



ARTEFICIAL INSEMINATION- LEVEL-II

LEARNING GUIDE-15

**Unit of Competence: Assisting Basic Husbandry
Practice of Dairy Cattle**

**Module Title: Assisting Basic Husbandry
Practice of Dairy Cattle**

LG Code: AGR ATI2M 05 0919 LO-02-15

TTLM Code: AGR ATI2 TTLM 0919V1

LO2: -Undertake raising ruminants

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

- ✓ Follow and clarify Instructions and directions
- ✓ Undertake dairy raising activities.
 - Feeding
 - handling
 - husbandry practice of ruminant
 - Identification
 - Castration
 - Milking
 - Rear new born
 - Hoof trimming
 - Estimate the age of ruminants.
 - Observe workplace practices in the handling and disposal of materials
 - Report problems or difficulties after in completing of work.

Learning Activities

1. Read the specific objectives of this Learning Guide.
2. Read the information written in the “Information Sheets
3. Accomplish the “Self-check” in each information sheet
4. If you earned a satisfactory evaluation proceed to “next Information Sheet”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #2.
5. Submit your accomplished Self-check. This will form part of your training portfolio.
6. Read the “Operation Sheet” and try to understand the procedures discussed.

1. What's a Ruminant?

Ruminants are various cud-chewing hoofed mammals having a stomach divided into four compartments (rumen, reticulum, omasum and abomasum), each one with a specific role to play. The most important is the rumen. Cattle, sheep and goats are ruminants. All ruminants 'chew the cud'. This means that the food they consumed earlier is returned to the mouth for a second thorough chewing before it is re-swallowed. The rumen is full of tiny microorganisms (bacteria and protozoa) that digest fibrous feed, such as fresh grass and hay, foodstuffs that humans and most other animals cannot digest. After digesting the fiber, the animal makes use of the end products for growth and milk production. The microorganisms can also convert non-protein nitrogen-containing ingredients (e.g. urea) into protein that the animal can use. These microorganisms also manufacture some vitamins, such as the vitamin B group.

Role of large ruminants

Large ruminants (cattle) play a vital role in the whole agricultural system and so have a large influence on the rural economy of the country. Livestock products like milk, meat, and hides, contribute more to national GDP, and the agricultural GDP.

A. Advantages of large ruminants to the farming system

- ❖ Large ruminants as a source of farm power
- ❖ Large ruminants as a source of manure
- ❖ Large ruminants as a source of animal protein
- ❖ Large ruminants as a means of cash generation

B. Constraint of large ruminants

- ❖ Excessive population depending on limited natural resources
- ❖ High labor requirement with minimal net return
- ❖ Severe feed shortage (in quality and quantity)
- ❖ Diseases and parasites and their effects

- ❖ Poor productivity potential of indigenous large ruminants
- ❖ Poor marketing structure

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

1. What are large ruminants? Define clearly. (2pt)
2. What are major constraints of raising large ruminants in Ethiopia? (5pt)

Note: Satisfactory rating above 6 points

Unsatisfactory - below 6 points

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

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

2.1. Carry out husbandry practice

2.1.1. Feeding cattle

Cattle need an adequate supply of protein, energy, water, minerals, and vitamins to obtain optimal levels of production. Cattle utilize these nutrients through a balanced diet (ration). The feed used can be separated into two classes, roughages and concentrates.

Roughages:-are feeds high in fiber and low in total digestible nutrients. This includes gradable pasture, alfalfa, grass hay, and straws. Roughages are the cheapest part of the ration and necessary for the bulk, vitamins and minerals it contains.

Concentrates: - are feeds low in fiber and high in digestible nutrients, which provide more net energy than roughages. This includes grains, cottonseed meal, wheat bran, and soybean meal

Essential Nutrients

The nutrients utilized by cattle are protein, carbohydrates, fats, minerals, vitamins and water. Producers should understand the digestive system of the ruminant animal and the nutrient requirements of the various classes of beef cattle. Water is one of the most important nutrients. Cattle should have access to all of the clean, fresh water that they need. Water is involved in all digestive and metabolic processes. Carbohydrates, fats and in some instances proteins provide the energy in all animal rations.

2.1.2. Selecting pasture mixtures

A profitable cattle operation will be strongly dependent upon a well-planned pasture and forage program. Forages provide about 80 to 90 percent of the required beef cattle nutrients. In cow-calf production, forages often meet all the requirements of the beef cow and her calf. A forage program may include pasture, hay, silage, crop residues or any combination of these. The most economical forages are usually those that are grazed. The yield and quality of the forage produced each season of the year depends on the forage species of plant, soil fertility and liming practices, climate, stage of plant growth at harvest and grazing management. To select the best pasture mixture, you must know the characteristics of adapted plants.

2.1.3. Handling Cattle

To handle cattle correctly, an understanding of animal behavior is essential. In fact, the greater the handler's knowledge of cattle behavior, the better their ability to predict an animal's response and the better the ability to predict animal responses, the quicker and easier the job and the lower the probability of injury to animals or people. Cattle, because of their size, strength, speed and potential for aggression, need to be handled thoughtfully and with confidence. The most important aspect of handling any livestock is to be able to recognize and interpret an animal's reactions. The beast's 'body language' will indicate its probable actions.

2.1. 3.1. Castration

Castration:-is removal of male reproductive organs. There are two methods of castration, these are:-

- A. **Open castration:**-Open castration/emasculator:-The incision for surgical castration should be of sufficient size, and extend to the base of the scrotum, to allow effective drainage and reduce the risk of infection.

B. **Closed castration**:-it can be done by: rubber ring method tension band and by use of burrdizo

A person should use the most appropriate tools and least painful method to castrate cattle that is applicable to the production system. This include:-

- Cattle to be castrated or made crypt orchid should be as young as possible (less than 12 weeks old) and the procedure should be done before the cattle are weaned.
- Calves should be more than 24 hours old when castrated.
- Calves less than two weeks old should be castrated by the **rubber-ring** method in preference to the **cutting method**.
- Calves more than two weeks old should be castrated by the cutting method in preference to the rubber-ring and tension band methods.
- Use of rubber rings or tension bands on calves should ensure that the correct position and tension is achieved to block the arterial blood flow.
- The incision for surgical castration should be of sufficient size, and extend to the base of the scrotum, to allow effective drainage and reduce the risk of infection.

2.1. 3.2. **Des-budding and de-horning**

Disbudding and dehorning Preference should be given for breeding of naturally **polled cattle**. Disbudding should be done in preference to dehorning. **Hot-iron cattery** should be used in preference to excision methods for disbudding calves. Calves should be disbudded or dehorned **as young as possible**. The hair around horn buds should be clipped before using caustic chemicals for disbudding. Tipping should only remove a solid, nonvascular portion of the horn, and result in a blunt horn end. Horn regrowth or a scur that has a blunt horn end should not be dehorned or tipped.

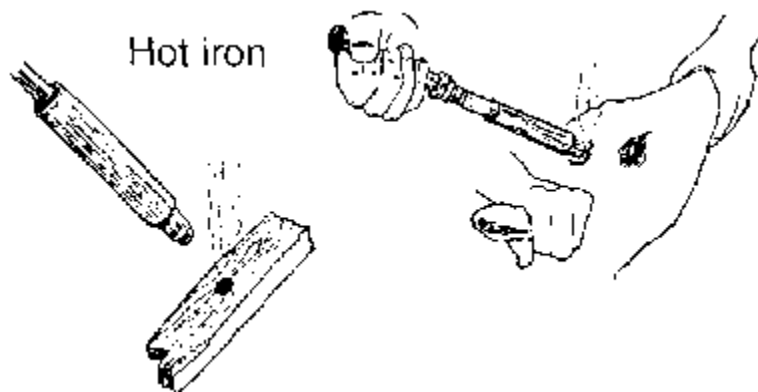
Advantages of dehorning of cattle

- Prevent damaging of hide of the cattle
- For proper spacing of feeder and waterer
- To prevent fighting hazards' on cattle handlers

The tools used to disbud animals

To dehorn an animal, you will need a dehorning iron which can be heated by electricity or over a direct flame. The end of the iron is round and hollow and will fit over the bud of the horn. *Using a hot iron is better than using caustic soda to remove the buds.*

The tools used to disbud animals



You may have an iron, but if you do not, ask a blacksmith to make one for you.

To test the iron heat, it until hot and then hold the end against a block of wood. A complete, even ring should be burned into the wood. You will need to test the iron each time you use it to make sure it is hot enough.

Disbudding

You will need someone to help you. Take care with the hot iron.

- ✓ Restrain the animal. Your helper must hold its head and pull the ear nearest the bud you are going to remove, down and away from the bud. He must hold the head very still.
- ✓ Cut the hair away from around the bud of the horn.
- ✓ Test the hot iron and when ready put the iron over the bud and twist it around for about 10 seconds.
- ✓ Continue until the bud feels loose,
- ✓ Reheating the iron if necessary.
- ✓ Push the bud out by pressing with the iron.

2.1. 3.3. New born calf management

Calf feeding

Aim of calf feeding:-the aim of calf feeding should be to reduce the mortality (death) rate while maintaining a growth rate of at least 400 g/day. For bigger breeds (friesian and ayrshire) the aim should be to wean calves at **12 weeks** at approximately **80 kg body weight**. The primary concern in rearing the newborn calf is to ensure it remains healthy. Feeding management addresses nutrient requirements and in the initial stages should be primarily directed at encouraging rumen development.

Stages of development of the calf rumen

Calf feeding is divided into **four phases**, depending on the development stage of the digestive system. When the calf is born, the rumen is not functional and forms only a small proportion of the stomach. as such the calf cannot digest complex fibrous feeds. The calf is thus fed on liquid feeds and low-fiber solid feeds until the rumen develops. as these feeds are mostly milk or milk by-products, which are expensive, early rumen development to allow feeding of cheap feeds is desirable. Early development is stimulated by feeding solid feeds. Concentrate feeding has been shown to stimulate development faster than fibrous feeds.

Colostrums' phase (1–3 days) the calf is born with low immunity (protection from pathogens found in the environment) and is therefore susceptible to infections. Colostrums' is the first milk extracted from the mammary gland of the cow after calving. Colostrums' is a source of antibodies that protect the calf from these pathogens. it is therefore imperative for calves to get this milk immediately after birth as the rate of absorption is highest within the first 3 days.

Pre-ruminant phase (4 days to 20–30 days) during the pre-ruminant phase, the calf rumen is still not functional and the calf can only take in liquids. the calf cannot digest complex carbohydrates or complex protein and thus only milk or milk by-products should be fed. milk replacers should contain simple proteins. rumen development starts towards end of this phase.

Transition phase (2 to 3 weeks before weaning) rumen development continues. In addition to liquids, the calf should be encouraged to consume dry feeds, especially concentrates, as they are known to accelerate rumen development.

phase Post-weaning in the post-weaning stage, the rumen is fully functional and the calf can handle fibrous material. However, the calves should be weaned on high-quality pasture and fodder to maintain a high growth rate. Water should be made available ad libitum.

2.1. 3.4. Hoof trimming: -remove/cut excess growth of cattle hoof

A lameness management strategy should be implemented and should include practices for prevention, early detection and effective treatment. Lameness assessment and/or hoof inspections should be conducted regularly and hoof trimming carried out when necessary.

Advantage of hoof trimming

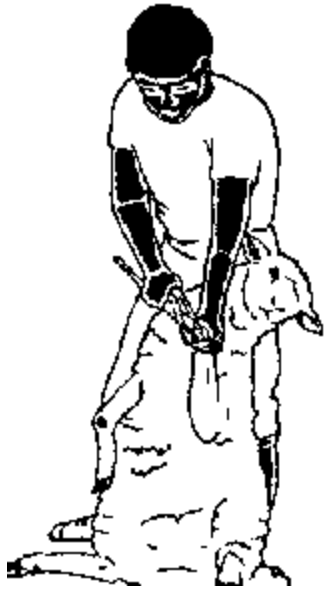
- Proper walking of animal
- Proper holding of the overall body
- To protect from fall down to the ground

The hoof is like your fingernail and grows continuously. Walking wears the hoof down but sometimes the hoof grows very quickly and becomes overgrown. In some places where the ground is too wet the foot can get infected and it becomes smelly and painful. This condition is called foot rot and the animal can become lame. When animals have infected or overgrown feet they cannot walk and graze properly. The male cannot mount the female and is useless.

How to hold or cast animals in order to trim the feet

You can trim the feet of sheep and goats alone or with someone to help you. Grasp the wool or hair on the chest with one hand while holding the animal on its flank with the other hand. Use your knee to push against the animal's back and force it into a sitting position. The animal can be kept in this position for a long time while the feet are trimmed.

How to hold or cast animals in order to trim the feet



Bad



Good



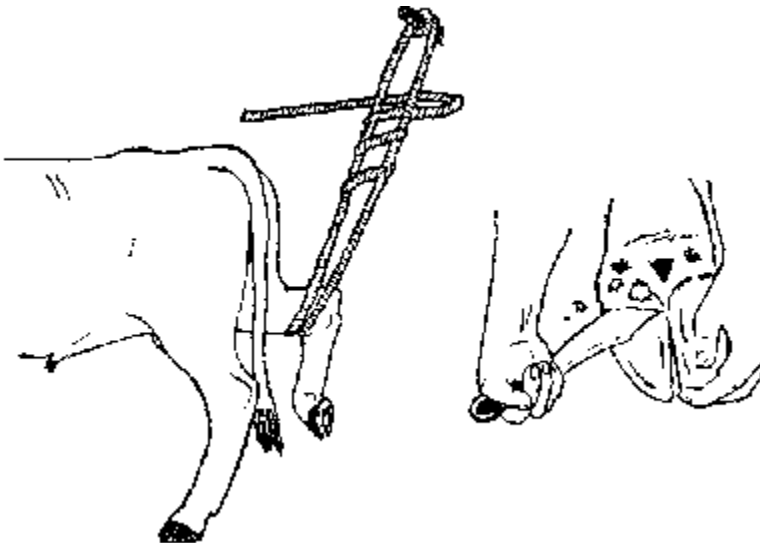
Bad



Good

In order to trim the feet of cattle or buffalo you will need to cast the animal (see Unit 10). The leg may be lifted and tied as shown.

How to hold or cast animals in order to trim the feet



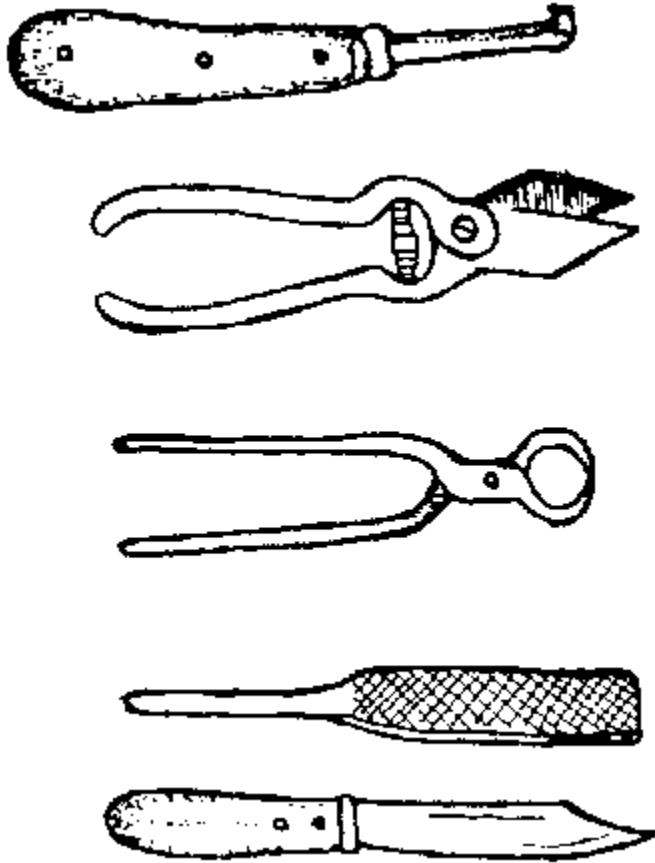
Trimming the feet

You will need any suitable sharp tool such as a knife, hoof cutter large carpenter's rasp, or sharp carpenter's pincers.

Cut the overgrown claw of the hoof by carefully taking off a little at a time. STOP if bleeding occurs. Do not cut down too far. Like your fingernail the hoof has a sensitive area which if cut into will become painful and infected. STOP if the foot (sole) springs

back when pushed with the thumb. When you have cut the hoof down use a rasp, if you have one, to file and neaten the edge of the hoof.

Trimming the feet



If the foot is infected and wet and smelly you should carefully remove the damaged areas so that the infected area is exposed to the air. The infected area should then be painted with tincture of iodine or formalin. Repeat the treatment every 2 days.

2.1. 3.5. Milk

Is white yellowish fluid which is secreted by mammary glands of mammals. Milk is composed of essential nutrients such as protein, carbohydrates, fat, vitamin and minerals.

Milking: -is a complete let down of milk from the mammary gland of dairy cow. The following things are some of the factors must be considered during milking:-

- Milking machinery and equipment should be regularly tested and maintained.
- Milking materials and equipments should be clean sterilize
- The milking technique should minimize the risk of discomfort, injury and disease.
- During milking provide concentrate feed
- Clean the milking area
- Do not smoking in milking area
- Milking is take place at regular time
- Do not change milker
- Avoid noising and shouting around the milking area
- Milker should be free from disease

Quality of milk test:-The quality of milk can check by the following methods:-

- Alcohol test
- Organoleptic test
- Clotting or boiling method
- Lactometer method

Self-Check -2 Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

3. Write the advantage of hoof trimming? (2pt)
4. What is good age for castration and dehorning? **(5pt)**

Note: Satisfactory rating above 6 points

Unsatisfactory - below 6 points

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

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

2.3. Age of ruminant

Age of ruminants can be determined by the following method: -these are

2.3.1. Dentition

- **Temporary (milk) and permanent teeth**
- Young animals, like children, have temporary or milk teeth which will be replaced by permanent teeth.
- Young ruminants have 20 temporary teeth; adult ruminants have 32 permanent teeth.

Temporary (milk) teeth:

Upper jaw No front teeth 6 back teeth

Lower jaw 8 front teeth 6 back teeth

Permanent teeth:

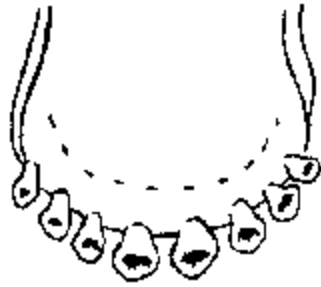
Upper jaw No front teeth 12 back teeth

Lower jaw 8 front teeth 12 back teeth

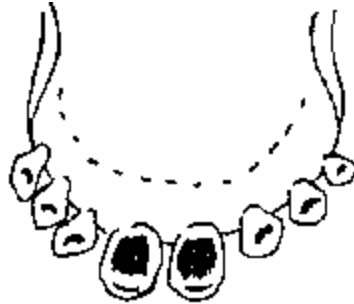
- *Remember that you will not be able to determine the exact age of the animal from its teeth, but there will be a few months either way.*
- *You should develop the habit of regularly checking the teeth (not just for age) because bad or worn teeth will stop an animal eating or chewing the cud. Such an animal is of no use.*

Age of cattle

- (1) Under two years old (No permanent teeth)
- (2) Two years three months (2 permanent teeth)
- (3) Three years old (4 permanent teeth)
- (4) Three years six months (6 permanent teeth)
- (5) Four years (8 permanent teeth)
- (6) Old animal, over four years old.



1



2



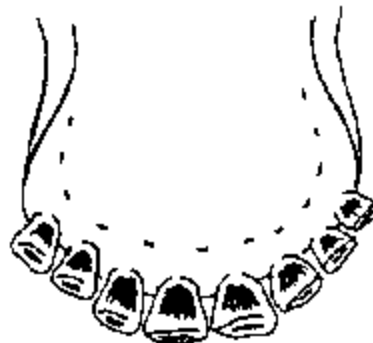
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4



5



6

2.3.2. Tail brush

The brush of tail is only useful as guide when assessing small, stunted or young cattle. A Brush that is about fetlock length or longer is an indication that the beast that is twelve months old or older. This method can be not used on cattle which have been bang tailed.

Bang tail is the act of catting the long hairs at a tip of the tail short to act as a simple identifier of animals and is commonly used after a procedure has been performed on an individual animal that belongs to a large mob.

Eg. The mob is run through a race and each animal is vaccinated –immediately after being vaccinated and will not be given a second dose of vaccine. This is useful when large numbers of animals are being processed by a group individual.

2.3.3. Ring horn

This is not a good guide and may give only a very rough idea. The first horn ring appears at 10- 12 months. One ring is added approximately in a year. But at the fifth year, the first three rings may not be visible and after 8 years, none may be visible.

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

1. What are the methods used for judging age of ruminants (5pt)?

Note: Satisfactory rating above 4 points

Unsatisfactory - below 4 points

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

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

References

1. East African dairy cattle manual,2012
2. Bulletin of dairy cow husbandry

Procedure of bloodless castration

Step 1. Preparation of material

Step 2. Restrain the animal to be castrated

Step 3. Hold the neck of scrotum in one hand and push the spermatic cord to the opposite side

Step 4. Apply the burdizzo to the spermatic cord and crush it. Close tightly about 2 inches above the testicle

Step 5. Left the burdizzo in place for approximately 2-3 minutes.

Step 6. Each cord should be crushed separately. Repeat the same procedure for the other testicle

Procedure of hoof trimming

A wooden block 7.5 cm long and 7 mm deep is used as a guide to the measurements used in this method.

Step1. Cut the medial hoof wall to the correct length of 7.5 cm at the toe, ensuring the cut at the toe is perpendicular to the sole and is square across the toe.

(1) Reduce the horn of the medial sole to the correct depth of approximately 7mm

(i) The cut edge at the toe should be 7mm;

(ii) The white line will reappear as an ellipse around the toe when sole is correct depth

(iii) If the sole is pinking it is getting too thin.

(iv) Using the handle of the knife check to ensure that the paring is producing a flat sole.

Step 2. Using the medial claw as a template, cut the toe of the lateral claw to the correct length and pare the sole to the correct depth.

Step 3. Hollow out the non-weight bearing axial surfaces between the white line and the heels of both claws.

Step 4. Investigate any problems on the sole.

Step 5. Trim the heels if necessary. Be careful because the heels are sensitive. Do not be too aggressive:

(i) Remove any loose tags of horn;

(ii) Reshape the heel;

(iii) Reduce any deep furrows.

(iv) Rasp the edges of the claws to prevent trauma.

Procedure

- Wear PPE properly
- Assemble all materials and equipments
- Clean the milking parlor
- Restrain animal
- Provide feed
- Restrain the hind legs along with the tail
- Dipping the four teat by dipping cup to remove bacteria
- Using a towel wash the udder and teat by warm water
- Dry by another towel
- Take strip of milk by strip cup from the four teats and check whether the milk is infected by mastitis or not
- If it is normal, complete milking within 5-6 minutes
- Dipping the teat by alcohol
- Release the cow
- Continue this procedure for next milking

Procedure

- Wear PPE properly
- Restrain the animal
- Prepare and Handle animal
- Open the mouth
- Look for the teeth
- Judge the age of animal

3. LAP Test	Practical Demonstration
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 4 hours for each task.

Task 1: perform bloodless castration.

Task 1: perform hoof trimming

Task 1: carryout hand milking

Task 1: determine the Age of Animal

Workplace practices safety

There is an obligation on the part of both the farm operator (employer) and those persons

- ✓ Working in the livestock facility to conduct their activities as safely as possible.
- ✓ The responsibilities of the employer and workers to take every precaution reasonable in the circumstances for safety on the work place.

. Employer's Responsibilities on the farm place

- provide necessary equipment, systems and tools to ensure a safe workplace;
- provide training, information, facilities and supervision to ensure the safety and health of workers;
- ensure workers, supervisors are acquainted with safety and health hazards and they are familiar with the use of all devices or equipment provided for their protection
- Conduct the undertaking in such a way to ensure others not in the employer's Service is not at risk for activities in the workplace.

Worker's Responsibilities on farm place

- take reasonable care to protect the safety and health of themselves and other people;
- at all times when the work requires, use devices and protective equipment, wear
- Clothing designated by the employer or required by the Regulations.

Information sheet-5	Reporting problems or difficulties after in completing of work.
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Checking materials tools and equipments during work activities

I. Use of Personal Protective Equipment

- ✓ Safety helmet
- ✓ Goggles/safety glasses
- ✓ Dust mask
- ✓ Gloves
- ✓ Work shoes
- ✓ Apron/over all

2. Cheking dairy farm activity tools and materials

- Milking tools and equipments
- Cleaning tools
- Farm materials and tools

Date _____ Supervisor

Employee _____

—

Employee signature verifies that he or she received training from the supervisor regarding the above checklist.

Managing losses involves:

- Medical treatment
- Accident investigation to determine causes
- Analyzing accident records
- Preventive action and follow-up

Accident investigation helps identify deficiencies in your safety program when causes of accidents are determined.

Investigation should begin as soon after the accident as possible. Make sure every employee understands that the purpose of such investigation is to determine causes so measures can be take to prevent the accident from reoccurring and not to fix blame.

Reporting faulty items

Notes: Complete within eight hours of injury. Explain that you are completing the report to prevent reoccurrence of the accident, not to blame the injured for suffering the accident

Date of accident:

Name of injured:

Parts of body injured:

Nature of injury

References

1. East African dairy cattle husbandry
2. Intensive live stock work manual