Animal production Level III

Based on March 2018,

Version 3 Occupational standard

Module Title: Assisting (Performing) Dairy Cattle Production Activities

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East Africa Skills for Transformation and Regional Integration Project (EASTRIP)

Table of Contents

LG #42-LO #1 - Assess husbandry practices of dairy cattle

Instruction Sheet

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

- Checking e*quipment and materials* for feeding and watering of *dairy cattle*
- Carrying out *record keeping* of dairy cattle
- Performing animal housing, sanitation, feeding, identification, dehorning and fencing
- Managing dairy cattle when dry off period
- Controlling potential and existing *OHS*

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

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

- Check e*quipment and materials* for feeding and watering of *dairy cattle*
- Carrying out *record keeping* of dairy cattle
- Perform animal housing, sanitation, feeding, identification, dehorning and fencing
- Manage dairy cattle when dry off period
- Control potential and existing *OHS*

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 1 to 6.
3. Read the information written in the “Information Sheet (1, 2, 3,4 and 5) in page 3,7,11,22 and 25 respectively
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check 4 and Self-check 5” in page, 6, 10, 21, 23 and 27 respectively.
5. If you earned a satisfactory evaluation proceed to operation Sheet 1 in page 28.
6. Do the “LAP test” in page 29 (if you are ready). Request your teacher to evaluate your performance and outputs. Your teacher will give you feedback and the evaluation will be either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work

Information sheet 1 - Checking e*quipment and materials* for feeding and watering of *dairy cattle*

1.1. Definition of terms

Dairy: - is a place where milk produced and sold

Dairy farm:- is a farm that produces milk and milk products

Dairy farming:- is the business of a dairy farm

Dairy cattle:- are cattle that raised primarily to produce milk and milk product

Dairy Cow:- Refers to the animal provide milk

Milking Cow:- Refers to cows actually giving milk/lactating

Newborn:- usually around 6-to-10 weeks of age calf

Weaned Animals:- A young calf that is removed from being fed milk

Dry Cows:-Non-lactating pregnant cows from the end of lactation until next parturition.

There are Different breeds of dairy animals

- **World dairy cattle's are:**
  - ✓ Ayrshire, Guernsey, Holstein-Friesian, Jersey, Short horn and Brown Swissetc
- **Ethiopian Dairy cattle type:**
  - ✓ There are many local cattle types/breeds in the country, which vary in size and colour.
  - ✓ All are grouped in to *Bos indicus.*
  - ✓ Adapted to tropical environment through natural selection. Some of them are:
    - ❖ Horro (dominating Western part of the country around Horro in Wollega)
    - ❖ Boran (Dominating Southern part of the country around Borena)
    - ❖ Fogera (Northern part of the country around Fogera)
    - ❖ Berca (Northern part of the country around Eritria, Tigray and Gonder)
    - ❖ Arsi-Bale (Dominate the highlands of central region of Arsi and Bale)

In general, indigenous cattle are multipurpose in their function i.e., meat, milk and draft

The main reasons for farmers to keep dairy cows are:

- Source of food (milk, milk products and meat)
- Income: from daily milk sales and stock sells.
- Resource utilization: crop residues, 'roadside' grasses and labour
- Manure: the availability of manure and the opportunity to make compost.
- Investment: prevents devaluation of your money and is good insurance.
- Animal power (draught power)
- Hides and skins
- Cultural

1.2. Checking e*quipment and materials* for feeding and watering of *dairy cattle*

Livestock feeding and handling equipment are used to care for the needs of your animals by providing continuous access to water & feed and keeping their living areas clean. Proper feeding and manure handling is important not only for animal health, comfort, and well-being but to reduce illness, disease, and parasites.

Water is the most important nutrient for dairy cattle. Dairy cattle need free access to a clean, quality source of water for optimal production. Water intake is affected by factors such as environmental temperature, ration dry matter content and milk production. A high-producing lactating dairy cow can drink up to 150 litres of water on a hot day. One important, but often overlooked, aspect of nutrition is the quality of water – this might include the presence of potential contaminants, the ultimate levels of these contaminants and most importantly, the impact they have on the cow's water intake.

Some equipment required for manage dairy cattle are:

- Milk harvesting equipment
- Milk cooling and refrigeration equipment
- Emergency drive source equipment
- Yard washing equipment
- Waste management system equipment
- Feeding equipment

- Watering equipment
- Dairy herd drenching equipment
- Teat spray equipment
- Hot water service
- Fly control systems.
- Milk processing equipment

Fig 1. Trough

Self-check 1- Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below.

1. Why you are checking the materials and equipments of waterer and feeder?(3pts)
2. List the most known Ethiopian dairy cattle breeds. (4pts)
3. What is the difference between milking and dry cows?(3pts)

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

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

Information sheet 2 -Carrying out *record keeping* of dairy cattle

2.1 Introduction

A farm record is a document that is used to keep account of different activities, events, materials etc. Information about animals, inputs and prices are very useful management tools. Recording and administration on the farm are important but should be kept simple and effective. It should provide information on the farm's economic situation, production aspects and cash flow. Technical information, like amount of concentrates fed, gives important management information when combined with prices and costs. Records about fertility, calving interval and disease are the basis for management decisions. Technical and economic records can be combined and provide both the farmer and the extension officer with the required information about the actual situation on the farm and possible developments. Some record Information are:

2.2. General Farm Information

- Farm name
- Owner, address, contact details
- Related Government Organizations
- Consultants, experts, vets

Individual cow card information

- EARTAG with birth date and breeding info if possible
- Name
- Birth date
- Breeding info (father + mother)
- Culling date and reason

Reproduction:

- Heats (start from month 13),
- Inseminations (date, bull, time after standing heat) BCS at insemination
- How is the feeling of uterus, cervix, womb
- Pregnancy results PD
- Abortions
- Goal: calving at 2 years,

Every **Calving:**

- Birth Date

- Birth specifications, heavy, length, vet needed
- Udder and teat condition
- Calf condition
- Cow condition, BCS, eager, active, feed intake
- Placenta
- Length of pregnancy (+/-278 days)
- Calving interval (year)

Lactation:

- Daily milk production
- Total milk production per 305 days and in total
- lactation Composition of milk
- Somatic Cell Counts (SCC), mastitis
- Health/sickness/treatment
- Vaccinations
- Reproduction info
- Drying off, dry period 6 – 8 week

Frequently scoring of the herd/farm:

- Herd size, culling, groups, ages
- Selling of bull calves
- General health, outward (wounds, injuries)
- Average calving age heifers (cost of feeding calving at
- 2.5 years, spent it on feed during year 1) Average calving interval
- Inseminations, (+/-2), interval (days) calving first heath
- BCS
- Feed signals; manure score, rumen
- Hygiene; udder score
- Milk quality delivered

Financial records

All activities on a farm are geared to raising an income for the farmer and his family. It is crucial to keep track of the money coming in and going out. So it is a simple system of income and expenditure will give much insight into the situation and will enable the farmer to make the right decisions.

H**ealth records**

Up to date written health records and field records are required for certification. Keeping records of all health problems and prevention practices can help to graduate from a crisis treatment pattern to good prevention management. Record keeping requirements include: - Health Records- condition of the sick animal and all treatments used.

Feed Records

The important feeding records are:

- Produced and available fodder on farm; quantity and quality of the different feeds.
- A feeding plan which tells how much feed is required per day per animal in different age groups
- Left-over feed if any (per head and per feed, if possible)
- Spoilage (per batch)

Self-check 2-Written test

Name…… ID…… Date…….

Direction 1. Choose the best answer from the given alternative

1. What is the importance of dairy farm record keeping?

A. Use as a mirror of the farm

B. It is the source of information

C. Use for decision making

D. All

Direction 2: Answer all the questions listed below.

1. How dairy farm employees Confirming safe in dairy farm operation activities ?(5pts)
2. Mention types of farm record and explain the importance (5pts)

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

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

Information sheet 3 -Performing animal housing, sanitation, feeding, identification, dehorning and fencing

3.1. Introduction

It is important to provide clean and comfortable housing facilities to the dairy animals for their proper growth and optimum productivity. The mulch animals should be protected from extreme weather conditions of summer, winter, scorching direct sunrays and winds by providing proper animal sheds. During summer, the animals suffer from heat stress and they become restless. Sweating and panting, to some extent helps them cool their bodies. Reduced feed intake of the animals 'results into decreased milk production.

3.2. Daily Activities of an Average Cow:

• Eating: 4 – 6 hours (9 – 15 meals)

• Lying down: 12 – 14 hours

• Social interaction: 2 – 3 hours

• Ruminating: 7 – 10 hours

• Drinking: 0.5 hour

• Others like milking: 2 – 4 hour

3.3. Basic Principles of housing of Cow

1**. Cow Comfort**

(a) Feed and water: access to palatable feed of the right composition and clean water.

(b) Light: all animals need to experience a day-night rhythm..

(c) Air: all animals should continuously breathe fresh air.

(d) Rest: all animals prefer to lay down 12 – 14 hours

(e) Space: all animals should be able to walk around comfortably

(f) Health: no animals should be suffering from wounds, infections or diseases.

2. Flexibility and expandability:-Simplicity of the design and set up are very important.

3. Simple, strong and economical:- The barn and support structures should be functional and durable for the estimated number of years.

4. **Optimization of movements/flows and labour efficiency**

(a) Feed flow: movement of all feed ration components

(b) Manure flow: movement of manure/urine and dirt from cleaning of floors

(c) Cow flow: movements of all animals during their lives.

(d) People flow: movements of people during all the work in and around the barn.

(e) Material flow: storage, use, handling, maintenance and disposal

(f) Information flow: how information is registered and transferred

3.3.1 Basic requirements

- Comfortable and healthy environment for the cows
- Good hygienic conditions for optimal milk quality
- High labor efficiency and good working conditions
- Investments economically justified and cost-effective
- Design adapted to local conditions - Expansion with minimum investments possible

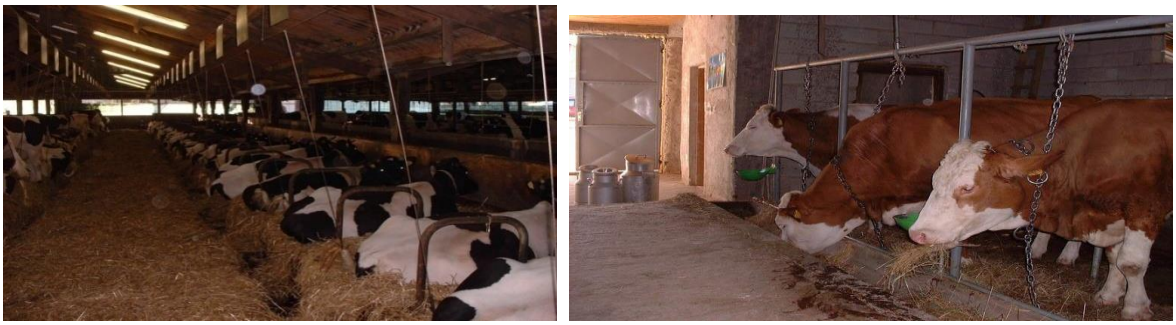


Fig 2 .Housing of Dairy Cattle

3.3. 2. Sanitation of Dairy farm

A cleaning and sanitizing program is a system that the dairy farm has in place to ensure that premises and equipment are effectively cleaned and sanitized at the appropriate times. Using the appropriate chemicals and dosage levels. The cleaning and sanitizing

program is documented within the dairy safety program and should include the following information:

• Cleaning and sanitizing procedures for the premises and equipment

• Frequency of cleaning

• Personnel responsible for each task

• Cleaning equipment

• Records to indicate that cleaning was carried out (for example daily check list)

• Corrective actions to be taken and records of these actions when they occur

3.3.3 Construction of dairy cattle house for the better animal welfare

Sufficient area should be available to all categories of animals. The floor should be sloped sufficiently for effective drainage.

- The partition of individual calf pen should be used to not mix each other.
- Adequate ventilation, effective temperature and humidity to be ensured
- The space allowances for cattle housed in group should be calculated in relation to the total environment, the age of stock and the size of group.
- The group size should not exceed more than 50-60 and preferably be 35 to 40 per group.
- When the cattle are fed in group there should be sufficient feeding space

Systems of Housing

- There are **two** systems of housing of cattle;

1. Loose housing system
2. Conventional housing systems

Loose Housing System

- Loose housing is defined as a system where animals are kept loose except at milking and at the time of treatment.
- The system is most economical.

- Animals are kept in an open lot or on pastures and are not bound except at the time of milking.
- One common manger and a common water tank can be provided for these animals.
- Concentrates are fed at the time of milking

Advantages of loose housing system

- The construction cost is less and economical.
- More flexible and easily extended to accommodate more number of animals
- Animals move freely/comfortably and can eat or drink as and when they desire.
- Heat detection is easy and efficient.
- Feeding, watering and cleaning operation can be done with the minimum labour requirement.

Disadvantages of loose housing system:

- Individual feeding attention is not possible.
- Health management is not adequate.
- Disturbances during heat period (oestrus) are encountered by fellow animals

Conventional housing system

- Animals are confined together on a platform, secured at neck by stanchion.
- The cows are fed as well as milked in this barn. The barn is completely roofed and the wall also complete windows or ventilators located at suitable places.

Fig 3.Well dimension and comfortable conventional house

There are two option of conventional housing system

Fig. 4.tail to tail house system

(1) Tail to tail system

The animals do not face each other. The manger & feeding passage is separated and the cleaning passage is common.

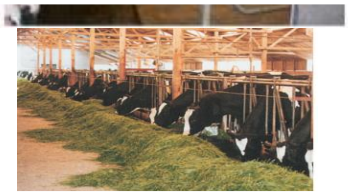


Fig. 5 .Head to head house system

(2) Head to head system:

They face each other. Manger may be common or separate (with feeding passage

3.3.4. Recommended Best Practices of Dairy Animals of Housing

- Provide bedding even when using mattresses
- Provide flooring with good traction to prevent slipping and falling
- Provide non-abrasive flooring material
- Provide soft, high traction flooring in areas where cattle stand for long periods
- Provide restraint facilities for ease of management and handling
- Provide opportunities for all cattle to exercise daily, if weather permits
- Inspect cattle for injuries that indicate hazards in barns
- Observe animal walking patterns and monitor gait scores
- Repair housing defects (e.g., broken stall partitions, concrete or other protrusions)

- Design facilities to allow for easy moving and grouping of animals.

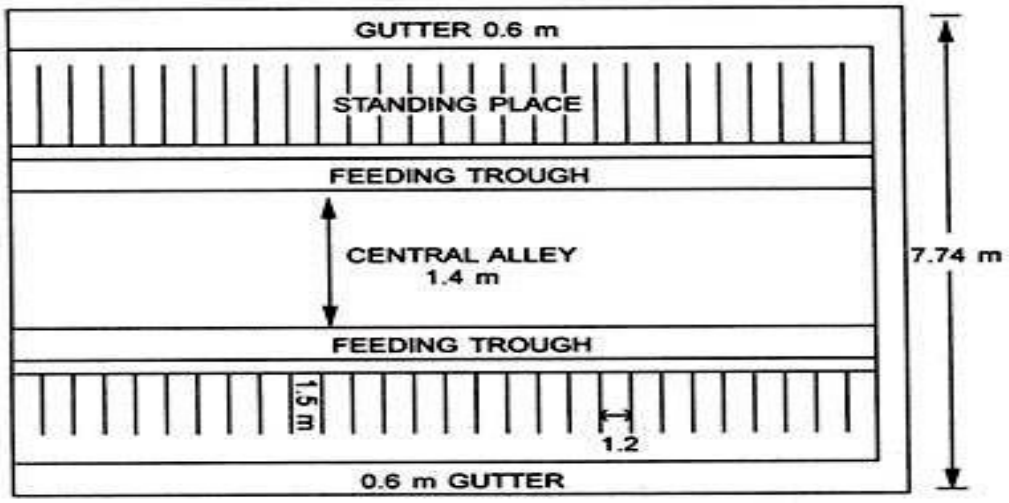


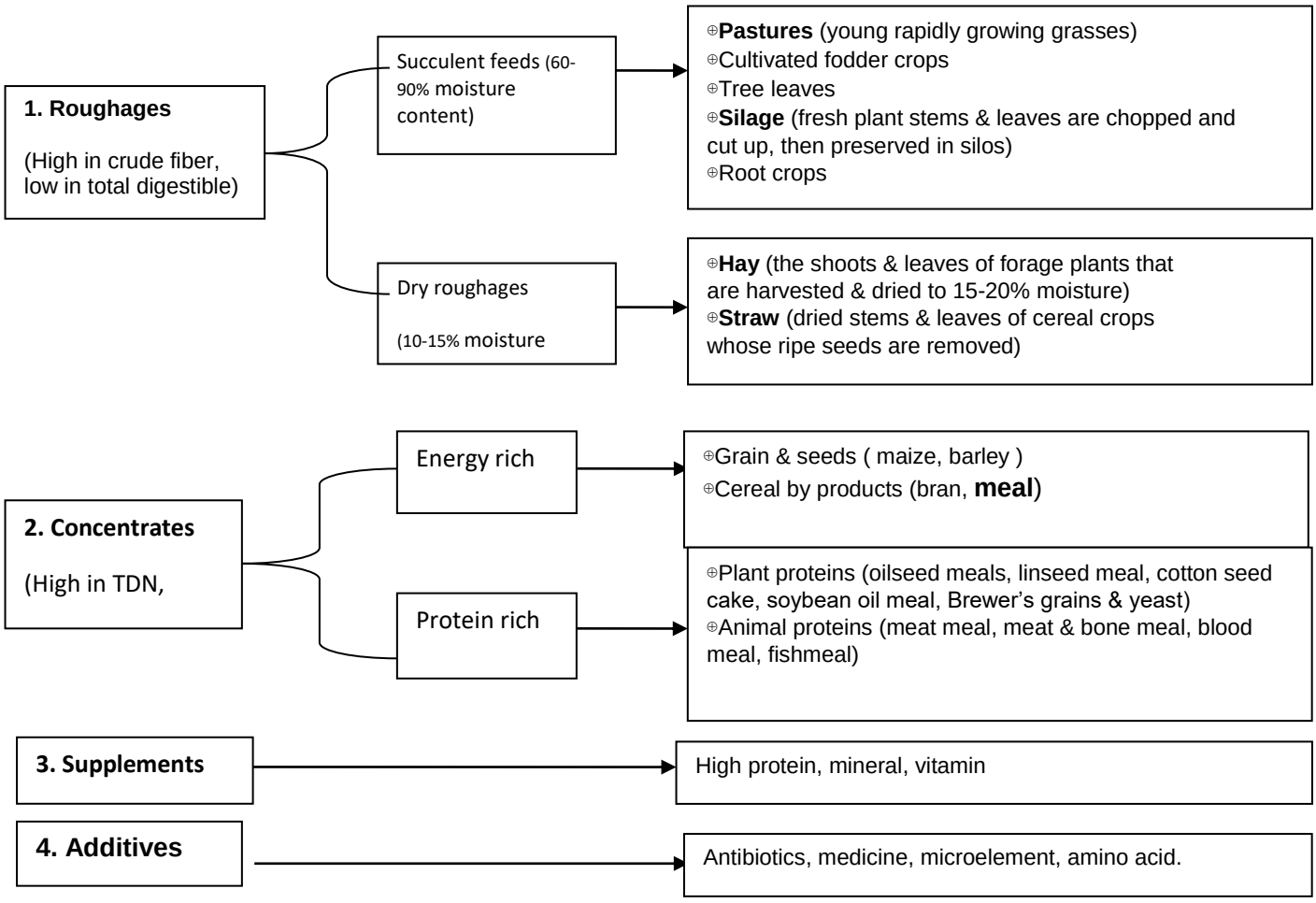
Fig 6. Layout of internal hose

3.4. Feeding of dairy animal

Animal feed is food given to domestic animals, especially livestock, in the course of animal husbandry. Feed is an important input to animal production and is the main cost of the raising animals.

Composition and classification of feedstuffs

Dairy cattle feeds are generally classified according to the amount of a specific nutrient they furnish in the ration. They are divided in to two general classes –roughages and concentrates



In order to properly store animal feeds correctly 1st understanding the type of animal feeds: like roughage, concentrate, hay, silage, treated straw, UMB, industrial by-products, agricultural by-products and feed additives.

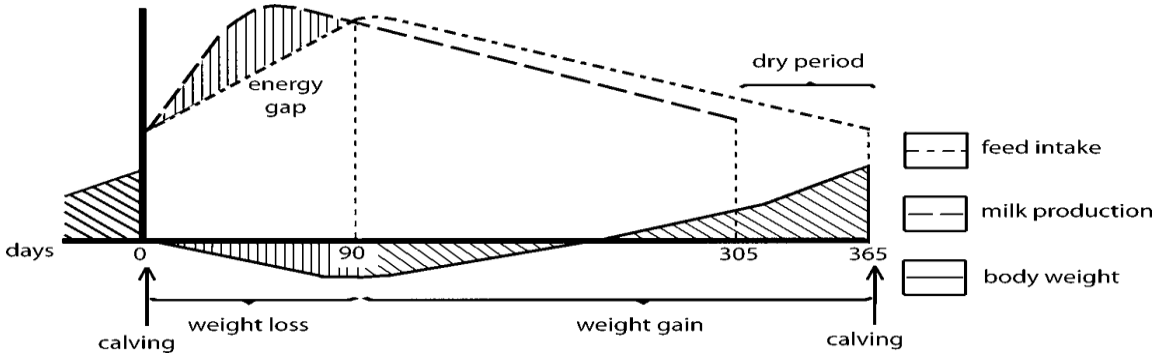


Fig 7. Lactation curve, DM intake and Body Weight

3.5. Identification

Animal identification is the process done to identify and track specific animals. It is done for a variety of reasons including verification of ownership, biosecurity control, and tracking for research or agricultural purposes.

Applying Identifications

Identification is necessary for efficient production of animals.

Fig 8. Ear tag applicator

Animal identification is divided into two:-

1. Temporary identification
   - Lasts for short period of time
   - Not stay throughout animal life
   - cutting brush of animal tail
   - Color Marks like pain

2. Permanent identification: Stays throughout animal life. E.g.

- Ear notching
- Ear tagging
- Tattooing
- Branding

Branding (Hot iron): - brand for a short time on the legs so as not to spoil skin.

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.

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

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

Fig 9. Calf identification

3.6. Dehorning of Dairy Cattle

Dehorning:- is the process of removing the horns of **livestock**.

Disbudding:- is a different process with similar results; it cauterizes and thus destroys horn buds before they have grown into horns.

3.7. Fencing of Dairy Farm

Fencing:- is an essential component of livestock management, for the demarcation of boundaries, improved appearance and security.

Important points:-

- Grazing management is the practice of taking the animals to the feed instead of bringing the feed to the animals. Effective fencing is critical to managing the needs of the animals and the pastures to meet long- and short-term grazing management goals.
- Effective fencing help to control animal movement.

Self-check 3-Written test

Name…… ID…… Date…….

Direction 1. Choose from the given altenatives

1. **Which one is effective in utilization of man power**
   - **A. Face to face housing system**
   - **B. Tail to tail housing system**

2. One is the major cost in dairy farm

- **A. Water**
- **B. Medicine**
- **C. Feed**
- **D. AI service**

Directions 2: Answer all the questions listed below.

1. What is the importance of record keeping in dairy farm?(3pts)
2. What are the major types of records in dairy farms?(4pts)
3. Write the characteristic good data records should have exists.(3pts)

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

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

Information sheet 4-Managing dairy cattle when dry off period

4.1 Introduction

Drying off:- When the cow abruptly end milk secretion and to seal the teat canal as quickly as possible. In many cases, dairy cows during dry period are the most forgotten group in a dairy cow unit.

The objectives of proper dry cow management are:

- Properly nourish the developing calf.
- Maintain optimum body condition.
- Prepare the mammary gland for the next lactation.
- Prepare the digestive tract for the next lactation.
- Minimize digestive, metabolic, and infectious diseases

4.2. Cows pregnancy and method of dry

Dry cows are those that are not producing milk. Most cows need a dry period between lactations. Good management during the dry period increases total herd profits. Accurate breeding records are needed to determine when the cow is due to calve. The lactation period begins with calving. The average gestation (length of pregnancy) for dairy cows is 283 days. A 10-day variation in gestation is considered normal. The cow should be dry for 45 to 50 days. The date to begin the dry period is calculated back from the projected date of calving. Conditioning for the dry period is done during the last few weeks of lactation. Body fat is replaced more efficiently during late lactation than during the dry period. Cows should not be too fat or too thin at the end of the lactation. Weight is controlled by adjusting the grain-to-roughage ratio. Give thin cows a higher percentage of grain than fat cows.

There are three ways to dry off the cow:

1. Stop milking her
2. Do not milk her out completely the last few days

3. Milk her every other day for several days

The first method is recommended in most cases. Milk left in the udder causes pressure that stops milk secretion. This helps the drying-off process. Do not feed grain or silage for 2 or 3 days. Reduce water and forage intake for 1 or 2 days. After the feed has been reduced for the recommended time, stop milking the cow.

4.3. Feeding the dry cow

• Two months (45 and 60 days) before the expected date of calving, the cow should be dried off.

- The feeding objective in this period is to ensure the cow is in good condition at the time of calving and the birth of a healthy calf.

• During the dry period, the cow requires nutrients to maintain its body, support the unborn calf and repair milk-producing cells of the udder in preparation for the coming lactation.

4.4. Importance of the dry period

- Cows need to go through the stage of dry period where these animals rest from the previous lactation, the breast is reconstructed and body condition is improved.
- If necessary lost body weight is regained. It is also the period during which the embryo grows with great pace.
- This allows the animal to maintain himself, to prepare for the next lactation and to meet the demands of pregnancy.
- It has been reported that two-thirds of the unborn calf growth occurs during this time

Self-check 4-Written test

Name…… ID……. Date…….

Directions: Answer all the questions listed below.

1. Write the advantages of Dehorning cattle.(5pts)
2. During construction of dairy cattle housing what are the points the farmers should be consider.(5pts)
3. Discuss the advantage and disadvantage of the two types of dairy house systems.(5pts)
4. What are the Recommended Best Practices of Dairy Animals of Housing?(5pts)

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

Note: **Satisfactory rating - 20 points** **Unsatisfactory - below 20 points**

Information sheet 5 -Controlling potential and existing *OHS*

5.1. Introduction

OHS is related to health, safety and welfare issues in workplace. Farming is one of the most dangerous occupations if not properly handle it Can reduce the risk of farm injuries and illness at farm by evaluating the risks and minimising them. Accidents can be prevented through better farmer and worker education, making sure equipment is well maintained and has adequate safety features, having safety procedures in place, and training every worker and family member about potential dangers.

Common hazards

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

- Animals – injuries inflicted by animals can include bites, kicks, crushing, ramming, trampling, and transmission of certain infectious diseases such as giardia, salmonella, ringworm and leptospirosis
- Chemicals – pesticides and herbicides can cause injuries
- Confined spaces – such as silos, water tanks, milk vats and manure pits
- Electricity – dangers include faulty switches, cords, machinery or overhead power lines
- Heights – falls from ladders, rooftops, silos and windmills
- Machinery – hazards include tractors without roll-over protection structures, power take-off shafts, chainsaws, augers, motorbikes and machinery with unguarded moving parts
- Noise pollution – noise from livestock, machinery and guns can affect
- Vehicles – crashes or falls from motorbikes, two-wheel and quad bikes, tractors
- Water –Dams, lakes, ponds, rivers, channels, tanks and creeks are all hazards, if mismanage
- Weather – hazards include sunburn, heat stroke, dehydration and hypothermia.

5.2. Making the farm a safer workplace

Suggestions of making the farm a safer work place include:

- Regularly walk around the farm and assess potential dangers
- Consult with farm safety advisers
- Everyone working on the farm is properly educated on farm risks and first aid
- Keep all equipment in good repair
- Store dangerous items such as machinery, firearms and chemicals
- Find ways to improve safety, such as fitting roll-over protection and seatbelts
- Keep a log of injuries and near-misses to pinpoint areas for improvement
- Consult with other workers and family members on how to improve safety.
- Prepare safety plan that includes ways to identify and minimise hazards
- Always use appropriate safety equipment, such as machinery guards and shields, helmets, gloves, goggles or breathing apparatus
- Make sure everyone understands and uses safety procedures, especially children
- If using four-wheel motorbikes, make sure you are using them in line with the recommendations – remember they are not all-terrain vehicles

5.3. Emergency plan

Some suggestions include:

- Access to a suitable and well-stocked first aid kit
- Make sure at least one person on the farm is trained in first aid
- Keep emergency numbers and correct addresses next to the telephone
- Regularly talk through the emergency plan with family and other workers
- Make sure your family understands what to do in an emergency

5.4. Milk marketing

The dairy farmer produces milk to sell at a profit. Careful management can help reduce the costs of producing the milk. Knowledge of the marketing structure for milk can help the dairy

farmer make wise management decisions. Management decisions are influenced by the following factors:

- Price, supply, and demand trends for milk and dairy products
- Markets available for milk
- Pricing structure and regulation of milk marketing

Self Check 5-Written Test

Directions: Answer all the questions listed below.

1. Why is important managing cow during dry period?(3pts)
2. How long is the optimum length of the dry period recommended before calving? (5pts)
3. Why is important Steaming up for dry period cows? (2pts)

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

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

Operation Sheet 1-Techniques for Cleaning of Animal Sheds

Procedures for cleaning of dairy cattle shed

Step 1. Remove the dung from the floor and urine channel

Step 2.Remove the used bedding and leftovers from the mangers in a similar way

Step 3.Empty the water trough and scrape its sides and bottom with the help of brush

Step 4.Wash the water trough with clean water and with the help of lime mixture

Step5. Scrape the floor with a brush and broom and wash with water

Step 6.Clean and disinfect the splashes of dung on the farm

Step 7. Remove the cobwebs periodically with the help of a wall brush

Step8. Sprinkle one of the available disinfecting agents in the following concentration.).

Step9. Allow adequate sunlight to enter in to the shed

Step10. Spray insecticides at regular intervals especially during the rainy season

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 8hours.

Task 1: Performing for Cleaning of Animal Sheds

Task 2: Performing for Ear tag application of dairy cattle

Task3: Performing dehorning of dairy cattle using hot iron method

Task4. Carrying out record keeping of milk yield of cows

Task5.Perform dairy animal sanitation activities, feeding, identification and dehorning

LG #43-LO #2 - Determine dairy cattle body condition and production system

Instruction Sheet-Learning Guide # 43

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

- Identifying and managing types of dairy production systems
- Undertaking and recording dairy cattle body condition scoring
- Identifying dairy animals' production status
- Confirming and adjusting feeding plan and the nutritional value of pasture
- Identifying unfit animals and making written record

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

- Identify and manage types of dairy production systems
- Undertake and record dairy cattle body condition scoring
- Identify dairy animals' production status
- Confirm and adjust feeding plan and the nutritional value of pasture
- Identify unfit animals and made written record

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, and Sheet 5 on page 32, 36, 42, 45 and 53 respectively.
4. Accomplish the "Self-check 1, Self-check 2, Self-check 3, Self-check 4, and Self-check 5" **in page -35, 42, 44, 51 and 55** respectively.
5. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1"**in page -56.**
6. Do the "LAP test" **in page – 57** (if you are ready).
7. Then processed to the next learning guide

Information sheet 1 -Identifying and managing types of dairy production systems

1.1. Introduction

There are many ways of keeping cattle for milk production. Choose will depend on local conditions, most importantly climate, infrastructure, land availability and local traditions. The one you choose depends very much on the circumstances in your area: climate, type of vegetation, market for selling the product, availability of labour and, last but not least, local traditions. Dairy cattle can be reared in ways that vary depending on the resources available to the farmer. The **three main systems** are: extensive, intensive and semi-intensive

1. Extensive system

In the extensive system, the cattle are reared on pasture. It is practiced where grazing land is available. In Ethiopia the grazing land mainly comprises natural unimproved grass.

Advantages

- It is cheaper than the intensive system
- It is not labour intensive

Disadvantages

- It requires dedicating much more land to grazing
- Cows waste a lot of energy by walking while grazing in the field
- It is difficult to accumulate manure for improving soil fertility in crop fields

2. Semi-intensive system

In the semi-intensive system, the cattle graze for some time during the day and in the afternoon or evening they are supplemented with other forages like napier grass.

3. **Intensive system**

In the intensive system, dairy cattle are enclosed in zero-grazing units where they are provided with all their requirements for feed and water

Advantages

- The cow does not waste energy walking in search of pasture
- It avoids diseases associated with communal grazing
- It allows dairy farmers with no grazing land to produce milk and make money
- The manure use to improving soil fertility and generate biogas

Disadvantages

- The method is labour intensive as feeding and cleaning the unit must be done daily
- The initial cost of putting up a zero-grazing unit is high
- It may be difficult to detect when a cow is on heat, especially a singly housed cow.

1.2. Grazing with supplementary feeding

In this system the animals graze during the day in paddocks on natural or improved pasture, are tethered on privately owned or communal land or are herded on communal land or along roadsides. Usually they are stabled at night. However, although this system can be used if enough land is available, it frequently comes under pressure due to land fragmentation and management problems for cows grazing on communal land and along roadsides.

Fig 10. Good quality grass

1.3. Zero grazing or cut and carry system

Traditionally this is a tie (stall) system. Zero grazing means that the animals are kept day and night in one place and all feed and water is brought to them. Dry cows and young stock are sometimes allowed to graze in a paddock or are tethered in the field.

The dry matter (DM) yield of one hectare of unimproved natural pasture is about 3000-4000 kg per year, but with good management and the use of manure and fertilizers, the DM yield of Elephant grass can be 8000 to over 15000 kg per year.

Self-check 1-Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

1. List the three types of dairy production systems. (3pts)

2. Discuss the advantage and disadvantage of intensive and extensive dairy production systems. (3pts)

3. Discuss the reaction ship between cow and environment (5Pts)

You can ask your teacher for the copy of the correct answer

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

Information sheet-2-Undertaking and recording dairy cattle body condition scoring

2.1. Introduction

Body condition scoring is a visual and tactile evaluation of body fat reserves. Body scores can be given to assess the condition of dairy cows. The thinner the animal, the lower its body score. Body scoring of dairy cows from the appearance of the tail head: 1= poor, 2=moderate, 3=good, 4=fat and 5=very fat. Details of the body scores: 1= Muscles, tail head and lower back vertebrae are shrunken and hollow. No fatty layers can be felt. Skin is supple and freely moveable. 2= All bones can easily be felt. Muscles sunken around tail head. Some fatty layers. 3= All bones can be felt but are well covered with fat. 4= Folds and patches of soft fat under the skin. Hipbones can be felt by firm pressure. Side bones of vertebrae cannot be felt. At the time of calving, cows should have a body score of 3 to 3.5.

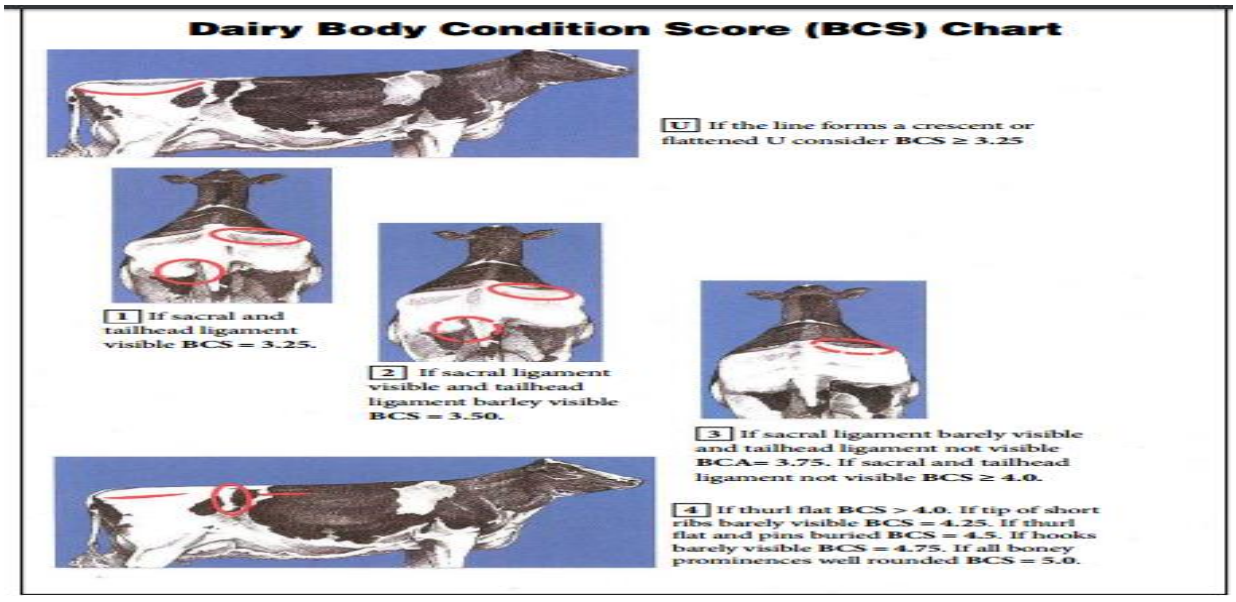


Fig.11 .Body conditioning score

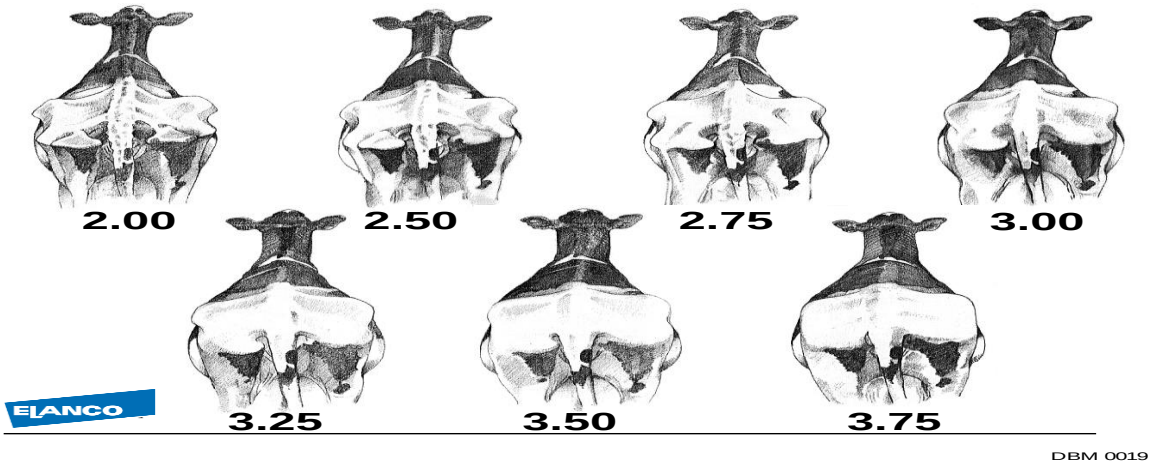


Fig 12. Body Conditioning of dairy Cattle

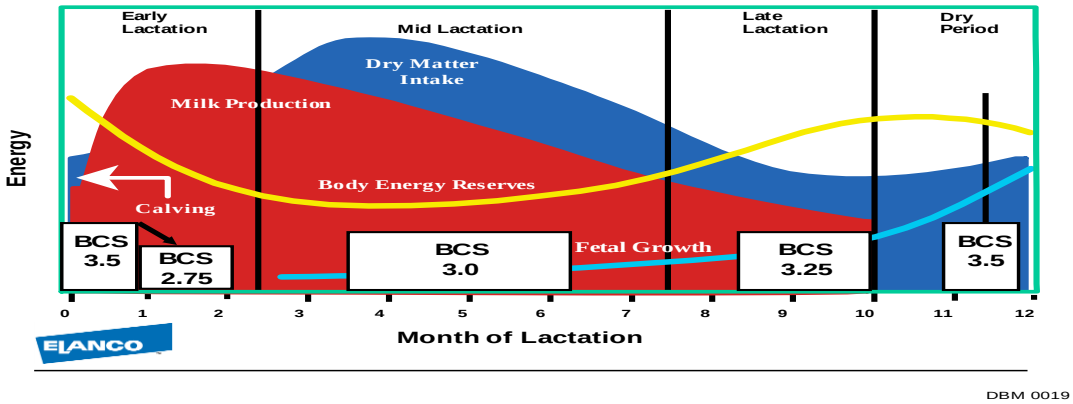


Fig 4. Body scoring condition (BSC)

Factors to be considered during selection of dams:

- physical appearance
- health,
- milk production record
- pedigree

2.2. General description of score

Frame (15%)

The frame is defined as the skeletal structure of the cow, except the feet and leg

- **Rump:** long and wide throughout the pin bones slightly lower than hip bones
- **Stature:** high, including length in the leg bones.
- **Front end:** adequate constitution with front leg straight, wide and squarely placed.
- **Back:** straight and strong , the loin broad, strong and nearly level

Dairy character (20%)

It is an indication of milking ability. The priority order for evaluating dairy character characteristics are:

- **Ribs :** wide flat, deep and slanted towards to the rare
- **Thighs:** lean incurving tod flat and wide apart from the rear
- **Wither :** sharp with the chine prominent
- **Neck:** long lean and blending smoothly into shoulder a clean

Fig.12. From the front,look at the head, chest,and front legs

Body capacity (10%)

The priority order for the evaluating body capacity characteristics is:

- **Barrel**: long, deep and wide.
- **Chest**: deep and wide floor with well sprung for ribs blending into the shoulder

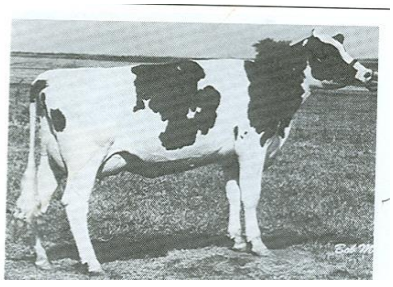


Fig 13. From the side,look at the top line, rump , barrel, heart girth ,shoulders , udders, teats, flank, legs and neck

Feet and leg (15%)

Feet have a little higher priority than rear leg when evaluating feet and leg.

- **Feet**: steep angle deep heel with short, well-rounded closed toes
- **Rear leg view**: straight, wide apart with feet squarely placed.
- **Rear leg Side view**: a moderate set(angle) to the hock.
- **Hock**: cleanly moulded, free from coarseness and puffiness with adequate flexibility.
- **Pasterns**: short and strong with some flexibility

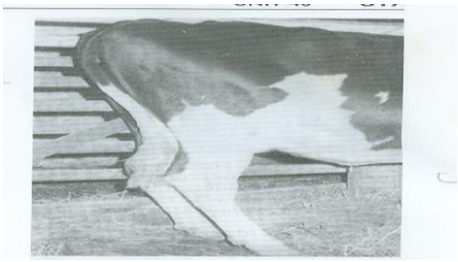


Fig.14. leg too much set (sickle hocked)

Udder (40%)

The priority order for evaluating the characteristics of the udder depth; teat placement, rear udder, udder left, fore udder, teats, balance and texture. The size of the udder is generally related to milk producing capacity. Teats should be 1.5 to 2.5 inches (3.8-6.4cm) long. When the udder is full they soul hang straight.

- **Udder depth:** moderate depth relative to the hock with adequate capacity
- **Teat placement:** squarely placed under each quarter, plumb and properly spaced
- **Rear udder:** wide and high, firmly attached with uniform width from top to bottom
- **Udder cleft:** evidence of a strong suspensor ligament
- **Fore udder:** firmly attached with moderate length and ample capacity
- **Teats:** cylindrical shape and uniform size with medium length and diameter
- **Udder balance and texture:** an udder floor that is level as viewed from the side.

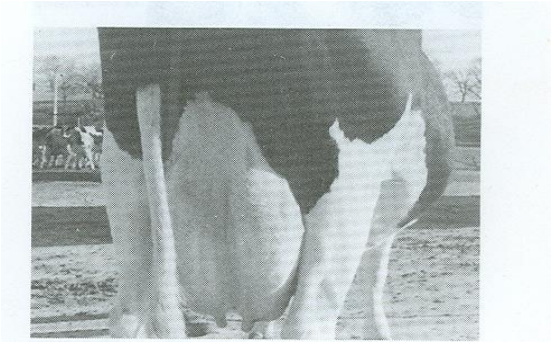


Fig. 15. A well- attched udder,with good width and depth

Self-check 2-Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

4. Why is important determining of body score of dairy cows ?(2pts)

5. Discuss the five score which have in dairy cows their characteristics?(3pts)

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

Information sheet 3 -Identifying Dairy cattle production status

3.1. Introduction

Different stages of growth, production and reproduction have different nutrient requirements. Generally the highest nutrient requirements are during lactation. The lowest nutrient requirements are during mid to late gestation of the mature female. Growing animals and producing animals have different needs to those of animals that are simply meeting their maintenance requirements.

To be profitable in livestock production these different dietary requirements need to be met as inexpensively as possible.

- Maintenance Requirements
- Requirements for Growth and Production
- Requirements for Breeding
- Requirements for Working Animals
- Requirements for Vitamins and Minerals

Seen from a different perspective, poor livestock keepers attempting to make the best use of limited resources will need to be able to target those resources to obtain the best effect, given a variety of desired outcomes. At the simplest level, the desire is to maintain livestock survival.

Self-check 3-Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

1. Why is important dairy cattle selection in the dairy farm?(3pts)
2. What are the five major traits for classification dairy cattle?(3pts)

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

Note: **Satisfactory rating - 6 points** **Unsatisfactory - below 6 points**

Information sheet 4 -Confirming and adjusting feeding plan

4.1. Introduction

Feeding plan: -is Setting of objective including information with regard to supplementary feeding pattern, feed purchases, minimum animal condition levels and production requirements. Each breed of cattle has its own strengths and weaknesses, making it better suited for certain climates, living conditions, reproduction and production goals. Breeds can vary in color, size, the presence or absence of horns, overall hardiness and production uses.

4.2.Nutritional value of pasture and feedstuffs

Feed is material which, after ingestion by animal, is capable of being digested, absorbed and utilized. Animal feed includes pastures and a wide variety of other forage. Grass and hay, for example, are described as feeds, but not all their components are digestible

Composition and classification of feedstuffs

Livestock feeds are generally classified according to the amount of a specific nutrient they furnish in the ration. They are divided in to two general classes –roughages and concentrates.

Roughages are bulky feeds containing relatively large amount of less digestible material, i.e., crude fiber over 18% in DM and low (about 60 %) in total digestible nutrient (T.D.N.). Roughages are subdivided into two major groups-succulent feeds and dry roughages, based upon the moisture content. Succulent feeds usually contain 60-90% moisture, whereas dry roughages contain only 10-15% moisture.

Succulent feeds

Succulent feeds are again classified in to various types such as pasture, cultivated fodder crops, tree leaves, silage and root crops.

a) Pastures:- Pastures are land areas seeded to various introduced forage species, i.e. young rapidly growing grasses. There are two types of pasture: Natural pasture (naturally growing pasture), and Improved pasture (spray good quality pasture seeds among natural pasture area or pen it for regular grazing), A good pasture is an area on which there is a growth of lush, green, nutritive, actively growing forage from which livestock can consume in a relatively short time.

Good Pasture

Conditions are where water is readily available to the animals, and there is a good system of cross fencing so pastures can be rotationally grazed.

Pasture Quantity– Good forage quantity is described as a condition where there is readily available amount material for grazing (proper plant height and plant spacing). The height of the forage is maintained between **3 and 8 inches** during the pasture season.

Pasture Quality - High quality forage is described as being **high in protein and energy, and is easily digested by the animals**.

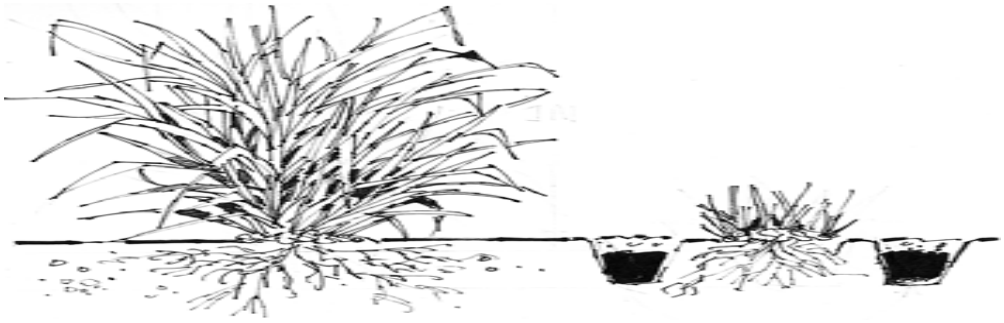


Fig 16. Improved forage

b) Cultivated fodder crop

1. Shared by human and animal. e.g. cabbage, sugar beet, sweet potato, carrot, radish.
2. Shared only by animal. e.g. clover, lucerne (alfalfa), Sudan grass, elephant grass.

c) Silage

Silage is a fermented feed resulting from the storage of high moisture crops, usually green forages, under anaerobic condition in a structure called a silo. A silo is an airtight to semi-airtight structure designed for the storage and preservation of high moisture feeds as silage.

d) **Tree leaves.** e.g. acacia. They are usually grazed by sheep and goats.

e) **Root crops**: characterized by their high moisture content (75-92 %) and relatively low crude fiber content (5-11% of the dry matter). E.g. Fodder beet, carrot

Dry roughages

Dry roughages classified as hay and straw based on the nutritive value and method of preparation.

Hay:- is defined as the shoots and leaves of forage plants that are harvested and dried for future feeding to livestock. A method of conserving green crops is that of hay making. The harvested material is dried to a moisture level of 15-20% to inhibit the action of plant and microbial enzymes.

1. **Lucern:** is the most suitable among the leguminous plants. Berseem and cowpea are more difficult to be converted in to hay.
2. **Non–legume hays** made from grasses are as good feeds as legume hays.

Straws:- refer to the stems and leaves of plants after removal of the ripe seeds by threshing, which are produced from most cereal crops and from some legumes.

Urea treatment. For every 100kg of straw a solution of 40kg water and 4kg urea is sprayed uniformly and the entire stock is then covered by polythene sheet or by gunny bags or by leaves of banana for about 3-4 weeks.

Concentrates:- refer to those feeds that contain a high density of nutrients, usually low in crude fiber (less than 18% in DM) and have a comparatively high digestibility and higher nutritive value having more than 60 % total digestible nutrient (TDN).

4.2. Supplement feeds

High protein supplements

Most of energy feeds are low in CP, usually have to be supplemented with high protein feeds in order to make balanced ration. High protein feeds are usually in limited supply and expensive. They are often used as supplements. e.g. soybean meal, cotton seed meal, urea (for ruminants), etc.

Mineral supplements e.g. common salt (0.25-0.50% in total ration), limestone, bone powder.

Vitamin supplements In confined feeding system, animals, especially monogastric animals, need vitamin supplements. e.g. Vitamin A & D mixed powder.

4.2.1. Essential nutritional requirements of animals

Nutrient is any food or feed constituted by organic or inorganic matter that has the same general chemical composition and aids in the support of animal life. It plays an important role in maintenance, growth, function, reproduction, and lactation (production).

Major Classes of Nutrients

Water:- forms an essential constituent of all plants and its content varies with the stage or maturity.

Dry Matter: The dry matter (DM) of foods is conveniently divided into organic and inorganic material, although in living organisms there is no such sharp distinction. Many organic compounds contain mineral elements as structural components.

Carbohydrate: The main component of the DM of pasture grass is carbohydrate, and this is true of all plants and many seeds. Carbohydrates are the main source of energy and act as fuel for the body.

Lipid: Substance in plant and animal, which is insoluble in water but soluble in ether chloroform or benzene, is regarded as lipid. Fat is the most important lipid present in both plants and animals.

Protein: In both plants and animals, proteins are the major nitrogen-containing compound.

Vitamin:- is present in plant and animal in small quantity. It is an important component of enzyme system.

Mineral:- is inorganic compound, which is also called ash after feed sample is burnt.

Self check 4-Written test

Name…… ID…… Date…….

Direction 1: Choose the best answer from the given alternatives

1.One is requiring to upgrade the nutritive value

A. Natural Pasture C. Improve Grasses

B. Improved legumes D. None

2.Which nutrients need supplement to animal?

A. Energy C. Mineral

B.Water D. Fat

Directions 2: Answer all the questions listed below.

1. Write the three stage of Milk production cycle of a dairy cow. (5pts)

2. Develop the Recommendations for Feeding Plan for different category of dairy cattle (5pts)

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

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

Information sheet 5-Identifying and recording animals that do not fit the established ideal range

5.1. Introduction

The comfort and humane treatment of sick, injured or cull animals are priorities. An effective Herd Health Management Program will identify sick or injured animals early and enable the development of protocols for the treatment or timely culling (fattening for slaughter, immediate slaughter or euthanasia) of those animals. Of special concern are downers (non-ambulatory animals) or severely debilitated animals. Prompt decision-making and action are vital to ensure the welfare of special needs animals.

Animal owners, veterinarians and laboratories are required to immediately report the presence of an animal that is infected or suspected of being infected with a reportable disease to District Veterinarian. Control or eradication measures will be applied immediately. Reportable diseases are listed in the Health of Animals Act and Regulations and are usually of significant importance to human or animal health. Anthrax, Bovine Spongiform Encephalopathy and Rabies are examples of reportable diseases applicable to cattle.

Requirements

- Cattle that are sick, injured, in pain or suffering must be provided prompt medical care or be euthanized.
- Appropriate authorities must be advised of any suspect or confirmed cases of reportable disease. If animals are culled, drug withdrawal times must be observed.
- Animals must be able to breathe freely and not suffer unnecessary discomfort.

Recommended Best Practices

A. Have sheltered, segregated and well-bedded sick pens for cattle that are sick, injured

B. Monitor sick, injured or recovering animals at least twice daily

C. Consult with the herd veterinarian regarding treatment

D. Identify decision trigger points for culling including:

• When to stop treating an animal if it is not responding

• The point past which, if an animal is not meeting target requirements

5.2. Good Culling Management Practices

The overwhelming majority of cattle are marketed in good health and physical condition. New enforcement of rules prohibits the slaughter of any animal that cannot walk (non-ambulatory). Some compromised cattle should not enter intermediate marketing channels because of concerns about animal well-being. Instead, these cattle should be sold directly to a processing plant or humanely euthanized, depending upon the severity of the condition, processing plant policy.

Self-Check -5-Written Test

Directions: Answer all the questions listed below

1. Write the good Culling Management Practices in dairy farm. (4pts)
2. Why animal are culling from farm? Mention at list 5 points .(10Pts)

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

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

Operation Sheet 1-Techniques For feed formulation

Procedures for feed formulation

Step1. Identify the group of livestock in which the ration is formulated

Step2. Identify ingredients used in ration formulation

Step3. Consult feed composition table to know the nutrient content of selected feed ingredient

Step4. Consult feeding standard tables to check the nutrient requirement of birds

Step5. Calculate the ratio and amount of ingredients used for ration formulation and

Step6. Grinded them at recommended sieve size

Step7. Blended the crushed ingredient thoroughly by using Mixer

Step8. Add minerals , vitamins and other additives in the ration

Step 9. Pack and store the formulated ration

Step10. Offer the ration for the group it is formulated according to feeding schedule.

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 8hours.

Task 1: Dairy Production System

Task 2: Performing feeding of animal balance diet

Task3: Performing selection of appropriate dairy cow using BCS

Task4. Carrying out record keeping of dairy farm

LG #44-LO #3 - Detect heat in female animals

Instruction Sheet-Learning Guide # 44

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

- Carry out estrus inducement and detection procedures
- Providing and securing mating areas
- Use mating procedures and handling techniques

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:

- Carry out estrus inducement and detection procedures
- Providing and securing mating areas
- Use mating procedures and handling techniques

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, and Sheet 3,in pages 60, 67 and 70 respectively
4 Accomplish the “Self-check 1, Self-check 2, and Self-check 3, in page 66, 69 and 80 respectively.
5 If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1 and Operation Sheet 2”in page 81 and 82.
6 Do the “LAP test” in page – 83 (if you are ready).
7 Then processed to the next learning guide

Information sheet 1-Carry out estrus inducement and detection procedures

1.1. Introduction

Heat or estrus is the period of time that occurs on the average, every three weeks (18–24 days) in sexually mature, non-pregnant female cattle, when they are receptive to mounting or riding actively by a bull or other cows. As an egg develops in the cow's ovary, the sex hormone estrogen (produced by the ovary) causes changes to the animal's reproductive, circulatory, and nervous system. Physical mounted, or **"standing heat"** occurs within the first 12–18 hours after the onset of heat.

1.2. Carry out estrus inducement and detection procedures

Based upon behavioral changes mentioned above, different methods of heat detection have been developed starting from visual appraisal of heat symptoms to fully automated heat detection.

Heat detection

Heat detection is critical to heat synchronization and breeding programs, particularly artificial insemination and embryo transfer programs. Effective heat detection is often the most limiting factor in an artificial insemination program. Heat detection can also be used to monitor onset of puberty in heifers, regularity of estrous cycles in breeding age females, and breeding effectiveness of natural service sires via returns to heat in the cow herd.

Heat detection efficiency (rate): is the percentage of eligible cows seen or detected in heat. Eligible cows are cows eligible for insemination. Heifers have reached puberty if they have resumed normal estrus function (cycling) after calving (typically 40 days or more post calving), are free of reproductive disorders or reproductive tract infections, and are open. A heat detection rate of 80 to 85 per cent should be attainable.

1.3. Heat Signs and Detection Methods

This is an extremely important exercise as a missed heat translates into a wasted 21 days while efficient heat detection makes it possible to serve the animal at the right time. The average heat interval is 21 days with a range of 18 to 24 days. Duration of heat is 24 to 36 hours in exotic and crossbred cows. Several methods are used to detect heat. The most commonly used by farmers are behavioral signs and physical changes.

The most important Aids to oestrus detection are:

I. Vasectomied or teaser bulls - These are surgically prepared bulls which are intact but will not impregnate the cow (teaser bulls have their penis deviated such that they will mount but cannot deposit semen in the cow). **II. Records**: can be used to predict date of expected heat.

III. Pressure sensitive (commercially available) mount detectors: They are glued to the rump (back) of the cow suspected to be on heat and are activated by pressure of mounting of the cow by others.

IV. Detection of ovarian changes: Use commercial kits to detect fall in progesterone levels in milk

Understanding the Estrous Cycle

A cow's reproductive cycle can be divided into four phases: proestrus, estrus, metestrus and diestrus. The shortest interval, estrus, marks the 24-hour period when the cow is the most fertile. These heat periods occur every 21 days. During estrus, the cow is influenced by increased levels of estrogen, causing her to display signs that she is in heat..

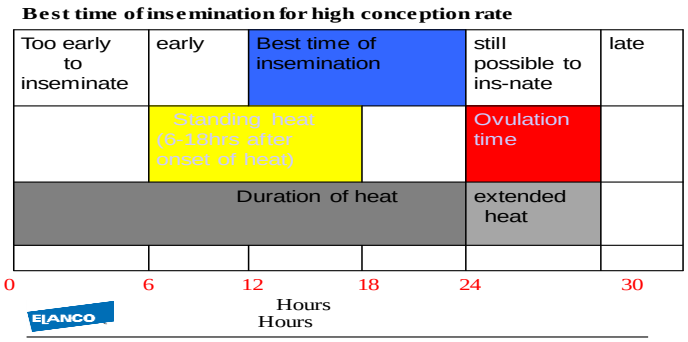


Fig 17. Best time for insemination

1.4. Estrus Synchronization

Synchronization is dependent on manipulation of hormonal events occurring during normal estrous cycle. Estrous (heat) synchronization in dairy cattle involves manipulating the females' estrous cycle so they can be bred at about the same time. It is achieved via premature leuteolysis using prostaglandins (PG) or simulation of corpus leuteum (CL) function by administering progesterone followed by abrupt withdrawal.

- This technology is known as estrus synchronization and is useful in large groups of cows.
- Estrus synchronization provides advantages to producers because all cows can be inseminated at the same time and all should calve around the same time.
- Estrus synchronization sometimes for ease of management, it is desirable for a group of animals to calve at the same time necessitating that animals come on heat at the same time.
- Some producers use an artificial version of the natural hormone prostaglandin to induce estrus.
- To achieve this, the animals are synchronised using hormones.

2 injections of Lutalyse 11 days apart will cause the cow to come into estrus regardless of her current stage in the estrous cycle.

There are several advantages to consider when following an estrous synchronization protocol, including:

1) Shortening the calving interval, which allows females (especially heifers) to conceive earlier in the breeding season;

2) more effectively using AI and embryo transfer to reduce time and labor in detecting estrus (heat); and

3) Producing a more uniform calf crop with similar ages.

Fig 18. Inducing Estrus

1.5. Recognizing signs of heat

There are several behavioral signs of estrus, also called standing heat. The average heat duration is between 15 and 18 hours but may vary from 8 to 30 hours, according to Penn State Extension. During calving season, look for these signs to identify when members of your herd will enter estrus:

Standing to be mounted:- The most common and accurate sign of estrus is standing to be mounted by other cows

Mounting other cows:- The act of mounting other cows may be a sign the cow is in heat or approaching heat.

Mucus discharge:-Mucus is an indirect result of elevated estrogen levels during estrus

Swelling and reddening of the vulva:- During heat, the vulva swells and becomes moist and red on the interior.

Bellowing, restlessness and trailing:-Cows in heat are more restless and alert, standing when their herd mates are laying down resting, trailing behind to try to mount other cows and bellowing more frequently. Cows behaving this way should be monitored closely for standing behavior.

Sniffing and licking:-Sniffing and licking the genitalia of other cows occurs much more frequently with cows before and during estrus.

Head raising and lip curling:-This activity follows sniffing and occurs more frequently when the cow being sniffed is in heat and urinates.

Decreased feed intake:- During their reproductive cycle, cows spend less time feeding

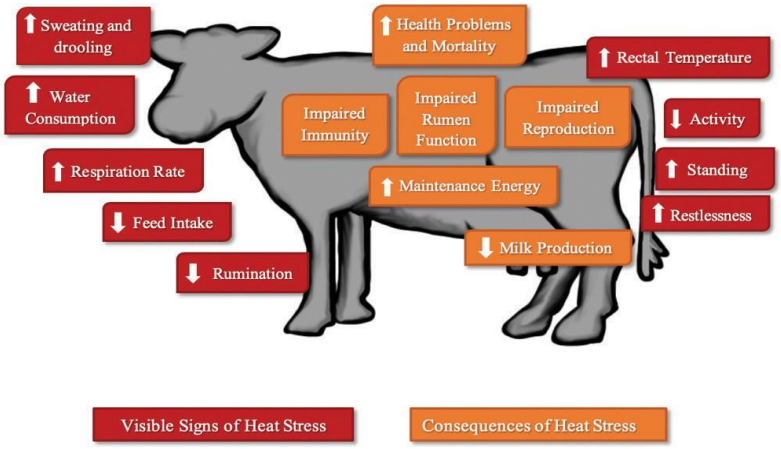


Fig 19. Visible signs of Heat stress and Consequence of Heat Stress

Metestrous bleeding:- Some cows and most heifers will have a bloody mucus discharge one to three days after estrus, signifying the cow has moved into the next phase of its reproductive cycle, metestrus.

Self-check 1-Written test

Name…… ID……. Date…….

Directions1. Say "True "for the correct statements and "False" for the incorrect

1. ----------Standing heat is the appropriate time to inseminate cow
2. ----------Heat detection is directly related to economy of dairy farm
3. ---------- Production is increase when the cow on heating time.

Directions2: Answer all the questions listed below.

1. What is estrus synchronization?(2pts)
2. What is the main advantage of estrous synchronization dairy cows?(3pts)
3. List methods of heat detection can be implemented in dairy cows. ?(2pts)

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

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

Information sheet 2-Providing and securing mating areas

2.1. Introduction

Good management is important for a successful heat detection program. Animals must have clearly readable, unique identification. An adequate area and equipment for heat detection must be available. This may include binoculars or the ability to approach cattle very closely..

A good management program of breeding areas should be:

- Provides the environment, housing and care that permit animals to reproduce, and maintain good health provides for their well-being
- Well-trained and motivated personnel can often ensure high-quality animal care, even in institutions with less than optimal physical plants or equipment
- Provide a secure environment that does not allow escape of or accidental entrapment of animals or their appendages between opposing surfaces or by structural openings.
- Are free of sharp edges or projections that could cause injury to the animals
- Allow observation of the animals with minimal disturbance of them
- When the cow showing a good sign of heat, there should be enough space (crush) which is sufficiently strong to restrain any cattle likely to be derived in it; that cattle should not be able to damage themselves while in it and that it should provide the necessary facilities for handling the animals, using the minimum labor

Some key points in mating dairy animals:

Mating heifers at too low live weights will lead to reduced fertility and more calving difficulties. Mating pure or crossbred Friesians weighing less than 260 kg will lead to more calving difficulties, as will mating Zebu dairy-type or Jersey heifers at less than 200 kg.

- Catch up' feeding after mating often results in heavier calves at birth, over conditioned heifers and more calving problems, with little improvement in milk yield during the first lactation.
- A herd of 100 cows generally requires the rearing of 20 to 30 heifer replacements each year. Bulls (or semen) must be selected on 'ease of calving' to reduce potential calving difficulties.
- Natural mating of heifers is easier than artificial insemination (AI) and running heifers with a bull for 9 weeks can lead to good pregnancy rates, provided the heifers are actually cycling.
- AI will provide greater scope for selection and genetic improvement in the dairy herd, but it requires a higher level of skill in heat detection and insemination. Natural mating is often required after AI to further increase conception rates.
- Sexed semen can produce 90% heifer calves in a well-managed breeding program. However, in addition to its considerably higher cost, conception rates are lower than with conventional semen (40% versus 50% with virgin heifers).

2.2. The key factors to consider when planning mating and calving down of dairy heifers

1. Provide good, clean calving down area
2. Ensure each calf gets sufficient good-quality colostrums
3. Live weight at mating
4. Advantages and disadvantages of natural mating
5. Use bull or AI
6. Detecting heat
7. Advantages and Importance of 'ease of calving' sires
8. Requires 25–30% replacement heifers each year
9. Treat naval cord and identify newborn calves
10. Age at mating

Self-check 2-Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

1. Write the key factors to consider be when planning mating.(4pts)
2. What are the important Aids to estrus detection of dairy cows?(3pts)
3. When should you observe heats of dairy cows probably?(3pts)

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

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

Information sheet 3-Use mating procedures and handling techniques

3.1. Introduction

Raising cattle for milk production requires close attention to breeding them so that they produce the most milk possible. This will require some planning, close observation and recording of mating and regular recording of the daily milk production of all of the cows in the herd. A suitable **recording sheet** for recording the reproductive activity of cattle is important. Heifers of the small, local cattle breed should be able to be mated at about 200 kg. and calve at about 350 kg. Heavier breeds such as Friesians, should first join at about 270 kg and calve when they weigh 450 kg.

There are **four** important considerations in **breeding** for milk production.

- Selecting the best cows
- Selecting the best bull
- Calf castration and selecting the best replacement bulls and heifers.
- Achieving the best breeding efficiency.

1. Selecting the Cow

All cows can produce some milk either for sale or for family consumption. There are some dairy bred cows and cross bred dairy cows (for instance Friesian and borna breed) to be found in smallholder dairy herds, this are often the descendants of cattle introduced by government missions for their own dairy herds. If there are none of these, start with quiet local animals with a history of successful breeding, and use a dairy bull over them to produce upgraded offspring.

A good type of dairy cow: Note the **triangular shape and straight top line** of the body, the small, refined head, large udder and milk veins and well-spaced teats.

To start a dairy herd, the first cows should have these characteristics:

- be of obvious dairy stock i.e. crossbreeds,
- preferably already having calved

- have a good udder and teats
- have a quiet and handle able temperament
- be as close as possible in shape and appearance of good cows.

2. Selecting the Bull

The bulls which are generally available on most small farms are unlikely to be useful for upgrading your present cows for dairy production. The safest and most efficient way to obtain a breeding bull is to sell (or castrate) all of the existing bulls on your farm, and replace them with a good dairy type bull from a respected private, school, church or government breeding farm, If you cannot get a pure-bred, you should use one which has at least half dairy blood.

In selecting and using a dairy breeding bull, you should:

- select a good bull from a known source (a government breeding farm),
- Make sure he is sound, not lame and can serve properly,
- Castrate all other bulls you have,
- Prevent outside bulls from coming onto your farm and mating with your cows,
- Do not allow the bull to mate with his daughters
- Select a replacement bull of a different breed [if available].

3. Organizing the Mating

You can number the bull with the cows and heifers all year round. This will simplify' your management, But: your cows will produce calves all year round and some will calve during the season when the feed is of poor quality and so will probably not milk well without being fed concentrates, and You will probably not know when each cow was mated, so you will not know when she will calve, nor will you know whether she is pregnant or not until she is almost ready to calve. Cows which are seen to be in oestrus can then be taken to the bull and the mating observed and recorded.

The advantages of this breeding system are:

- You can take good care of the bull and make sure he doesn't become injured in the field. He is also quieter and much easier to manage.
- You will know if a cow is showing breeding activity and you know the breeding dates if she is joined. From this you can predict her calving date, thus, you can keep accurate records,
- You can anticipate her next mating time and be ready to join her again if she does not conceive the first time,
- You can quickly tell if you have a problem in the herd of cows continually return to the bull for several months without becoming pregnant,
- You can quickly identify cows or heifers which have reproductive problems

The disadvantage of this system is:

- you need a separate pen for the bull
- you must observe the cows and heifers every day

4. Signs of Oestrus

If your cattle are quiet and easy to handle (and all dairy cows and bulls on small farms should be), you can take the cow to the bull and leave her loose in the bull paddock, or you can tie her up to a tree with a rope or halter, and lead the bull to her and allow him to mount. You will know she is ready to be mated when she shows:

- bellowing and perhaps walking up and down a fence line,
- streams of clear mucus coming from the vulva,
- mounting or mounted by other cows,
- if she is running with other cows, her tail may be slightly raised and the hair on the top of the base of the tail may be roughened and standing up,
- if she is milking, her milk production may suddenly fall a little.

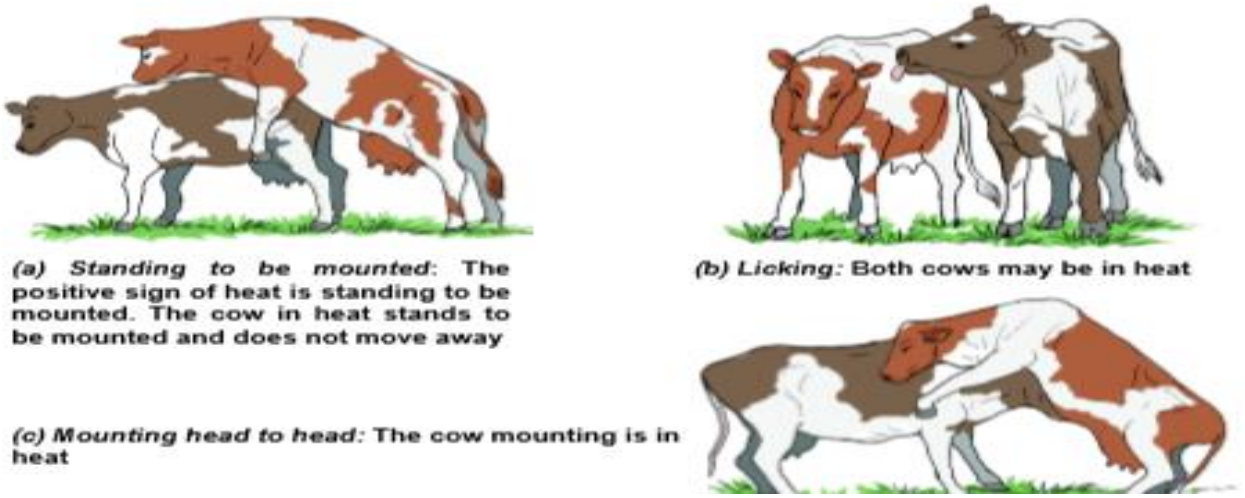


Fig.20. (a) to (c): Behavioral signs of heat in cows

Heifers may not show these oestrus signs as strongly as cows. So it is preferable to keep heifers and cows separate, and introduce the bull to the heifer paddock every day after the time when you think they are old and big enough to mate. You should then record any mating that occurs. Often if the heifers are old and big enough to mate but for some reason are not showing signs of oestrus, the presence or sight of a bull will cause them to come into oestrus a few days later.

Oestrus occurs every 18-21 days and lasts for about 18 hours.

A cow or heifer will continue to come into oestrus every 18-21 days until she is successfully mated and becomes pregnant.

3.2. Targets for heifer/cow mating programs

A series of targets for heifer mating programs for Friesians which can be used as guidelines for tropical dairy systems. These are:

- Begin mating at 13–15 months of age with heifers weighing 375–410 kg, with hip height of at least 127 cm and wither height of at least 122 cm.
- Strive to achieve 70% first service conception, or 7–12% less with sexed semen.
- Inseminate at least 80% of the heifers within the first 21 days of mating.

- 85% of the heifers should be pregnant within three heat cycles.
- Test all heifers to confirm pregnancies (some animals – typically 3% – will abort after pregnancy testing).

Breeding can be achieved through 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.

The 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.

Increasing the chances of conception through natural service:

- Take the cow to the bull as soon as it is detected to be in heat and leave it for at least twelve hours.
- Young inexperienced heifers should be mated with old experienced bulls
- Young inexperienced bulls should be given to old experienced cows.
- The bull should be kept fit and in good health particularly the legs and feet.

Artificial Insemination: Artificial Insemination popularly referred to as AI is one of the breeding methods that has contributed to the development of the dairy sector. Farmers

are encouraged to use semen from proven bulls which is obtained from AI centers and registered service providers.

Benefits of Artificial Insemination

- Prevention of venereal diseases
- Indefinite preservation of genetic materials of low cost enabling wide testing and selection of bulls
- Enhances genetic progress as best bulls are used widely nationally and internationally
- Small scale farmers through AI can access good bulls cheaply
- One is able to select the bull of interest.
- When handled properly, there is no chance of spread of breeding diseases.
- It is easy to control inbreeding.
- 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.
- It is cost effective since the farmer does not have to rear a bull.

Disadvantages of AI

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

8-step guide to artificially inseminating a dairy cow

1. Positioning the cow

The chance of AI success is greatly increased when the cow is relaxed; it should stand on a level surface with plenty of grip. The cow should also be appropriately restrained.

2. Thawing the straw

Before thawing the straw, check the water temperature; it should be at 35C, or as instructed by the semen company. After withdrawal, wipe it dry and place it in the gun, 3.which should have been pre-warmed by rubbing between the hands. Only thaw one straw at a time.

3. Preparing the cow

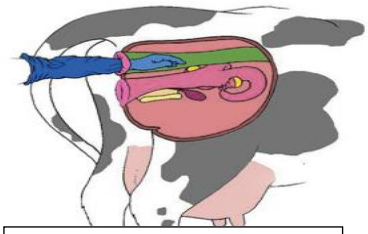


Fig 21. cleaning of the

- Clean the cow's vulva with a paper towel and put on a full-arm glove and lubricant.
- Insert your arm into the cow, by forming a cone with your fingers while keeping the tail aside with your other hand.

4. Finding the cervix

The initial landmark is the cervix and this should be located before inserting the gun.

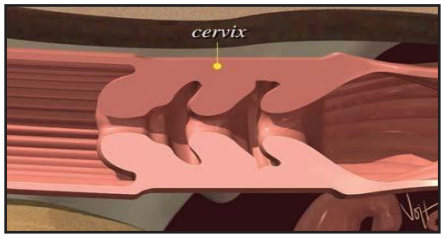


Fig 22.The opening into the cervix protrudes back into the vagina.

5.Inserting the AI gun

After locating the cervix, use the elbow to exert downward pressure on the vagina. This will part the lips of the vulva, in preparation for the AI gun. The lips should be wiped clean, with the gun inserted past the vestibule and into the vagina.

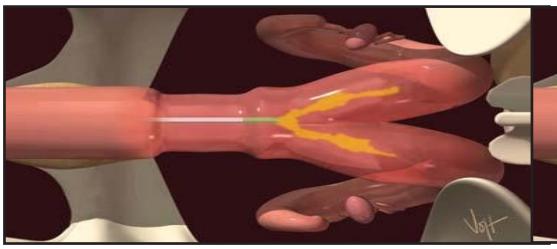


Fig 23. Appropriate place

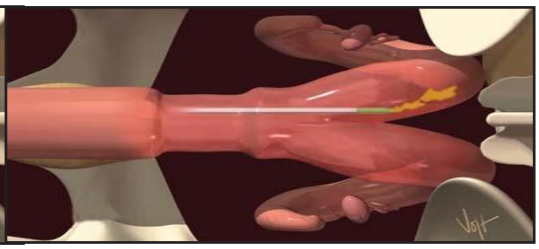


Fig 24. Not appropriate place

6. Lining up the AI gun

Line up the gun with the cervix and pass it through the canal, manipulating the cervix back over the tip of the gun.

7. Reaching the cervix

Once the gun is just through the cervix, you should feel a release in resistance to the gun.

8.Maintaining equipment

Do not reuse sheaths; splitting straws increases the risk of disease spread and can reduce pregnancy rates.

3.3. Factors affecting rate of conception:

1. **The fertility chain**

Successful conception is dependent on several factors, which form a fertility chain. The concept of the chain is that it is only as strong as the weakest link.

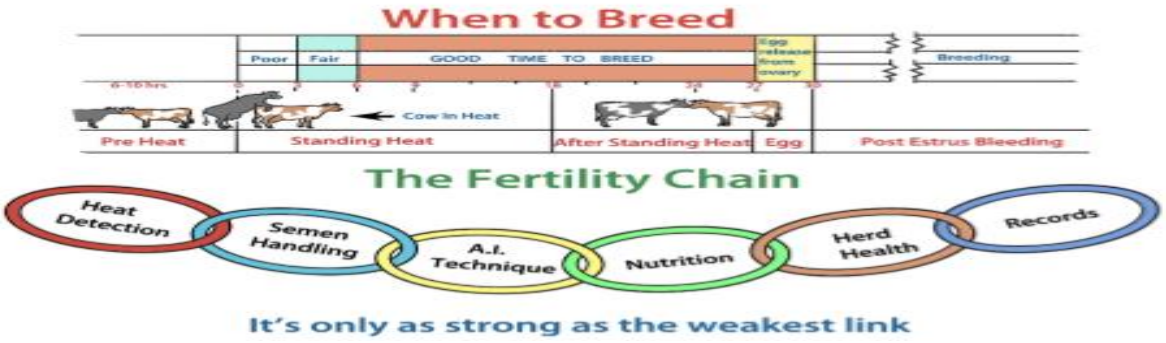


Fig 25. The fertility chain

2. **Heat detection and time of service:** This depends on whether natural service or artificial insemination is used. A cow in 'standing heat' stands for mounting by bull or another cow.

3. Semen quality and handling

To maintain a good dairy herd, the farmer must use semen of proven bulls all the time. The semen must be obtained from agents or service providers registered by the veterinary department.

4. A.I. Technique

Farmers should only use registered inseminators who are competent and know how to handle semen and apply proper AI techniques.

5. Nutritional factors

Nutrition is the single most important factor that affects cow fertility than any other factor. Low protein and low energy intake causes delayed puberty, silent heat and infertile ovary.

6**. Normal health of female genital tract**

The cow should be maintained in good health condition. Any disease of the female reproductive tract affects conception rate.

Self-Check # 3-Written Test

Directions: Answer all the questions listed below.

1. Let's one farmers need to establish new dairy farm, so what is the first thing should be consider the cows have characteristics.(5pts)
2. What are the criteria should be using for selecting and using dairy breeding bull.(5pts)
3. What is the advantage of natural breeding over the AI breeding?(5pts)

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

Operation sheet 1 -Assisting in semen collection and handling

Procedures for assisting in semen collection and handling

1. Schedule male for semen collection
2. Present and maintain temperature of (AV, electro ejaculator, thermos flask)
3. prepare male sexual
4. Live mount such as teaser bull or female
5. Held AV parallel to teaser bull and slant to the path's of bull penis
6. Allow bull to mount
7. Grasp the sheath of penis and guide to AV
8. Take semen immediately to lab after ejaculation

Operation Sheet 2-Techniques for prepare animal for Insemination

Procedures for prepare animal for Insemination

1. Work steps
2. Put on necessary clothes
3. Join the nearest dairy farm
4. Observe changes in behavior of the animal
5. Interview herds man on changes in animal behavior
6. Observe reproductive organ of female animal
7. Identify animal on heat
8. Report to dairy farm inseminator

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 8hours.

Task1. Carry out estrus detection of dairy cows

Task 2.Properly assisting of artificially insemination of cow

LG #45-LO #4 - Coordinate and monitor milking operation

Instruction Sheet-Learning Guide # 45

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

- Confirming efficiency and effectiveness of milking operation
- Following the procedures maintaining milk Quality, resource and equipment.
- Determining and carrying out Milking procedures and milk record keeping
- Carry out decided dairy cattle milk composition and source of constituents
- Carry out hygiene and sanitation

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:

- Confirm efficiency and effectiveness of milking operation
- Follow the procedures maintaining milk Quality, resource and equipment.
- Determine and carrying out Milking procedures and milk record keeping
- Carry out decided dairy cattle milk composition and source of constituents
- Carry out hygiene and sanitation

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, and Sheet 5in page 86,89,92,96 and 99 repectvely.
4 Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check 4, and Self-check 5” **in page -88, 91, 95, 98 and 32 101** respectively.
5 If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1 and Operation Sheet 2”**in page -102 and 103.**
6 Do the “LAP test” **in page – 104** (if you are ready).
7 Then processed to the next learning guide

Information sheet 1-Confirming efficiency and effectiveness of milking operation

1.1 Introduction

Milking is the most important single activity on the dairy farm. Consumers demand high standards of milk quality, so milking management aims to minimize microbial, chemical and physical contamination. Milking management covers all aspects of the process of obtaining milk from cows quickly and effectively, while assuring the health of the cows and the quality of the milk. Consistency in the day-to-day implementation of milking procedures is an important part of Good Agricultural Practices (GAP) for milking. Milk to be of high grade must be clean and of good flavour and contain a minimum of bacteria, none of which should be harmful in order to produce such milk very careful methods have been devised.

Dairy Cow Lactation Cycle

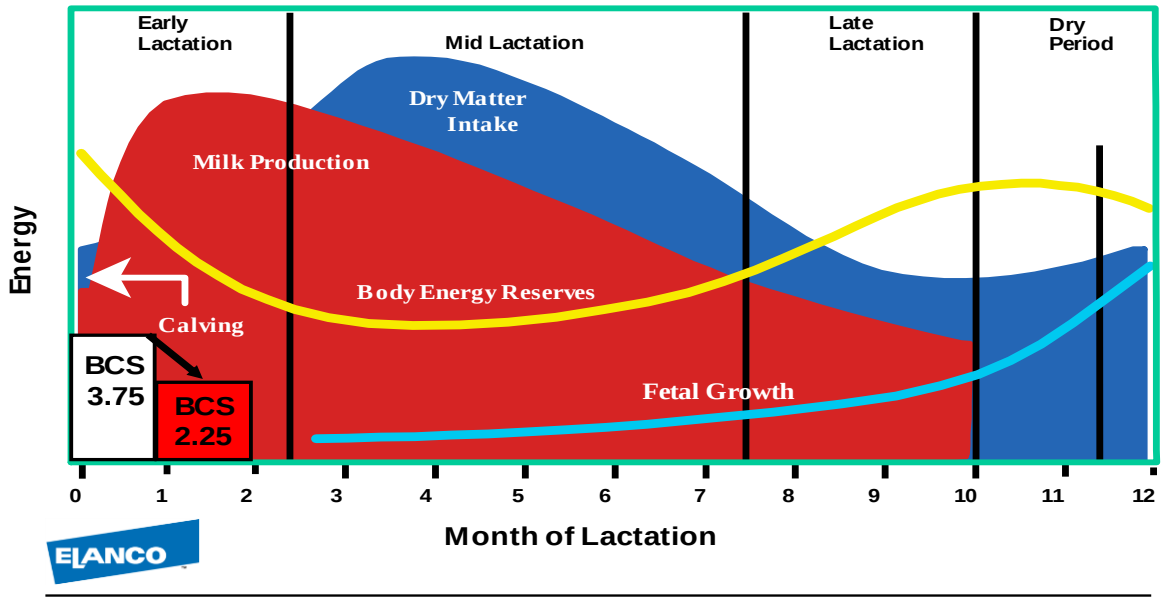


Fig 26. Dairy lactation Cycle

1.2. Confirming efficiency and effectiveness of milking operation

Milking procedures must be monitored for efficiency and effectiveness. Incomplete milking is very dangerous to the cow as it may cause mastitis and loss to the owner as it may cause total yield reduction.

1.3. Monitoring milk quality

Milk quality should be checked starting from the first drop up to the total milk collected. Measure PH and temperature of the whole milk. Monitor for the fulfilment of all procedures for producing quality milk. Producing quality milk is profitable to the producer, consumer and the cow as well. Stick to industry standard requirements if there are any.

1.4. Monitoring cost of milking operation

Monitor costs to ensure operations are completed and maintained within budget. Slow milking procedures are risky. It causes loss of stimulation of the cow and consequently reduced yield. Such situations are costly to bear. Labour efficiency should be checked and adjustments must be made to fit to the budget limit.

1.5. Hygiene and sanitation of working area and equipment

When milking is completed, clean work area and milking equipments. Follow routine procedures for cleaning equipments and utensils. Dry the teats of the cow before and after milking. Properly handle wastes in a responsible manner and use pressurized water to wash the milking area.

Self-check 1-Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

1. What are a good general guideline of accepted milking practices on a modern dairy farm?(3pts)
2. Why is important monitoring of milk quality in dairy farm?(3pts)

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

Note: Satisfactory rating - 6points Unsatisfactory - below 3 points

Information sheet 2-Following the procedures to maintaining milk Quality, resource and equipment

2.1. Introduction

Milk from health cow, having good flavour, free from dirt and filth, contains relatively small number of bacteria and essential free from pathogens is clean milk. Clean milk production is always profitable for producers, manufacturers and consumers. Therefore, producing quality milk requires the following activities.

1. ***Herd health*****:** the dairy animal must be free from pathogens and should be periodically checked in every year for all of contagious diseases.
2. ***Clean animal*****:** the milker must clean the flanks and udder of cows just before milking to prevent entry of dirt into the milk.
3. ***Clean surrounding*****:** milking area should be clean and dust free.
4. ***Control of flies*****:** fly control measures must be arranged as they may carry contagious disease like *typhoid, dysentery* etc.
5. ***Milker's cleanliness*****:** must be free from infectious diseases. Should keep personal hygiene, wear clean cloths, trimmed nails and cover hair. Never spit around or talk while milking. The milker must cover cuts and wounds.
6. ***Clean utensils*****:** all milking equipments and containers must be clean and free from pathogens.
7. ***Straining*****:** is done to remove sediments and other foreign materials. Use clean dry cloth to maintain quality of the milk.
8. ***Feeding:*** should be done *an hour before* milking. During milking give the animal some concentrate which is *less dusty* and to keep the cow busy.
9. ***Cool and store milk properly***

2.2.Identifying Milk Quality

Producing quality milk is helpful to ***the producer, consumer and the manufacturer***. To ensure quality milk production it is important to follow appropriate quality milk production techniques. .

2.3.Hygiene requirements and clean milking equipments

Proper Milking procedure should aim at minimizing microbial, chemical and physical contamination. Milking management covers all aspects of the process of obtaining milk form cow quickly and effectively, while protecting health of the cow and quality of milk.

The suggested practices for milking are:-

- Ensure milking routines do not injure cows or introduce contaminants into milk
- Ensure milking is carried out under hygienic conditions
- Ensure milk handled properly after milking

Resource and Equipment Requirements

- Milk harvesting equipments
- Milk cooling and refrigeration equipments
- Emergency power supply
- Yard washing equipments
- Steady and continuous water supply, hot water services
- Teat dip and teat spray equipments
- Feeding equipments
- Fly control system
- Waste management system equipment

Self-check .2-Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

1. What the factors must be considered when practicing effective milking hygiene? (3pts)
2. Write the methods of milking systems in dairy farm.(2pts)

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

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

Information sheet 3-Determining and carrying out Milking procedures and milk record keeping

3.1. Introduction

This process of milking is requires ***experience*** and ***skill***. It is important that a cow milked at a faster rate at regular interval. Proper milking is enjoyable to the cow and profitable to the owner. This could be achieved if milking is programmed in coordinated steps. Milking schedule depends on the organization's milking policy as different milking schedules need different resource inputs.

a) ***Milking time:*** milking can be done twice or three times a day. But this interval must be regular. A sudden change in the time of milking affects the total yield

b) ***Milking order:*** clean cow should be milked first. A suggested order

- First calf heifers free of mastitis
- Older cows free of mastitis
- Cows with history of mastitis but not showing the symptoms
- Cows with quarters producing abnormal milk

Milking Systems

There are two types of milking systems. The choice of the system depends on the ***level of operation, economic efficiency and number of cows*** to be milk

3.2. Machine milking (automatic)

The machine should be removed immediately after milk out of the udder or when the milk ceases to flow. Over milking is thought to be one of the major causes of mastitis..

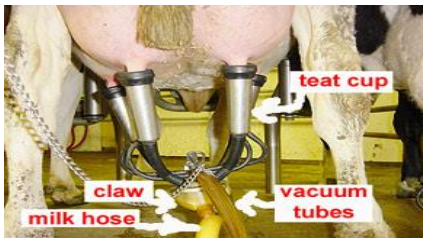


Fig 27. Milking machine

3.3. Hand milking (manual)

Hand Milking

Hand milking is the process of milking cow by using hand. It is divided into three: - full hand milking, pisting, and knitching (using two fingers). Among the three full hands milking is the most appropriate than the others.

Fig 28. Different type of hand milking

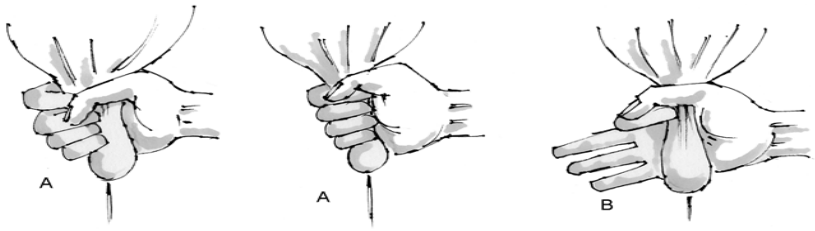


Fig 29: Hand milking. A: full hand milking. B: stripping

3.3.Milk Record keeping

- ***Reasons for keeping record***

The first reason for keeping records is to know definitely which cows are profitable and to dispose of the inferior animals. Experience has shown that without such records, individual cows in a herd are often greatly misjudged. In many cases the individual which the owner considered the best is found by actual records to be far below others which were not looked upon with any special favor

- ***Records aid correct feeding***

The second important reason for keeping dairy records of milk produced by each animal is that it makes possible the proper feeding of the individual cows. All skilled feeders recognize that cow's in-milk should be feed grain in proportion to their milk production. Unless there is a record of the daily milk production available there is no satisfactory basis for regulating the amount of feed supplied.

- ***Record detects sickness***

The third advantage in having daily records is the opportunity it offers the herdsman to detect sickness in a particular animal before it would otherwise be observed. If there is a noticeable decline in the amount of milk produced, with no apparent cause, it is certain that the animal is not in the right condition and will probably show a more marked case of sickness very soon, if not properly treated.

- ***Records reveal competence of milker***

A fourth reason for weighing and recording each milking regularly is the chance it gives to judge of the work of different milkers. It is a well-known fact that some milkers are able to secure much more milk from the same cow than are others. The difference may be as much as 25% or even more

Self-check .3-Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

1. How long is the milking time required for both hand milking and machine?(5pts)
2. Write the recommendations milking procedures of dairy cows.(5pts)

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

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

Information sheet 4-Carry out decided dairy cattle milk composition **and source of constituents**

4.1. **Introduction**

Milk composed of water, lipid (fatty material), protein, Sugar, minerals, vitamins, enzymes and same body cellular materials. The average composition of cow's milk, is presented in table.

There is a great deal of variation in composition of milk between different breeds of cows and between individual cows within breeds. Figures indicating the average composition of milk from each of the breed are presented in table . Variation in the composition of milk may be inherited.

Table 1. Approximate average composition of the milk of cows

Components	Cow (%)
Water	86.8
Total solids	13.2
Fat	3.7
Protein	3.2
Sugar	4.6
Ash	0.7

All of the constituents of milk come from the blood of the cow. Some are modified by the tissue of the mammary gland. Others appear in similar form in milk and in blood.

Table 2. Approximate composition of milk of the five major dairy breeds

Breeds	Fat	Protein	Solid not fat
Ayrshire	4	3.5	9
Brown Swiss	4	3.5	9
Guernsey	4.9	3.7	9.4
Holstine	3.6	3.2	8.7
Jersey	5.4	3.8	9.4

The water content of milk acts as a currier for other nutrients. Some of the nutrients are in solution in the water. Others are in suspension, which accounts for the water opaque appearance of milk. The water in milk is removed directly from blood. About 95% of the milk fat in cows is triglycerol, with the fatty acid portion of the molecule having carbon chain length of 4 to 18. About half of these fatty acids are synthesized within the mammary gland.

The most important milk protein is casein, accounting for over 80% of the milk protein Lactose is a (milk sugar). It is formed from blood glucose. Mineral (ash) in milk are similar to that found in the blood because they are in a soluble form and are therefore in equilibrium with the same minerals in blood

4.2. Milk ejection

Milk ejection, often called **"milk letdown"** is physiologically a separate function from milk synthesis. Milk ejection is triggered by stimulation of sensory nerves in the teats by either suckling the young or having the teats massaged. This stimulation results in the release of Oxitocine hormone from the posterior pituitary. Oxitocine reaches the mammary gland by way of arterial circulation. It stimulates the myoepithelial cells surrounding alveoli and small ducts, forcing the milk down into larger ducts, gland cisterns, and teats, where it can be readily removed. While stimulation of sensory nerves in teats will trigger the milk ejection reflex, milk ejection can become condition responses.

Self-check 4-Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

1. List the milk composition of dairy cows (5pts)
2. What are the factors affecting of milk compositions of dairy cows? (1Pts)

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

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

Information sheet 5-Carry out hygiene and sanitation

5.1. Introduction

Hygiene and sanitation are basic for gain required production in each farm.

Considerations of the following are crucial:

1. Do not use faulty machinery. All farm machinery must be regularly maintained according to manufacturer's instructions. Mark all controls.
2. Observe appropriate hygiene practices: no smoking, eating or drinking around the dairy. Wash hands following contact with effluent and manure.
3. Provide appropriate protective clothing and equipments such as gloves, apron, rubber boots, goggles and other skin protection to ensure that it is worn by staff that comes in contact with animal effluent and manure.
4. Maintain or replace all personnel protective equipments regularly
5. Follow effluent and manure management guidelines poor practices increase the health risks associated with flies and insects
6. Whenever chemicals are used, read and understand the material safety precautions prescribed
7. Work in proximity to others and site visitors
8. Put warning signs on the fence of effluent and manure storage ponds saying "Danger manure storage"
9. Follow specifics safety rules to each activity described

Equipment needed

- Clean hand
- Bucket
- Parlour or stanchion
- Water hose or bucket of water / continuous water supply/
- Paper towels
- Teat dip, sanitizer
- Cattle controller(if not trained)
- Rope

Follow these procedures

1) Place a milk bucket under the cow's udder instead of the machine
2) Milking is done by hand pressure applied at the upper portion of the teat with the thumb and first finger. The pressure traps the milk in the teat
3) The teat is squeezed against the palm of the hand by the remaining three fingers, with pressure first applied by middle finger then follows the other fingers, this causes milk to squirt from the canal
4) When the milk is squeezed out of the teat, the pressure applied by the finger is released and the milk is free to flow from the cistern of the udder to the teat. Then apply the above procedure to the teat to remove the milk. Continue this process until the cow is milked out.
5) If the teats are very short use only the thumb and first two fingers. With extremely short teats, stripping may be

necessary. Striping – milking by applying pressure with the thumb and first finger at the top of the teat as in step 2

6) Immediately after milking, the teats should be dipped in an effective teat-dip solution

Self Check -Written Test

Directions: Answer all the questions listed below.

1. what is the recommended milk storage area should be considers.(3pts)
2. List the procedure of Carry out hygiene and sanitation. (5Pts)

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

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

Operation Sheet 1-Techniques for hand milking practices

Procedures hand milking of Dairy Cattle

1. Feed the cow its production ration (this is optional depending on the feeding system)
2. Restrain animal - tie hind legs above hock joint in the form of a figure
3. Wash hands with soap and clean water before milking.
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.
5. Wash udder with warm clean water with disinfectant using a clean towel. Warm water also stimulates milk let down.
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

Operation Sheet 2-Machine milking

Procedures of machine milking:

Step1. Start by providing animals with a clean, low-stress environment.

Step2. Stripping teats serves as an important stimulation for oxytocin release

Step3. Applying sanitizing solution (pre-dip).

Step4. The final step in the preparation process is to remove the pre-dip and dry the teats.

Step5. To get the most out of milk letdown, attach milking units within 60 to 90 seconds after first stimulation for optimal oxytocin release.

Step6. Take-off machines, from the cow teats

Step7. Dip or spray every teat after milking with an effective post-dip product

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 8hours.

Task1.Performingof hand milking practices

Task2. Performing of Machine milking system of dairy cows

Task3. Performing of general milking practices on a modern dairy farm.

Task4.Carrying out hygiene and sanitation of working area and equipment

Task5.Determine of dairy cow milk composition and source of constituents

Task 6.Carrying out dairy milk record keeping

LG #46-LO #5 - Rear new born

Instruction Sheet-Learning Guide # 46

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

- Identifying, selecting and preparing facilities of calf pen, equipment and supplies.
- observing monitoring of newborn after delivery
- Identifying calf feeding methods.
- Carry out general management of calf.
- Identifying and maintaining hygiene, health and environmental 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:

- Identifying, selecting and preparing facilities of calf pen, equipment and supplies.
- observing monitoring of newborn after delivery
- Identifying calf feeding methods.
- Carry out general management of calf.
- Identifying and maintaining hygiene, health and environmental requirements

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 and Sheet 5 in pages 107, 112, 117, 123 and 127 respectively.
4. Accomplish the “Self-check 1, Self-check 2, Self-check 3, Self-check 4, and Self-check 5” **in page -111, 116, 122, 126 and 136** respectively.

5 If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1 and Operation Sheet 2”**in page -137 and 138 respectively.**

6 Do the “LAP test” **in page – 139** (if you are ready).

7 Then processed to the next learning guide

Information sheet 1-Identifying, selecting and preparing facilities of calf pen, equipment and supplies

1.1. Introduction

The newborn female calf should become a milk-producing cow in about 2.5 year's time. However, calves may die and this mortality means a loss of money. Far worse is morbidity, the chronic disease status of calves resulting in stunted animals. Morbidity affects all aspects of the animal during its entire life: its growth, the age of first calving, milk production and calving interval. Proper young stock rearing preventing mortality and morbidity is extremely important for the economic situation of the farm. This starts with the care of the cow around calving. The next step is to help the calf – a monogastric animal at birth – to become a ruminant. A ruminant has four functioning stomachs, while in the recently born calf only the real one, the abomasum, is developed. The other three stomachs, especially the rumen, develop when the young animal eats roughage. This process takes about 8 to 10 months.

1.2. **Identifying, Selecting and Preparing facilities of calf pen, equipment and supplies**.

Types of facilities and equipments required

Facilities are:

- Appropriate sheds
- Water supplies
- Exercise yards
- Health center

Tools and Equipments

- -Nipple pail - Bucket
- -Heating pan - Rack
- -Towels - Scissors
- -Rope - Brushes

Veterinary equipments

- Dehorner - ear tags
- -Hoof trimmer - ear tag applicator
- -Burdizzo - Branding ironDrenching gun

Feeding equipment

- Types of feeds provided - milk laxative, palatable &c nutritious.
- Suitable feeds - Wheat bran, oats, and linseed oil seeds.
- DCP & TDN of ration must be 16-18% & 70% respectively.
- 40-60 gms. Sterilized bone meal & 40 gm common salt may be adder', to grains.
- Succulent green, palatable fodders containing 50-60% legumes are suitable while amount concentrates should be increased gradually in three weeks.

Fig 31. Individual calf feeder

Fig 32. Mass calf feeder

1.3. Dairy Calf Housing

On a dairy farm, there are new babies being born every day. Just like people, cows only produce milk (lactate) if they have recently had a baby. The cows get a break from milking for about two months before they calve (have their baby).

Fig 33. Calf house

Requirement in Calf housing

- Protect from sever conditions
- Ventilation
- Sanitation
- Hygiene

1.4.Castration Equipments

In general, castrated men experience a much-diminished sex drive, because their bodies have very low levels of the male hormone testosterone. This lowers the frequency, strength, and duration of erections, and can cause hot flashes, vertigo, loss of body hair, and breast growth.

Fig 34. Castration equipment (Burdizzo)

Self-check 1-Written test

Name…… ID……

Date…….

Directions: Answer all the questions listed below.

1. Write the facility required for calf rearing (5Pts)
2. Explain the methods and importance of calf rearing (5pts)
3. Discuss the importance of calf housing (5Pts)

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

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

Information sheet 2-Observing and monitoring of newborn after delivery

2.1. Introduction

The newborn calf should begin to breathe shortly after the umbilical cord breaks. Mucus around the nostrils should be removed. Do not pound on the calf's chest or lift it by the rear legs since this can do more harm than good. Shortly after birth, the navel cord should be dipped (not sprayed) with a 7% tincture of iodine solution. (Do not use teat dip or weaker iodine solutions.) The cow should be allowed to lick the calf after delivery.

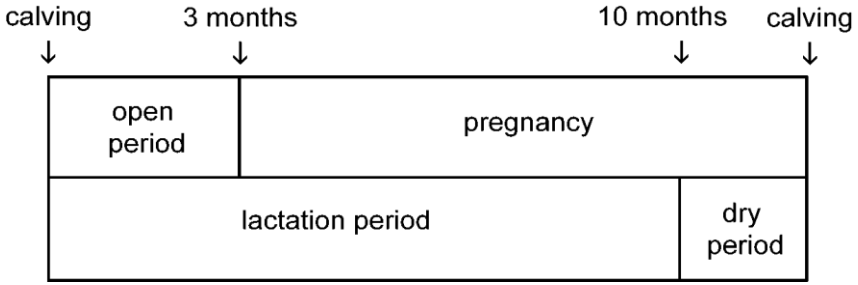


Fig 5: Schematic overview of an ideal 12 months calving interval

2.1. Calf rearing

A newborn calf needs milk for about 3 to 4 months. After weaning, thecalf can do without milk but it still needs high quality feed to stimu- late its growth and development. The period after weaning is often the most difficult, especially if high quality feed is not available or is con- sidered too expensive. Calf mortality, however, is highest during the first 3 to 4 months.

1.3. Bedding

Bedding plays a key role in calf comfort. Managing bedding during early preweaning is important. An ample, dry bed of fluffy material can:

- Provide a cushioned resting surface.
- Help calves stay clean.
- Act as a moisture absorption media.
- Decrease the risks of disease.
- Reduce stress

Fig 35. Bed of new born dairy animal

Selecting bed

Overall, bedding types don't affect average daily gain and dry matter intake of calves with proper management. There are many types of bedding including:

- Straw
- Shavings
- Sawdust
- Sand
- Gravel

1.4. Fly control

Of the bedding types, straw promotes the highest fly populations. Sawdust is less desirable for maggot growth because it

- Poorly absorbs liquid.
- Has little organic matter.
- Is harder to breakdown.

1.5. Comfort

Sand and gravel bedding tend to compact and get dirty after a few weeks.

Adding fresh straw over soiled bedding will keep the calf comfortable. But this will allow the bedding to hold more moisture and possibly ferment. Shavings and sawdust differ in size, which can affect animal comfort and productivity. Thus, you should use a reputable supplier for bedding.

Keeping calf bed clean and dry

A clean living space reduces the number of pathogens the calf must overcome. In dirty conditions, calves use energy to fight mud, heat or pathogens. In clean conditions, calves can use this energy for growth and maturing instead.

- Check calf bedding regularly to make sure it isn't constantly wet. Pathogens don't do as well in dry environments.
- Remove soiled bedding and manure from pens and add fresh bedding to keep beds clean and dry.
  - ✓ Don't walk or use equipment between pens and animals. People and equipment can spread disease.

- Always replace bedding between calves.

Provide deep bedding if your hutches are directly on the ground or other solid surface

Self-check .2-Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

1. Explain the importance keeping hygiene of calf house (5Pts)
2. Discuss the advantage of bedding calf house (5Pts)

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

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

Information sheet 3-Identifying calf feeding methods

3.1. Introduction

Colostrums is the first milk which is rich in vitamin A, D and immunoglobulin suited to the requirements of a young calf. The newborn calf needs colostrum as soon and as much as possible, preferably within half an hour but at least within 2 hours after birth. 'Colostrum' is the milk the dam produces during the first 3 days after calving. Colostrum contains a lot of antibodies and it gives the calf so- called 'maternal immunity'. Some farmers allow the calf to stay with its dam for 2 or 3 days to get the maximum amount of colostrum.

The problem is that it may be difficult to teach the calf to drink from a bucket thereafter. Other farmers milk the cow 3 to 5 times a day and feed the colostrum immediately to the calf, about 0.75 to 1 kg each time. This is important for building up immunity as soon as possible. Maternal immunity lasts for some 2 to 3 months and within this period the calf has to build up its own immunity. Best is to allow the calf some exposure to pathogenic organisms and parasites.

3.2. Suckling

Many local and crossbred cows will not let down their milk without their calf being present. This does not necessarily mean that the calf has to suckle first, often its close presence will do.

If this is the case the cow will stop producing if her calf dies. Therefore try milking the

Feeding dried skim milk, whey, and butter mil

- These products can be fed to calves if available
- The dried products can be mixed with water at the rate of 1 kg to 9 kg of water and then fed as skim milk by warming up to ^{0} avoid digestive troubles.

Feeding calf starters

- Calf starter is a mixture consisting protein feeds, mineral vitamins and antibiotics.
- It is fed with limited milk gruel form usually after 2 weeks of age but a dry cstarter is given after 2 months of age
- An ideal calf starter contains 20% DCP and 70% TD

Some farmers allow the calf to suckle the last milk for 10 to 15 minutes. This may help to reduce mastitis, but as the last milk contains the most fat, the calf may get too much fat. Better leave (part of) one quarter or teat for the calf, but not always the same teat.

In some areas milk is only collected in the morning in which case the calf can join its dam for suckling after the morning milking till mid-day. From then on until the next morning milking, calf and dam re-main separated.

Fig 36. Coloustrm feeding

3.3. Feeding grain mixture

- Better growth and resistance to calf alignment to consumption of grain and milk than when fed on milk only.
- At the age of 7-15 days the feeding of grain mixture be started in order to get calves accustomed to grain mixture, place small amount of grain mixture in the used pail, as the calf is finishing its milk it may consume a portion, or may offer a little in the hand immediately after feeding milk.

3.4.Feeding silage and pasture

Silage

- Calves at their ages between 3 to 6 months need small amount of

silage,

- Feed 1 to 2 kg daily to calves aged up to 3 months and then increases these amounts by about 500g/day for each month.
- Use every precaution to ensure the quality of silage because moldy or damaged silage will lead to indigestion.

Pasturing

- A separate pasture for calves is always desirable
- If calves have to depend largely on pasture before 12 months of age, they will not grow normally as they are unable to obtain adequate pasture
- Allow the calves' access to constant supply pasture and common salt

Providing Minerals

- Milk is one of the best sources of Ca & P
- When feeding milk no deficiency of minerals during the milk feeding period.
- High quality legumes are excellent sources of good for P
- Unless these feeds are freely consumed after supplement mineral

Table 3. Feed requirement of new born

Age	Colostrum(lit)	Milk(lit)	Calf starter(gm)	Green fodder/hay	Mineral mixture(gm)
1-4 days	2-3	-	-	-	5
5-15 days	-	2-3	-	-	10
16-30days	-	2.5-3	-	adlib	10
1-2 months	-	2.5	250	adlib	10
2-3 months	-	2	500	adlib	10
3-4 months	-	1	750	adlib	20
4-6 months	-	1	1000-1750	adlib	20

Remember

Points to bear in mind when calf rearing:

- Immediate provision of colostrum to the newborn calf is essential
- Feed an adequate amount of milk from a clean bucket
- Introduce special or good quality concentrates at about one week of age
- Start giving roughage during the second week, preferably goodquality hay
- Make sure the calf pen is dry, draught free with a slatted floor, tick free, bedding
- Provide the calf with fresh and clean water from early age onwards

Self-check .3-Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

1. Mention the requirement of colostrums for calf (5Pts)
2. Explain the time when feeding additional feed (5Pts)

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

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

Information sheet 4-Carry out general management of calf

4.1 Introduction

Management of calf is crucial for thinking the next generation of the herd. Post weaning feeding of dairy calves:

- The rumen is developed at this stage to pick up microbial digestion.
- The calves are in a position to handle concentrate and roughage for rumenal digestion.
- Calves are fully kept on calf starter, succulent green fodder and good quality hay
- The calves after weaning reach to a stage to consume 1-2 kg calf starter

4.2. Feeding calves above 6 month of age

- Rumen is fully developed
- Calves could meet most of their nutritional requirement (70%) from succulent forge
- At 100kg body wt. Calves can meet the growth requirement by providing 1kg. Concentrate
- Good quality fodder are increase of feeding stuff for every 50kg increases body wt.
- Dry matter intake is hardly 3% of body wt. should be supplied from concentrate

4.3. Special Managerial practice

Castration: removal of the testis or crushing spermatic cord of male animal

- Importance –avoid breeding of undesirable bull
- ✓ Reduce aggressiveness
- ✓ Improve carcass quality
- ✓ Easily handle
- Methods of castration–bloody (open method) and non-surgical (close castration) burdizzo and elastic band.
- Time of castration –prefer at young age (before 3 month of age)
- ✓ Should be done at good season (feed availability, less fly Population
- ✓ Avoid castration during extremely hot, cold, or damp (humid weather)

Dehorning – removal of the horn of an animal

- Importance – reduce risk of injury of animals and people
- ✓ Reduce space requiremen
- ✓ Easier to handle
- ✓ Method –chemicals (caustic soda stick test)
- ✓ Age 1-2 weeks: rub the dehorning chemicals.
- ✓ Physical-hot iron dehorner, electrical dehorner

Hoof trimming – removal of an outgrowth of hoof

- Especially for commercial dairy farms.

Removal of extra teats

- Causing difficult to milking processes
- Predisposing fro mastitis (udder infection).

Identification of animals

- Every animal should be marked (identified) by a reliable methods starting from the day of birth.
- The identification card should be given for each animal.
- Method of identification- neck chain

✓ Ear tag
✓ Ear notch
✓ Freeze brand
✓ Etc

Self-check .4-Written test

Name…… ID…… Date…….

Directions: Answer all the questions listed below.

1. How to manage post weaning of calf? (4Pts)
2. Mention the advantage of castration and dehorning of calf (5Pts))

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

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

Information sheet 5-Carry out general management of calf

5.1.Introduction

Individual heifers should reach a minimum weight prior to weaning. No specific weaning weight has been defined by research. The type of rearing system will affect the target weaning weight. Although, common weights used for weaning are 70kg for Jerseys, 80kg for Fr x J Crossbreds, 90kg for Friesians.

5.2.Weaning

Successful weaning based on calf weight and meal intake will help calves develop into healthy heifers. Making sure a heifer is fully prepared before weaning reduces the chance she will need preferential treatment post-weaning. Preferentially managing small groups of animals to try and “catch them up” to the group is time-consuming and can be difficult to manage, so it is best avoided by good early management.

Weaning time

Calves should only be weaned after they have been eating at least 1kg of starter concentrates per day for three consecutive days. This will avoid a growth check after weaning. This level of intake is usually achieved by eight weeks of age. The amount of concentrates a calf eats depends on the availability of concentrates and the volume of milk being fed. If calves are fed milk ad lib or close to the level of milk they would normally drink

(for example to make use of transition, non-saleable milk or to achieve higher weight gains in an automated feeding system), gradual weaning should not be initiated before the 12th week of life.

If calves are fed milk ad lib or close to the level of milk they would normally drink (for example to make use of transition, non-saleable milk or to achieve higher weight gains in an automated feeding system), gradual weaning should not be initiated before the 12th week of life.

Calves can be weaned once they are consistently consuming 1kg of concentrates per day. This level of intake can potentially be reached at an age of six weeks if access to palatable starter and water is available ad lib. Concentrate consumption in the period immediately before weaning can be increased by restricting milk replacer availability for seven to 14 days pre-weaning.

This can be done by:

a) Limiting the total quantity of milk replacer offered by restricting the daily allowance per calf in the period prior to weaning.

- Two weeks before weaning allow 0.75kg milk powder and one week before weaning reduce to 0.50kg powder per calf per day.

b) Limiting daily access to the nipples in the period before weaning.

- Two weeks before weaning allow 12 hours access and one week before weaning allow six hours access per day.

c) Reducing the bore of the pipeline by restricting the flow of the milk for seven to 14 days before weaning.

- This makes it difficult for the calf to satisfy its appetite with milk alone and encourages it to consume solid food.

d) Abruptly turning off the water heating system and reducing the concentration from 10 to 5% is also effective in reducing milk intake and thereby increasing concentrate intake.

Critical of weaning

- Calves should have been consuming at least 1kg calf starter/day for three consecutive days.
- Calves should be healthy.
- Calves must not be stressed (avoid disbudding, castration etc. at the same time).

The post-weaning growth check found in many calves is due to three factors:

I. Low intake of dry feed up until weaning, resulting in limited rumen development. This results in a growth check for about two weeks while the rumen becomes accustomed to digesting significant quantities of dry feeds.

II. High intake of bulky roughage such as grass and hay. Calves are physically unable to eat enough roughage to sustain rapid growth weights with their small, developing rumen.

III. Calf stress when feeds are changed. Feeding concentrates before, during, and after weaning should limit the level of growth check. If a growth check does occur, the lost growing time will never be made up and it will take longer to attain target weights.

Feeding newly weaned animal

Weanlings are often used to feedstuffs such as grass and hay, which are not rich in nutrients, so producers must find a way to balance the familiar feedstuff with new, nutrient-rich feeds.

The dry matter intake on calves is often about 1 percent of body weight. The Hays protocol suggests that producers offer the calf 0.5 percent of its body weight of concentrate-based 75 to 85 percent total digestible nutrients or TDN ration. Try to limit silage and other familiar feeds. So, the calf is offered half of 1.0 or 0.5 percent of body weight of a weaning ration or pellet and half of 1 percent of body weight of good quality grass hay.

- Positioning the feed is as important as the feed itself. Put the hay the calves are most familiar with on top of the feed ration on the first day.
- The second day the ration should be increased to around 0.7 percent of the body weight and keep the hay the same. Put the hay on top of the ration.
- On the third or fourth day, increase the amount of feed, but not the hay. At this time, put the ration on top of the hay.
- Days seven through 10 of weaning, the goal is to have a calf eating 2 percent to 2.2 percent of its body weight – maybe

even 2.5 percent.“We are trying to build a transition into the calves as they move into new feeding rations in a stabilized way,” said Waggoner, noting that this regimen balances the need to transition the calves and ensure they have enough nutrition. Often weanling calves are fed as much as they will eat which can lead to problems later.

Nutritional requirements of weaned animal

- Water is essential for all living animals. Weaned calves require 10–15 L/day with up to 25 L/day on hot days.
- Energy is required to maintain body temperature and to support normal body function. Energy is best described as metabolisable energy (ME), with requirements quantified in MJ of ME/day.
- Milk is digested in the abomasum with much higher energetic efficiency than are solid feeds in the rumen.
- Proteins are required to maintain normal body processes, repairing tissues and forming blood and also laying down muscle. Protein is quantified in g/day or percentage of feed dry matter.
- Rumen development in the milk-fed calf depends on its intake of solid feeds that contain fibre.
- Calves also require small amounts of minerals and vitamins. The most important minerals are calcium, phosphorus and magnesium.

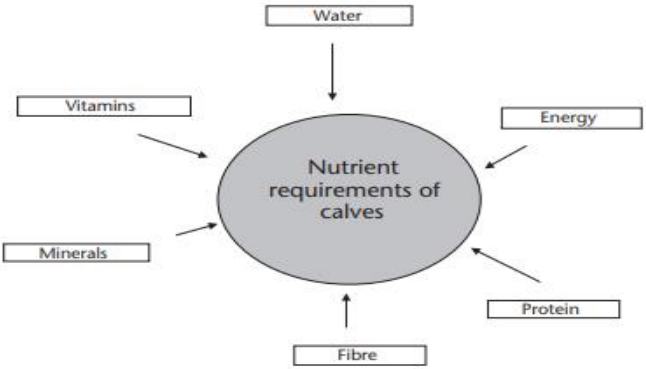


Fig 37.The nutrient requirements of calves

5.3.Common disease of calf

Calf scours (white scour)

- Cause – mostly Escherichia coli
- Transmission- calves are overfed, under feeding, feeding pails are dirty

- feeding milk temperature below body temperature, dirty pens

- Symptoms-

✓ high temperature before showing diarrhea with light colored,

✓ Diarrhea with foul smelling, watery or foamy faeces, dullness and dislike for food, develops a dry and rough skin, many calves are affected at a time, some may die.

- Prevention and control

✓ Prevention –proper hygiene and sanitation in calf feeding practice, calf pen.

✓ Control-isolation of infected calves and disinfection of premises, avoid over and under feeding.

✓ Treatment – Antibiotics, provide luck warm water with 1g salol/ tannin added to it. Later milk diluted with water is given.

Coccidosis (red dysentery)

- Causes-Eimeria zurla and E. bovis
- Transmitted- frequently found in animals, disease only follows massive infection, when animals are kept in unhygienic and over crowded
- Symptom

✓ The faeces are thin, foetid , mixed with mucus and blood or blood clot are passed in or affects faeces, marked strain, and emaciation and may die in a week or so.

- Prevention

✓ Proper management practice

- Control

✓ Isolation sick calves

- Treatment

✓ Sulfamezathine

Pneumonia

- Causes

✓ Infection occurs during sudden falls in temperature or when animals are exposed to unfavorable weather conditions and when their resistance is lowered especially for calves in the age group 3-8 weeks are more susptable

- Symptoms

✓ initially- chill followed by high temperature, breathing becomes

faster and laboured; coughing is dry and painful in the beginning but become soft and moist as the disease advanced; watery or mucus like discharge from nostrils.

- Prevention

✓ Avoid exposure to sudden cold or rain, over crowding of animals, keep animals in neat clean and dry houses.

- Control and treatment

✓ Give sulphoamides and other antibiotics.

Navel-ill (joint calves)

✓ It is a disease of young calves

- Caused by

✓ Many types' bacteria which enter the body through the navel or a wound or by bacterial infection of the navel of the newly born calf or due to contamination of the raw navel on account of filthy surrounding.

- Symptoms

✓ Swelling of the navel with foul smelling pus, fever and diarrhea, its leg joint may be swollen and liver may be affected.

✓ Death usually follows.

- Treatment

✓ Antibiotics

✓ Treating the navel of new born calves with iodine or other antiseptics.

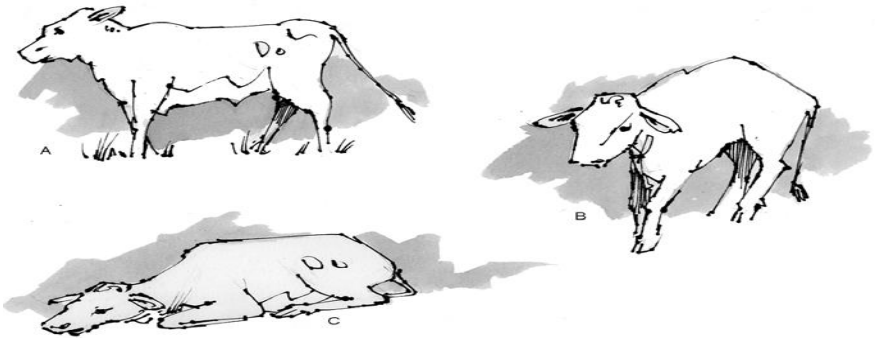


Fig 38: Signs of health and disease in the calf. A: Healthy, alert,clean eyes, shining coat and pricked ears. B: Diarrhoea, dirty hind legs and tail, drooping ears and sunken eyes. C: Pneumonia, Runny eyes and nose, difficult breathing, open mouth and neck stretched out

Self Check-Written Test

Directions: Answer all the questions listed below.

Name…… ID…… Date…….

1. Mention the cause of Calves health problems (5pts)
2. List and explain common disease of Calves (5pts)

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

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

Operation Sheet 1-Techniques for Ear tag application of calf

Procedures for Appling of ear tag application calf:

Step 1: Catching and Restricting Movement

Step 2: Significance of Identification Number

Step 3: Tag Placement

Step 4: Proper Use of the Applicator

Step 5: Placing the Tag

Step 6: Applicator Maintenance

Step 7: Watching for Infection

Operation Sheet 2-Techniques for dehorning of calf

Procedure for dehorning of calf

Step 1.Check with a needle to ensure that the area around the horn tip is numb.

Step 2.Check that the dehorning iron is red hot.

Step 3.Trim the hair around the horn bud.

Step 4.Make sure the calf is properly restrained.

Step 5.Apply the iron at right angles to the horn bud.

Step 6.Rotate the iron continuously until the bud loosens.

Step 7.Dislodge the end by digging the rim of the iron under the loosened end

Step 8.Hold the iron over the horn cavity at an angle for two or three seconds to cauterize the wound.

Step 9.Reheat the iron and repeat procedure for the other horn.

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 8hours.

Task 1: Performing for Cleaning of calf shed

Task 2: Performing for Ear tag application of Calf

Task3: Performing dehorning of Calf

Task4. Carrying out critical Calf management

Task5.Perform calf sanitation activities, feeding, and identification

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