protect the animals from cold, rain and wind.
- The houses should be easy to clean.

### **Housing of cattle**

Since goats are browsers, they are provided with a raised house to allow them to exercise. The house should be well ventilated to allow free air circulation. Since goats are prone to pneumonia, the houses should be protected from cold. The floor should be raised to allow droppings and urine not to be accumulated. The house should allow goats to get direct sunlight.

### **Housing of rabbits**

Rabbit hatches should have wide doors to allow the handlers to reach out to the animals. The height from the ground should average 1m to keep away from predators. The floor should be slatted to allow droppings, urine and fodder to be drained off. The hatch should have a run to allow the rabbits to exhibit their natural instincts. Roof and wall materials should keep the interior free from rain and wind.

## Poultry housing

### Poultry housing selection

- i. A structure that allows for easy composing of manure should be selected.
- ii. Should be well lit to create a natural environment.
- iii. Should be well aerated to avoid stress.
- iv. Should be easy to clean; use of removable litter is recommended.
- v. Wet floors should be avoided as chicken are sensitive to cold.
- vi. Should provide recommended space per bird with a run for exercise.

### Types of Poultry housing systems

- a) **Free range:** Birds here are kept free during the day but housed at night.
- b) **Deep litre system:** Birds here are kept together in in house with litre provided.  
Litre should be 5-10 cm deep.

Table 4: Stocking rate in a deep litter

Type of chick	No. per square meter
Mature layer	3-4
Layers chicks	20-25
Layers growers	4-6
Young broilers less than four weeks old	2-5
Boilers 4-7 weeks old	10-12

### c) Fold system

Birds are kept in movable houses.



Figure 7: Fold system

<https://www.thehappychickencoop.com/chicken-tractor/>

## **Fish pond**

### **Factors to consider during siting**

Water should be available and flowing by gravity. The soil should be moderate clay that is not easily eroded and can hold water. The pond should be close to the markets to increase profitability. Site should be free from predators.

### **Structural Requirements**

**Inlet:** This allows water to flow into the pond. It should be at an elevation.

**Outlet:** It allows water drain out of the of the point. This is located on the lower side of the pond.

**Sloping bottom:** The shallow end should be 50-60 cm deep while the deep end should be 100-120 cm on average.

**Sloping sides:** Sides should be sloping to allow weeds to provide food for fish to grow.

## **5.3. Livestock structures are cleaned, disinfected or fumigated as per LPM**

### **Cleaning of Livestock Structures**

#### **A crush**

##### **Cleaning and disinfection**

Brush off as much loose dirt and organic matter as possible then rinse the crush with clean water. Apply a high-quality foaming detergent to kill bacteria, allow to work for 20-30 minutes. It is then rinsed with clean water and leave to dry. Disinfect with a product such as Cyclex.

#### **A milk parlour cleaning**

It is advisable to perform a hot wash routine after milking for effective cleaning. External surfaces of milking equipment in the parlour are disinfected to kill mastitis pathogens and bacteria. Residual milk is drained from the pipes into the bulk tank, hot water is poured after it to ensure all residues are drained. Use of Sodium hydroxide as a disinfectant is advisable. Spread Calcium Carbonate at the entrance of shed area to disinfect the shoes of staff. Dung is removed and replaced with a bedding.

#### **Poultry house**

Since poultry production requires a high level of cleanliness and proper hygiene, cleaning tools such as broom, rakes and scrubbing brushes are vital. The poultry wastes are collected, put in a wheelbarrow and taken to the farm.

#### **Fish ponds**

The fish pond water should be allowed to flow out once a year to reduce accumulation of disease-causing organisms. Weeds that grow in the pond should be controlled by use of hand or mechanically in case of a large-scale production.

#### **Rabbitry**

Watering and feeding equipment should be cleaned regularly using clean water.

The bedding should be changed regularly and a new bedding provided. After cleaning the stoke the hatch should be disinfected using Sodium hydroxide.

#### **5.4. Personal protective equipment is adhered to according as per occupation safety and health standards.**

##### **Protective clothing during handling of animals**

- **Hard leather shoes:** A worker should put on shoes when disinfecting surfaces with chemicals such as acids and alkalis.
- **Apron:** Worn when handling potentially contaminated materials to avoid contamination.
- **Lab coat:** Worn over the other clothes to avoid contamination. For instance, by veterinary officer.
- **Face mask:** Worn to protect the face from injury. For instance, during harvesting of honey.
- **Gloves:** Worn to protect the hands from animals and animal products. For instance, droppings of birds.
- **Gumboots:** Worn to protect legs from injury and contamination. For instance, when cleaning farm structures.
- **Respirator:** Worn when handling chemicals that are volatile and also during spraying of livestock.
- **Veil:** Worn to protect the persons handling bees from stings.

##### **Preventive measures to exposure to danger**

- a) Avoid wearing street clothes when working with animals.
- b) Keeping cages and animal areas clean to avoid sliding and falling down.
- c) Avoid skin contact with animal or animal products such as urine.
- d) Training workers to recognize signs and symptoms to protect themselves from contact with the sick animals.
- e) Keeping the recommended number of animals per square meter for easy and safe handling of the animals.

#### **5.5. Bio- security measures are adhered to according to animal disease handbook and LPM.**

##### **Benefits of biosecurity**

- Helps reduce disease and infection in animals
- Reduces the risks of losses
- Helps to keep out diseases
- Improves overall health of the animals
- Reduces mortality rates due to diseases
- Increases profitability of farm enterprises

### **General Biosecurity Measures**

- Prior to entering a facility employees and visitors should wear protective equipment such as overalls.
- Equipment and other materials should be disinfected to prevent disease causing organisms and pathogens.
- Foot baths should be placed on the door, they contain disinfectants that kill pathogens.
- The younger animals should be handled followed by the older ones because they are more prone to infections.
- Those animals in the farm should not be allowed to be in contact with those from outside.
- Ensure the animal houses are clean at all times, to avoid breeding of vectors that carry diseases.
- Provide proper housing structures.

### **Biosecurity Measures for poultry**

- Farmers should restrict visitors from entering the poultry unit.
- Workers of the poultry units should limit visiting other farms as they may bring pathogens.
- Other animals should be kept out of reach of poultry units because they may be carriers of some diseases.
- When there are new birds, they should be kept separate for seventy-two (72) hours.
- The feed should be free from contamination. For example, salmonellosis is transmitted through feed.
- Proper vaccination should be done to prevent disease infection, by boosting immunity.

### **Why are biosecurity measures are carried out for poultry?**

This is because poultry are highly susceptible to diseases. During an outbreak, a farmer can lose the whole stock.

### **Conclusion**

This learning outcome covered cleaning, disinfection, adherence to livestock structures, personal protective equipment, biosecurity measures as per the LPM.

### **Further Reading**



1. Swine diseases transmission and prevention by Amass and Bay singer
2. Animal husbandry by A. Kumar.

3. Consumer attitudes towards the development of animal friendly husbandry systems  
by Frewer and A.Kole

### 5.3.6.3 Self-Assessment



#### Written assessment

1. Which of the following is not an importance of livestock structures?
  - a) Efficiency
  - b) Protection
  - c) Feeding
  - d) Security
2. The following are factors to consider when siting a structure. Which one is not?
  - a) Topography
  - b) Weather conditions
  - c) Security
  - d) Land availability
3. Which statement best describes disinfection?
  - a) Cleaning structures and equipment to destroy bacteria
  - b) Preventing effects to organism by routine practices
  - c) Keeping farm machinery safe
  - d) None of the above
4. Which of the following is not a farm structure?
  - a) Crush
  - b) Calf pen
  - c) Farm
  - d) Dip
5. Pick one factor that is considered in constructing a dairy shed.
  - a) Space
  - b) Land available
  - c) Location of the farmer
  - d) Type of the structure
6. A deep litter is a housing structure for which livestock?
  - a) Poultry
  - b) Rabbits
  - c) Goats
  - d) Fish
7. Pick a statement that describes a bio-security measure.
  - a) Measures to protect the animals in a farm.
  - b) Farm management process of biological agents
  - c) Measures to protect animals from harmful biological substances
  - d) None of the above
8. What do we mean by the term bio-security?
9. What is a shelter?



10. What are the structural requirements of a fish pond?

11. State four general Biosecurity measures.

### **Oral Assessment**

1. Discuss the aspects of biosecurity that should be considered in pig husbandry?
2. What is the importance of animal structures?

### **Case Study Assessment**

Visit a farm next to your school and observe the type of structures. State the factors considered in construction of the structures.

### **Practical Assessment**

Construct a livestock structure of any animal of your choice.

Construct a guide to constructing a fish pond.

Visit the school farm and carry out one routine management practice of your choice and do it.

#### **5.3.6.4 Tools, Equipment, Supplies and Materials.**

- Zero grazing unit
- Pig stay
- Rabbit hitches
- Farrowing crates
- Feeding troughs waterers
- Milking pails

#### **4.3.6.5 References**




Julia Rothma.(2011), Farm Anatomy.ISBN.

L.J. Frewer, A.Kole., V.D. Kroon. (2006) Consumer attitudes towards the development of animal friendly husbandry systems.

M.Oesterheld,SJ McNaughton(2008), Effect of Animal Husbandry on Herbivore. Prentice Hall.

### 3.3.7 Learning Outcome No 6: Manage young and growing stock

#### 3.3.7.1 Learning Activities

Learning Outcome No 6: Manage young and growing stock	
 <b>Learning Activities</b>	<b>Special Instructions</b>
6.1. Weighing of young stock as per the manufacturer's specifications. 6.2. Feed young stock as per guidelines in LPM. 6.3. Wean young stocks following procedures stipulated in LPM 6.4. Housing young stocks according to breed and age as per LPM. 6.5. House young stock separately as per LPM. 6.6. Feed growing livestock according to the feeding standards as per feeding standards tables. 6.7. Assess fully grown stocks for breeding in accordance with LPM	Organize per student to visit the farm  Provide some feeds for students to identify  Set a written cat on the weaning procedure

#### 3.3.7.2 Information Sheet No3/L06: Manage young and growing stock



##### Introduction

This learning outcome entails; weighing of young stock, feeding young stock, wean young stocks, housing young stocks, housing young stock, feeding growing livestock and assessing fully grown stocks for breeding in accordance with LPM.

##### Definition of key terms

**Growing stock:** A group of animals that have not attained the maturity age or state.

**Parturition:** Process of giving birth in cattle.

**Weaning:** Process of gradually introducing food to the young animals other than the mother's milk while withdrawing the supply of its mothers' milk.



## **Content/procedures/methods/illustrations**

### **1.1 Weighing of young stock as per the manufacturer's specification**

#### **Weighing of young stock**

Process of finding how heavy the young animals are using scales. Weighing of young animals is done regularly.

#### **Reasons for weighing young stock**

- Helps in determining feed quality to be given to the animal.
- Helps in picking the weaning time
- Helps in easy monitoring of the animal's health
- Helps in identification of the optimal breeding time
- Evaluates to identify best breeds for your firm
- Helps in measuring the correct dose of the therapeutic pharmaceutical to treat animal diseases.

#### **Types of scales used for weighing**

- **Pen like scales**

Used to weigh animals that are difficult to rule.

- **Flat scale**

Weighing large animals.

- **Square/rectangular scales**

Used for weighing heavy animals.

#### **Factors to consider before buying a weighing scale**

- Waterproof
- Durable
- Kind of animals
- Efficiency of the scale

#### **Things to consider before weighing the animal**

- Choose the right livestock scale
- Determine the weighing set up
- Use a stable weighing surface
- Check for interferences
- Minimize stress and livestock shrinking

#### **How to get the animal weight**

- Measure the girth of the animal in relation to the location of the animal's heart
- Measure the length of the animal's body

- Using the measurements from top 1 and 2, calculate the body weight using the following formula.

$$w \text{ (pounds)} = \frac{\text{Heart Girth} \times \text{Heart Girth} \times \text{Body weight}}{300}$$

Example;

$$\frac{1000 \times 80 \times 100}{300}$$

=1,000,000 pounds

## 6.2. Feed young stocks as per the guidelines LPM

### Feeding

Process by which young animals obtain feeds.

#### Factors to consider when feeding young animals

- Nutrient contents
- Particle size
- Quality of the feed
- Health condition of the animal
- Physiological condition of the animal

Water, protein and calcium are needed for all young animals to survive but some species have specific requirements that contribute to optimal health.

#### Feeding young animals

##### Feeding calves, lambs, kids

These animals can satisfy most of their dietary needs by foraging for nutrient rich vegetations, though most pastures do not contain large enough quantities of edible plants to provide the nutrients required for healthy development. Supplemental sources of nutrition are necessary to maintain the well-being of animals and support growth. Newborn calves must be fed colostrum from their dam immediately after birth because it carries immunoglobulins that are absorbed by the gut to help the immune system resist disease. This passive transfer of immunity has proven to improve growth rates and decrease costs associated with calves.

##### Piglets

Piglets rely on careful management to survive because they are born without anti body protection. Their bodies cannot regulate internal temperature and they only have enough fat energy for one day. The piglets must be given colostrum immediately after birth in order to strengthen their immune systems. Short and medium chain fatty acids stimulate the gut health of suckling piglets, achieving eubiosis. The nutritional requirements for pigs differ according to their various developmental stages where

essential minerals, vitamins and amino acids are carefully added to support optimum performance.

### **Equines**

Foals need a well-balanced intake of nutrients to develop properly and prevent disease or sickness from setting in. Nursing foals receive most of their nutrients from their mothers' milk where proteins, calcium, phosphorus and many others are provided. Newborn foals need to be fed colostrum to receive a high concentration of nutrients and antibodies from the dam. Colostrum also helps the foals to pass fecal excrement which would otherwise cause constipation.

### **Ducklings, goslings and chicks**

They require constant access to amino acids, vitamins, minerals and antioxidants that contribute to healthy energy, metabolism and other necessary functions. A variety of physiological and morphological changes occur in young poultry immediately after hatching that affects their ability to digest food. During the post-hatch stage, nutrient transporters in young poultry are controlled by the level of protein they receive in their diet, as well as the quality and composition of feed.

## **6.3 Weaning of young stock following LPM procedures**

### **Weaning in calves**

There are two phases of young stock management on any dairy farm;

- The milk feeding calf phase from birth to weaning at 2-4 months of age.
- The weaned Leifer-rearing phase from weaning to point of first calving.

### **The milk feeding calf phase**

The key principles of milk-rearing herd replacements;

- Ensuring healthy cows can give birth to healthy calves in a clean and comfortable environment.
- Providing suitable colostrum to allow adequate transfer of immunity.
- Supplying milk, fresh water, appropriate and finitely supplements
- Providing appropriate and clean housing
- Minimizing the risk of diseases and spread
- Managing the weaning process
- Instigating practice that reduce the risk of antibiotic and chemical residues.

### **Pre-calving**

- Select sires for ease of calving
- Manage the transition period before and after calving to minimize metabolic diseases
- Ensure that the target mating weighs are achieved by joining heifers
- Implement a farm-specific vaccination program
- Prepare facilities for calving, concentrating on space and hygiene.

- Identification, target and recording
- Record all details of the birth
- Permanently identify each calf
- Set targets for feeding weaning and disease control
- Decide on a protocol for calling very sick calves

### **Colostrum feeding management**

Consider vaccinating the cows for local diseases to improve the colostrum quality  
Preferably separate the cow and calf within a few hours and administer the colostrum by hand.

Ensure an adequate colostrum feeding program;

- The quality of colostrum
- Quantity of colostrum feed
- The method of feeding colostrum

### **Milk feeding and access to drinking water**

- Select the type of milk
- Beware of the potential problems with very cheap comply
- Do not dilute milk or colostrum with water
- Provide clean drinking water
- Use hot water, detergents and sanitizes when washing feeding equipment.

### **Solid feeds**

- Provide good quality concentrates
- Understand the importance of adequate protein in the concentrates
- Decide on formulation
- Provide appetite from first week of age
- Do not mix concentrates with water
- Feed limited amount of forages

### **Preventing and treating scours**

- Be aware that good colostrum feeding management is the key
- Be consistent with all feeding and herd management
- Minimize stresses on calves
- Understand scours and age when they can occur
- Understand how to assess degree of dehydration in sick calves

### **Health and herd management**

- Dip the calf's navels in iodine solution soon after birth
- Understand calf behavior
- Be confident with veterinarian support
- Be aware of how to assist the veteran with follow up treatments of sick calves

- Minimize exposure to infections and faecal contamination of the calf rearing area
- Record all instances and degree of health problems for later reference
- Ensure newly introduced stock are kept in separate quarantine area
- Ensure all staff are aware of farm health protocol

### **Managing weaning**

- Weaning must be carefully planned
- Decide on weaning protocol
- Immediately remove milk from the diet
- Note whether concentrate intakes quickly increase following weaning
- Minimize early post-weaning stress such as vaccinations and disbudding
- Move weaned calves to other pens only after a few days
- Continue feeding concentrates for many months even if forage quality is good

### **Environment management**

- Protect stock from climatic stresses
- Consider sprinklers and fans in very hot climates
- Maintain a clean environment to minimize the disease risk
- Ensure the rearing facilities do not cause undue stress on newborn calves
- If cold weather is likely to be experienced, ensure the walls are solid to calf height.
- Provide artificial heating for sick calves in cold conditions

### **6.4 Housing young stock separately as per LPM**

- Consider individual calf cages for rearing calves for the first weeks of life
- Ensure each pen has containers for fresh water, milk, concentrates and if being fed forages.
- If using group pens, ensure no more than six calves per group; with sufficient floor space for each calf.
- Ensure good spacing in the calf shed
- Provide adequate lighting in the shed for nighttime activities
- Ensure hot water is readily available for cleaning purposes

### **The weaned heifer phases**

The key principles of rearing weaned replacement heifer are;

- Ensuring they grow well to achieve target live weights for mating and calving
- Basing the ration on high quality forages with concentrates specially formulated for growing heifers
- Suppling fresh water at all times
- Providing appropriate and clean housing
- Minimizing the risk of disease and disease spread

- Ensure welfare requirements are met for any calves sold

The aim of heifer rearing is to achieve maximum growth and development and earliest puberty at least cost.

#### **Early post-weaning management**

- Minimize stress immediately before and after weaning.
- Avoid moving calves out of milk-rearing pens for several days after weaning.
- Monitor individual concentrate intake after weaning to ensure rumen development is adequate.

#### **Targets and recording**

- Routinely weigh to monitor changes in live weight during heifer rearing every 3months.
- Use target live weights to modify feeding management if required
- Use body condition as an extra guide to heifer feeding management
- Record animal health treatment until first calving
- Plan mating at target mating weights
- Decide on protocol for calling very sick heifers

#### **Forage quality**

- Ensure the forage is of good quality
- Provide adequate forage
- Chop forages into small lengths
- Consider wilting fresh grass to increase forage intakes

#### **Feeding of concentrates**

- Feed concentrate until puberty depending on forage quality
- Ensure concentrates contain adequate proteins
- Decide on the formulation
- Provide fresh drinking water all times

#### **Mating management**

- Ensure target weights are achieved before joining heifers
- Seriously assess the benefits of synchronizing estrus in large groups of heifers
- Select bulls and semen on ease of calving
- Consider access to bulls for natural mating following several cycles of AZ.
- Ensure heifers are well fed and gaining weight during the mating period

#### **Health and herd management**

- Understand stocks behavior
- Plan for disease prevention rather than treatment
- If selling stock, ensure they are fit for travel and sale
- Ensure staff are aware of farm health protocol
- Newly introduced stock should be kept in separate quarantine area

### **Environmental management**

- Minimize heat and cold stress as with milking cows
- Protect stock from climatic stress
- Consider sprinklers and fans in very hot climates
- Maintain clean environment to minimize the disease risk
- If cold weather is likely to be experienced, ensure walls are solid to calf height

### **Housing and facilities**

- Heifers should have adequate space in their pens
- Good ventilation in the heifer shed
- Provide adequate lighting in shed for nighttime activities
- Provide small refrigerator for storing vaccines and other drugs in a secure area
- Devise a good efficient disposal system for regular cleaning of facilities

### **Pre-calving management**

- Manage the transition period before and after calving to minimize metabolic diseases.
- Implement a farm specific vaccination program
- Prepare facilitate for calving, concentration on space and hygiene

### **Weaning pigs**

Piglets are weaned any time after they have received the protection provided by colostrum. Diets have been formulated that permit piglet to wean 1 or 2 days after farrowing. However, not many pigs are weaned at this early age because of the exceptional management necessary to achieve it. Those weaned at 1 or 2 days are placed on milk replacer.

### **Milk replacer**

Pigs up to 7-10 days of age have a limited digestive enzyme capacity.

After 7-10 days, the piglet's enzyme system is mature enough to digest more common feedstuffs e.g. corn, soybean.

### **Pre-starters (8-14 days)**

It is used for pigs that have been weaned prior to 3 weeks of age but have nursed for up to 14 days.

Total intake for a pre-starter is not high and probably will average 3.5lb per pig.

### **Starters (12-28 days)**

This program will follow the pre-starter diet and can develop it by a couple of days.

It can begin for pigs that have been nursed for up to 2-3 weeks. The diet differs from pre-starters diet.

### **Early weaning**

It's not a common practice. There is an advantage on early weaning of pigs. Once the baby pig has received colostrum diets are available that are superior to sows' milk. The pigs that are successfully weaned early will be uniformly heavier at 8 weeks of age. The disadvantage of early weaning the pigs will need more sophisticated diets, more careful management and increased equipment.

### **Weaning at 8 weeks**

Many swine procedures wean pigs at 7, 8, 9 weeks of age. Such pigs have had access to simple creep diet e.g. coins.

### **Weaning of lambs and kids (sheep/goats)**

There are factors considered when weaning lambs and kids. They include; age, season of birth, parasite problem, predator risks and forage resources.

### **Early weaning**

It eases the lactation stress of high producing females and other females that may be highly stressed due to age and physical condition. It helps prolific females raise their offspring's. The females return to breeding condition earlier.

### **Advantage of early weaning**

- It is less expensive to feed lambs and kids; young animals convert feed very efficiently.

### **Disadvantages of early weaning**

- On the other hand, early weaning causes stress to both female and their offspring's.
- There is high risk of mastitis attack
- It requires more degree of management and more pasture fields.

### **Late weaning**

It is more natural and less stressful to lambs and kids

It allows producers to take advantage of available forage to finish their lambs and kids. Management is simpler; female and offspring are maintained in a single group for a longer time.

Late weaning can become parasitized or killed by predators

## **6.6. Housing of Growing stock according to LPM**

### **Factors considered when planning for appropriate environment for growing stock**

- Individual characteristics e.g. sex, age, size, behavior and health.
- The ability of the animals to form social groups with conspecifics through sight, smell and possibly contact, whether the animals are maintained singly or in groups.
- The design and construction of housing
- Availability or suitability of enrichments
- Project goals e.g. production, breeding, research and testing



- Duration of the holding period
- Presence of hazardous or disease-causing materials
- Intensity of animal manipulation and invasiveness of the procedures conducted.

## **Individual Animals**

### **Beef cattle**

Housing requirements depend on season and age. As cattle mature, they are moved to what is known as feed lot. In feed lot, cattle are able to roam in large fenced areas, they allow for their free access to food and water.

### **Dairy cattle**

The female calves (heifers) are placed in individual pens, e.g. hutches or together in groups, where they are fed milk replacer, grain, water and hay. At about seven weeks, calves are weaned, taken off milk and moved into group housing with other dairy heifers. The heifers then grow and once they have a calf, they begin producing milk and move into a barn with other cows.

### **Pigs**

When the sow is almost calving, it is moved to the farrowing crate (gestation). The pens have metal bars that prevents the mother from the piglets when they are born. It prevents the mother from accidentally laying on the baby pigs and crushing them. It is easier to control temperatures and diseases in the farrowing crate.

### **Sheep**

The type of housing necessary for sheep depends on the type of kind of production system and the time of the year the lambs are born.

### **Broilers**

As the birds grow, the farmers will take the dividers down and let the chickens move around the entire barn. The chickens will be kept in this barn until they weigh about six pounds and are ready to go to market.

### **Layers**

At 17 weeks old, the layers are moved into a laying house where they begin laying eggs. On larger farms, laying houses are connected by a series of conveyor belts that transfer the eggs from each.

## **6.6 Feeding of growing stock**

### **Cattle**

Calves over one year are fed on high quality roughage. A judicious mixture of roughage and concentrate is essential for obtaining optimum growth without undue fat deposition.

From six months onwards, calves can be given the same type of concentrate mixture (14-16%), Digestible Crude Protein and about 70% Total Digestible Nutrients as used for adult cattle housed from a central building to a house.

## 6.7 Assessment for breeding for fully grown stocks

**Breeding:** It is mating of the selected animals.

### Methods used

- **Progeny testing**

Used when a high level of accuracy is needed for selecting a sire to be used extensively in artificial insemination. It involves choosing the sires and dams in the population based on an animal model evaluation.

The best 1-2% of the cows are chosen as bull's mothers and the best progeny tested bulls are chosen to produce generation of sires.

The parents are mated to complement any individual deficiencies.

- **Accuracy and selection**

Involves ranking candidates for selection depending on their performance record to a statistical model. A performance record ( $y$ ) can be expressed as;

$$y = g + e + \Sigma$$

where,  $g$  stands for genetic effects

$e$  stands for environmental effects (categorized)

$\Sigma$  stands for random environmental effects

### Conclusion

The learning outcome covered weighing, weaning feeding and housing of young stock based on LPM. It also covered housing and feeding of growing stocks and assessment of fully-grown stocks for breeding.

### Further Reading



1. Merck manual October 2014, Nutritional Requirements of Beef Cattle Accessed March 18, 2015.

2.

### 4.3.7.3 Self-Assessment



#### Written assessment

1. Which one of the following is not a type of animal weighing scale?

- a) Square
  - b) Flat
  - c) High
  - d) Pen
2. Which one of the following is a type of animal feed?
- a) Forage
  - b) Nutrient
  - c) Protein
  - d) Carbohydrate
3. Which one of the following is not a ruminant?
- a) Sheep
  - b) Cow
  - c) Goat
  - d) Pig
4. At what age are the pigs weaned?
- a) After two weeks
  - b) 7-10 days
  - c) Two weeks
  - d) Two months
5. Why are calves fed with colostrum immediately after birth?
- a) Immunity
  - b) Temperature
  - c) Growth
  - d) Breeding
6. What is the main reason for feeding young animals with high nutritive feeds?
- a) Growth
  - b) Selection
  - c) Breeding
  - d) Parturition
7. Which one of the following is not a young one?
- a) Equine
  - b) Piglet
  - c) Lamb
  - d) Foal

**Short answer questions**

1. What do you understand by the term parturition?
2. What is the meaning of the term weaning?
3. Name any type of weighing scale
4. State any factor considered when weighing the animal
5. Give any factor considered when feeding young animal

### **Oral Assessment**

1. Differentiate between parturition and farrowing
2. State two methods of Breeding assessment

### **Case Study Assessment**

1. Visit the university farm and carry out the following activities;
2. Identify the type of animals kept there and ages
3. Identify the type feeds given to them
4. Identify their housing depending on the ages
5. Calculate the body weight for each breed of animal kept

### **Practical Assessment**

#### **3.3.7.4 Tools, Equipment, Supplies and Materials**

- Convectional and non-convectional livestock.

#### **3.3.7.5 References**



- Clutton-Brock, Juliet (1999). *A Natural History of Domesticated Mammals*; Cambridge University Press.
- Kahlodi M.A. (2014). Assessment of the relationship between body weight and body measurements in indigenous goats using path analysis. *Animal production*. South Africa. 2136.
- Raji A.O., Igwebuikwe J.U and Aliyu J. (2008). Testicular Biometry and its Relationship with Body Weight of Indigenous Goats in a Semi-Arid Region of Nigeria. *ARP Journal of Agricultural and Biological Science*.3 (4). Pe.