



Artificial Insemination – Level1

Learning Guide # 6

Unit of Competence: -Supporting Dairy Cattle Husbandry Practices

Module Title: - Supporting Dairy Cattle Husbandry Practices

LG Code: AGR ATI1M 02 LO1- LG 6

TTLM Code: AGR ATI1M 02 TTLM 0919v1

LO1. Prepare for treatment and husbandry practices of dairy animals



Instruction Sheet

Learning Guide #6

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

- Checking and confirming Equipment's and materials for dairy animals treatment against work plan
- Mustering, Yarding , controlling, Inspecting and identifying Dairy animals for treatment
- Identifying, Housing, sanitation, feeding, Castrating, Dehorning, Branding Dairy animals against work plan
- Recognizing, assessing and controlling Existing OHS Hazards in work places

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- Check and confirm Equipment's and materials for dairy animals treatment against work plan
- Muster, Yard , control, Inspect and identify Dairy animals for treatment
- Identifying, Housing, sanitation, feeding, Castrating, Dehorning, Branding Dairy animals against work plan
- Recognizing, assessing and controlling Existing OHS Hazards in work place

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” **in page -6, 9, 12 and 14** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 ” **in page -15.**
6. Do the “LAP test” **in page – 16** (if you are ready).



Information Sheet-1

Checking and confirming Equipment's and materials for dairy animals treatment

1.1 Checking and confirming Equipment's and materials for dairy animals treatment

Introduction

Apply basic animal husbandry practices

Animal husbandry is the science of taking care of domestic animals that are used primarily as food or product sources. In many places throughout the world, people are essentially specialists in animal husbandry by means of being farmers, ranchers, sheepherders, or anyone who takes care of a variety of animals. Anyone who takes care of domesticated animals, especially in large groups, is practicing animal husbandry.

A second definition of animal husbandry is that it is a subject that can be studied, often in the college environment. People who take undergraduate degrees in animal husbandry may be less interested in caring for a flock of animals and more likely to specialize with graduate degrees in veterinary medicine, pharmacy degrees specializing in animals, or in managing large companies that produce products for animals like feed. Some people who raise animals may also take a class or two in animal husbandry to learn how to do certain things, like how to dock tails, make use of the newest technology to milk animals, or how to breed animals using artificial insemination techniques.

In general, many of the practices involved in learning animal husbandry come naturally from being raised on farms where large numbers of animals are raised. This is particularly true in primarily rural areas and in less developed countries. Children are early taught how to take care of the same types of animals their parents raise so that they can take over farms and ranches as adults.

In more developed countries, programs like 4H exist, which help young children learn how to raise animals, show them, sell them, and possibly slaughter them. It all depends upon the type of animal raised and its uses as a saleable product. With most people no longer



raising their own domestic animals for meat or clothing, 4H gives children the opportunity to raise one or two animals, sometimes more depending upon the parents' resources.

From a scientific standpoint, specialists in animal husbandry may try to address specific problems occurring in large groups of animals. An animal husbandry specialist might study the current means for preventing mastitis in cows, or the specific needs of shelters for pigs. As many farms have become more industrialized, figuring out maximum storage space for animals may be a focus.

There are many different schools of thought in the scientific practice of animal husbandry. Some groups concede the necessity of animals for food and a variety of products but feel that goals in raising stock should always be focused on the humane caring of animals. In the past twenty years a variety of animal husbandry specialists have advocated for the “free-range” caring of certain animal groups, as opposed to keeping animals in tight quarters for most of their lives.

Other specialists in animal husbandry specifically look to just how little space you can store an animal in, modifications that can be made to produce more docile animals, and genetic alterations or drug injections that make the animal more valuable financially. The introduction of bovine stimulating hormone (BSH) to produce a greater milk supply from each individual cow was hailed by some animal husbandry experts and despised by others.

In all, animal husbandry may refer to the study or raising of domesticated animals, particularly in large group settings. You can be born into families where you'll have to learn it, or take it up as a branch of study. There are multiple ways to go about it, just as there are multiple species of animals raised.

1.1 Checking and confirming Equipment's and materials for dairy animals treatment against work plan

1.1.1 The farmstead structures:



Farmstead structures and equipment's are all the necessary, buildings in the farm, equipment's and the compound itself.

The farmstead structure in a dairy farm includes:

1. **Cattle shed** – a shed where cattle are kept.
2. **Feeding pen** – a pen where feed is being served to the animals.
3. **Feeders and water** supplying system.
4. The **drainage system / channel** - a system where by excreta / Cow dung and urine produced by the animal in the house is removed
5. **Milk store a room** / place where milk is stored temporarily.
6. **Maternity pen**: where pregnant animals are kept.
7. **Hay barn / store** – where hay is stored for future use.
8. **Water supply** system such as Tanker, Bore well line etc. .
9. **Feed store** – where mostly concentrates and supplementary feeds are kept.
10. **Silage Pits** – a place where silage preparation takes place.
11. **Isolation pen** –where sick animals are separately kept away from healthy animals.
12. **Cattle Crush** – structure used for vaccination and treatment of animals.
13. **Fence** –to keep animals protected from wild animals and theft.

1.1.2 The farm Equipment's:

Different types of equipment's used in dairy farm such as:

1. **Fixed weighing scale** –to take the weight of animals.
2. **Heart girth meter** – it is used to estimate the weight of animals where there is no weighing scale available in that area.
3. **Milk collection and storing cans** – are used to transport and store milk.
4. **Hoof trimmer** – used to trim the long hoof of animals.
5. **Dehorner** – used to remove the horns of the animals.
6. **Castrator (Burdizzo)** – used to castrate / crush the spermatozoa chords in the testicles of the male animals.
7. **Veterinary equipment's** –all types of equipments that the veterinarian uses to give medical treatment such as drugs to treat sick animals.



8. **Milk processing equipments**– are used to process milk (Cooling / Chilling / Cream Separation / Pasteurization etc) and to convert one form of milk to another or into different products.
9. **Hand gloves** –is hand wear to prevent contamination.
10. **Ear tags** and **Ear tags applicator** –used for the identification of animals and punching of ears for fixing of tags.
11. **Restraining** materials –used to restrain animal e.g. Rope.
12. **Brushes** and **cleaning** materials.
13. **Milk testing laboratory equipment** such as
14. Thermometer for temperature
15. milk fat testing Butyro-meter, for milk total solids / water content testing Lactometer

Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. List down at least 10 Farmstead structures! (5point)

_____ , _____ , _____ , _____
 _____ , _____ , _____ , _____
 _____ , _____ , _____ , _____

2. List down at least 10 farms equipment! (5point)

_____ , _____ , _____ , _____
 _____ , _____ , _____ , _____
 _____ , _____ , _____ , _____

Note: Satisfactory rating – 5 and 10 points

Unsatisfactory - below 5 and 10 points

Answer Sheet

Score = _____
 Rating: _____

Name: _____

Date: _____

Short Answer Questions

Operation title: **-preparing material for Animal husbandry work**



Purpose	To acquire the trainees with different equipment, tools and materials helps for Animal husbandry practice.
Equipment ,tools and materials	Supplies and equipment needed or useful for Animal husbandry practice include these: ➤ Fixed weighing scale ➤ Heart girth meter ➤ Milk collection and storing cans ➤ Hoof trimmer ➤ Dehorner ➤ Castrator ➤ Veterinary equipment ➤ Milk processing equipment ➤ Hand glove ➤ Ear tags and Ear tags applicator ➤ Restraining material: cattle crush, chute, rope ➤ Brush and Cleaning material ➤ Milk testing laboratory ➤ Thermometer ➤ Milk fat testing Butyro-meter
Conditions or situations for the operations	• All tools, equipment's and materials should be available on time when required. • Appropriate site with artificial insemination facilities' and equipment should adjusted for Animal husbandry practice.
Procedures	1. Wear personal protective clothes. 2. Identify materials, tools and equipment's helps for insemination. 3. Check weather all materials and equipment's are properly work or not. 4. Follow correct handling of tools and equipment's. 5. Prepare and list the role of tools and equipment's used for insemination.
Precautions	❖ Care should be taken while preparing materials, tools and equipment's. ❖ Preparing materials, tools and equipment are according to inseminator command.

Supporting Dairy Cattle Husbandry practice

LAP Test	Practical Demonstration
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions:

1. You are required to perform any of the following:

1.1. Identify equipment and **material for** Animal husbandry practice



- 1.2. Prepare equipment and **material for** Animal husbandry practice
2. Request your teacher for evaluation and feedback

Information Sheet-3	Identifying House sanitation, feeding, Castrating, Dehorning, Branding Dairy animals
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1. 3 Identifying House sanitation, feeding, Castrating, Dehorning, Branding Dairy animals

1.3.1 Housing:

An efficient management of cattle will be incomplete without a well planned and adequate housing of cattle.

Improper planning in the arrangement of animal houses may result in additional labor charges and thus curtail (limit or reduce) the profit of the owner.

During erection of a house for dairy cattle, care should be taken to provide comfortable accommodation for individual cattle. In addition to this-

1. Proper sanitation
2. Durability
3. Management for production of clean milk under convenient and conditions is highly important.

1.3.2. The types of dairy house

General Two types of dairy houses are used at present time.

- A. The loose housing barn-in combination with some type of milking barn or parlor
- B. The conventional dairy barn / stanchion houses.

1. Loose housing system

- The system where animals are kept loose except during milking and at the time of treatment.
- This system is most economical
- **Features of Loose housing**
 - ✓ Cost of construction is significantly lower than conventional type.



- ✓ It is possible to make further expansion without much change.
- ✓ It facilitates easy detection of animals which are in heat .
- ✓ It makes animals free, thus animals get optimum exercise which is extremely
- ✓ Important for their better health and production.

2. Conventional Dairy Barn:

- Conventional dairy barns are comparatively **cost**
- Now becoming **less** popular in day-to-day operations.
- This system refers to housing in which the cows confined close together on single platform and secured at the neck by, **stanchion.** ,
- Cattle here are more protected from adverse climatic conditions.
- Under this system, the sheds are well ventilated but draught free

STANCHION

- It is one of the standard dairy cow stalls.
- The cow can be fastened easily and quickly with the Stanchions and held more closely in place than any other type of tying system
- Floors may be constructed using concrete, stone or packed earth

Purpose of House (Building) and Equipment's:

1. To protect animals from unfavorable weather conditions.
2. To minimize risk of injury to the animals.
3. To provide the cattle with enough drinking water and with ample opportunity to feed adlib.
4. To provide area for special handling of cattle during breeding, treatment and vaccination.
5. It affords comfortable working conditions.
6. To develop conducive and high degree of labor work efficiency in material handling.
7. To be within economic limitations for which cattle can pay back.
8. Dairy cattle may be successfully housed under wide varieties of conditions ranging from close confinement to a little restriction except at milking times



- An alternative is the strategy of within herd good calf management. The latter is feasible because today most of smallholder dairy farmers own small dairy herds and with the introduction of **AI** this would provide farmers an opportunity to transform the herd structure by the introduction of "**proven dairy semen**" with a great potential to produce better heifers to increase milk production.
- This strategy is in accordance with the government promotion of improved milk production by the smallholder sector.

1.3.3 Dairy animals feeding

Feeding is an important aspect of dairying as it accounts for around 70% of total cost of milk production.

- A normal adult animal should be fed 6 Kg dry and 15-20 Kg green fodder per day.
- Legume and non-legume green fodder should be fed in 1:3 proportion.
- Green fodder should be harvested at 50% flowering stage.
- Surplus green fodder should be conserved in the form of 'hay' or 'silage' .
- Conserved fodder becomes useful during summers or when green fodder is scarce

Different types of dietary feed ingredients for dairy cows and buffaloes include

- concentrates such as compound cattle feed, oil cakes, grains and grain by products like brans and chunnies
- cultivated green fodders, grasses and crop residues like straws and stoves

1.3.4 Hoof trimming: -

foot care is important because cattle hooves particularly sheep's and goats hooves grow continually, and if adult sheep do not walk on hard rough ground their hooves become overgrown and need regular trimming. Process:

- Restrain the cattle or hold the calf, sheep or goat in a sitting position
- Clean the trimmed hoof and mark up
- Take hold of one leg
- Using hoof trimmer cut the overgrown hoof.
- Using the knife or closed shear clear out an shaped hoof
- Cut away the excess hoof until the hoof is the same length as the foot
- In the heels of the hoof are also overgrown cut these down too, to the same level.
- Be careful not to cut away too much hoof and expose live tissue.
- If the foot bleeds, the hoof has been cut too far.
- Experienced foot trimmers should cut off the hoof only in thin slice.
- Disinfect the trimmed hoof



1.3.5 Castration

Castration is the removal of the testicles of a male animal. Sometimes Livestock keepers like cattle, sheep and goat keepers prefer to castrate the young's which are not allowed to reproduce and which are bred for meat production. If you still want to castrate young sheep and goats do this before they are three months old.

It is advisable to castrate them as young as possible; the shock is then minimal.

Castration is usually performed for management reasons so that the livestock can be looked after together in one flock with out the possibility of the females becoming pregnant.

At early age castration is a small, quick and effective treatment .

Male calves are castrated at the earliest within **2-3 months of age**. It involves severing or crushing the spermatic cords so that sperms cannot longer produced.

For **sheep**, there are three common methods of castration

- A. using rubber ring or elastrator
- B. knife
- C. Burdizzo. Is blood less castrator or safe for use on animals of all ages

Procedures:

- First make firm arrangement to hold (restrain the animal)
- Next grasp each testicle and feel up to the bottom of scrotal sac
- With thumb and fore finger, hold the spermatic cord against the sac.
- Then place the jaws of the burdizzo castrator 2 cm above the testicle and below the rudimentary teats.
- With fingers hold the spermatic cord below the jaws of the castrator.
- After confirming the correct position, close the jaws firmly.
- Through burdizzo handle try to feel the crushing of cord.
- Make two crushes each in the spermatic cords in total four.
- Make sure that distance between each crushes is about 2 cm.
- Remove the jaws stayed 3-5 minutes and clean with disinfectants before next use.
- The calf is observed for any ill health (side effects) in the next three days.



- After 1 month check that testicles have disappeared or shrunken.



Figure . Proper application of a burdizzo

We advise strongly that you seek help of veterinary or experienced keepers to carry out the castration and possibly show you how to do it. Always take care that the treatment is done carefully and that hands, tools and the scrotum are cleaned thoroughly in order to prevent infection.

Rubber ring or elastrator:-it can be used only for lambs with in few days of birth. A special

Applicator and rubber rings are used needed.

An assistant holds the lamb with both its right legs in his right hand, both its left legs in his Left hand and its rump on his knee. The scrotum is then easy to reach.

- Feel the testicles and draw them down on the lower part of the scrotum
- Using the applicator put a rubber ring over the scrotum. This cuts off the blood supply so that the scrotum shrivels and drops off a few weeks later.
- The rubber ring method of castration quick and easy to use, and no sterilization or disinfection is required. However, this method may occasionally result in tetanus infection.

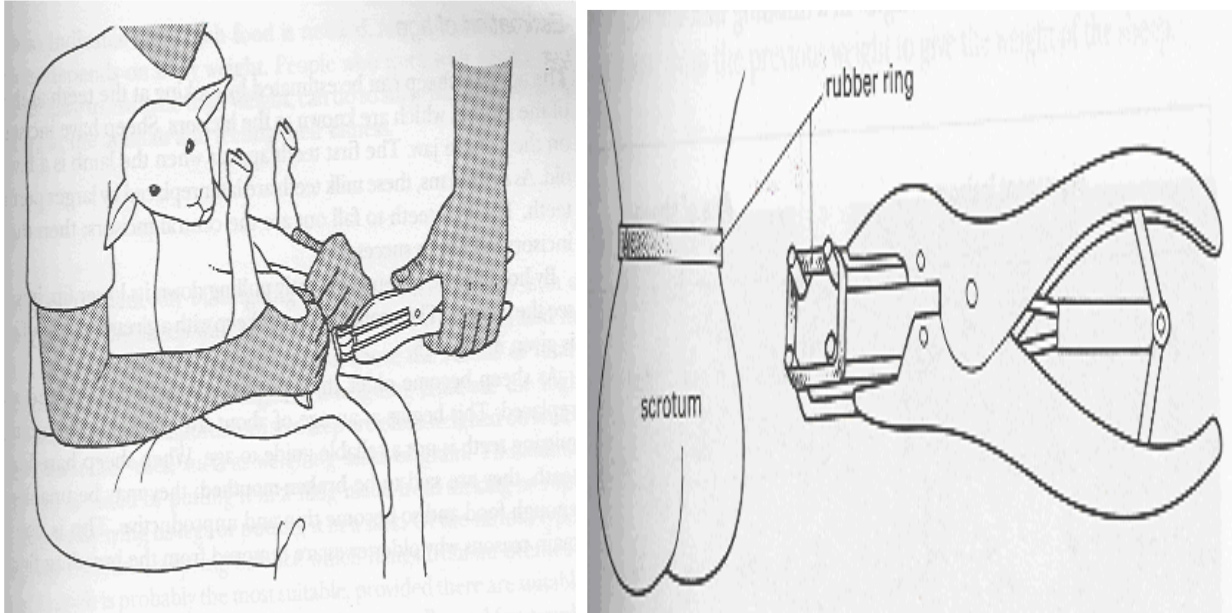


Figure. Proper application of elastrator

1.3.6 Dehorning

Dehorning performed as a management tool in intensive systems to avoid damage that could possibly arise from fighting or as safety precautions for personnel dealing with the flock. It also uses for less floor space, bring uniformity in appearance and prevent horn cancer.

The best age to remove horns is **2-3 weeks** after birth. Under extensive system, this may not be necessary as horns are a defensive mechanism and may be used by producers in restraining animals.

Dehorning of sheep and goats will not be treated in further details as it is not practiced in Ethiopia.

Horned cows are not only dangerous to people working with them, but cause a great deal of damage to hides. Dehorning also improves the animal looks.

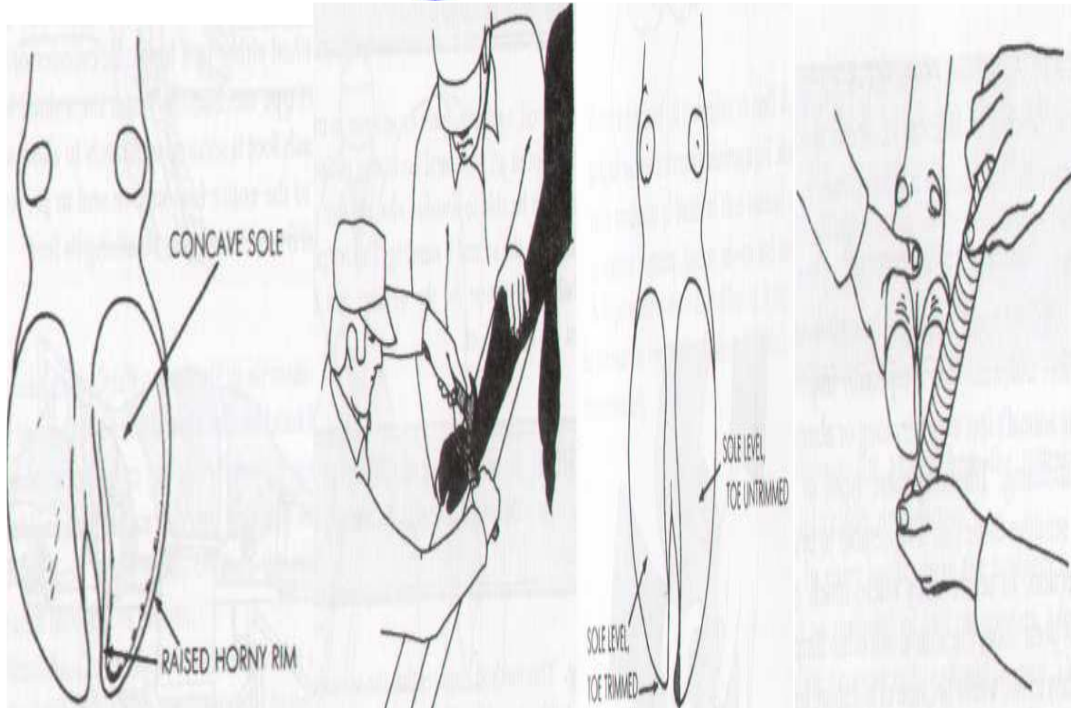


Figure15. Dehorning methods

Types of dehorning

- A.** By application of caustic soda/stick
- B.** By use of hot iron
- C.** By use of **saw with wire/snip with** shears and for use of older animals/

A. Application of caustic soda/stick

- The best method is to use caustic soda /stick by rubbing the **buds** of the **horns** when the calf is about **2 weeks** old.
- To avoid the burning of adjoining a skin, a **Vaseline ring** around the horn bud applied in such a way to protect eyes of the calf.
- The caustic stick should be applied /rubbed on to the bud till bleeding starts

B. Hot iron: Electric, gas or fire-heated iron

- Most common in calves (**4 to 6 weeks**). When using this method, ensure that the killing of **horn bud** is effective; otherwise, the horn will grow again.



- Hot iron dehorning can be done with ease up to the **age 3 months** (while the dehorning iron still fits over the bud comfortably). There after horn growth is rapid, making surgical removal necessary.

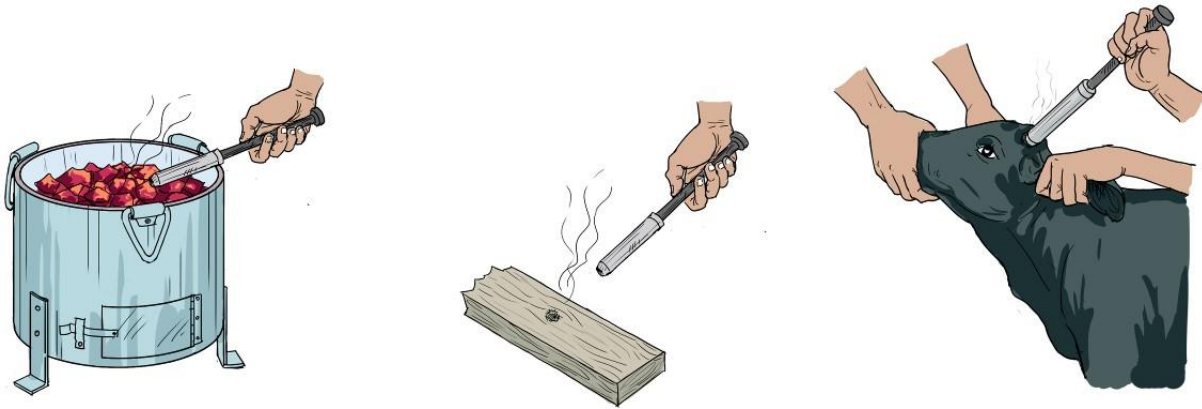


Fig. 11: Hot iron dehorning

D. Surgical method: use of saw or cutting wire

- In older animals, surgical procedures must be used, especially if horns have grown to a **length of 2 cm** or more.
- The removal of larger horns causes a great deal of pain and anesthetics should be used with dehorning and steps taken to prevent bleeding.
- Blood attracts flies and blowfly strike causes serious problems in open wounds.
- Once horns have grown very large, removal of the horns exposes the hollows in the skull and these must be closed to prevent infection.

1.3.7 Identification of Animal

- Identification of calves should be done immediately after birth to allow efficient and proper recording.
- The law states all cattle must permanently be identified by an official ear tag on each ear. Identification can be through various methods:

1. Ear marking

A. Ear notching - cut part of ear using an agreed code. This mark is permanent but exposes cow to infection.



B. Ear tattooing - difficult to read and does not work in dark animals.

C. Ear-tagging - use an applicator, easy to read but expensive.



Ear notching



Ear tattooing



Ear tagging

Three types of calf identification by Ear marking

2. Branding animal

Branding is another method of permanent cattle ID No.

There are two methods of branding: **hot branding** and **freeze branding**

A. Hot iron branding

- Short time on the legs so as not to spoil skin.
- This is permanent but not common in dairy cattle

B. Freeze branding offers a permanent form of identification that is easy to read at a great distance, causes minimal damage to the hide and research has shown it is less painful than hot branding.

Freeze branding uses **liquid nitrogen** or **dry ice** and **works quite** differently from hot branding in that a very cold branding iron applied to the hide results in freezing the hair follicles. Freeze branding kills the pigment producing cells in the hair follicle, which results in hair growing back white or no hair regrowth.

Self-Check -3

Written Test

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

I. Choose the best answer (each 1point)



1. Which one of the following is/are not the criteria during erection of dairy cattle to provide comfortable accommodation for individual animals?

- A. proper sanitation
- B. Durability
- C. Easy management for production of clean milk udder
- D. Loose House**

2. Which one is/are not the type of dairy house?

- A. Loose house barn
- B. Conventional dairy barn
- C. Stanchion
- D. None**

3. What is/ are the purpose of house and Equipment in dairy production?

- A. To protect animals from unfavorable weather conditions.
- B. To minimize risk of injury to the animals.
- C. To provide area for special handling of cattle during breeding, treatment and vaccination.
- D. It affords comfortable working conditions.
- E. All**

4. _____ is the area where animals fastened easily in conventional dairy barn.

- A. Feeding trough
- B. Water trough
- C. Stanchion**
- D. All

5. The removal of male animal testicles is Called_____

- A. Hoof trimming
- B. Dehorning
- C. castration**
- D. All

II. Answer the following question!

1. Mention the types of dehorning animal! (3point)

_____ , _____ , _____

2. Write the three types of sheep castration procedure! (3point)

_____ , _____ , _____

3. Write the three types of ear marking procedure! (3point)



4. Write the two types of animal branding methods! (2point)

Note: Satisfactory rating - 8 and 16 points

Unsatisfactory - below 8 and 16 points

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

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

Operation title: - **Hoof trimming**

Purpose	To acquire the trainees with properly Hoof trimming
Equipment ,tools and materials	-Hoof trimmer - Hoof knife - Rope and for large animal cattle crush or chute -Disinfectant, Clean water - Human labor
Conditions or situations for the operations	-Hoof should be trimmed correctly -The animal must properly restrained -the animal not extremely stressed
Procedures	➤ Wear personal protective clothes.



	➤ Restrain the cattle or hold the calf, sheep or goat in a sitting position ➤ Clean the trimmed hoof and mark up ➤ Take hold of one leg ➤ Using hoof trimmer cut the overgrown hoof. ➤ Using the knife or closed shear clear out an shaped hoof ➤ Disinfect the trimmed hoof
Precautions	Be careful not to cut away too much hoof and expose live tissue.
Quality criteria	-Did PPE wear properly? -Be careful not to cut away too much hoof and expose live tissue. -The hoof not extremely blooded. -Did the animal hoof correctly trimmed the hoof

LAP Test	Practical Demonstration
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Name: _____ Date: _____

Time started: _____ Time finished _____

Instructions:

1. You are required to perform any of the following:
 - 1.1. Support Animal for hoof trimming
 - 1.2. Prepare animal for hoof trimming
2. Request your teacher for evaluation and feedback

Information Sheet-4	Recognizing, assessing and controlling Existing OHS Hazards in work places
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1.4 Recognizing, assessing and controlling Existing OHS Hazards in work places

In order to apply OHS must consider three basic things

1. Working Environment
2. Materials required
3. A person working



While conducting any activity OHS hazards, procedures, and requirements must be considered. OHS procedure is a safe work procedure that followed when we perform a given activity. OHS hazards include:

- ✓ Solar radiation
- ✓ Soil-born micro organisms
- ✓ Manual handling
- ✓ Aggressive Animal
- ✓ Slippery and uneven surfaces
- ✓ Handling materials and tools e.g. sharp materials
- ✓ Zoonotic diseases are those diseases, which transferred from animal to human and vice versa. E.g. anthrax, tuberculosis, brucellosis etc.
- ✓ ***The above three of them consider their health and safe***

Artificial Insemination – Level1

Learning Guide # 7

Unit of Competence: -Supporting Dairy Cattle Husbandry Practices

Module Title: - Supporting Dairy Cattle Husbandry Practices

LG Code: AGR ATI1M 02 LO2- LG 7



TTLM Code: AGR ATI1M 02 TTLM 0919v1

LO2. Determine dairy Animals condition

Instruction Sheet	Learning Guide #7
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Identifying and managing types of dairy production system
- Assessing and Recording dairy animals Condition
- Identifying dairy animals Nutritional Requirement, value of Pastures and feed stuffs
- Identifying Nutritional value of Pastures and feed stuffs

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



- Identify and manage types of dairy production system
- Assess and Record dairy animals Condition
- Identify Dairy animals production status
- Identify dairy animals Nutritional Requirement, value of Pastures and feed stuffs

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3 and Self-check 4” **in page -6, 9, 12 and 14** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 ” **in page -15.**
6. Do the “LAP test” **in page – 16** (if you are ready).

Information Sheet-1	Identifying and managing types of dairy production system
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2.1 Identifying and managing types of dairy production system

Dairy production is an important component of livestock farming in Ethiopia. The milk production systems in Ethiopia can be classified in to four:

- Highland smallholder
- Pastoralism
- Urban
- Peri-urban and Intensive dairy farming.

2.1.1 Highland smallholder dairy production system

The production system is predominantly subsistence **smallholder mixed farming, crop and livestock husbandry** typically practiced within the same management unit.



The majority of milking cows are indigenous animals, which have low production performance.

The feed requirement for dairy farming derived from **native pasture** and a balance comes from **crop residues** and **stub grazing**.

2.1.2. Pastoralism

It is the major milk production system in the low land part of Ethiopia.

Livestock production is the dominant form of production to sustain the livelihood of pastoral society

Characterized by shortage of feed availability, due to rainfall variability. As a result, milk production is low and highly seasonally dependent.

2.1.3 Urban and Peri-urban

This milk production system developed in and around major cities and towns, which have a high demand for milk.

The main feeds sources are agro-industrial by products (Oil Seed Cakes, Bran, etc.) and purchased roughage.

Compared to other systems urban and peri-urban production system have relatively better access to inputs and services provided by the public and private sectors, and use intensive management.

Milk producers own both cross and indigenous breeds.

2.1.4. Intensive Dairy Farming

Specialized dairy farming practiced by state sector and very few individuals on commercial basis.

Most of the intensive dairy farms are **concentrated** in and around Addis Ababa and are based on **exotic breed stock**.



Both the **pastoralist** and **smallholder farmers** produce 98% of the country milk production. Whereas, the urban, peri-urban and intensive dairy farmers produce 2% of the total milk production of the country. (MOA, 1994 E.C).

Even though Ethiopia has a huge potential for dairy development, the sub-sector has been hampered by multi-faced constraints that include – genotype, feed resource, access to inputs & services, dairy cattle management, access to dairy product markets, etc.

Self-Check -3	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

I. Choose the best answer (each 1point)

1. Which one of the following is/are not the criteria during erection of dairy cattle to provide comfortable accommodation for individual animals?

- A. proper sanitation
- B. Durability
- C. Easy management for production of clean milk udder
- D. Loose House**

2. Which one is/are not the type of dairy house?

- A. Loose house barn
- B. Conventional dairy barn



C. Stanchion

D. None

3. What is/ are the purpose of house and Equipment in dairy production?

A. To protect animals from unfavorable weather conditions.

B. To minimize risk of injury to the animals.

C. To provide area for special handling of cattle during breeding, treatment and vaccination.

D. It affords comfortable working conditions.

E. All

4. _____ is the area where animals fastened easily in conventional dairy barn.

A. Feeding trough B. Water trough

C. Stanchion

D. All

5. The removal of male animal testicles is Called _____

A. Hoof trimming

B. Dehorning

C. castration

D. All

II. Answer the following question!

1. Write the type of dairy production based on the milk production in Ethiopia! (4point)

_____, _____, _____, _____

2. Majority of dairy production system in Ethiopia practiced by (2point)

_____, _____

3. What is the source dairy animal feed at **high land** dairy production system? (3point)

_____, _____, _____

4. What is the major milk production system in low land of Ethiopia? (2point)

Note: Satisfactory rating – 6 and 11 points

Unsatisfactory - below 6 and 11 points

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

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Information Sheet-2	Assessing and Recording dairy animals Condition
----------------------------	--

2.1.1. Body condition score

Assessing a cow's BCS tells a lot about:

- previous level of feeding,
- likely future productivity, and
- future feed requirements

Effective management of body condition and nutrition improves

- herd reproductive performance,
- milk production,
- feed conversion efficiency,
- Enhances cow health and welfare.

Cows that are too thin at calving are less fertile and produce less milk –

- They take longer to recommence cycling,
- Reducing submission rates and conception rates.
- They partition more feed energy to body condition gain versus milk production.
- This means cows fail to achieve their genetic peak milk yield and have lower lactation persistency. Cows that are too fat at calving often have health problem
- They are more likely to have calving problems,
- Metabolic disorders and other health problems,
- Have poorer appetites after calving than thinner cows.

Cows that lose excessive condition in early lactation are also less fertile. They take longer to recommence cycling, reducing submission rates and conception rates. Poor expression of heat signs can also occur. Measuring and managing body condition is all about managing your herd's nutrition program.

Condition scoring your cows at critical times during their lactation cycle lets you know if you need to consider changing herd nutrition.



Body condition scoring

- Body condition scoring is a visual assessment of the amount of fat and muscle covering the bones of a cow, regardless of body size.
- It is not affected by gut fill or pregnancy as live weight.
- It involves assessing specific locations on the cow to determine how thin or fat the cow

Different systems are used to body condition score dairy cattle and beef cattle.

- In **Australia** 1up to **8point** scale,
- In **US** and **Ireland** 1 up to 5point scale and
- In **New Zealand** 1up to 10 point scale are most commonly used for dairy cattle:
- A cow with a **BCS of 1** is considered extremely **thin**, the result either of severe under-feeding or disease in Australia.
- A cow with a **BCS of 8** is considered extremely **fat** and is at risk of several **metabolic diseases** after calving in Australia.

The scoring method is the same for all dairy breeds despite their differences

- E.g. **Holstein-Friesians** Angular body shape, appear thinner, carry more body fat over ribs
- **Cross-breds** More even distribution of fat over body
- **Jerseys** Narrow body with prominent hip bones and higher set tail

Body condition targets

A herd's range in body condition score (BCS) is as important as its average BCS.

We need to know what proportion of cows are too thin and too fat, as these cows are likely to have reduced reproductive performance and milk production and increased risk to their health and welfare.

Body condition scoring Targets time

- **At calving:**
- **At mating:**



➤ At drying-off:

Key points to look at

Key points to look at

1st Observation



Look closely at area between tail and pins:
Is it deeply sunken, sunken, slightly sunken or filled in?

2nd Observation



If area between tail and pins is deeply sunken:
Look at insides of pins. Are they hollow?



If area between tail and pins is sunken:
Look at backbone. Is it flat or a bumpy sharp ridge?

If area between tail and pins is slightly sunken or filled in:
Look at depression between hip and pin.
Is it U-shaped, shallow or flat?



Self-Check -3	Written Test
---------------	--------------

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

1. What is/are the faction of animal body condition scoring?
 - A. To know previous level of feeding
 - B. To estimate likely future productivity
 - C. To estimate future feed requirements
 - D. **All**
2. What is /are the purpose of effective management of body condition and nutrition?
 - A. Herd reproductive performance
 - B. Milk production
 - C. Feed conversion efficiency
 - D. Enhances cow health and welfare
 - E. **All**
3. What is/are body condition scoring targets time?
 - A. At calving
 - B. At mating
 - C. At drying-off
 - D. **All**
4. What type of expected risk from extremely fattened cow after calving?
 - A. Infection diseases
 - B. Bacterial diseases
 - C. **Several Metabolic diseases**
 - D. None

II. Answer the following question!

1. List and Discusses the **systems** body condition score for dairy cattle and beef cattle of Different countries! (3point)



2. What are the key area/ points to look at during body condition score procedures Dairy cattle and Beef cattle?(3point)

Note: Satisfactory rating – 5 and 10 points Unsatisfactory - below 5 and 10 points
 You can ask your teacher for the copy of the correct answers.

Answer Sheet

Score = _____
 Rating: _____

Name: _____

Date: _____

Short Answer Questions

Information Sheet-3	Identifying Dairy animals production status
---------------------	---

2.1.2. Lactation stage

1. Calving to peak lactation (Early lactation (1 to 4 months or 14-100 days)

- Milk yield at the peak of lactation sets up the milk production for the year, one extra liter per day at the peak can produce an extra 200L/cow over the entire lactation.
- The full lactation response to extra milk at peak yield varies greatly with feeding management during mid- and late lactation. There are several obstacles to feeding the herd well in early lactation to maximize the peak. The foremost of these is voluntary food intake.
- At calving, appetite is only about 50% to 70% of the maximum at peak intake.
- This is because during the dry period, the growing calf takes up space, reducing rumen volume and the density and size of the rumen papillae is reduced.
- Peak milk production occurs around weeks 6 to 8 of lactation.

2. Peak lactation to peak intake (Mid-lactation 4 to 8 months or 100-200 days)

Following peak lactation cows' appetites gradually increase until they can consume all the nutrients required for production provided the diet is high quality.

- Cows tend to maintain weight during this stage of their lactation.
- Cows will have achieved peak production (8-10 weeks after calving)

3. Mid lactation to late Lactation (Late lactation 8 months to dry-off or 200-305 days)



Although energy required for milk production is less demanding during this period, because milk production is declining, energy is still important because of pregnancy and the need to build up body condition as an energy reserve for the next lactation.

It is generally more profitable to improve the condition of the herd in late lactation rather than in the dry period. While lactating, cows use energy more efficiently for weight gain (75% efficient compared to 59% efficient when dry).

4. Dry Period

Maintaining (or increasing) body condition during the dry period is the key to ensuring cows have adequate body reserves for early lactation.

Ideally, cows should calve in condition of score of at least 4.5, and preferably 4.5 to 5.5 (Austria) period if it is needed to achieve a BCS of **3.5** (5-point scale) or **6.0** (9-point scale) at calving. Total body weight should increase during the dry period regardless of body condition because the calf develops

Self-Check -3	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page

1. List and discuss the stages of lactation! (5point)

Note: Satisfactory rating – 3 and 5 points

Unsatisfactory - below 3 and 5 points

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

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

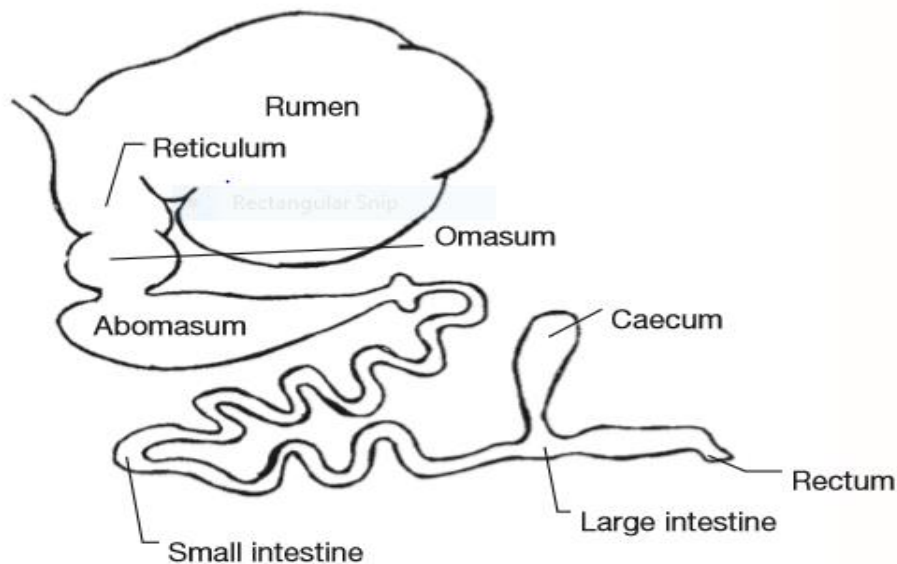
Information Sheet-4	Identifying dairy animals Nutritional Requirement
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1.2 Nutrients for dairy cows

- Cows are herbivores and have digestive systems well adapted to forage based diets.



- Cows belong to a group of mammals known as ruminants.
- Ruminants have a complex digestive system, which is characterized by a four-chambered stomach.
 - ✓ Rumen
 - ✓ Reticulum
 - ✓ Omasum
 - ✓ Abomasum.



The **largest** of these chambers is the **rumen**. The digestive system of ruminants enables them to digest plant material in a way that non-ruminant mammals with single stomachs, such as pigs, dogs or humans, cannot.

The rumen contains large numbers and many types of microorganisms (often referred to as microbes). These microbes feed on plant material eaten by the cow and produce products that are used by the cow, and by the microbes for their own multiplication and cell growth. The microbes themselves digested further down the digestive tract.

The ultimate purpose of dairy cows is to produce milk, so their diets must allow them to fulfil the functions of lactation and reproducing annually.



The nutrients required by dairy cows are water, energy, protein, fibre, vitamins and minerals. These requirements largely determine how we think about the composition of their feed.

- Feed contains both water and dry matter. water must also be available
- The dry matter component of that diet is the part which contains the necessary
 - ✓ Energy
 - ✓ Protein
 - ✓ Fiber
 - ✓ Minerals
 - ✓ Vitamins.

A. Energy

An animal needs energy in its diet for several reasons:

- **Maintenance:** to provide energy for basic body functions such as digestion and blood circulation.
- **Production:** to allow the production of meat, milk eggs etc.
- **Growth:** to give energy for the growth of bone and muscle.
- **Reproduction:** to provide energy for the growth of a calf, lamb or the production of eggs.
- **Activity:** for muscle movement as the animal walks and moves.

B. Protein

- Protein is the material which makes up muscle, skin, wool and most of the bodies of animals and needs to be provided in the diet of animals for them to make meat, milk and eggs.
- Protein is made of chains of chemicals called amino acids, and in monogastric animals such as chickens, several specific amino acids called essential amino acids must be present in the diet.

C. Fibre

- Fibre is needed in a diet to provide bulk as the food passes through the animal.



- A ruminant animal (cattle, sheep, goats and deer) is able to ferment fibre and provide energy, but a monogastric animal such as a chicken or pig cannot ferment fibre for energy.
- The diets required by monogastric animals need more grain and less fibre than those for ruminants.

D. Vitamins and minerals

- Minerals such as calcium and phosphorus must be present in the diet for the metabolic processes in the animal, which require these.
- Vitamins are also necessary in the diet; ruminant animals have much lower dietary requirements for vitamins as many are synthesized in the rumen by the microbial fermentation process.

Self-Check -4	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page

1. Mention the four-stomach chamber of Ruminant! (4point)

2. List down the dry mater content of animal feed! (5point)

3. What are major animal feed content? (2point)

**Note: Satisfactory rating – 6and 11points
11points**

Unsatisfactory - below 6and

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions



Artificial Insemination – Level1

Learning Guide # 8

Unit of Competence: -Supporting Dairy Cattle Husbandry Practices

Module Title: - Supporting Dairy Cattle Husbandry Practices

LG Code: AGR ATI1M 02 LO3- LG 8

TTLM Code: AGR ATI1M 02 TTLM 0919v1

LO3.Observe for heat detection



Instruction Sheet	Learning Guide #8
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Carrying out Estrus inducement and Detection procedures
- Providing and securing mating areas
- Using mating procedures and Handling techniques to minimize stress and discomfort based on OHS Requirements

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- Carryout Estrus inducement and Detection procedures
- Provide and secure mating areas
- Use mating procedures and Handling techniques to minimize stress and discomfort based on OHS Requirements

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” **in page -6, 9, 12 and 14** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 ” **in page -15.**
6. Do the “LAP test” **in page – 16** (if you are ready).



Information Sheet-1	Carrying out Estruses inducement and Detection procedures
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4.1 Carrying out Estruses inducement and Detection procedures

4.1.1 Detecting Estrous (Heat) of livestock by:

- ✓ Physical Observation
- ✓ Laboratory test
- ✓ Computerized estrous detection

4.1.2 Visual signs of Heat (physical observation)

Standing Heat: this is the most reliable heat sign. The animal in heat allows others to mount her as she stands

- Riding of other cows can be assign of heat, but all riders are not necessarily in heat
- Roughened hair, or hair rubbed off, on the trailhead may be evidence of others riding indicating this animal may be in heat
- Cows in heat may follow others, stand close and sniff, Nuzzle and Lick the back or rump of others.
- Cows in heat or near onset of heat tend to group together
- Cows generally are more nervous than usual, and may bawl considerably, pace the fence and generally are more restless.
- Another good indicator is stringy, clear (egg white appearance) mucus hanging from the Vulvar opening or smeared on the tail or buttocks. Clear mucus discharges often can be seen in the gutter or on the ground where a cow had been resting.
- The vulvar lips will look moist and slightly swollen.
- Bloody mucus, although not a consistent sign, can be observed between the second and fourth days following heat.

Dairy or Beef cows need to be provided with good” footing” to feel safe when they exhibit heat sings or are to be mounted.

- In summary, 30 minute observations
- Both as early in the morning and as late in the evening as practical.



4.1.3 Tips and Aids to detect Heat

Observation is primary important in detecting heat. Several aids available to help confirm and identify cows not exhibiting obvious signs of heat. The following aids (one through four) are based on normal mounting activity of other animals.

- Anticipate heat with records
- Chin ball markers are quite effective
- Heat mount detectors
- Tail chalking techniques

Self-Check -4	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page

1. Write the Estrus detection methods of livestock! (3point)

_____ , _____ , _____

2. List and Discusses the major visual signs of heat in dairy animal! (4point)

 _____ , _____
 _____ , _____
 _____ , _____

3. What are the major Tips and Aids to detect heat of dairy animals? (4point)

 _____ , _____
 _____ , _____

Note: Satisfactory rating – 6and 11points

Unsatisfactory - below 6and 11points

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

Answer Sheet

Score = _____
 Rating: _____

Name: _____

Date: _____

Short Answer Questions

Artificial Insemination – Level1



Learning Guide # 9

Unit of Competence: -Supporting Dairy Cattle Husbandry Practices

Module Title: - Supporting Dairy Cattle Husbandry Practices

LG Code: AGR ATI1M 02 LO4- LG 9

TTLM Code: AGR ATI1M 02 TTLM 0919v1

LO4. Prepare Animals for Parturition

Instruction Sheet	Learning Guide #9
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Identifying and confirming Nutritional needs of pregnant animals
- Determining and providing feeds and feed supplements
- Implementing procedures to minimize feed wastage, spoilage, Disposing and feed wastes
- Preparing animals for giving birth
- Preparing and Implementing contingency measures

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

Identify and confirm Nutritional needs of pregnant animals

- Determine and provide feeds and feed supplements
- Implement procedures to minimize feed wastage, spoilage, Disposing and feed wastes
- Prepare animals for giving birth
- Prepare and Implement contingency measures

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3 and Self-check 4” **in page -6, 9, 12 and 14** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 ” **in page -15.**
6. Do the “LAP test” **in page – 16** (if you are ready).

Information Sheet-1	Identifying and confirming Nutritional needs of pregnant animals
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4.1 Identifying and confirming Nutritional needs of pregnant animals

Pre parturient Care of the mother throughout the gestation and especially during the last part, the nutrition of the pregnant animals is important.

Feeding of animals should be oriented in such a way that the prepartum or parturient incidence of some of the commonly occurring metabolic disorders is minimized, a healthy viable progeny is produced and the milk production of the dairy type animals is optimum.

In dairy cattle, farmers often feed their pregnant cows with **concentrates only during** the last few days of pregnancy and often vegetable oil is added to the concentrates. Although growth of the fetus occurs maximally during the last part of gestation, however, the value of such oil feeding is not beyond doubt. Recent suggestions for feeding of pregnant dry cows include the feeding of high-fiber low-energy chopped straw

The feeding of anionic salts in combination with adequate calcium and magnesium and restriction of rumen degradable protein .

Extra energy feed is required for **sheep** and **goats** that have been diagnosed to be carrying **twins**.

The feeding of the bitch should be aimed at increasing the energy intake during the last four weeks of pregnancy and 1.0 –1.8% calcium and 0.8-1.6% of phosphorous should be included in the diet of late pregnant bitches

Vaccination of pregnant animals for the prevention of some infectious diseases has been mentioned previously, however, these vaccinations depend on whether or not, the disease is prevalent and the species-specific requirement.

Pregnant mares however, need to be essentially given tetanus antitoxin or tetanus toxoid during gestation and immediately after foaling.

Special attention need to be attached to the hygiene at the time of parturition and as such, animals must be shifted to hygienic parturition stalls and this would also prevent overcrowding.



4.4 Preparing animals for giving birth

Signs of approaching parturition

- Some externally visible changes do occur in animals when parturition is approaching.
- The most important external changes of approaching parturition are seen in the **udder**, **vulva** and **pelvic ligaments** and to some extent in the behavior.
- The symptoms are inconsistent between individual animals, and between consecutive parturitions.
- The symptoms therefore, do not permit an accurate prediction as to the exact time of parturition in a certain animal but are only useful indications as to the approximate time parturition can be expected
- Clinicians must therefore refrain from too positive statements concerning the exact time of parturition.

Physiological phases of myometrial activity

The regulation of uterine activity during pregnancy can be divided into four distinct physiologic phase.

Phase 0: inhibitors active during pregnancy the uterus is maintained in a state of functional quiescence through the action of various putative inhibitors including, but not limited to:

- Progesterone
- Prostacyclin (prostaglandin I-2)
- Relaxin
- Parathyroid hormone-related peptide Nitric oxide
- Calcitonin gene-related peptide
- Adrenomedullin
- Vasoactive intestinal peptide.

Phase 1: myometrial activation as term approaches the uterus becomes activated in response to uterotropins, such as estrogen.

This phase is characterized by increased expression of a series of contraction-associated proteins (CAPs) (including myometrial receptors for prostaglandins and oxytocin), activation of specific ion channels, and an increase in connexin-43 (a key component of gap junctions).



An increase in gap junction formation between adjacent myometrial cells leads to electrical synchrony within the myometrium and allows for effective coordination of contractions.

Phase 2: stimulatory phase Following activation, the "primed" uterus can be stimulated to contract by the action of uterotonic agonists, such as the stimulatory prostaglandins E2 and F2 alpha and oxytocin.

Phase 3: involution Involution of the uterus after delivery occurs during phase 3 and is mediated primarily by oxytocin.

HORMONES INVOLVED IN THE PARTURITION

A. Prostaglandins:

Prostaglandins are predominantly paracrine/autocrine hormones (i.e., they act locally at their site of production on contiguous cells).

An increase in uterine prostaglandin biosynthesis is a consistent element in the transition into labor and is probably common to all species

B. Progesterone:

Administration of a progesterone receptor antagonist or removal of the readily induces abortion in early pregnancy (before 7 weeks of gestation), corpus luteum [suggesting that progesterone is necessary for early pregnancy maintenance.

Administration of exogenous progesterone after early luteotomy prevents abortion, further supporting the hypothesis that ovarian progesterone production is essential in maintenance of early pregnancy.

Placental progesterone production becomes important between 7 and 9 weeks, and the placenta is the dominant source of progesterone thereafter. However, the role of progesterone in late pregnancy is not as well defined.

C. Estrogen:

The placenta is the primary source of estrogen biosynthesis during pregnancy. Estrogens do not themselves cause myometrial contractions, and maternal administration of estradiol to rhesus macaques from 130 days of gestation has no effect on length of pregnancy



Instead, estrogens act by up regulating myometrial gap junctions [4] and uterotonic receptors (including L-type calcium channels and oxytocin receptors) [2], thereby enhancing the capacity of the myometrium to generate contractions.

D. PGF 2alpha:

Enhances myometrial contractions, induces luteolysis and the release/secretion of relaxin.

E. Oxytocin:

Oxytocin is a peptide hormone synthesized in the hypothalamus and released from the posterior pituitary in a pulsatile fashion.

Its biologic half-life is approximately three to four minutes, but appears shorter when higher doses are infused.

Oxytocin is inactivated in the liver and kidney, although during pregnancy it is primarily degraded by placental oxytocinase.

Oxytocin is the most potent endogenous uterotonic agent, and is capable of stimulating uterine contractions at intravenous infusion rates of 1 to 2 mU/min at term.

The frequency and amplitude of oxytocin-induced uterine contractions are identical to those occurring during spontaneous labor.

F. Glucocorticoids:

These hormones have several actions that can also help prepare the uterus for labor.

Glucocorticoids act directly to up regulate prostaglandin production in fetal membranes at term

Cortisol appears to stimulate expression of placental (but not hypothalamic) CRH in vitro.

In addition, cortisol enhances amnionic cyclooxygenase to enhance prostaglandin synthesis and inhibits chorionic prostaglandin dehydrogenase activity, thereby preventing prostaglandin metabolism

Parathyroid hormone-related peptide: Parathyroid hormone-related peptide is a potent smooth muscle relaxant capable of inhibiting oxytocin-induced contractions in baboons

It is unclear whether it has a physiologically important role in maintaining uterine quiescence prior to the onset of labor.



G. Relaxin:

Relaxin is a member of the insulin-like growth factor family of proteins.

Plasma levels are highest at 8 to 12 weeks of gestation and thereafter decline to low levels, which persist until term.

The primary source of relaxin is thought to be the corpus luteum.

Information Sheet-5	Preparing and Implementing contingency measures
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Parturition

The process of delivery of the fully-grown fetus on the completion of the normal pregnancy period.

- It is the interesting biological process.
- In the sense that the uterus that was quiescent during the entire pregnancy starts contracting.
- The cervix that was tightly contracted relax sufficiently to allow the passage of the young one to the world outside.
- the mother's womb, passing through the birth canal (which is formed by the **uterus**, **cervix** and **vagina** within the **pelvic bones** and their attachments the most important events for the farmers as by this act of his animal, he would derive gain in terms of milk or sale of animal and its progeny.
- Most domestic animals are prone (suspected) to maximum injuries and infections, some of them endangering the life of the fetus and the dam immediately, and some of them affecting the future productive and reproductive life of the mother.
Therefore, due care must be **exercised in advance** and **sufficient vigilance** must be kept during parturition to minimize parturient problems.
- Biochemical connective tissue changes in the uterine cervix appear to precede uterine contractions and cervical dilation, and all of these events usually occur before rupture of the fetal membranes.

