Dairy production

Level-II

Learning Guide-24

Unit of Competence: Assist Basic Husbandry Practice of Dairy animals

Module Title: Assisting Basic Husbandry Practice of Dairy animals

LG Code: AGR DRP2M06 LO1-LG-24

Code: AGR DRP2TTLM 1219v1

LO 1: Prepare for dairy animal raising activities

Instruction Sheet	*Learning Guide #24*

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

- Identifying required materials, tools and equipment and checking lists.
- Preparing house and housing facilities
- Using correct manual handling techniques and applying dairy animals restraining techniques
- Selecting and checking suitable PPE (personal protective equipment)
- Providing work task 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**:

- ♠ Identify required materials, tools and equipment and checking lists.
- ♠ Prepare house and housing facilities
- ♠ Use correct manual handling techniques and Applying dairy animals restraining techniques
- ♠ Select and check suitable PPE (personal protective equipment)
- ♠ Provide work task OHS requirements

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below from 3 to 7.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, Sheet 4, and Sheet 5”.
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check 4 and Self-check 5” **in page -9, 17, 24, 29 and 31** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1” **in page -32.**
6. Do the “LAP test” **in page – 33** (if you are ready).
7. Then processed to the next learning guide

Information Sheet-1	Identifying required materials, tools and equipment

1.1. Introduction

Dairy farming is a class of agriculture for long-term production of milk, which is processed for eventual sale of a dairy product.

What is Animal husbandry?

Animal husbandry may be defined as a science as well as an art of management including scientific feeding, breeding, housing, and health care, of common domestic animals aiming for maximizing returns.

1.2. Economic Importance of keeping dairy animals

Some economic importance of keeping dairy animals tremendous nutritional and economic values to man as stated below:

- Meat and milk of dairy animals are good sources of animal protein to man which are of better quality than plant protein.
- They serve as source of income to subsistence farmers
- They are also used as gifts or bride price which serves as family wealth
- They are sources of gainful employment.
- The manure/dung from these animals can be used as a source of organic fertilizer.
- Cattle, and some other ruminants can also be used as “beast of burden”

1.2. Identifying materials, tools and equipment?

For easy production of dairy animals certain equipment have been designed and are used to facilitate management operation. In dairy animals, these equipments appear to be common and work with the same principle. Virtually all of these equipments are imported but could also be fabricated locally.

During working any dairy animals husbandry management activities the suitable materials, tools and equipment should be identify. These identified materials, tools and equipment should also be checked the functionality and then use properly. After identifying all the required materials know the operation and maintenance system or check the present condition of tools improve / maintain if necessary. Like:-

Clippers (Shearer):-is essential for removing wool from sheep quickly, completely, easily and with minimum to sheep and operator.

Castrator: - Used for removing or destroying testicles, the glands that produce male germ cell. The process is known as castration. E.g Burdizzo, Using knife and Elastrator

Weighing scale: - Special platform scales are required for weighing large animals, sheep and goat, these gives an idea about their condition and wellbeing.

Dockers: Used for removing tail from the body of the animal. The process is known as Docking. It is mainly applied in the case of sheep with long tail such as *Awassi* breed for the ease of mating and fattening purpose.There is several equipments used for docking: Using knife, Using hot iron and Rubber band.

Vaccinating gun/Syringe/:-Important for injecting the animal with vaccine.

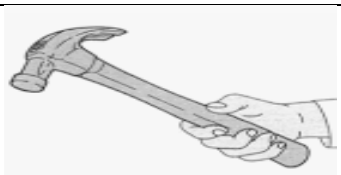
Follow instructions on the package.

The following equipment are used in dairy animal production and some of them have pictures below.

- Disc harrow
- Milking pails,
- Milk homogenizer
- Fork
- Hoe
- Litmus paper
- seed
- seedling
- Strip cup
- Dehorning saw
- Dehorning wire
- Dip Vat (Tank**)**
- Litmus paper
- Feeding trough
- Milk pasteurizer
- Syringes
- Spade
- Lubricant
- Cup
- Towel
- Trimmer
- Pasture
- Gloves
- Overalls
- Trimmer
- barrow
- Safety
- Steel capped
- boots/shoe
- Sunhats
- Goggles
- Tractor
- Hammer
- Castration equipment
- Ear tags
- Branding iron
- Wheel
- Shovel

Equipment	Advantage	Sample Picture
Weighing scale	This is used to know or measure the weight of the animals, feed and materials	
Tractor	Compact **tractors** are ideal for heavy duty landscaping and tasks such as digging, hauling or plowing in large gardens, fields and pastures.	
Strip Cup	A strip cup is a very useful tool and a must for all dairy farmers. Milking the first few strips into a strip cup will show if there are any lumps present indicating beginning or advanced mastitis, which should be controlled urgently.	
Thermometer	A thermometer is very useful to check body temperature. It is an essential tool for the serious livestock farmer to help her or him in judging animal health.	
Boling gun	It is used for oral administration of solid drugs.	

Burdizzo Castrator	This is used to castrate unwanted males on the farm. Castration is the act of making a male animal impotent by open or a surgical removal of its scrotum.	
Elastrator	It is a bloodless castrator that use the ring method	
Drenching Gun	This is made of a long tube or rubber hose long enough to enter the mouth of ruminants. It is used for oral administration of liquid drug especially during de-worming exercise	
Tattoo pliers	The needles pierce the skin to make clear and readable marks. Black tattoo ink is used for normal use and green tattoo ink for animals with a black or darkly pigmented skin.	
Hooves Trimmer	Used to trim or remove animal hooves.	
Dehorning saw	Used to cut the horn of animal	

Dehorning wire	Used to cut the horn of animal	
Crush	Used to restrain animal	
Hammer	A **hammer** is a simple tool designed to manually drive nails, brads, and other fasteners into softer materials, such as wood or drywall. A **hammer** has a head and a handle, or shaft.	
Ear tags	**Ear tag** is a plastic or metal object used for identification of domestic livestock and other animals. Flexible plastic **tags** are probably the most widely used for animal identification, as they are readable from a distance.	
Ear tag applicator	Used for fixing ear tag to the ear of the animal for identification.	
Bull holder/ nose lead	The cattle nose lead cow ring holder is a bull head fixation device. It can be used to spread the attention of cattle by simply clamping it on both sides of the nasal septum.	

Branding iron	A **branding iron** is used for **branding**, pressing a heated metal shape against an object or livestock with the intention of leaving an identifying mark.	
Shovel	A **shovel** is a tool for digging, lifting, and moving bulk materials, such as soil, coal, gravel, snow, sand, or ore. Most **shovels** are hand tools consisting of a broad blade fixed to a medium-length handle.	
Wheel barrow	A **wheelbarrow** is a small hand-propelled vehicle, usually with just one wheel, designed to distribute the weight of its load between the wheel and the operator.	
Mineral boxes	Used to store minerals	
Waterier	Is a man-made or natural receptacle intended to provide drinking water to animals, livestock on farms or ranches or wild animals	

Feeding trough	Is a man-made intended to provide feed for animals	
Milking pails/can	Used as storage or continuer of milk.	
Fork	Used to collect waste	
Nipple Feeders	For feeding young cattle with milk replacers	
Spade	Used to digging and loosing soil	
Automatic Syringes	Used to provide vaccine drugs for large numbers of animas.	

Self-Check -1	Written Test

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

1. Why you use different materials, tools and equipment in animal production? (2pts)
2. If you are ordered to perform animal identification write the materials that you use? (3pts)
3. What do you do before using materials, tools and equipments? (2pts)
4. List at least four /4/ the economic importance of keeping dairy animals (4pts)

Note: **Satisfactory rating - 3 and 4 points** **Unsatisfactory - below 3 and 4 points**

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

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

2._____

_____

3._____

_____

4._____

_____

Information Sheet- 2	Preparing house and housing facilities

2.1. General Housing Requirements

As has been pointed out, cattle will be more efficient in the production of milk and in reproduction if they are protected from extreme heat, i.e. temperatures of 25 to 30°C, and particularly from direct sunshine. Thus in tropical and subtropical climates shade becomes an important factor. If animals are kept in a confined area, it should be free of mud and manure in order to reduce hoof infection to a minimum. Concrete floors or pavements are ideal where the area per cow is limited. However, where ample space is available, an earth yard, properly sloped for good drainage is adequate.

An efficient management of dairy animals will be incomplete without a well-planned and adequate housing of animals. Improper planning in the arrangement of animal housing may result in additional labour charges and that curtail the profit of the owner. During erection of a house for dairy cattle, care should be taken to provide comfortable accommodation for individual cattle. No less important is the proper sanitation, durability and arrangements for the production of clean milk under convenient and economic conditions.

2.2. Location of dairy animal houses

The points which should be considered before the erection of dairy cattle house are as follows.

1. **Topography and Drainage**

- A dairy building should be at a higher elevation than the surrounding ground to offer a good slope for rainfall and drainage for the wastes of the dairy to avoid stagnation within.
- A leveled area requires less site preparation and thus lesser cost of building.

2. Soil type

- Fertile soil should be spared for cultivation.
- Foundation soils as far as possible should not be too dehydrated or desiccated.
- Such a soil is susceptible to considerable swelling during rainy season and exhibit numerous cracks and fissures.

3. Exposure to the sun and protection from wind

- A dairy animals building should be located to a maximum exposure to the sun in the north and minimum exposure to the sun in the south and protection from prevailing strong wind currents whether hot or cold.
- Buildings should be placed so that direct sunlight can reach the platforms, gutters and mangers in the cattle shed.
- As far as possible, the long axis of the dairy barns should be set in the north-south direction to have the maximum benefit of the sun.

4. Accessibility

- Easy accessibility to the buildings is always desirable.
- Situation of a cattle shed by the side of the main road preferably at a distance of about 100 meters should be aimed at.

5. Water supply

- Abundant supply of fresh, clean and soft water should .be available at a cheap rate.

6. Surroundings

- Areas infested with wild animals and dacoits should be avoided.
- Narrow gates, high manger curbs, loose hinges, protruding nails, smooth finished floor in the areas where the cows move and other such hazards should be eliminated.

7. Labour

- Honest, economic and regular supply of labour is available.

8. Marketing

- Dairy buildings should only be in those areas from where the owner can sell his products profitably and regularly.
- He should be in a position to satisfy the needs of the farm within no time and at reasonable price.

9. Electricity

- Electricity is the most important sanitary method of lighting a dairy.
- Since a modem dairy always handles electric equipment's which are also economical, it is desirable to have an adequate supply of electricity.

10. Facilities, Labour, Food

Dairy animals house should be so constructed and situated in relation to feed storages, hay stacks, silo and manure pits as to affect the most efficient utilization of labour. Sufficient space per cow and well-arranged feeding mangers and resting are contributing not only to greater milk yield of cows and make the work of the operator easier also minimizes feed expenses. The relative position of the feed stores should be quite adjacent to the cattle barn.

Note: Worthy features of feed stores are given:

- Feed storages should be located at hand near the center of the cow barn.
- Milk-house should be located almost at the center of the barn.
- Centre cross-alley should be well designed with reference to feed storage, the stall area and the milk house.

2.3. Types of housing

Dairy cattle may be successfully housed under a wide variety of conditions, ranging from close confinement to little restrictions except at milking time. However, **two types** of dairy barns are in general use at the present time.

- ♠ The loose housing barn in combination with some type of milking barn or parlor.
- ♠ The conventional dairy barn.

1. Loose Housing

- ✓ It is a system of housing in which animals are kept loose in an open paddock throughout the day and night except at the time of milking and treatment.
- ✓ In this system, shelter is provided along one side of open paddock under which animals can retire when it is very hot or cold or during rains.
- ✓ Common feed manger and water tank is provided and concentrates are fed at the milking time which is done in a separate milking barn or parlour in which cows are secured at milking time and are milked.
- ✓ The open paddock is enclosed by means of half walls or plain wire fences of convenient height.

Fig.2.1. Loose dairy cattle house

Advantages

- ➔ Cost of construction is cheaper.
- ➔ Future expansion is possible.
- ➔ The animals will move freely so that it will get sufficient exercise.
- ➔ The animal can be kept clean.
- ➔ Common feeding and watering arrangement is possible.
- ➔ Clean milk production is possible because the animals are milked in a separate milking barn and Oestrus detection is easy.

Disadvantages

- ➢ It is not suitable for temperate Himalayan region and heavy rainfall areas.
- ➢ It requires more floor space.
- ➢ There is competition for feed.
- ➢ Attention of individual animal is not possible.
- ➢ A separate milking barn is needed for milking of animals.

2. Conventional Barns or Stanchion Barns

- In this system of housing, the animals are confined together on a platform and secured at neck by stanchions or neck chain.
- The animals are fed as wells as milked in the same barn.
- These barns are completely covered with roofs and the sidewalls are closed with windows or ventilator located at suitable places to get more ventilation and lighting.

- It is applicable for temperate and heavy rainfall region.
- The same type of housing can be utilized for tropical region with slight modification.

Fig 2.2. Conventional dairy cattle house

Advantages

- The animals and men caring for animals are less exposed to harsh environment.
- The animals can be kept clean.
- Diseases are better controlled.
- Individual care can be given.
- Separate milking barn is not required.

Disadvantages

- Cost of construction is more.
- Future expansion is difficult.
- Not suitable for hot and humid climatic conditions

The house animal shed should have the following parts

1. Feeding passage
2. Manger
3. Standing space
4. Gutter or drainage channel
5. Milking passage

The house animals can be housed according to number of animals available.

Single row system: In single row system, 12-16 numbers of animals can be kept.

Double row system

- If it is greater than 16, then double row system is preferable.
- In double row system up to 50 animals can be maintained in a single shed.
- The distance between two sheds should be greater than 30 feet or it should be twice the height of the building.

In double row system two methods available. They are:

1. Tail to tail system (out-method)

Advantages

- Cleaning and milking of animals easy.
- Supervision of milking also easy.
- Less chance for transmission of diseases from animal to animal.
- Animals can get more fresh air from outside.

Fac

Fig. 2.3 Face to face system

2. Head to head system (in-method)

Advantages

- ♣ Getting animals into the shed is easy.
- ♣ Feeding of animals also easy.
- ♣ Disinfection of gutter will be more due to the direct fall of sunrays over the gutter.
- ♣ Animals are better exhibited to visitors

Disadvantages

- Milking supervision is difficult
- Possibilities of transmission of disease are more.

Fig.2.4. tail to tail system

Dairy animal farm lay out

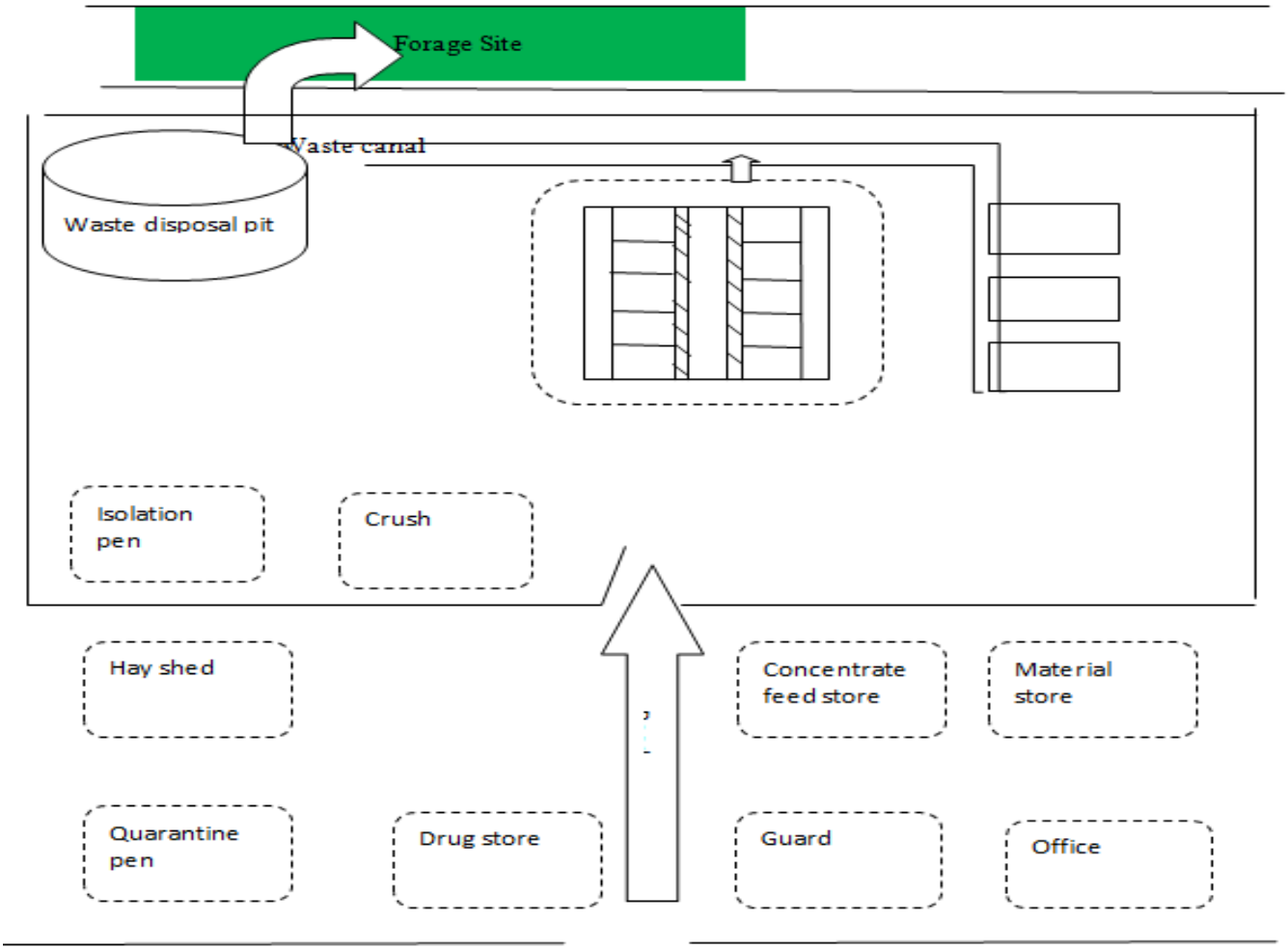


Fig. 2.5 farm lay out

Table 2.1. Housing space requirements for cross bred cattle

Age group	Manger space (mtr.)	Standing or cover areas (sq.mtr.)
Pregnant cows	1.0-1.2	8.5-10.0
Cows	0.8-1.0	1.8-2.0
Bull	1.0-1.2	9.0-11.0
6-12 months	0.3-.04	1.2-1.6
4-6 months	0.2-0.3	0.8-1.0
1-2 years	0.4-0.5	1.6-1.8

*To be used individuals

Self-Check -2	Written Test

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

1. What is the advantage of house for the animal?
2. Write the points which should be considered before established of dairy cattle house.
3. Discuss the difference between loose and conventional dairy cattle house.

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

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

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

2._____

_____

3._____

_____

Information Sheet-3	Using correct manual handling techniques

Manual handling is any task that requires you to push, pull, lift, carry, move, hold or lower any object, person or animal. Manual tasks include tasks that have repetitive actions, sustained postures and may involve exposure to vibration.

3.1. Importance of animal handling and restraint techniques

Dairy animal's manual handling is important to protect you from the pain and suffering that come with farm activities.

Animal restraint is the process of preventing an animal from action or motion.

• Restraint can be achieved simply by moral persuasion, by physical force and by chemical means.

There are steps of personal bio-safety during animal handling

Step 1:- clothing the examiner should wear lose clothes. Avoid bright color cloths. Wear proper suit.

Step 2:- health condition if the examiner is unhealthy or suffering from any disease there is strong possibility that his illness became severe.

Step 3:- approaching no sudden movement while approaching. The examiner should approach from the left or right head side of the animal.

Fig.3.1.Wear proper suit

There are different restrain techniques to handle animals:

1. **Restraint techniques rope**: - rope is the most cheapest and easy tool for restraining large or small animal. Examiner must be familiar with basic rope work. Examiner should know some quick and easy knots.

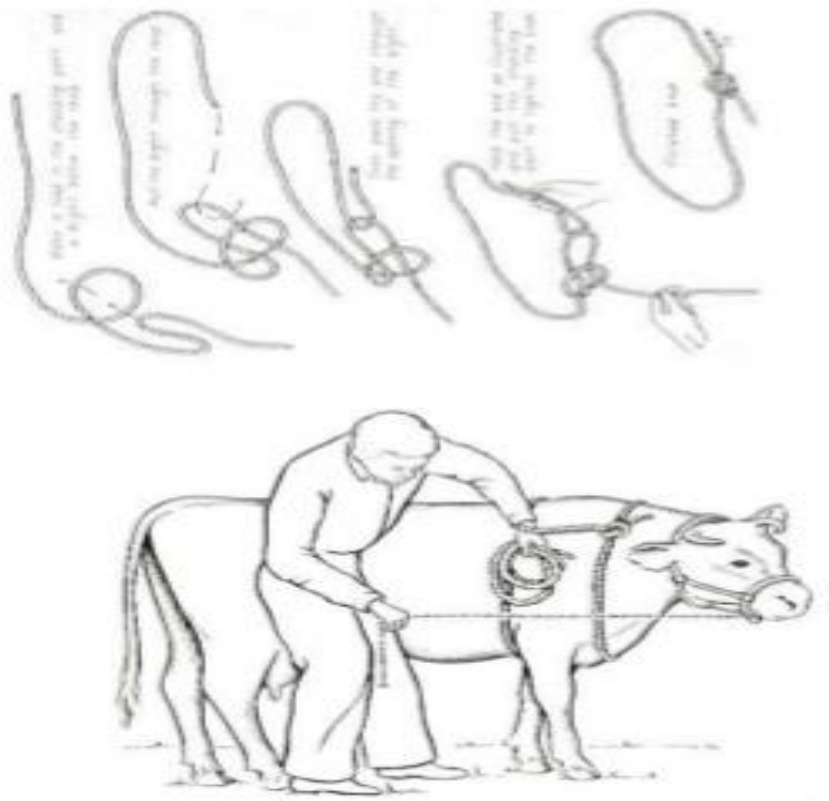
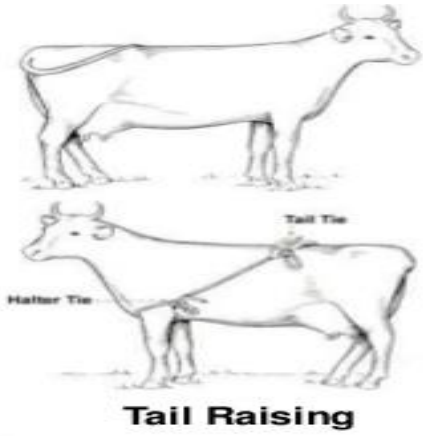


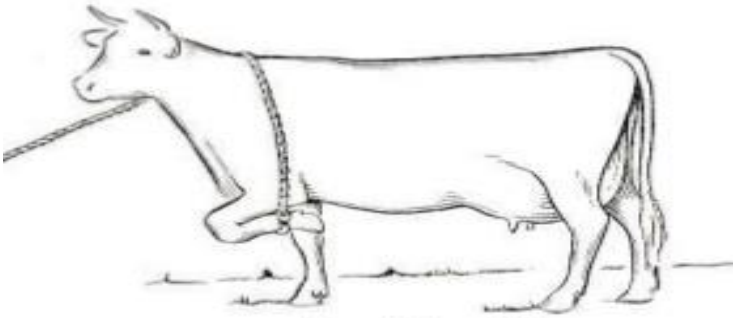
Fig. 3.2.restrain animals using rope

2. **Head and tail raising technique: -** this technique are applied to prevent animal from kicking or hitting the examiner with tail during the examination leg raising tail raising front leg tie.

Leg Raising



Tail Raising



Front Leg Tie

3. Head restraint technique:-

casting or throwing:- halter a halter is used to restraint the head of animal from unnecessary movement also the rope is lied to the nose ring so that animal didn't show any resistant if you don't have crush and you want to trim the hooves of animal this technique is use full.

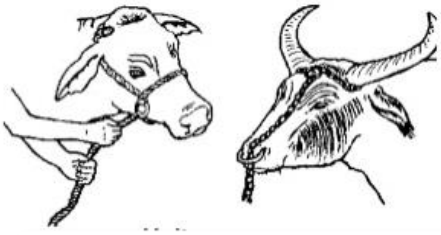
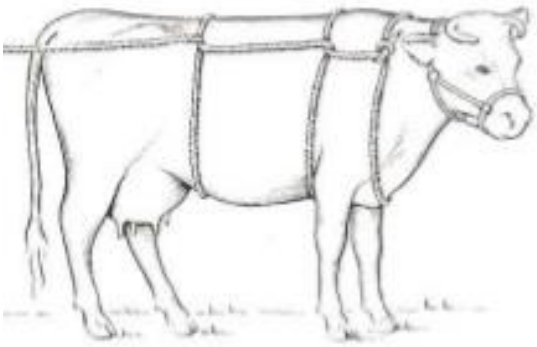


Fig.3.3 halter and casting or throwing



4.Nose lead technique:- this technique is majorly use to restrain male cattle that kept for breeding and beef purpose in this method metal ring is fixed between the wall of two nostrils which contain sensitive tissue and restrain the animal from unnecessary movement

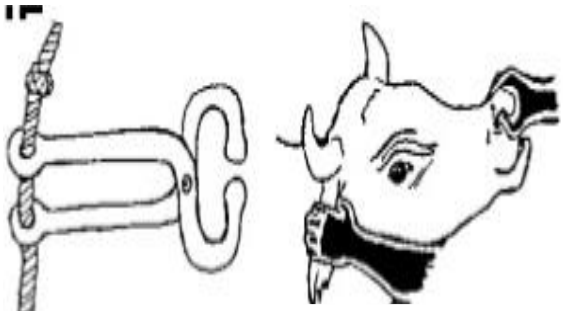


Fig.3.4 nose ring holder

5. Cattle crush technique: cattle crush is a strongly built cage for holding animals safely Which they are examined or given veterinary Treatment.

Fig. 3.5 cattle crush

6. Milking hobbles technique: the animal are tied using a rope or metal hobbles so that animal didn't kick .this is done in female animal when milking or when going to give birth.

Fig. 3.6 cattle hobble

7. Restraint techniques for sheep and goat: do not attempt to keep sheep or goat from moving by pulling on its head, horn or hide. He will quickly become excited and resist.

Fig. 3.7.standing a sheep for restrain

Restraint between legs: - straddling the animal between the handler's legs, and squeezing the sheep shoulder between the legs.

Fig.3.8 holding a sheep

8. Restraint for hoof trimming and examination: - sheep or goat should be set up on their rump. If they are to be vaccinated in the groin, it will be sufficient restrain to tilt him backward so that he is off balance.

Hoof trimming hoof examination sheep or goats should be held the same way for hoof trimming or for vaccination in the groin.

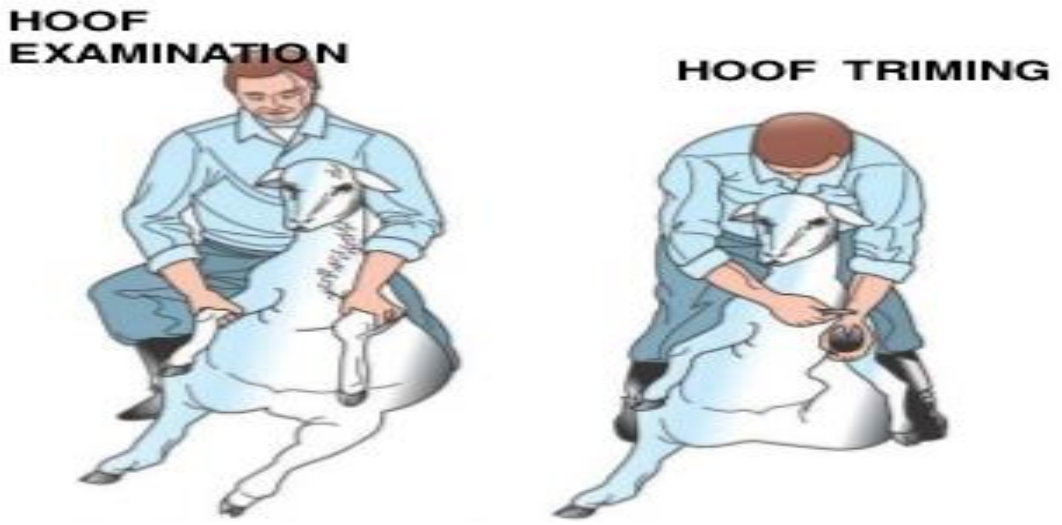


Fig. 3.9 sheep Manual handling *may be setup for restrain*

3.2. Manual handling aids of materials and tool equipments

Manual handling aids materials and tool equipments can reduce the physical effort needed to lift and move objects, making it safer.

When providing manual handling aids for the workplace it is important to ensure that:-

1. The right equipment is selected for the task
2. That all staff are trained in the correct use of the equipment
3. The equipment is visually inspected for defects before use
4. The wheels are suitable for the floor surface
5. The wheels move freely
6. The handle grips are comfortable and are in good order
7. The handle height is between the waist and shoulder
8. If they have brakes do they work?
9. The aids are regularly inspected and maintained to ensure it is good working order
10. He load secured before moving

Using correct manual handling techniques during loading and unloading materials helps to minimize damage of:- Workers ,Other persons, Materials and Vehicles

Self-Check -3	Written Test

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

1. What is manual handling? (2pts)

2. Write the different types of restrain techniques to handle animals. (8pts)

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

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

2._____

_____

Information Sheet-4	Selecting suitable PPE (personal protective equipment)

- Before starting dairy animals rising all the required materials, tool and equipment (which are listed in the below) must be prepared and they have to be also checked weather they are functional or not, and their availability within our farm or surrounding market for purchase.
- Personal protective equipment should be provided, and other safety measures should be adopted when needed. Animal care personnel should wear appropriate institution-issued protective clothing, shoes or shoe covers, and gloves. Clean protective clothing should be provided as often as necessary. PPE is designed to protect many parts of the body; eyes, head, face, hands, feet, ears, or torso. Some examples of PPE used in husbandry of ruminant animal are Overalls, Gown, Gloves, Safety goggles, Plastic boots/shoes, Sunhats/helmets, Nose protector/respirator etc.
- OHS requirements always must be applied in accordance with regulations/codes of practice and enterprise safety policies and procedures. This occupational health and safety requirement include: Some examples of PPE used in husbandry of dairy animal are: Overalls, Gown, Gloves, Safety goggles, Plastic boots/shoes, Sunhats/helmets, Nose protector/respirator etc.

To provide adequate protection, the protective clothing and equipment must always be:

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

Basic Types of PPE

The strict controls will not necessarily eliminate all the risks associated with most job tasks and this is where the need for PPE must be evaluated. A hazard assessment can help identify which specialized PPE will be required. However, the following basic types of PPE should be made available in worksite.

Eye and face protection: To provide protection during exposure to hazards like flying particles, metal or sparks, liquid chemicals, caustic liquids and light radiation .According to the types and extent of hazards, different PPE should be worn. These must always remain clean and free of contaminates.

Goggles

Goggles offer good protection against front and side impact.

Hearing protection: - To provide protection during exposure to high pitch and loud noise levels. Exposure to high levels of noise may result in hearing loss.

Hand protection: - To provide protection during exposure to potential hazards such as sharp objects, abrasive surfaces, temperature extremes, and chemical contact.

Selecting proper gloves is very important since the hands are used to handle hazardous materials. Chemical-resistant gloves are always recommended when working with pesticides and chemicals.

Nitrile protective gloves

Provides good protection when using many different pesticides.

Barrier laminate gloves

Offer the best chemical resistance in gloves designed to handle hazardous chemicals. Avoid cotton-lined or rubber gloves that absorb chemicals that result in continued absorption.

Padded cloth gloves

Protects hands from sharp edges, slivers, dirt, and vibration. Not acceptable for handling hazardous materials.

Metal mesh gloves

Better protection than cloth gloves against sharp edges and cuts. Not acceptable for handling hazardous materials.

Head protection: To provide protection to potential hazards such as falling objects, striking against low-hanging objects, electrical hazards, or chemical application.

Fig. 4.1. Chemical –resistant hats with added wide brim

Respiratory Protection-Respirators are used to prevent the exposure to air contaminated with harmful dusts, fumes, mists, gases, smokes, sprays, or vapors.

All respirator usage, including disposable respirators, air purifying respirators, and air-supplied respirators, require annual fit testing and testing and training prior to use.

Fig. 4.2 Respiratory protection

Body Protection- PPE includes safety vests and suits and should be used for tasks that can cause body injuries from extreme temperatures, flames and sparks, toxic chemicals, insect bites and radiation. Ensure that they are clean and free from cuts and burns. Always get a good fit to ensure full body protection.

Fig .4.3 chemical-resistant coveralls aprons

Self-Check # 4	Written Test

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

1. Why agricultural works have more injury? (2pts)
2. Write the advantages of PPE? (2pts)
3. Discus about the type of PPE with examples? (3pts)

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

2._____

_____

3._____

_____

_____

Information Sheet-5	Providing work task OHS requirements

5.1. Occupational Health & Safety (OHS)

Occupational health and safety issues that may be specifically associated with dairy animal operations include the following:

Physical hazards, Biological hazards, Chemical hazards and Exposure to heat, cold, and radiation.

Occupational health and safety (**OHS**), also commonly referred to as occupational health, or workplace health and safety (WHS), is a multidisciplinary field concerned with the safety, health, and welfare of people at work.

The goals of occupational health and safety programs include to foster a safe and healthy work environment. It may also protect co-workers, family members, employers, customers, and many others who might be affected by the workplace environment.

Apply OHS requirements in accordance with regulations/codes of practice and enterprise safety policies and procedures. This may include:

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

Apply safe operating procedures regarding:

- Machinery movement and operation
- Working in proximity to others and site visitors and Electrical safety

Apply emergency procedures:

- Emergency shutdown and stopping of equipment
- First aid application and site evacuation
- Machinery movement and operation &Working in proximity to others and site visitors

Self-Check -5	Written Test

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

1. What is OHS? (2pts)
2. Discus about OHS requirements in work place? (2pts)
3. What will happen if the worker doesn't follow OHS requirements and supervisor instructions? (3pts)

Note: **Satisfactory rating – 5 points** **Unsatisfactory - below 4 and 5 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

2._____

_____

3._____

_____

Operation Sheet 1	Techniques of personal bio-safety dairy animal handling

Procedures for dairy animal handling

Step 1: Wear proper suit. Avoid bright color cloths.

Step 2: check your health condition before contact dairy animals

Step 3: approaching no sudden movement while approaching.

Step 4: The examiner should approach from the left or right head side of the animal.

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 1 hours.

Task 1: The techniques for dairy animal handling.

List of Reference Materials

- Old Version of Module on Dairy Animal Husbandry Practices.
- Manual on Animal Handling and Retrain.
- National Open University of Nigeria. Ruminant Animal Production
- Environmental, Health, and Safety Guidelines of Dairy Processing
- University of Wyoming Extension. Personal Protective Equipment For Agriculture Http://Www.Wyomingextension.Org/Agpubs/Pubs/B1233.Pdf

Dairy production

Level-II

Learning Guide-25

Unit of Competence: Assist Basic Husbandry Practice of Dairy animals

Module Title: Assisting Basic Husbandry Practice of Dairy animals

LG Code: AGR DRP2M06 LO2-LG-25

Code: AGR DRP2TTLM 1219v1

LO 2: Undertake raising ruminant work

Instruction Sheet	Learning Guide # 25

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

- ➔ Following Instructions and directions
- ➔ Undertaking raising dairy animals activities
- ➔ Carrying out age estimation of dairy animals
- ➔ Observing enterprise policies and procedures in the handling and disposal of materials

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

- ➔ Follow Instructions and directions provided by supervisor
- ➔ Undertake raising dairy animals activities in a safe and environmentally appropriate manner
- ➔ Carry out age estimation of dairy animals
- ➔ Observe enterprise policies and procedures in relation to workplace practices in the handling and disposal of materials

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 7.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3,&Sheet4
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3, Self-check 4 and Self-check 5” **in page -38, 73, 80 and 82** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet1, Operation Sheet 2, Operation Sheet 3, Operation Sheet 4, Operation Sheet 5, Operation Sheet 6, Operation Sheet 7, Operation Sheet 8, Operation Sheet 9, and Operation Sheet 4” **in page -83,84,85,86,88,90,91,92,93,and 94** respectively.
6. Do the “LAP test” **in page – 95** (if you are ready).
7. Then processed to the next learning guide

Information Sheet-1	Following Instructions and directions

Any employee who has works in industry which raises dairy animals or any farmer who raise his own stock must follow the following instruction and direction:-

- Enterprise policies and procedures
- Manufacturer instructions
- Material safety data sheets (MSDS)
- OHS standards and procedures
- Specifications for tools, equipment's and materials
- Standard Operating Procedures (SOP)
- Verbal directions from manager or supervisor
- Work instructions and standards and Work notes.

- Instructions and directions provided by supervisor must be followed .And also employee must observe and follow Enterprise policies and procedures in relation to workplace practices in the handling and disposal of materials.
- When two points are see separately they have their own definition. But both, directions and instruction act as guidelines similarly. However, they do differ in some manners. The main difference between the two is the fact that instructions are mainly associated with instruction or teaching. Hence, instructions are given to teach somebody something. For example: instructions for milking, instructions for honey harvesting , instructions for castration, instructions for completing a project, instructions for writing a report, etc.

- Directions, on the other hand, are in the form of guidelines. They are mainly utilized while guiding somebody into a particular direction. Directions are mainly associated with driving directions, which aim to get somebody from point A to point B. However, they can be associated with anything that may lead somebody somewhere, especially in a particular direction.

.

Self-Check -1	Written Test

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

1. What do you think on the consequence that if the worker don't follow the instruction during working of different activities in the farm? (3pts)
2. What is the difference between instruction and direction? (3pts)

Note: **Satisfactory rating - 14 points** **Unsatisfactory - below 14 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

2._____

_____

Information Sheet-2	Undertaking raising dairy animals activities

2.1. Feeding and watering of animals

Feeding has a direct impact on the growth rate, production capacity and health status of the animal.

Feeding is key for a profitable and sustainable farming**.** The cost of feeding has long been recognized as the major cost and the largest cash expense in animal production.

Feed which is high in energy has a superior feeding value. If the amino acids in the feed protein are the same as or closely resemble, the amino acids required by the animal, the feeding value of the feed is much higher. For example, the protein feeds of animal origin have a higher value than those of plant origin. High energy protein concentrates and by-products such as molasses and oil meals have a higher feeding value than forage. Good quality forage can provide an adequate diet for maintenance and a milk yield of up to 8 litres per day from upgraded cows. The net digestibility of dry forages can be increased when fed together with 25% of fresh green material.

2.1.1. Dry matter intake

The amount of feed which a cow can consume is a vital part of feeding. The dry matter of forage varies from about 20% for young green pasture, to over 80% for mature dried out pasture.

A general rule for feeding dairy cows is that:

- Dry matter intake is approximately 2 .5 to 3% of bodyweight for a mature cow in the tropics. e.g. Thus a 450 kg cow will consume 11- to 13.5 kg of dry matter per day.
- Dry matter intake is also linked to digestibility. Usually dry matter intake is higher for feed of high digestibility.

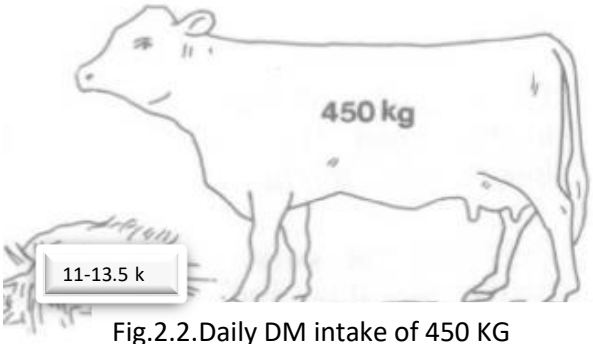


Fig.2.2.Daily DM intake of 450 KG

- Dry matter intake will be lower for the dry cow and higher for pregnant and lactating cows.

- Dry matter intake is usually lower in hotter areas as the cows may suffer from heat stress.

2.1.2 Digestibility

Young, grass/legume green pastures are highly digestible.

Mature and dried out pastures are not very digestible. They usually have a high fibre and cellulose content so the animal must use a lot of energy to break down the feed. During the wet season there should be enough green forage available for feeding. Grasses should be supplemented with legumes and particularly tree legumes. Forage may be fed by grazing or by cut and carry management if sufficient labour is available. It is in the dry season that feed digestibility can become a major problem. Even if the cow is getting sufficient intake of dry matter she can be undernourished if the feed has a low digestibility. Forage at this stage will have a low digestibility. It is therefore important to supplement forage feeding with drought resistant green legumes or with well conserved hay. Tree legumes or under sown legumes are ideal for supplementing the diet of the cow in the dry season. Up to 40% of the feed can be in the form of legumes. Hay should be cut before the grass flowers. This will yield a highly digestible feed that is ideal for feeding in the dry season. In general, if the digestibility of forage is low milk production will be very poor and the animal will lose weight and condition.

2.1.3. Protein

Protein is essential for growth and milk production. A balanced diet should have 12 to 13% crude protein. Tropical grasses are generally low in crude protein this is particularly so in mature pastures where the protein content can be lower than 7% which is considered to be the minimum protein requirement for milking cows and young growing animals. A useful guide for a balanced diet is as follows:

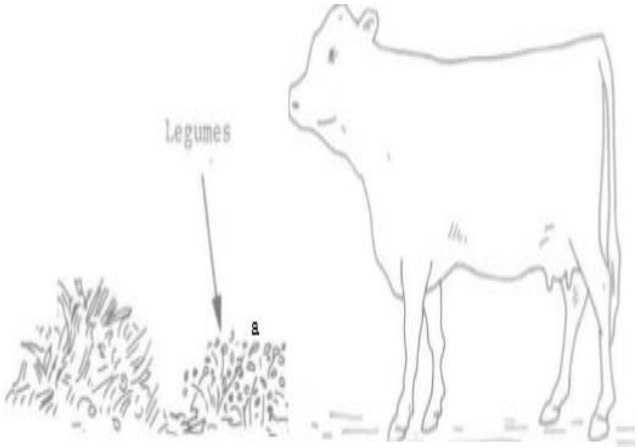


Fig. 2.3.At least one-third of the cow's feed grass-legume based pastures

.

What to feed?

For high milk yields and maximum production the dairy cow should be fed a mixture of good quality forage and concentrates or industrial by-products. However, in many cases in Ethiopia concentrates may not be available or may be too expensive to purchase.

1. **Forage**

Forage will be the main feed for dairy cows on all farms. Extension workers should refer to the Ministry of Agriculture Forage Manual for a complete guide on forage production and use.

A few summary points are made here.

- ➔ Existing pastures in most areas are unproductive and need to be improved. For intensive dairying new permanent pastures with grass/legume mixtures may need to be established
- ➔ Legumes are essential for high quality dairy forage. Legumes may be included in pastures, under-sown, or grown as tree legumes. Good quality hay should be conserved for use in the dry season.

Permanent grass/legume pastures are a suitable source of forage on smallholder dairy farms. It involves establishing perennial mixed pastures on prepared seedbeds.

Permanent grass/legume pastures have four important advantages.

- It produces a high yielding, high quality forage.
- The legumes improve or maintain soil fertility.
- It allows a high stocking rate.
- It improves crop yields by means of rotation

A well prepared moist seedbed is essential for permanent pasture establishment.

Permanent pastures require good management. The pastures are costly to establish in the first year but the returns are good so the cost is justified. Nitrogen based fertilisers are not required because of the use of legumes. Weeding is necessary until the pasture species have a chance to become established.

The pastures may be used for cut and carry management, for grazing or for conservation. If management is good, yields from grass/legume pastures can be very high. In general,

a cross-bred cow has the potential to produce 8 liters of milk per day from `good' quality grass/legume pasture.

Mixtures of the following pastures. Species are suitable for grass/legume .In the medium altitude areas Rhodes grass may be mixed with Green leaf Desmodium, or Alfalfa.

2. **Fodder crops**

Fodder cropping involves the growing of high yielding, high quality short-term crops for intensive livestock feeding. Fodder crops are a useful method of feeding dairy cows. The main crops of interest are: Oats and vetch Alfalfa Fodder beet Napier grass or Elephant grass. Fodder crops are ideal for feeding at the end of the wet season and in the dry season when other forage is scarce. The fodder crops may also be conserved and fed as required in times of shortage. Fodder crops are ideal for supplementing dry feeds such as hay or crop residues. Fodder crops have a high labour requirement and seed and fertiliser costs may be high. However, there is generally a good yield of high quality forage so the investment is very worthwhile. Fodder crops are relatively easy to grow and they are acceptable to the farmer and already well proven in many areas.

Good management and husbandry practices are necessary for successful fodder crop production. Where land is limited, as in some arable areas, care should be taken when planning the cropping programme, because the replacement of food or cash crops with fodder crops may not be desirable.

3. **Crop residues**

Crop residues are already widely used for feeding cows in all areas of Ethiopia. The crop residues are fed during the dry season when other forage is scarce. The most common **crop residues** are: teff straw, barley straw, wheat straw, maize stalks, sorghum stalks sweet potato leaves and *ensete* leaves.

Crop residues are useful for providing roughage for the cows. However, they are low in protein, and digestibility may also be low.

Crop residues must be supplemented with other feed to give a complete diet. Legumes are the ideal supplement as they have a high protein content. The following legumes are suitable: Tree legumes, Leucaena, Sesbania, tree Lucerne and Gliricidia.

Herbaceous legumes Alfalfa, Desmodium and Lablab. When conserving crop residues layers of green legumes should be included in the stacks. This will increase the feeding value of the crop residues and make feeding in the dry season easier.

4. **By-products/Concentrates**

If concentrates are available and if the farmer can afford to buy them, they are an important part of the dairy diet. The level of usage of concentrates will depend on local prices and availability. The following industrial by-products/concentrates are available in some areas of Ethiopia. Meat and bone meal, molasses, noug cake, brewer's grain, oil cake and wheat bran.

2.1.4. Preventing and treating of bloating problems

Bloat is a form of indigestion marked by excessive accumulation of gas in the rumen. Immediately after cattle consume a meal, the digestive process creates gases in the rumen. Most of the gases are eliminated by eructation (belching). Any interruption of this normal gas elimination results in gas accumulation or bloat.

Bloat can be caused by:

- ⇒ A condition secondary to acidosis indigestion
- ⇒ Certain proteins in forage
- ⇒ The amount, rate of intake, and coarseness of the roughage
- ⇒ Rate of digestion of grains as a result of processing (grinding too fine)
- ⇒ Host-parasite reaction following grub treatment choking
- ⇒ Enlargement of the lymph nodes between the lungs, which can compress the esophagus or interfere with the function of the vague nerves
- ⇒ An inherited tendency for bloat

There are three categories of bloat:

i. Frothy bloat which occurs when diets that lead to the formation of a stable froth or foam in the rumen are fed.
ii. Free gas bloat caused by diets that lead to excessive gas production.
iii. Free gas bloat caused by failure to eructate rumen gases leading to accumulation (e.g. esophageal obstruction). When bloat occurs, gases cannot escape and they continue to build up causing severe distention of the abdomen, compression of the heart and lungs, and eventually death.

Predisposing factors

Bloat is a risk when animals are grazing young, lush pasture, particularly if the pasture has high legume content (clover or lucerne). Ruminant animals produce large volumes of gas during the normal process of digestion which is either belched or passes through the gastrointestinal tract. If anything interferes with the gas escape from the rumen, bloat occurs. Natural foaming agents in legumes and some rapidly growing grasses cause a stable foam to form in the rumen. Gas is trapped in small bubbles in this foam in the rumen and the animal cannot belch up the gas. Pressure builds up in the rumen causing an obvious swelling on the left side of the body.

Signs of Bloat

i. Animal stops grazing and is reluctant to walk
ii. The left side of abdomen is distended
iii. The animal strains to urinate and defecate
iv. Rapid breathing — mouth may be open with tongue protruding
v. Staggering

Fig.*2.4 Staggering; a sign of bloat in a cow from the rear, left side distended indicating bloat.*

Prevention of Bloat

***Pasture management*:** Legumes should be introduced into the diet gradually over several days. Avoid cows gorging on new pastures by feeding them on other feeds before letting them out to graze. Silage, hay or more mature pasture can be used to reduce the cow's appetite. Initially, cows should only be allowed access to the pasture for short periods (one hour or so) and monitored closely during grazing and immediately after removal. Cutting and wilting the pasture for 2 - 3 hours prior to feeding reduces the risk of bloat.

Preventative medication*:* Detergents and anti-foaming agents can be drenched prior to grazing.

Treatment: A sharp knife can be used to puncture the rumen on the left side of the animal (at the farm level as an emergency). Puncturing the rumen with the standard trocar and cannula is a quickest way to release the gas which cannot be expelled with a stomach tube. The trocar is used to puncture while the cannula is left in place to release the gas. Dotted triangle is the left Para lumbar fossa where “hollow “of the flank is found.

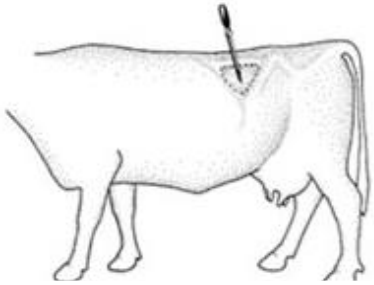


Fig.2.5 Insertion point for needle or Trocar fitted with a cannula.

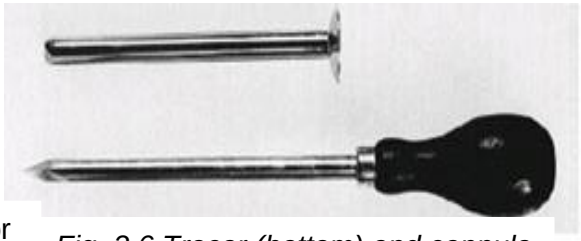


Fig. 2.6 Trocar (bottom) and cannula

2.1.5. Water

Animals need plenty of fresh clean water every day. Always give water before feeding animals and allow them to drink at least three times a day. Ruminants on pastures can be watered every 2 - 3 days.

2.2. Mating system

Animal breeding, controlled propagation of domestic animals in order to improve desirable qualities. There are two types of mating of animals for production of the progenies. These breeding methods are:

Natural service or artificial insemination, and irrespective of the method, the aim should be to achieve increased chances of conception.

Natural service: This is where the cow is taken to a bull and left for some time for the bull to serve.

T**he advantages of this method are:**

- The cow has an opportunity to be served more than once; this increase the chance of conception.
- The semen is fresh and of good quality since there is no handling.
- Where the farmer does not own a bull, cost of service is lower compared to A.I.

Natural service has the following disadvantages:

- Rearing a bull is not economical especially to a small holder farmer
- There is risk of spreading breeding diseases.
- There is risk of inbreeding if the bull is not changed frequently
- There is no opportunity to select the type of bull the farmer wants.

Natural mating can be done in two ways:

Free/pasture mating - This method of mating is practiced by farmers who own bulls which run full time with the cows. One bull can serve 20-25 cows. It has the advantage no heat detection required and disadvantage of lack of accurate records and possibility of transmission of reproductive diseases e.g. brucellosis.

Fig. 2.7 free mating

Hand mating- The bull is enclosed in its pen and the cows are brought in when they show signs of heat. Most small-scale farmers will practice this method since bulls are owned by few farmers and others bring their cows for service at an agreed fee.

Artificial insemination (AI): Mating is done through artificial means by collecting semen from male and the inseminating the females. This method help in use of outstanding males for mating of a large number of females thereby production of large number of highly productive and performing progenies.

Fig.2.8 Insemination

Benefits of Artificial Insemination

1. Prevention of venereal diseases
2. Indefinite preservation of genetic materials of low cost enabling wide testing and selection of bulls
3. Enhances genetic progress as best bulls are used widely nationally and internationally
4. Small scale farmers through AI can access good bulls cheaply
5. One is able to select the bull of interest.
6. When handled properly, there is no chance of spread of breeding diseases.
7. It is easy to control inbreeding.
8. A.I. is the best method of improving the genetic make-up of local breeds because it enables semen from the very best bulls to be widely available.
9. It is cost effective since the farmer does not have to rear a bull.

Disadvantages of AI

1. It requires very accurate heat detection and proper timing of insemination for greater chances of conception.
2. The inseminator must be trained on the technique.
3. It requires high investment in equipment.

Symptoms of heat

The various symptoms of heat are:

- The animal will be excited condition. The animal will be in restlessness and nervousness.

- The animal will be bellow frequency.
- The animal will reduce the intake of feed.
- Peculiar movement of limbo sacral region will be observed.
- The animals which are in heat will lick other animals and smelling other animals.
- The animals will try to mount other animals
- The animals will standstill when other animal try to mount. This period is known as standing heat. This extends 14-16 hours.
- Frequent maturation (urination) will be observed.
- Clear mucous discharge will be seen from the vulva, sometimes it will be string like the mucous will be seen stick to the near the pasts of vulva.
- Swelling of the vulva will be seen.
- The tail will be in raised position.
- Milk production will be slightly decreased.
- On Palpation uterus will be turgid and the cervix will be opened.

2.3. Assist animal in normal parturition

Parturition is giving birth to the young calf. And also itis a natural process which normally takes place without help. Close observation is required in case the cow has difficulties. Cows calving for the first time (heifers) tend to have more problems than older cows and therefore need more attention when calving. Two months before the expected calving date (the parturition), so 7 months after service, and the cow should get plenty of rest, because the growth of the calf takes up a lot of the cow's energy. This means that 2 months before the expected calving date, a milking cow should be dried off (i.e. you should stop milking her) and a cow you keep for traction should stop working. At about the 272 days of pregnancy, an in-cow is ready to calve

2.3.1. The signs Of Calving

You will know that the cow is about to calve or give birth when you see:

- The belly has increased in size, especially on the right flank.
- The udder is filling up and the teats are stiffening.
- The vulva becomes red and swollen with the presence of mucous and blood colored fluid.
- The animal is restless and the water bag appears at the vulva.

Normal Calving

- The water bag appears through the vulva.
- The cow will strain more.
- The head of the calf will appear and this breaks the bag.
- You will then be able to see both of the calf's front feet.
- It takes 4 - 6 hours for the calving to reach this stage.
- In heifers, it might take longer.
- As the chest comes through the vagina the calf starts to breathe.
- It is better to leave the cow alone to give birth naturally.
- However, if you want to help with the calving you can gently pull the calf by its feet.

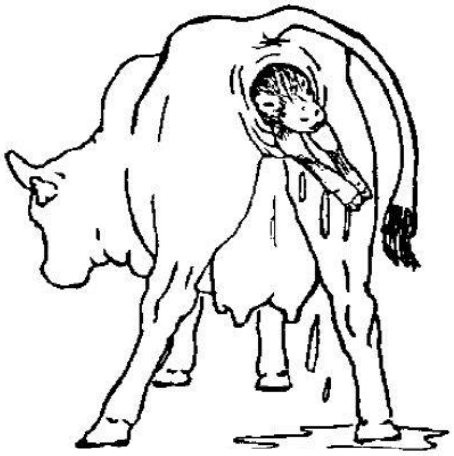


Fig.2.9 normal calving

- If the navel cord is still attached to the cow you can cut it with a clean sharp knife or a pair of scissors, then put tincture of iodine or alcohol on the end of the navel cord.
- Sometimes the back feet of the calf appear first. You will see that the back feet come out from the vulva with the soles of the feet showing uppermost. You should then look (or feel with your hands) for the tail and the hock joints.

Difficulties in calving

Leave the animal to give birth naturally.

If difficulties occur, you may find:

- Only the head of the calf has appeared.
- The head and one foot has come out.
- Two front feet showing but no head.

If this happens you should either ask the veterinarian to help.

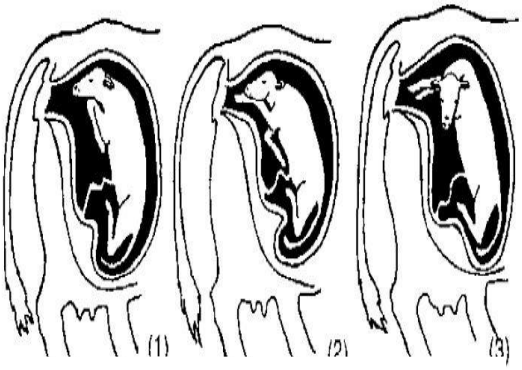


Fig. 2.10 difficulties calving

Helping a cow having difficulties in Calving

- You will need a bar of soap, hot water, a clean rope and clean vegetable oil such as olive or sunflower oil.
- Wash the area around the vulva and wash your hands well.
- Make sure that your fingernails are cut short and are thoroughly clean. Long nails can injure the animal.

- If you have oil put some over your hand and arm, if not, soap your hand and insert it into the vagina to discover what is wrong.
- You will need to recognize the difference between the front and back legs of the calf in the womb.
- Touch the fetlock joint and then run your hand up the leg to the next joint. There will be a knee joint on the front leg and a hock on the back leg.
- Push the calf either to one side or back into the uterus so that you can correct the situation and move the head and legs into the right place for birth.
- When the calf's head and legs are in the correct position tie a clean rope around both feet.
- Pull gently on the rope. You may need someone to help you pull.
- Sometimes the water bag will burst but neither the feet nor the head will have appeared. This is a very difficult position to sort out and if you can you should immediately ask your veterinarian for help.

2.3.2. Lambing or Kidding

The gestation period of ewe is 140 to 150 days (21 to 22 weeks) which is similar to that of a doe. On the average the gestation period in sheep and goat is about 5 months. With this, it is possible for ewe or doe to give birth at least once a year or three in two years. The act of giving birth in sheep is called “lambing” while it is “kidding” in goats.

Sign of lambing and kidding

Ewes and does demonstrate essentially the same characteristics when giving birth. Towards the end of pregnancy:

➔ The animal keeps away from others.

➔ The doe and ewes will lie down and stretch the neck back to look at the sky (star gazing) and lick its lips.

➔ The udder of the animal swells and becomes larger.

➔ The ewe or doe becomes restless, bleats and there is a hollow appearance on the flank region of the loin.

➔ Some watery discharge that is opaque and yellowish is observed from the vulva and the animals choose a secluded place to give birth.

Parturition process is completed within two hours. The animal could be assisted if in distress or invite a veterinarian especially if the foetus position is abnormal. The normal position is when the lamb or kid comes out with head rested on the fore leg coming out first from the vagina. The dam cleans up the lamb or kid by licking the mucus from the body and stimulates the lungs to respire in some cases. lungs to respire in some cases.

Fig. 2.11 The sequential process of kidding

2.4. Rearing new born animals

A calf is tomorrow's cow. Healthy, profitable calves, Well-grown dairy heifers are a good investment in the milking herd. The life of a bovine is divided into two parts; the first 24 hours, and the rest. The first 24 hours of life of a calf is so important that it has a strong bearing on the rest of its life. A calf not provided adequate care in the first 24 hours may succumb to diseases or will always remain weak and an underperformer, even though it has good genetic potential and is provided a good environment. Another important reason for losing a calf is diarrhea, the management of which is equally important till such time the cause is treated and cured.

Keeping this in view, the following session are covered under this section:

A. Care of new born calf

B. Calf diarrhea and its management

Rearing the milk-fed calf

The golden hour: The first hour after calving is the most critical period in the entire life of a new born calf.

Important points to remember:

- Clean nostrils and mouth which helps the calf breathe better and help prevent future breathing problems.
- Allow the mother to lick the calf clean which promotes circulation within the calf's body and prepares the calf to stand up and walk.
- Tie the navel cord with a thread at a distance of around 2 inches from the base and cut the remaining cord with a clean instrument.
- Dip the navel (a simple smearing will not serve the purpose) in 7% or higher tincture of iodine solution and repeat after 12 hours. (Do not use teat dip or weaker iodine solutions). A poorly maintained navel is the gateway to serious infections.

Figure.2.12 Licking stimulates the calf to standup

Fig. 2.13 Dip the navel of new born calf

• With their undeveloped digestive tract, calves require the highest quality and the most easily digestible source of nutrients, namely, whole milk or calf milk replacers.

Unfortunately, these are also the most expensive feeds. The most effective way of minimising the high feed costs of calf rearing is through early weaning and reduced milk feeding.

Good calf rearing depends on two major nutritional factors.

• Adequate intake of high quality colostrum within the first day of life.

• Feeding management to encourage early rumen development.

Colostrum feeding

• Calves are born with no immunity against disease. Until they can develop their own natural ability to resist disease, through exposure to the disease organisms in their surroundings, they depend entirely on the passive immunity acquired by drinking colostrum from their dam.

• Colostrum contains the antibodies necessary to transfer immunity onto their calves. It also contains a chemical allowing newborn calves to utilize their own fat reserves to immediately provide additional energy.

• The chances of calves surviving the first few weeks of life are greatly reduced if they do not ingest and absorb colostrum into their blood stream.

• The term colostrum is generally used to describe all the milk produced by cows up to five days after calving, until it is acceptable for use by milk factories. However a more correct term for milk produced after the second milking post-calving is transition milk. This milk no longer contains enough of the factors to provide maximum immunity to calves, but still contains other components, which reduce its suitability for milk processing.

Recommendations on colostrum feeding

♠ Farmers to ensure all calves drink from their dam within the first 3–6 hours of life and if not, to provide additional colostrum from its mother or another freshly calved cow.

Fig.2.14 hand –feeding to ensure adequate colostrum intake by calves

♠ Two feedings during the first day, 6–12 hours apart, and each of two litres of good quality colostrum used to be considered sufficient to provide passive immunity, mainly because of concern about the small capacity of the abomasum in new born calves.

- Remove the calf as soon as possible after birth (within 15 min) and feed it colostrum. This can be via teat, bucket or stomach tube.

3 Q's principles behind colostrum feeding:

- Quality is providing good quality colostrum.
- Quantity is ensuring calves ingest sufficient antibodies.
- Quickly is timing the first feed to ensure efficient absorption of the antibodies into the blood.

• After their first milking, dairy cows begin to reabsorb the immunity factors back into their udder tissue. For this reason, colostrum from the second milking contains only half the immunity factor content as that from the first milking.

Artificial colostrum

Colostrum serves two functions in new born calves, as a source of antibodies and also a rich source of nutrients (has high amount of energy and protein compared to milk). Artificial colostrum does not supply the antibodies but is a good source of nutrients for new born **calf, e.g. composition of artificial colostrum: one egg (protein source) + half liter fresh warm water + half liter whole milk (source of lactose and milk protein) + one teaspoonful castor oil (energy) + one teaspoonful of cod liver oil (energy**).

Phases of Calf Feeding

Phase	**Feed**
Colostrum phase (1-4 days)	colostrum
Pre-ruminant phase (5-days to 20-30 days)	milk
Transition phase (liquids and dry feeds)	Milk replacers and calf starter
Post weaning (dry feeds)	Calf starter

Table 1. Four phases of the calf feeding program

- The aim should be to switch young calves to cheaper feeds as early as possible so that more milk can be available for sale. However, the diet must be able to promote health and growth.

Calf Feeding Methods

After the first week during which the calf is left with the dam, several methods can be used for feeding depending on ease and convenience.

1. Single suckling

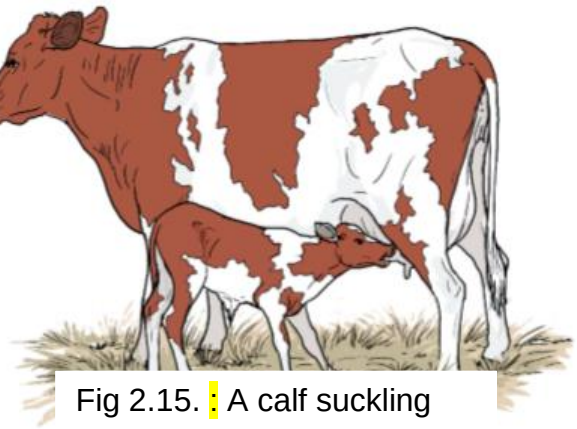


Fig 2.15. : A calf suckling

The calf is separated with the mother but during milking it is brought to suckle. The amount of milk the calf consumes is difficult to quantify. Some farmers will allow the calf to suckle one quarter. This method is rarely used in commercial dairies. The disadvantage is that if the calf is not present, then the cow may not let down all the milk. This method is the best in terms of hygiene as the calf gets clean milk at body temperature.

Foster mother or multiple suckling

In farms where several cows give birth at the same time, one cow can be assigned to a number of calves depending on milk production. The calves suckle in turns ensuring that each calf only suckles the designated quarter. This method is not practical in small scale farms.

2. Nipple suckling: - A plastic nipple is attached to a clean bottle filled with milk and the calf is trained on how to suckle. An alternative is to attach a nipple on a short plastic hose pipe and insert the same into a bucket. The calf is then trained on how to suckle.

Fig.2.16. *Calf being Fed in Bucket with a Nipple*

Bottle feeding: - The milk is placed in a clean bottle and the calf is fed directly from the bottle. This method is tedious and slow if many calves are to be fed. There is a high likelihood of milk going to the lungs via trachea.

Bucket feeding: the most commonly used method and milk is placed into a bucket and the calf is trained to drink (place finger in the milk and as calf suckles your finger it takes in milk). Stainless steel buckets, where available, should be used for hygienic reasons as plastic buckets are difficult to clean.

Fig. 2.17 A calf bucket feeding

B. Calf diarrhea

- Diarrhea in calves can occur due to various reasons.
- Calves with diarrhea lose considerable amounts of water and electrolytes.
- Diarrhea and rapid loss of fluid and ions can cause the calf to die very quickly.

Management of calf diarrhea.

➔ Replace the lost water and electrolytes at the earliest - Feed 2-4 liters of electrolyte solution every day.

➔ The electrolyte solution provided should be over and above the normal feeding.

➔ Consult a veterinarian at the earliest to determine the cause of diarrhea and to provide appropriate treatment.

Prevention of calf diarrhea

- Ensure that adequate quantities of colostrum has been fed to the calf within 6 hours of birth to avoid failure of transfer of immunity.
- Ensure that the calf is maintained in a hygienic and dry environment.
- Ensure udder cleanliness before allowing the calf to suckle.

Calf Housing

Housing of calves is an important aspect of calf management. Claves are housed for several reasons, the most important being protection from adverse weather conditions and predators, avoid internal and external parasites and control feeding and management.

A calf pen should be constructed where possible from locally available materials. It should be constructed to:

i) Allow approximately 2 m^2 (1.2 X 1.5m) space per calf
ii) Be well drained or bedded
iii) Be well lighted (artificial or natural)
iv) Be well ventilated
v) Strong to stand predator invasion

Calves can be housed permanently indoor until weaning time when they are turned to pasture or semi-indoor where they housed only at night. The calf house can be permanent or temporary and movable. Permanent houses should be constructed such that they are easy to clean when a new calf is introduced. Temporary houses are moved from one location to another when new calf moves in.

Fig 2.18 : A movable calf pen.

2.5 Under taking Milking practices

Practical aspects of milking: Milk synthesis and secretion is continuous unless interfered with by pressure from the filling of the gland cistern (this explains why more milk is extracted by frequent emptying (milking) to ensure pressure does not built up). The ejection of milk from alveolar lumen is under influence of oxytocin (hormone).

Good milking practice's is important: to produce maximum quality of milk, to minimize mastitis infection and minimize stress.

2.5.1. Methods of milking

There are two methods milking practices. These are: **Hand and machine-milking. In Ethiopia dairy producers they followed hand milking practices.**

Good hand-milkers can obtain more milk from cows than machines. However, few milkers have the skill or endurance to empty the udder completely before letdown passes.

Steps of milking procedures: The cow is brought to the milking parlour as calmly as possible. Frightening the animal at this stage has a negative effect on milk let down due to release of adrenaline (hormone) which has a negative effect on milk letdown. Read and practices the following milking procedures steps.

1. **feed the cow it's production ration (this is optional depending on the feeding system)** - This calms the animal and stimulates milk letdown.

2. Restrain animal - tie hind legs above hock joint in the form of a figure 8. A loose knot should be used to safeguard both animal and man (applicable only for hand milking).

3. Wash hands with soap and clean water before milking. Dry hands with towel.

4. **Test for mastitis using a strip cup** - strip first few rays of milk into strip cup from each quarter and observe for any abnormalities. If mastitis is detected, the cow should be milked last.

Fig. 2.19 check by using stripcup

5. Wash udder with warm clean water with disinfectant using a clean towel. Warm water also stimulates milk let down. Dry udder using a dry towel.

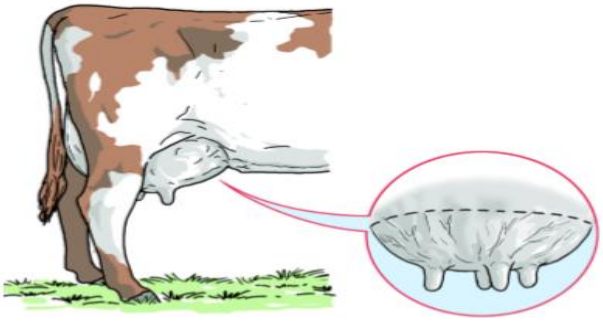


Fig.2.20 area of udder to be cleaned

6. Apply milking jelly - prevents cracking of teats and eases milking (for hand milking only)

7. Milk quickly and completely by squeezing the teat, do not pull. Milking each cow should take 7–10 minutes at most.

8. Use clean containers for milking.

9. After milking: Strip the animal - getting last drops of milk from udder to avoid incomplete milking (can lead to mastitis).

10. After milking dip the teats in a teat dip (disinfectant to ensure that bacteria do not gain entry through the teat sphincter which is loose immediately after milking).

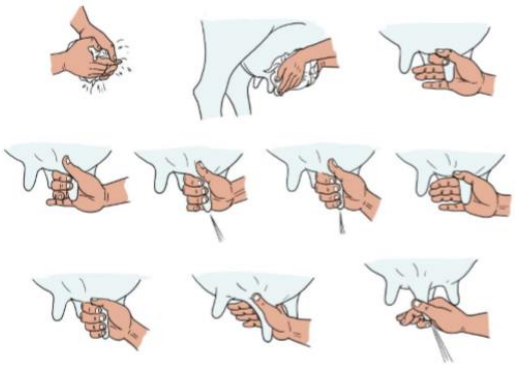


Fig.2.21Dipping cow teats in

Fig. 2.22 step by step method of hand milking

It is recommended that the animal remain in a standing position for at least one hour to ensure the teat does not come into contact with the ground while the sphincter is still loose.

2.6. Operating Shearing activities

Sheep shearing is the process by which the woolen fleece of a sheep is cut off. The person who removes the sheep's wool is called a *shearer*. Typically each adult sheep is shorn once each year (a sheep may be said to have been "shorn" or "sheared", depending upon dialect). They can be hand and machine shears. Hand shears are recommended for flocks of 10 or less, hand machine (clippers) for flock of less than 150 and power machine for flocks above that number.

Wool shearing practices vary in different regions. However, shearing is mostly practiced twice a year in spring and autumn seasons. Sheep are washed at least two days before shearing in order to remove dirt, suint and grease which hinder shearing.

Procedure to shearing of sheep:-

1. The sheep must be held properly in a comfortable position to prevent its struggling during shearing.
2. The skin should be stretched so that it is smooth in the area being shorn.

3. Wool fibers should be cut only once next to the skin to avoid “second cuts” or short fibers of reduced value.
4. Belly wool, leg wool and tags have a lower value and should be kept separate from the higher-quality wool from the back, neck and sides.
5. The fleece should be removed in one piece so that it will remain together when tied.
6. The fleece should be tied only with paper wool twine to prevent contamination.


fig.2.23 sheep shearing

2.7. Undertaking hoof trimming

A hoof trimming is the process of cutting abnormally grown hooves of the animal. Most of the time abnormally grown hooves are difficult for walking and also they are carrier of disease causing organism.

- In management systems where sheep and goats are mostly confined and do not walk daily on hard groundcover or climb rocks, abrasion of the hoof is not balanced with hoof growth. This will affect mobility and could lead to reduced intake from grazing. It may additionally lead to diseases such as foot rot. To avoid these problems, hooves need to be examined regularly and trimmed as needed.
- First use the point of the hoof trimmers to remove any dirt from the outside and the bottom of the hoof. The front of badly overgrown hooves can then be removed. The sides of the hoof should be cut back evenly with the sole of the foot. Continue to trim the sides around one toe and repeat the process on the other toe. Trim the frog and heel flat until the sole is parallel to the hairline of the pastern. Trim off thin slices. A

good rule to follow is to stop when you see pink. If blood appears, stop trimming and finish the trimming at a later time.

Fig. 2.24 Hoof trimming

Some benefits of hoof trimming:

- Reduces toe injuries.
- Reduces lameness.
- Helps prevent diseases like laminitis and foot rot.
- Increases lifespan.
- Increases milk production.
- Makes it easier to stand, eat and drink
- Higher breed back.

2.8. Applying Identifications

Identification is necessary for efficient production of dairy animals.

Animal identification is divided into two:-

1. Temporary identification 2. Permanent identification

Temporary identification is lasts for short period of time and not stay throughout animal life. E.g. cutting brush of animal tail, color Marks like pain and mud and charcoal.

Permanent identification: Stays throughout animal life.

E.g. - Ear notching - Tattooing

- Ear tagging - Branding

Branding Hot iron - brand for a short time on the legs so as not to spoil skin. This is permanent but not common in dairy cattle.

From the above animal identification types **Ear tagging is** the most popular method of identification of farm animals.

- It facilitates easy supervision, management and accurate record maintenance.
- It requires tagging forceps and tags
- The numbers in the tags should be contrast and clear style based on the skin colour of the animal.
- Location of tag in the ear for tagging should be half the way between base and tip of the ear.
- The ear tag is applied in the ear by puncturing the ear with the applicator.

B. Ear notching - cutting the ears in a particular shape and coding the shape. It involves the use of razor or scissors to cut a “V” shape on the tip of the pina. The position of the cut indicates numbers. If it is at the top of the pina it denotes 1, if at the tip, 5 and if under, it is 3. The right ear represent tens while the left represent units. The two is added to give the animal an identification number in the herd.

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

Fig.2.25 three types of calf identification

2.9. Undertaking Disbudding and Dehorning

Dehorning or disbudding is the process of removing horn of the animal and it mainly applied for cattle, sheep and goat. The age to dehorn calves depends on the condition and the method used. The sooner it can be done the less inconvenience is suffered by

the calf. Generally the calves that are 3 to 10 days old can be dehorned more easily, because the horn button does not become attached to the skull until the calf pass 10 days of age.

Disbudding is the act of removing the horn at its budding stage in cattle, sheep and goats. This operation is carried out at about age 3 to 4 weeks of age on any of the animals. Dehorning can be done by several methods.

Dehorning is removal of the horns after they have formed from the horn bud. Physical methods of dehorning (gouge dehorning) include the use of embryotomy wire, dehorning knives, saws, and high tension rubber bands. The Barnes-type scoop dehorner is commonly used for physical dehorning. When cattle have large horns they are sometimes "tipped", a procedure that removes the sharp end of the horn but leaves the base. Dehorning of adult cattle is associated with increased risks of sinusitis, bleeding, prolonged wound healing, and infection.

Dehorning can be done by several methods.

1. Hot iron: Electric, gas or fire-heated iron is the most common in calves (4 to 6 weeks). The young ruminant is haltered (i.e. using a rope to restrain it) to a pole, held down by the stockman and the base of the horn is felt with bare hand of the operator.

The iron rod heated with electricity has an automatic control that maintain the temperature at about 1000^0 F, applying it to the horn bud for l0 seconds is sufficient to destroy the horn tissue.

The hair around it is shaved and local anesthesia is injected at the base of the eyelid or forehead to minimize pain. A hot iron cuter is then plugged into electricity. The hot iron is then applied to the horn bud and carefully twisted to remove the bud. A scar is then left over the tissue at this point. This operation is commonly done in ruminant production especially in the temperate region and most local experimental stations. Hot iron dehorning can be done with ease up to the age 3 months (while the dehorning iron still fits over the bud comfortably), thereafter horn growth is fairly rapid, making surgical removal necessary.

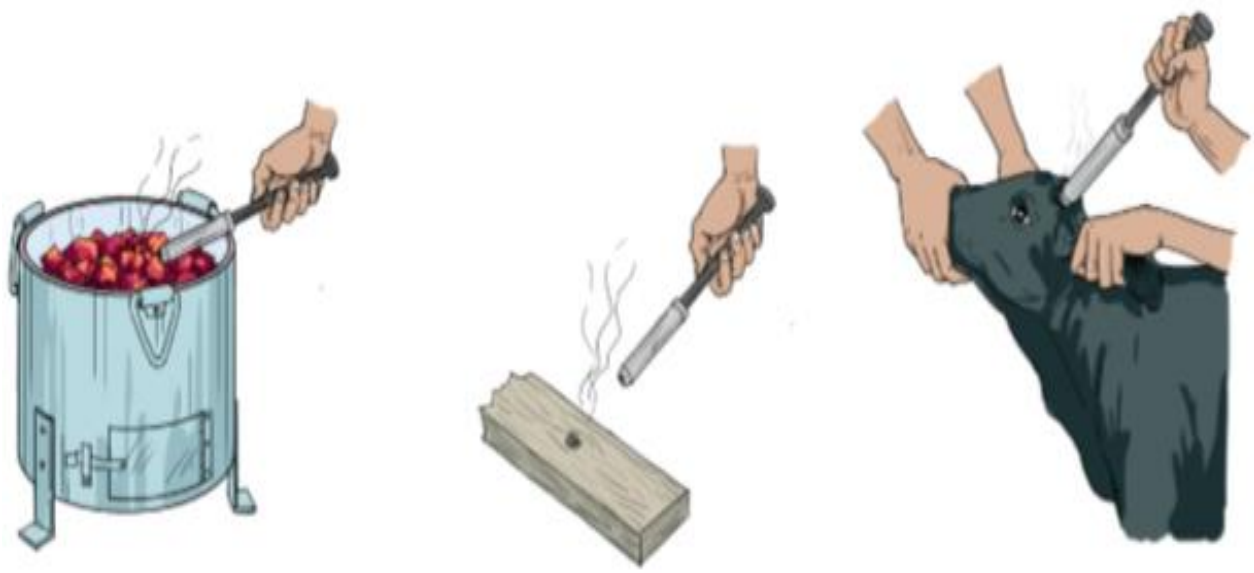


Fig.2.26 hot ion dehorning

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 anaesthetics should be used with dehorning and steps taken to prevent bleeding. Blood attracts flies and blow-fly 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.

Chemical method of dehorning

The horn button may be prevented from growing by burning with chemicals. This method is most successful if done before the calf is10 days old. The chemical that are most commonly are caustic potash or caustic soda. Dehorning should be done during the cool weather of spring and autumn. It is the best method.

Clippers and saws

This method is mainly used when old ruminant animals are to be dehorned.

Dehorned animal are important for the following reason:

- Dehorned cattle are quiet & less aggressive and thus easy to handle
- Need lees space at feeding troughs and yards.
- Improves the animal looks (sight)
- Reduce injury of people working with them
- Reduce damage to hides & skin

2.10. Undertaking Castration

Castration is the act of removing the testicles of a male animal to render them ineffective. This operation is carried out on all unwanted males in dairy animal production. This management operation prevents unwanted breeding and improves the carcass quality of the animal. In addition, castrated males are easier to handle. It can be carried out by surgically operation or bloodlessly by the use of a burdizzo or rubber ring elastrator after the animal must have been haltered. Surgical operation is done within the first week of the animal's life while the bloodless one could be done within the first two weeks of life. Castration can be done by using an elastrator ring, burdizzo or open castration using a knife.

Why do we castrate animals?

Castrating is important for the following purposes:

- To have good Carcass composition and weight development
- Castrated animals are good for fattening purpose
- Prevent breeding of related individuals (inbreeding) that can result in genetic defects, poor growth rate, and other problems
- Avoid unwanted pregnancies and the mating of young females before they are of adequate size and age for pregnancy and parturition.
- Enhance on-farm safety for animals, producers and employees. Castrated animals are usually less aggressive and easier to manage.

Techniques of castration

Knife castration: is the only completely safe method to sterilize male animals and can be done at any age by a qualified veterinarian. With this method of castration there is always a danger that the wound can become infected and the necessary precautions must be taken.

Procedures of castration using sharp knife

1. Use a very sharp knife, razor or scalpel.
2. Check that the knife, razor or scalpel is very sharp and clean. Clean the blade with a disinfectant such as alcohol, iodine, Dettol or gentian violet.
3. Use warm water and soap to wipe the scrotum and wash your hands.

4. Cut the bottom end of the scrotum. Squeeze the testicle above the cut end of the scrotum and it will come out.
5. Pull each testicle out as far as possible, twist the testicular cord around several times. Cut the cord in cattle and buffalo by scraping the knife slowly up and down. Pull to sever the cord in lambs and kids.
6. Do not put your fingers inside the open scrotum. Put either tincture of iodine, gentian violet, Dettol or antibiotic powder on the wound.

Elastrator rings: The rubber ring is applied around the neck of the scrotal sack using the special instrument designed for this purpose. The testicles must be in the scrotal sack distal (away from the body of the calf) to the elastrator ring. To minimize pain when using the rubber ring method of castration, they must be applied within three days of birth.

Procedure of castration using Elastrator rings technigues:

To castrate with rubber rings, we use a tool called an elastrator. It can only be used to castrate ruminants which are a few days old.

1. Put a rubber ring around the four teeth of the elastrator and squeeze the handle. The rubber ring will be stretched open.
2. Pass the scrotum of the animal through the ring making sure that it goes over the two testicles.
3. Release the elastrator and the rubber ring will tighten over the cords. After two weeks, the scrotum will fall off.

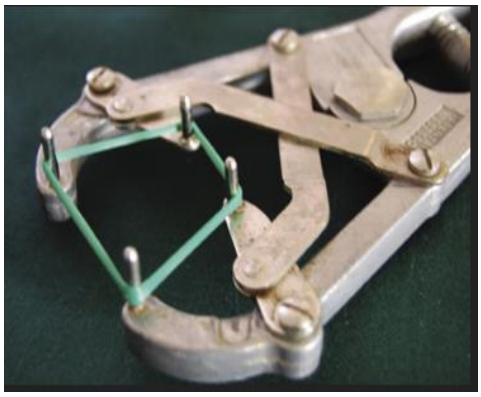


Fig.2.27 Elastrator method of castration

Fig.2.28. Proper placement of the rings

- *A strong rubber ring is placed around the top of the testicles thus cutting off blood supply. The testicles die off slowly.*

The burdizzo: A burdizzo is a pair of pincers used to squeeze and crush the spermatic cords. After application, the testicles degenerate and are absorbed but the external surface of the scrotum is not damaged. Castration with this method can be done at any time; but when done at a later age, it may bring about a shock in growth. The best time to apply the burdizzo is three to four weeks after birth when the spermatic cords can be felt.

The burdizzo is applied to each spermatic cord separately (Figure) in such a way that the blood supply to the testicles is damaged, while circulation to the scrotal sack remains intact. Gangrene can set in where blood circulation to the scrotum is lost. To achieve these objectives, the burdizzo is applied to the individual spermatic cords at opposite sides of the scrotum, leaving a central area free for blood to circulate or applying the burdizzo at different levels on opposite sides of the scrotum.

To castrate with the burdizzo should be follow the follow techniques:

1. Feel the scrotum with your hand and you will feel the two rope-like testicular cords inside.
2. Take the Burdizzo in your right hand and with your left hand push the cord to the side between the jaws of the Burdizzo and squeeze hard.
3. Now take the Burdizzo in the left hand and crush the other cord.
4. Leave the instrument closed for 15 to 20 seconds. Make sure you can feel the spermatic cord in the jaws of the emasculator before and after it is closed.
5. Open the jaws and move the instrument about 2cm lower and crush the other side of the scrotum.

6. **The clamp lines should never be directly opposite each other** otherwise the blood supply to the scrotum will be compromised leading to complications

Fig 2.29 Burdizzo method of castration (no blood)

Care after castration

The following care should be taken after castration of the animals:

- Turn calves in with their mothers in a clean grass pen.
- Do not turn into muddy or filthy lots or lots around barns (where there is much danger of infection).
- Watch the animal closely for about 10 days after castration.
- Beware of fly attacks and infection (especially with emasculator method).
- Treat wounds with wound aerosol which discourages fly attacks. If swelling and pain are severe and/or if the animal develops fever, a suitable antibiotic should be injected.

2.11. Transportation of dairy animals

All steps should be taken to avoid stress while transportation. Adequate water, space, feed, water and rest should be provided at regular intervals while transporting, since stress predisposes to various diseases. The flooring should be provided with some bedding material like paddy straw. Dairy animals need to be moved for a number of reasons including marketing, slaughter, re-stocking, from drought areas to better grazing and change of ownership. Typically, methods used to move animals are on hoof, by road motor vehicle, by rail, on ship and by air.

Generally the majority of livestock in developing countries are moved by trekking on the hoof, by road and rail. Historically, livestock has been moved on foot, but with increasing urbanization of the population and commercialization of animal production, livestock transport by road and rail vehicles has surpassed this. Transport of livestock is undoubtedly the most stressful and injurious stage in the chain of operations between farm and slaughterhouse and contributes significantly to poor animal welfare and loss of production.

Effects of transport

Poor transportation can have serious deleterious effects on the welfare of livestock and can lead to significant loss of quality and production.

Effects during transport and movement of animals include: Stress, Bruising, Trampling, Suffocation, Injuries, Heart failure, Heat stroke, Sun burn, Bloat, Fighting, Poisoning, Poisoning, Dehydration and Exhaustion

Methods of transport

Cattle

The most appropriate methods of moving cattle are on hoof, by road motor vehicle or by rail wagon. Moving cattle on the hoof (trekking) (Fig. 2.30) is suitable only where road and rail infrastructure does not exist, or when distances from farm to destination are short. This method is slow and fraught with risks to the welfare and value of the animals. Rail transport is useful for short-haul journeys where loading ramps are available at railheads and communication is direct to destination. Road motor transport is by far the most versatile, the method of first choice and the most users friendly.

The most satisfactory method of transporting cattle is by road motor vehicle. Moving by rail truck requires more careful management and trekking is satisfactory for well-planned distances.

Fig. 2.30 Moving cattle on the hoof *Fig. 2.31: Road motor vehicle for transporting cattle*

Transport operations

A number of factors must be taken into account during the journey in order that the animals do not suffer, become injured or die.

1. **Trekking-** Only cattle, sheep and goats can be successfully moved on hoof, and here certain risks are involved. The journey should be planned, paying attention to the distance to be travelled, opportunities for grazing, watering and overnight rest.

Animals should be walked during the cooler times of the day and, if moving some distance to a railhead, they should arrive with sufficient time to be rested and watered before loading. The maximum distances that these animals should be trekked depend on various factors such as weather, body condition, age etc., but the distance given in Table 3 should not be exceeded when trekked.

Species	**One day journey**	**More than one day**	
		First day	**Subsequent days**
Cattle	30 km	24 km	22 km
Sheep/goats	24 km	24 km	16 km

Table2.1. Maximum distances for trekking

2. ***Time of the day-*** High environment temperatures will increase the risk of heat stress and mortality during transportation. It is important to transport animals in vehicles during the cooler mornings and evenings or even at night. This is particularly important for pigs. Wetting pigs with water will help keep them cool.

3. Duration of journey- Where possible, journeys should be short and direct, without any stoppages. If the vehicle stops, pigs will tend to fight. Cattle and sheep/goats should not travel for more than 36 hours and should be offloaded after 24h for feed and water, if the journey is to take longer than that. Pigs should have access to frequent drinks of water during long journeys, particularly in hot and humid conditions.

4. Driving- Vehicles should be driven smoothly, without jerks or sudden stops. Corners should be taken slowly and gently. The second person should be in attendance to spot downer animals so that the vehicle can be stopped and the animal lifted. Train drivers should avoid “fly shunting” of trucks with livestock.

5. Wind chill- Wind blowing on wet animals being transported in cold weather causes a wind chill factor, where the body temperature is considerably reduced, resulting in severe stress or deaths.

Key things to remember during transportation:

- The size and design of the transport vehicle should be compatible with the number of stock being transported.
- The transport vehicle should be in good repair to ensure cattle arrive at their destination with least injury and in the shortest possible time.
- The stock crate should be well designed so as to minimize bruising. A well designed stock crate will have a large smooth contact surface without projections on which animals can bruise.

Pens should be approximately 3 meters’ in length (pens should not be longer than 4 meters’) to provide more support to animals during travel and thus reduce stress and allow them to adapt to transport more readily.

It is recommended that the following classes be transported or penned separately:

⇒ polled & dehorned cattle;

⇒ young calves;

⇒ a cow with a suckling calf;

⇒ adult bulls;

⇒ cattle greatly different in size;

⇒ females in advanced stages of pregnancy

Handling *facilities*

It is important to make sure you have adequate facilities to unload the cattle when you get them back to your property. A set of yards or a small paddock to confine the cattle for the first couple of days is essential. Holding the cattle in a small paddock or set of yards for the first couple of days will help to settle and calm them. It may also help prevent the spread of weeds and disease to your property. This initial step is important for the bio-security of your property.

Feed and water requirements on arrival

The holding paddock or yard must have a supply of water that is accessible to all animals. It would also be a good place to introduce your cattle to some hay, in order to settle them after the transport. When you finally introduce your cattle to the larger paddock, it is best to continue giving hay for at least the first 2 days, so that their rumen (stomach) has time to adjust gradually to the pasture feed.

Water: Ensure safe water is always available. Generally the water requirements for cattle are:

- ☞ Dry cows - 70 litters/day
- ☞ Lactating cows (cow with calf at foot)- 90 litters/day
- ☞ Weaned calf (animal removed from its mother) - 55 litters/day

These values will vary with weather conditions, and it is not unusual for a pregnant cow with calf at foot to drink over 150 liters of water per day. As summer progresses, dams start to shrink and evaporation can account for up to a meter of water loss from a dam each day.

Self-Check -2	Written Test

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

1. Define animal retraining? (2pts)
2. Write the main sign of bloating dairy animals. (4pts)
3. List at least four/4/ points the importance of dehorning and castration each. (4pts)
4. Mention the methods of animal identification. (2pts)
5. What is the importance of castration dairy animals? (4pts)

Note: **Satisfactory rating - 15 points** **Unsatisfactory - below 15 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

1._____

_____

2._____

_____

3._____

_____

4._____

5._____

_____

Information Sheet-3	Carrying out age estimation of dairy animals.

3.1. Importance of estimating age

The main purpose of estimating age in the dairy animals are

1. important factors in selection and purchases of animals
2. performance and economic return from animal depend up on age
3. important criteria for fixing the price of animals
4. importance for determine the dose of medicines according to age and weight of animals
5. in the absence of records it becomes necessary to determine age of animals by other methods

3.2. Estimating Age of dairy cattle

Determining age of the animal is important while purchasing a new animal since the information provided by the seller may not always be reliable. Cattle Age can be estimate by two methods:

I. Estimate age by dentition: •

It is easy to estimate the approximate age of animals by inspecting the state of her/his teeth.

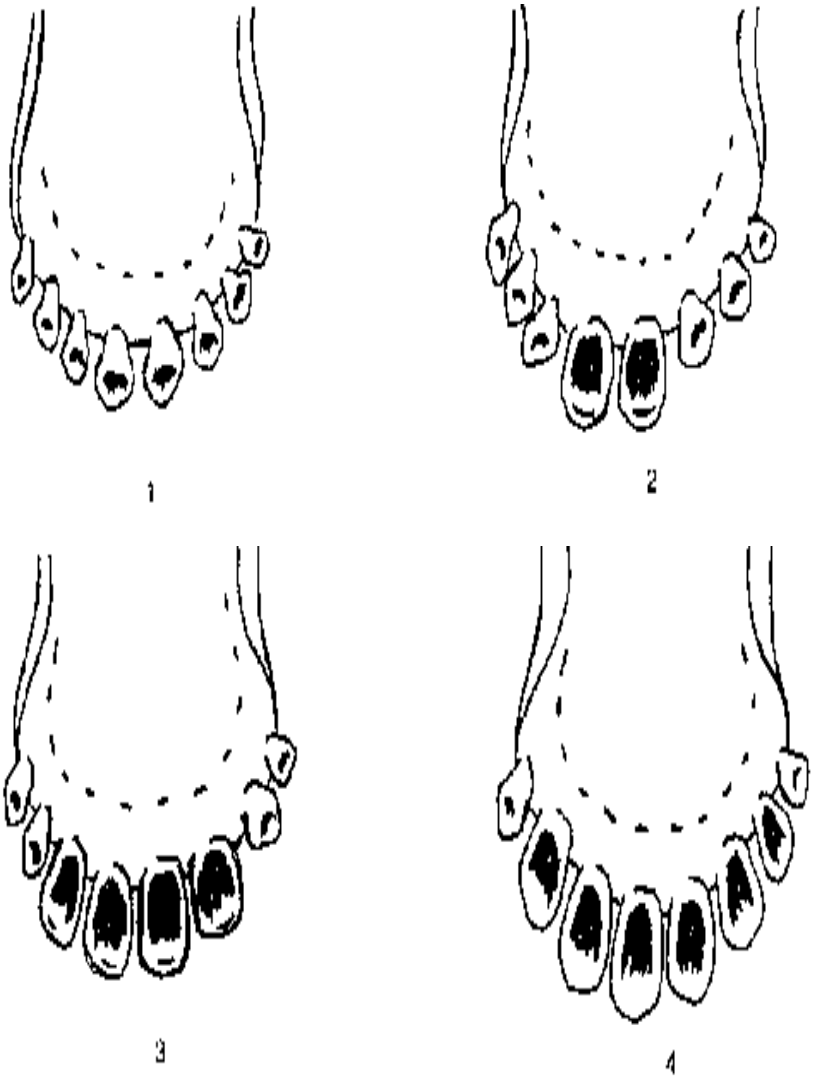
•At birth to one month, two or more temporary incisor teeth are present. By first month all 8 temporary incisors appear.

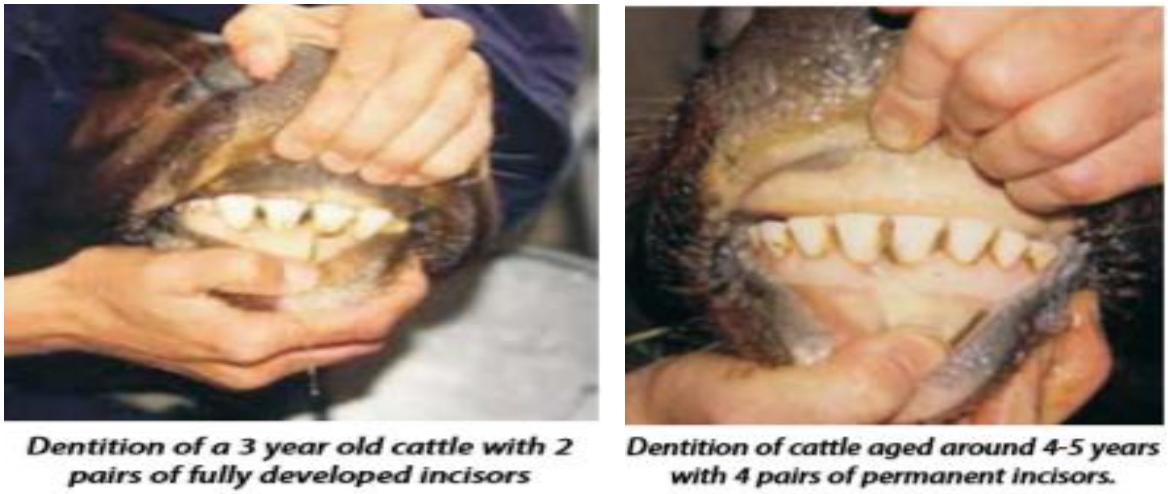
The age at which the pairs of permanent incisor teeth erupt is as follows:

I. First incisor teeth 18–24 months
II. Second incisor teeth 24–30 months
III. Third incisor teeth 36 months
IV. Fourth incisor teeth 40–48 months
V. This is a very useful guide when objectively assessing the feeding management of young stock. Because poorly fed animals may look healthy and relatively well grown, but if their first (or even second) incisor teeth have erupted they are likely to be much older than at first glance.

• At approximately age 4–5 years the last of the cow's permanent incisor teeth (the "corner" incisors) are cut, and are typically fully developed by age 5 years. Therefore, at age 5 years, cows typically have all eight permanent incisors erupted and in use. At this age the incisors are tall, relatively flat across the front (when compared to older ages), sharp at the top, and close together.

• From age 6 years or more, estimating cattle age by their teeth is based on their degree of wear and becomes more difficult.





Dentition of a 3 year old cattle with 2 pairs of fully developed incisors

Dentition of cattle aged around 4-5 years with 4 pairs of permanent incisors.

Fig. 3.1.Teeth of cattle

II.Estimate age by horn rings: This is not a good guide and may give only a very rough idea. As the horn grows in size with the increase in age of animals. Rings get formed on it. The first horn ring appears at 3years age in zebu cattle; there after every year one ring appears. Hence the following formula may be used:

E.g. **n+2= age of animals in years**

Where n= number of rings on horns

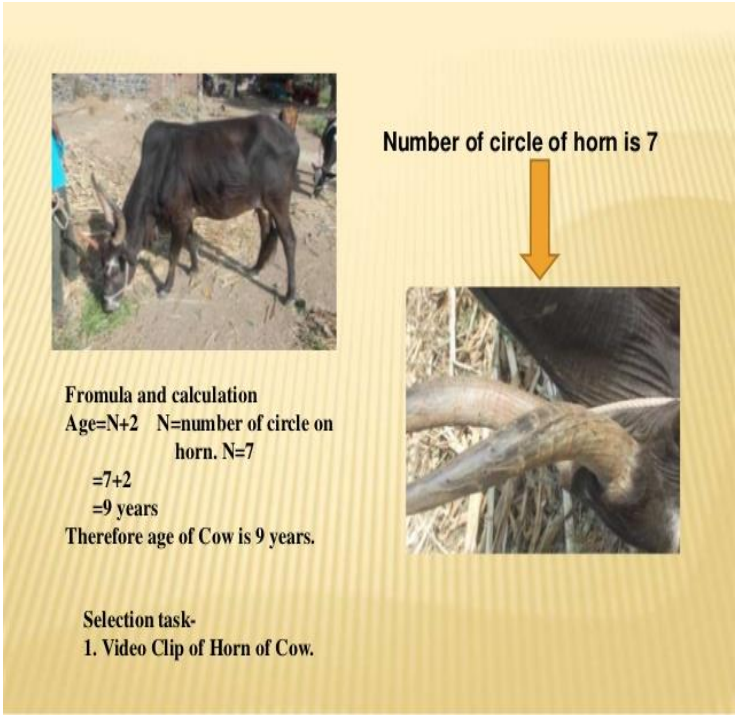


Fig.3.2 estimate by horn ring

III. Estimate Age by Tail brush method

The brush of the tail is only useful as a guide when assessing small, stunted or young cattle. A brush that is about fetlock length or longer is an indication that the beast is twelve months old or older. This method cannot be used on cattle which have been bang-tailed. Bang tailing is the act of cutting the long hairs at the tip of the tail short to act as a simple identifier of animals and is commonly used after a procedure has been performed on an individual animal that belongs to a large mob e.g. the mob is run through a race and each animal is vaccinated - immediately after being vaccinated the animal is bang-tailed so they are identified as vaccinated and will not be given a second dose of vaccine. This is useful when large numbers of animals are being processed by a group of individuals.

3.3. Age Estimation of Sheep and Goats by Dentition

Why is it important?

Indirect ways of determining approximate age of sheep and goats are vital in systems where production records are unavailable. For instance, if the flock structure has to be determined, age of animals needs to be estimated. Application of drugs also requires knowledge of age and/or weight of the animal. A few days after birth, lambs/kids will have milk teeth, also known as temporary incisors, arranged in four pairs in the lower jaw. These are replaced by larger permanent teeth as the age of the animal increases. There is a range of ages at which particular teeth appear because the speed of teeth growth will vary according to health and nutrition of sheep and goats.

The central pair of temporary incisor teeth is shed and replaced by the permanent teeth at approximately 14 months of age. At approximately 20 months, the second pair of milk teeth is replaced by a pair of permanent incisors. At 3 and 4 years, the third and fourth pairs of permanent teeth appear. At 4 years of age the sheep has a "full mouth." When a ewe/doe loses some of her incisor teeth, she is called a "broken mouth."

a. A 10 month old doeling b. A 32-month old doe c. Broken mouth

Fig. 3.3. Teeth of goats of different age

Note that the doe ling Figure 28 b has her milk teeth fully grown and spread out. The doe in Figure 28 b has had three pairs of teeth replaced.

Older sheep and goats that have worn teeth have difficulty in eating and will lose condition, become more prone to diseases and breed less than younger animals. Inspecting the teeth can be a very useful way of deciding when to cull.

Age of goats and sheep

1. Animal under one year old (no permanent teeth)
2. One year old (2 permanent teeth)
3. Two years old (4 permanent teeth)
4. Three years old (6 permanent teeth)
5. Four years old (8 permanent teeth)
6. Old animal, more than four years old

How to hold sheep and goat to check their teeth

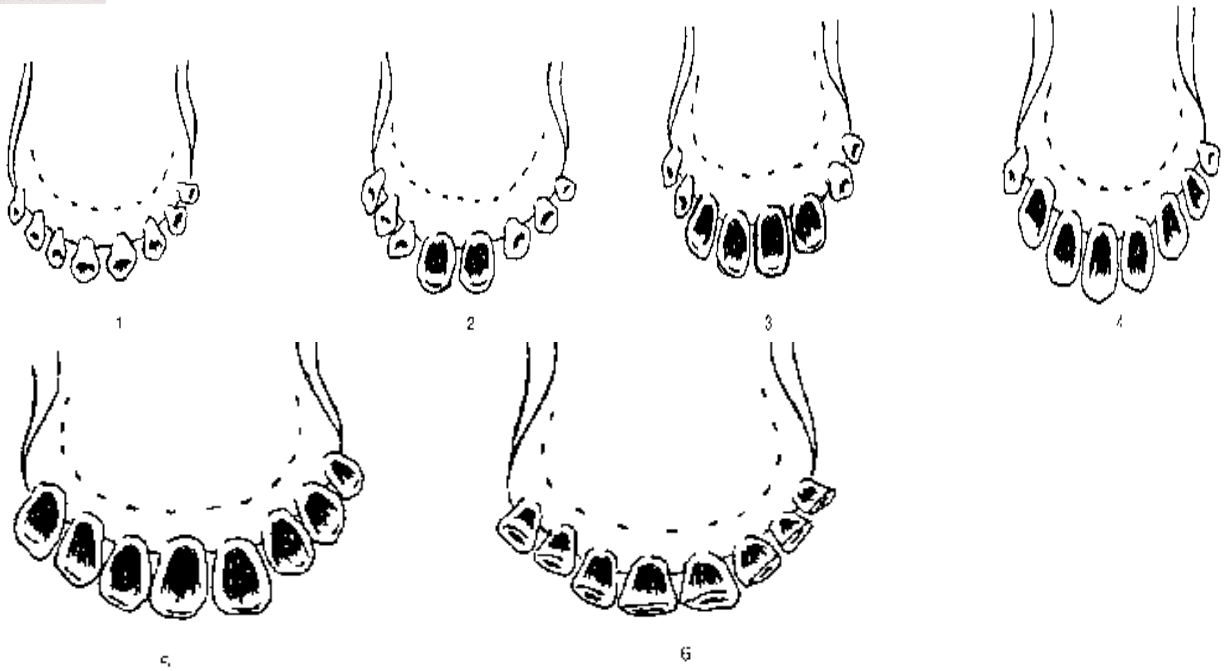


Fig.3.4. teeth of shoat

Self-Check -3	Written Test

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

1. What is the advantage of knowing the age of dairy animal? (2pts)
2. Mention the methods of dairy animal's age estimation? (2pts)
3. Discus the advantage and disadvantage of dental age estimation? (3pts)

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

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

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

2._____

_____

3._____

Information Sheet-4	Observing enterprise policies and procedures

Enterprise policies and procedures in relation to workplace practices in the handling and disposal of materials should be observed. During handling and disposing of materials the worker should be observe work place policies and procedures.

Careful waste management is needed to:

• utilize the fertilizing qualities of the manure, urine and other waste;

• maintain good animal health through sanitary facilities;

• avoid pollution of air and water and to provide good hygiene around the farmstead.

The method of disposal depends on the type of waste being handled. Solids can be stacked and spread on fields at the optimum time of year, while liquids must be collected in a tank and may be spread from tank-wagons.

Before handling a carcass and waste materials, consider the diseases that can be passed to humans (anthrax, brucellosis, rabies, ringworm and mange are the most common ones). If the animal died unexpectedly, a post-mortem will reveal the cause of death and guide the means of disposal. Post-mortems should be performed by qualified veterinarian. If anthrax is suspected the carcass should be burned and no post-mortem should be carried out.

How to burn a carcass and waste material

1. Dig two trenches (2 m long, 40 cm wide and 40 cm deep) in the form of a cross. The trenches will provide oxygen to the fire.
2. Place two iron bars so they lie across one of the trenches.
3. Place strong wooden posts across the bars.
4. Place the carcass and a heap of fuel (wood and straw soaked in waste oil) on the wooden posts.
5. Light the fire and burn the carcass.

Disposal by burying

1. Dig a hole 2 m long by 1.5 m wide and 2 m deep.
2. Put the carcass in the hole and cover with soil and logs or large stones to stop wild animals or dogs digging it up again.

Self-Check -4	Written Test

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

1. Discus the advantage of following enterprise policy and procedures during disposing of waste materials? (3pts)

2. Why you need management of dairy animals waste. (3pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

2._____

_____

Operation Sheet- 1	Assisting dairy cows difficulties in Calving

Procedures for assisting dairy cows during difficulties calving

Step1- You will need a bar of soap, hot water, a clean rope and clean vegetable oil such as olive or sunflower oil.

Step2- Wash the area around the vulva and wash your hands well.

Step3- Make sure that your fingernails are cut short and are thoroughly clean. Long nails can injure the animal.

Step4- If you have oil put some over your hand and arm, if not, soap your hand and insert it into the vagina to discover what is wrong.

Step5- You will need to recognize the difference between the front and back legs of the calf in the womb.

Step6- Touch the fetlock joint and then run your hand up the leg to the next joint. There will be a knee joint on the front leg and a hock on the back leg.

Step7- Push the calf either to one side or back into the uterus so that you can correct the situation and move the head and legs into the right place for birth.

Step8- When the calf's head and legs are in the correct position tie a clean rope around both feet.

Step9- Pull gently on the rope. You may need someone to help you pull. Sometimes the water bag will burst but neither the feet nor the head will have appeared.

Operation Sheet # 2	Undertake of milking procedures

Steps of hand milking procedures

Steps1. **Feed the cow its production ration (this is optional depending on the feeding system)** - This calms the animal and stimulates milk letdown.

Steps 2. Restrain animal - tie hind legs above hock joint in the form of a figure 8. A loose knot should be used to safeguard both animal and man (applicable only for hand milking).

Steps 3. Wash hands with soap and clean water before milking. Dry hands with towel.

Steps 4Test for mastitis using a strip cup - strip first few rays of milk into strip cup from each quarter and observe for any abnormalities. If mastitis is detected, the cow should be milked last.

Steps 5. Wash udder with warm clean water with disinfectant using a clean towel. Warm water also stimulates milk let down. Dry udder using a dry towel.

Steps 6. Apply milking jelly - prevents cracking of teats and eases milking (for hand milking only)

Steps 7. Milk quickly and completely by squeezing the teat, do not pull. Milking each cow should take 7–10 minutes at most.

Steps 8. Use clean containers for milking.

Steps 9. After milking: Strip the animal - getting last drops of milk from udder to avoid incomplete milking (can lead to mastitis).

Steps 10. After milking dip the teats in a teat dip (disinfectant to ensure that bacteria do not gain entry through the teat sphincter which is loose immediately after milking).

Operation Sheet # 3	Techniques of shearing sheep

Procedure to shearing of sheep

Step1: The sheep must be held properly in a comfortable position to prevent its struggling during shearing.

Step2 The skin should be stretched so that it is smooth in the area being shorn.

Step3 Wool fibers should be cut only once next to the skin to avoid “second cuts” or short fibers of reduced value.

Step4 Belly wool, leg wool and tags have a lower value and should be kept separate from the higher-quality wool from the back, neck and sides.

Step5 The fleece should be removed in one piece so that it will remain together when tied.

The fleece should be tied only with paper wool twine to prevent contamination.

Operation Sheet # 4	Hoof trimming of shoat

Objective/ Purpose:

- To reduce the exposure/predispose of sheep and goat to other foot problems such as foot root
- To minimize susceptibility of the animals to joint/tendon problems, and arthritis
- To reduce competing of feeds

Equipment, Tools and Materials:

- Hoof cutter
- Automatic squeeze table
- Trimming tools
- Sharp knife
- Hoof scatter
- Disinfect ant

Conditions:

- Trim hoof immediately after rain or heavy dew, because the hoof wall will be much softer and easier to trim.
- Animals can be allowed to stand in a wet area for 2 to 3 hours before trimming.

Procedure for hoof trimming:

step1. Properly restrain the animal.

Sheep: For small number of sheep, it is usually enough to tip the animal, and sit it on its rump, a position normally used for shearing

Goats: Goats can be trimmed while in a standing position. Hoof trimming is best done in a squeeze chute or by positioning or tying the animal next to a wall or fence and trim the hooves.

Options for restraining a goat in a position to trim front (1 and 2) and back hooves (3)

Step 2. Observe the color and check the smell of the hoof. A rotten smell is usually indicative of foot rot and appropriate treatment should be given.

Step 3. The next thing to do is to clean any mud, manure, small stones, etc., from between the walls of the hoof.

Step 4. The ends of the dewclaws can be the starting place for trimming. The tips of the dewclaws should be removed. It is important to remove small bits at frequent intervals to avoid bleeding as a result of cutting too short. Cutting the ends of the dew claws

Step 5. It is always advisable to begin by removing very small pieces of hoof wall and toe. The toe and outside hoof wall are trimmed down to where fresh sole can be seen (stop when the sole looks pink) and the bottom of the foot is parallel to the line where the hair stops known as the coronary band.

Step 5: The inside wall of the foot should normally be trimmed a little bit lower than the outside.

This allows most of the animal's weight to be on the outside hoof wall where it should be placed naturally.

Operation Sheet # 5	Techniques Applying Identification of Dairy animals

Procedures applying for Identification of dairy animal

1. **Ear notching**

Procedures for Identification by ear notching

Step1. Prepare appropriate PPE

Step2. Restrain the animal properly

Step3. Have ear notching equipment

Step4. Apply safely and humanely

Step5. Apply antiseptic

Step6. Release the animal

2. **Ear tagging**

Equipments

- ♣ Ears tag applicator
- ♣ Plastic materials
- ♣ Crush and PPE

Procedures to follows

- ➢ Wear PPE
- ➢ Restrain the animal
- ➢ Prepare ear tagging equipment
- ➢ Apply ear tag quickly and humanely
- ➢ Release the animal

3. **Tattooing**

- important equipment
  - ♣ Pliers
  - ♣ ink (color)
  - ♣ crush
  - ♣ PPE

- Procedures for tattooing
  - Put on PPE
  - Restrain the animal
  - Apply pliers(needle)on recommended area
  - Apply(rub) ink on pierced area
  - Complete and release the animal

4. Branding

A. Hot branding

Important equipments

- iron
- Crush
- PPE

Procedures for hot branding

- Put on PPE
- Restrain the animal
- Prepare hot iron
- Select appropriate place for branding considering the quality hide
- Put hot iron on skin for 3 sec
- Apply antiseptic
- Release the animals

B. Freeze branding

- Using freeze iron for animal identification
- Procedures of freeze branding
- Put on PPE
- prepare liquid coolant with -106^{oc} or -157
- Immerse copper iron in liquid coolant for 20min
- Restrain the animal
- Clip hair from branding area
- Soak clipped area with the same solvent of liquid coolant
- Re-soak and apply branding iron firmly for 30-35sec(based on animal age)
- release the animal

Operation Sheet # 6	Techniques for castration of dairy animals using sharp knife

Procedures of dairy animal's castration using sharp knife

Step1.Use a very sharp knife, razor or scalpel.

Step2 Check that the knife, razor or scalpel is very sharp and clean. Clean the blade with a disinfectant such as alcohol, iodine, Dettol or gentian violet.

Step3 Use warm water and soap to wipe the scrotum and wash your hands.

Step4 Cut the bottom end of the scrotum. Squeeze the testicle above the cut end of the scrotum and it will come out.

Step5 Pull each testicle out as far as possible, twist the testicular cord around several times. Cut the cord in cattle and buffalo by scraping the knife slowly up and down. Pull to sever the cord in lambs and kids.

Step6 Do not put your fingers inside the open scrotum. Put either tincture of iodine, gentian violet, Dettol or antibiotic powder on the wound.

Operation Sheet # 7	**Techniques for castration of dairy animals using Elastrator rings**

Procedure of castration using Elastrator rings techniques:

Step 1 Put a rubber ring around the four teeth of the elastrator and squeeze the handle. The rubber ring will be stretched open.

Step 2 Pass the scrotum of the animal through the ring making sure that it goes over the two testicles.

Step 3 Release the elastrator and the rubber ring will tighten over the cords. After two weeks, the scrotum will fall off.

Operation Sheet # 8	Techniques for castration of dairy animals using Burdizzo

Procedure follow using burdizzo castration of dairy animals

Step1 Feel the scrotum with your hand and you will feel the two rope-like testicular cords inside.

Step2 Take the Burdizzo in your right hand and with your left hand push the cord to the side between the jaws of the Burdizzo and squeeze hard.

Step3 Now take the Burdizzo in the left hand and crush the other cord.

Step 4 Leave the instrument closed for 15 to 20 seconds. Make sure you can feel the spermatic cord in the jaws of the emasculator before and after it is closed.

Step5 Open the jaws and move the instrument about 2cm lower and crush the other side of the scrotum.

Operation Sheet # 9	Estimate age of dairy cattle by teeth

Procedure of cattle age determination by teeth

Step1 Wear appropriate PPE before starting the operation

Step2 Properly restrain the animal

Step3 Properly hold the animal

Step4. Observe number of permanent teeth

Step5 Release the animal

Step6 Estimate the age of cattle

Operation Sheet # 10	Estimate age of cattle by horn

Procedure of cattle age determination by thorn

Step1 Wear appropriate PPE before starting the operation

Step2 Properly restrain the animal

Step3 Properly hold the animal

Step4 observe number of rings formed horn

Step5 cunt the ring number

Step6 calculate the number based on the formula N+2=age

Step7 final convert the number of ring to age

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 28 hour.

Task1. Identify, cheek and maintain materials tools and equipment

Task2. Follow instructions and directions during dairy animal husbandry practices

Task3. Apply dairy animals restraining techniques

Task4. Provide feed and water to dairy animals

Task5. Treat of bloating problems

Task6. Assist animal in abnormal parturition

Task7. Undertake Castration of dairy animals

Task8. Under take hand milking procedures

Task9. Undertake Dehorning of dairy animals

Task10. Undertake hoof trimming

Task11. Operate Shearing activities

Task12. Apply Identifications

Task13. Carry out dental age estimation of dairy animals

Task 14.carry out horn ring age estimation of dairy animals

List of Reference Materials

- Small holder dairy farming manuals.
- https://www..dairy knowledge. Determining age of an animal dairy portal.
- http://vikaspedia.in/agriculture/livestock/general-management-practices-of-livestock/animal-breeding#section.
- http://agritech.tnau.ac.in/animal_husbandry/animhus_cattle_AI.html
- Literature Review on the Welfare Implications of the Dehorning and Disbudding of Cattle (July 15, 2014).
- Handbook of Good Dairy Husbandry Practices.
- Smallholder dairy farmer training manual.

Dairy production

Level-II

Learning Guide-26

Unit of Competence: Assist Basic Husbandry Practice of Dairy animals

Module Title: Assisting Basic Husbandry Practice of Dairy animals

LG Code: AGR DRP2M06 LO3-LG-26

Code: AGR DRP2TTLM 1219v1

LO 3: Handle and clean materials and equipment

Instruction Sheet	Learning Guide # 26

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

- Handling waste material
- Handling and transporting materials, tools and equipment
- Reporting problems or difficulties in completing work
- Cleaning, maintaining and storing materials, tools and equipment

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:

- Handle waste material
- Handle and transport materials, tools and equipment
- Report problems or difficulties in completing work
- Clean, maintain and store materials, tools and equipment

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 7.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3, & Sheet 4”.
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” **in page -100, 102, 105 and 110** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, and Operation Sheet 2” **in page -111 and 112.**
6. Do the “LAP test” **in page – 113** (if you are ready).
7. Then processed to the next learning guide

Information Sheet-1	Handling waste material

4.1 Waste management

Conventional, biologic, and hazardous waste should be removed and disposed of regularly and safely. There are several options for effective waste disposal. Contracts with licensed commercial waste-disposal firms usually provide some assurance of regulatory compliance and safety. On-site incineration should comply with all federal, state, and local regulations.

Adequate numbers of properly labeled waste receptacles should be strategically placed throughout the facility. Waste containers should be leak proof and equipped with tight-fitting lids. It is good practice to use disposable liners and to wash containers and implements regularly.

The Waste material includes in dairy farm production are:

- Broken rearing and farm items
- Broken rearing and farm items
- Plant debris
- Plastic, metal and paper-based materials
- Dung and urine and Spoiled milk

There are different ways of avoiding those waste materials from our farm area.

- The first way is recycling that waste material in a usable form. For example that of dung and urine of the animal can be used as fertilizer for crop production and as source of power by constructing biogas tank
- The second way is that of returning waste material such as old iron, thin, metal and plastic to manufacturers.
- The third way is that of re using waste material.

Creating clean and safe work place

Sanitation or clean working area is a must for efficient cattle production because dirty or unclean work area can be possible reason of disease for both animal and stock owner. Due to the reason of this our work must be cleaned on a regular time of interval. Every task must be under taken in accordance with OHS requirements (regulations/codes of practice and enterprise safety policies and procedures) to create safe work area.

Self-Check -1	Written Test

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

1. What are the major waste material in ruminant farm?(5pts)
2. What do you think the importance of creating clean working area for producer (2pts)
3. Write the methods to avoid wastes of dairy animals from the farm. (3pts)

Note: **Satisfactory rating - 10 points** **Unsatisfactory - below 10 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

2._____

_____

3._____

_____

Information Sheet-2	Handling and transporting materials, tools and equipment

2.1. Handling Material, tools and equipment

It is any tool used to aid in the movement, protection, storage, and control of materials and products. The equipment used to do so can be broken down into four main categories. Each category has a wide variety of useful equipment that makes safely moving heavy materials or large volumes of materials easier.

2.2. Storing materials, tools and equipment's

The title of this equipment category is pretty self-explanatory. Storage equipment is used to hold materials while they wait to be transported from the manufacturer or wholesaler to their final destination. Having the right storage equipment can increase efficiency on the production floor and maximize space utilization- two very important factors in any production environment

Safe storage of materials and equipment is essential for many businesses, such as construction job sites, laboratories, and other locations that handle chemicals, flammable gases and other hazardous materials. Storage methods and procedures are regulated for many such items; when in doubt it is always best to be cautious to prevent accidents. Locking storage cabinets and restricting access to storage areas will prevent unauthorized handling of stored items and minimize the possibility of theft.

Self-Check -2	Written Test

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

1. Why you need to handle all dairy farm materials, tools and equipments. (4 points)
2. Write the purpose of properly storage of dairy farm materials, tools and equipments.(6 points)
3. List out the types of referral service providers. (10 points)

Note: **Satisfactory rating - 10 points** **Unsatisfactory - below 10 points**

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

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

2._____

_____

Information Sheet-3	Reporting outcomes in completing work

What is reporting?

- A report is a document that presents information in an organized format for a specific audience and purpose. Although summaries of reports may be delivered orally, complete reports are almost always in the form of written documents.
- Providing information about serious wrongdoing that you have become aware of at your workplace/ place of study. Reporting is about notifying concerning what you believe to be the discovery of breaches of laws and regulations, breaches of ethical norms or serious conditions which might harm individuals, the university, cooperative partners, or society as a whole.
- In modern business scenario, reports play a major role in the progress of business. Reports are the backbone to the thinking process of the establishment and they are responsible, to a great extent, in evolving an efficient or inefficient work environment.

The significance of the reports includes:

- Reports present adequate information on various aspects of the business.
- All the skills and the knowledge of the professionals are communicated through reports.
- Reports help the top line in decision making.
- A rule and balanced report also helps in problem solving.
- Reports communicate the planning, policies and other matters regarding an organization to the masses. News reports play the role of ombudsman and levy checks and balances on the establishment.

Employees have the right and, in some cases, duty to report wrongdoing at the institution, such as when there is a danger posed to life and health.

Examples of situations where employees need to speak out:

- Defects or shortcomings which could lead to a danger posed to life or health
- Breaches of professional and research-oriented ethical guidelines

- When fellow students or colleagues are bullied, harassed (including sexual harassment) or discriminated against in connection with their work at workplace
- Drug use or other forms of problematic addiction
- Environmental crime
- Activities which could damage property or infrastructure

Reporting regarding conditions which are only of internal or personal interest, for example internal personal conflicts in which the employee can be considered to be a part of the conflict, shall be dealt with in accordance with workplace guidelines for managing conflict. Any difficulties or problems should be report for the concerned body or supervisor with format given by the organization. Report can be regular or scheduled (like annual report, have year report, quarter year report, monthly report, weakly and daily report) and emergency report (report where emergency or uncertainty occur).

Self-Check -3	Written Test

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

1. What is report? (2pts)

2. Mention the significance of the reports? (2pts)

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

2._____

_____

Information Sheet-4	Cleaning, maintaining and storing materials, tools and equipment

4.1. Aspect of cleaning

The arrangements for cleaning equipment that comes in contact with products are an essential part of a food processing plant. It must be kept in mind that food manufacturers are always obliged to maintain high hygienic standards; this applies both to the equipment and, naturally, to the staff involved in production.

4.1.1. Objectives of cleaning

Talking about cleaning results, the following terms are used to define the degree of cleanliness:

- Physical cleanliness – removal of all visible dirt from the surface
- Chemical cleanliness – removal not only of all visible dirt but also of microscopic residues that can be detected by taste or smell but are not visible to the naked eye
- Bacteriological cleanliness – attained by disinfection
- Sterile cleanliness – destruction of all microorganisms

It is important to note that equipment can be bacteriologically clean without necessarily being physically or chemically clean. However, it is easier to achieve bacteriological cleanliness as a matter of routine if the surfaces in question are first rendered at least physically clean.

In dairy cleaning operations, the objective is nearly always to achieve both chemical and bacteriological cleanliness. The equipment surfaces are therefore first thoroughly cleaned with chemical detergents and then disinfected.

Cleaning procedures

If you live on a dairy farm, you know that milking equipment is expensive and needs to be maintained. Cleaning dairy equipment helps ensure a better quality milk. It also helps maintain the lifespan of your milking equipment. With the help of Blain's Farm & Fleet, you can learn how to clean out your dairy equipment on the farm. With some supplies and these three steps, your dairy equipment will be ready to go.

Cleaning operation must be performed strictly according to carefully worked out procedures in order to attain the required degree of cleanliness. This means that the sequence must be exactly the same every time.

The cleaning cycle in dairy comprises the following stages.

- Recovery of products residues by scraping , drainage and expulsion with water or compressed air
- Pre-rinsing with water to remove loose dirt
- Cleaning with detergent
- Rising with clean water
- Disinfection by heating or with chemicals agents (optional): if this step is included, the cycle ends with a final rise if the water quality is good.

4.2. Practically Maintain Farm Tools and Equipment

Farm tools and equipment help to make farm work easier and effective. There are very many of them designed to do one all a number of functions. The design and shape of the tools and equipment should be given proper attention if they are to do their function for which they were made. This brings to mind how to effectively maintain farm tools and equipment.

4.2.1 Importance of maintain farm tools and equipment

Maintaining farm tools and equipments can have the following purposes. Like:

1. They last longer when maintained.
2. Tools and equipment that are maintained work more efficiently.
3. When you keep tools and equipment in good shape, you reduce the risk of injury to the operator.
4. Regular maintenance reduces the cost of maintenance.

4.2.2. Methods of Maintain Farm Tools and Equipment

1. Sharpen tool before and after use.

When you sharpen tools it reduces the amount of force you need to apply to accomplish the task. Blunt tools may break when being used

2. Oil or grease metal parts.

This will prevent rusts of metal parts of tools and equipment. Oiling the movable parts makes the tools easy to work with. It also increases the efficiency of the tool or equipment.

3. Wooden handles should be strong.

Make sure tools with wooden handles are strong and durable. If there is any defect, replace them.

4. Hang your garden tools.

Keep your tools hanged. Leaving them on the floor can cause rusts as they may come in contact with moisture. Leaving tools on the floor may cause injury to persons or persons stepping on them may break or deform them, causing them to be unsuitable for work.

5. Store tools in their original cases.

Some tools and equipment come in their special cases to keep them protected for damage. Make sure to clean and keep them in their original cases.

6. Use silica gel packs.

Silica gel helps to keep tools dry in their cases. Use silica gel to prevent rust of tools and equipment with metal parts.

7. Dry Tools after Use

After using tools or equipment, clean and make sure they are dried before packing or hanging them. This will prevent them from rusting.

As much as tools and equipment at vital to accomplishing tasks on the farm, it is important to always keep them ready for work.

4.3. Storing materials, tools and equipment's

Safe storage of materials and equipment is essential for many businesses, such as construction job sites, laboratories, and other locations that handle chemicals, flammable gases and other hazardous materials. Storage methods and procedures are regulated for many such items; when in doubt it is always best to be cautious to prevent accidents. Locking storage cabinets and restricting access to storage areas will prevent unauthorized handling of stored items and minimize the possibility of theft.

General Plan

Create a plan for storing all equipment and materials at your site. Assign a specific location to each item or type of item and label the space accordingly. Make certain that work areas and walkways are kept clear of all stored items. Use tape or paint to identify

such areas on the floor of a large area, such as a manufacturing facility. In an office, laboratory or similar smaller setting, use cabinets with doors that close securely. Always leave at least 1.5 feet between the top of stored items and fire sprinklers, if present. Make sure that all stacks are solid and secure them whenever possible.

Flammable Materials

Materials that are highly flammable require special handling. Gases such as propane and butane must be kept in pressure-safe containers with appropriate labels. Flammable gases are to be kept in a separate, well-ventilated area. According to the Occupational Safety and Health Association, flammable liquids such as gasoline and kerosene must be stored in approved containers located away from other flammable materials. These can be stored only in a specially constructed room that is able to contain a fire for one to two hours. Keep flammable materials 50 feet away from sources of heat or flame.

Chemicals and Other Hazardous Materials

All chemicals, including cleaning materials, should be kept in their original containers or in properly labeled containers of an appropriate type. Every workplace that uses chemicals of any type should have a book containing all material data safety sheets, and the book must be kept where it is easily accessible. Chemicals must be stored where there is no public access and where tipping or breaking can't happen, such as secure shelves inside a locked cupboard. The cupboard must be labeled with the type of materials it contains.

Machinery and Equipment

Machinery such as forklifts such must be kept in a safe location where it is protected from unauthorized access, weather and accidental damage. It must be kept away from driveways, walkways and other areas where access is required. All equipment should be turned off when not in use. If there is a chance of oil, hydraulic fluid or other liquids leaking from the vehicle while it is stored, use a drip pan underneath it to catch any spills. Check the area frequently for such leaks and clean them up immediately if any are found, as these represent significant fall hazards for employees.

Remember*:* always after work was accomplish clean, maintain and store on their original place of materials tools and equipment.

Self-Check -4	Written Test

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

1. What is the objective of cleaning? (2pts)
2. Discus about methods of cleaning? (2pts)
3. Discuss Methods of Maintain Farm Tools and Equipment? (3pts)

Note: **Satisfactory rating – 12 points** **Unsatisfactory - below 12 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1._____

_____

2._____

_____

3._____

_____

Operation Sheet 1	**dispose waste material**

Procedures for disposal of waste materials

Step1. Put on appropriate PPE

Step2. Prepare waste disposal materials tools and equipment

Step3. Identify disposable materials with returning material

Step4. Collect waste materials properly

Step5. Dispose waste on designated waste disposal area.

Operation Sheet 2	Cleaning materials, tools and equipment’s

Procedures for Cleaning materials, tools and equipment’s

Step1. Put on appropriate PPE

Step2. Prepare cleaning materials

Step3. Wash the equipments by water

Step4. Apply suitable detergents for the type of waste present on the equipments

Step5. Rinse the equipments

Step6. Dry the cleaned equipments by towel or heat

Step7. Return or store the equipments on their original place.

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

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

Task1. Dispose waste material properly

Task2. Clean materials, tools and equipment's

Task3. Maintain materials, tools and equipment's

Task4. Store materials, tools and equipment's

Task5. Prepare report for your work

List of Reference Materials

- https://blog.agrihomegh.com/effectively-maintain-farm-tools/
- https://www.farmandfleet.com/blog/how-to-clean-dairy-equipment/
- Dairy processing hand book. Chapter 21, cleaning dairy equipment.
- Dairy Farmers Training Manual, Ministry of Livestock Development, Nairobi, Kenya 2012.
- Pashu sakhi Handbook http://vikaspedia.in/agriculture/livestock/general-management-practices-of-livestock/feed-and-water-for-ruminants
- https://bizfluent.com/how-7576502-store-equipment-materials-safely.html
- https://en.wikipedia.org/wiki/Maintenance_(technical)
- https://www.uia.no/en/about-uia/speak-up/hvordan-varsle/what-is-reporting