Animal production level III

Based on March, 2018, Version 3 OS and January, 2021, V1 Curriculum

Module Title: - Supporting Sheep and Goat Production Activities

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LG #47	LO #1- Perform site selection

Instruction sheet

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

- Inspecting location of new or existing site.
- Assessing topography, adequacy of water and soil type
- Identifying distance from neighboring residence

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

- Inspect location of new or existing site.
- Assess topography, adequacy of water and soil type
- Identify distance from neighboring residence

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
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Information Sheet 1- Inspecting location of new or existing site

1.1 Inspecting location of new or existing site

Selecting a suitable location for starting a Sheep & Goat farm is very important. Consider the essential facilities, while selecting the location. Clean and fresh water source, availability of adequate amount of greens, access to proper medication, transportation and proper marketing are the essential facilities for starting commercial sheep & goat farming.

- **Drainage:** The area should be slightly sloped for effective drainage.
- **Wind direction**: Animal houses should be partially or totally protected from the direction of strong winds depending on the wind intensity of the area.
- **Climatic factors**: Such as temperature and rainfall.

There are several factors to be taken into account when looking at the costs and inputs of setting up and running a shoat production enterprise.

A. Distance. The distance to the nearest abattoir should be as short as possible. If goats are on a transport for more than 12 hours, they can become very dehydrated and will lose several kilos in bodyweight. Some goats will die if very dehydrated. Your profit will decrease considerably; in most markets, the price paid for goats is calculated on the hot-dressed carcass weight (HCW). Dehydration can be reduced significantly by transporting the goats at night, when conditions are cooler. Transporting goats at night is therefore good practice in summer.

B. Transport costs. Most companies charge per kilometer, so the longer the distance to the sale yards, abattoir or port of embarkation for the goats, the higher the freight cost.

C. The cost of set-up, including fencing, dams, plant, buildings and stock, must also be considered.

D. In marginal areas subject to dry conditions, will the possible future profit justify the cost of feed and supplements? These can be considerable and must be taken into account. It is useful to look at the average rainfall in the area where

you intend to buy land. It is of course more difficult now to estimate rainfall in a particular area, due to climatic change. However, past records will give a rough guide to what can be expected.

E. Management inputs. These include such things as ear tags, foot rot shears, vaccines, medications and labor.

Self-check 2	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What are the factors to be taken into account when looking at the costs and inputs of setting up and running a shoat production?(8pts)

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

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

Information Sheet 2- Assessing topography, adequacy of water and soil type

Site selection of fish farm

Site selection: is the process by which various factors indicated are considered to enable one to decide on the right site for a specific production system. Success or failure of any shoat venture largely depends on the right selection of the site for it. In choosing a site several factors other than the physical aspect of the site are to be considered.

Factors to be considered in site selection

There are several factors to be considered in site selection among these are;

A. Water Supply

Adequate supply of good quality water must be available year round in the site. The water sources must be reliable and adequate

B. Topography of the site

Topography refers to the “lay of the land” or the changes in the surface elevations of the ground whether flat, rolling or sloping, undulating, and hilly. Layout and specifications are made largely in accordance with the land topography.

It is desirable or ideal to construct a shoat farm on flat land with moderate slop. However, there is no problem in setting up a farm on sloppy side of hills or valley areas. The topography should be suitable for Easy to drain waste from the farm.

C. Availability of land

The major requirements for the setting up of a dairy farm are the availability of land for the construction of sheds for the animals and for the production of fodder

D. Availability of capital

Availability of capital for the purchase of animals, construction of shoat sheds, for the purchase of equipment and machinery. The capital required could be raised through loans from nationalized banks which can be repaid in easy installments.

E. Accessibility

This is important for the transport of construction equipment and material, and for production inputs required for daily operations. Transporting costs can considerably increase if materials are manually carried through long distances. It is better if the site is accessible throughout the year by means of land and water.

F. Availability of labor.

The cheapest sources of labor are those which can be provided by the local residents, or people living within or near the area. It is important that the customs and tradition of local laborers are known. The pattern of labor distribution and utilization should be considered as this is important in preparing the calendar of activities.

G. Availability of marketing outlets and prices

The first and perhaps most important step are to investigate your potential market. Look at whether your target market is a year-round market. Enquire about the age and type of stock preferred by each market, and the maximum and minimum numbers buyers will purchase at any one time. Also take into account the distance from your nearest sale yard, abattoir or port.

Self-check 2	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

What is site selection? (4pts)

1. What are factors to be considered during shoat farm site selection? (12pts)

Note: **Satisfactory rating - 16 points** **Unsatisfactory - below 16 points**

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

Information Sheet 3 - Identifying distance from neighboring residence

Location of the Farm

Commercial shoat farms can be set up near the cities where there is an assured market of milk and meat round the year or in the milk-shed areas of milk and meat processing plants. Nearness to market is important as nearer the market lesser will be the transportation charges and lesser will be the loss due to spoilage of highly perishable milk and meat products during storage and transportation. Ideally the shoat farms should be located nearer to towns but not in towns itself as in urban areas the conditions are not exactly ideal nor economical for production of milk and meat. Land may not be available or available at high rentals for animal sheds and for fodder production. The producer has to purchase the feed items at higher prices. Yet many city farm owners earn handsome money as they can sell milk and meat at high prices to the consumers directly often circumventing the middlemen.

In rural areas the cost of fodders and labor which are the major inputs for farm production are comparatively lower but so also is the demand and prices of milk and meat. The villages located close to cities on highways leading into cities are ideally suited for shoat business. In fact most of commercial milk producers in the country comprise of this category who market milk readily in cities by themselves. The cornerstone of successful farming is the elimination of middlemen in the marketing and the producers themselves have to devise their marketing mechanism so that the producers directly sell the products and value added products to the consumers.

The other important requirement for setting up of a successful commercial shoat farm is the land for fodder cultivation. The land should be well fertile with assured irrigation facilities so that all the seasonal fodder crops could be successfully raised and abundant good quality green fodders are made available for animal feeding throughout the year. The place where the farm is to be set up should have a source of good quality fresh water for animal drinking and for the cleaning, washing etc. at the shoat farm

Self-check 3	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What is the effect of distance with neighboring residence and cities? (6pts)

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

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

LG #85	LO #2- Prepare and monitor husbandry practice

Instruction sheet

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

- Checking and preparing equipment and materials for treatment
  - ✓ Checking treatment site
  - ✓ Preparing facilities for treating health problems
  - ✓ Confirming safe and sound operation plan
- Recognizing all potential and existing OHS hazards.
- Mustering safely, yarding, controlling, inspecting and identifying
- Administering treatment
- Monitoring sheep and goats for treatment

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

- Check and prepare equipment and materials for treatment
  - ✓ Checking treatment site
  - ✓ Preparing facilities for treating health problems
  - ✓ Confirming safe and sound operation plan
- Recognize all potential and existing OHS hazards.
- Mustering safely, yarding, controlling, inspecting and identifying
- Administering treatment
- Monitor sheep and goats for treatment

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Information sheet – 1 Checking and preparing equipment and materials for treatment

1.1. Introduction

Maintaining sheep and goats in a good heath condition is of great importance to increase or maintain productive and reproductive performances such as meat and milk yield, number of births/ life time, because sick animals are less able to produce and reproduce.

Keeping animals healthy doesn't involve the use of expensive drugs and highly qualified veterinarians.

In most cases the majority of economically important diseases can be controlled through simple preventive (prophylactic) measures such as good feeding, hygiene (cleaning), well ventilated housing, vaccination, drenching, spraying/dipping and hoof timing. These measures can control about 80-90% of the diseases of economic importance (disease that may result in loss of production and survival of animals).

The term health doesn't imply that an animal is free from all disease causing agents. An animal may be infected by a potentially pathogenic agent, but may be unaffected by it and remain in good health condition.

Basic Concepts and Causes of Disease

A disease is an opposite of a health and it may be also defined as any abnormality in the functions and organs of the animal body.

Forms and causes of diseases:

Diseases can be classified as either hereditary or acquired ones.

Hereditary diseases are caused due to disease causing factors that are carried on the genes (defective genes) and that are transmitted from parents to offspring. They are relatively few in number. They may be considered as a breeding problem.

Acquired diseases are caused due to a complex interrelationship of an animal with its environment or complex interrelationship of determinants of diseases. Determinants of disease are factors that affect occurrence of disease.

Determinants of disease:

Host: may be resistant or susceptible to a particular infectious agent, so it determines the occurrence of disease. E.g. Anthrax can affect all mammals but birds are resistant to it. FDM affects all livestock except horses.

Environment: It is an important predisposing factor and a change in temperature and humidity may cause respiratory disease (pneumonia). Soils help to wards development of spores for Anthrax. Environment may be favorable or unfavorable to the agent and increase or decrease the density of pathogenic agents. Animals when grazing on pasture may make the environment favorable or unfavorable for themselves or for the agents through trampling or their droppings. The environment is common for both the host and the agent and the host may be in contact with a disease causing agent in the common environment. Good hygienic conditions prevent multiplication of agents and help an animal to have a good health condition.

Agents of diseases: Agents can be a living or non-living organism. Its presence is necessary for the occurrence of disease and such agents are termed as a disease causing agents. Agents act either alone to produce ill health or infectious diseases, e.g. Anthrax. They act also together with different micro-organisms. E.g. Pneumonia is caused by bacteria, mycoplam and virus triggered by poor ventilation.

Forms of agents of disease:

- Physical agents (accidents)
- Lightning fall (strike)
- Nuclear installations
- Biological agents
- Poor nutrition
- Stress
- Lack of tolerance
- Lack of immunity

1.2. Checking and preparing equipment and materials for treatment

1.2.1. Preparing equipment and materials for the treatment

This may include syringes, antibiotics and vaccinations, drench guns, overhead gantry, yards, drenches, scales, races, gates, backpacks, thermometer, estatoscoph, faeces col lection plastic bags, plastic globes, sample jars, portable coolers, kits supplied by the Department of Agriculture, hand shears, jetting hand piece, water pump, temporary yards, portable plunge dips, sharpening stone, jetting race, tanks, spray dips/shower dips, plunge dips and portable crutching equipment and personal protactive equipments like boots, hat/hard hat, overalls, gloves, protective eyewear, hearing protection, respirator or face mask, and sun protection. This all equipments and materials must be prepared. Preparation may include the calibration of equipment to check accuracy of dose rates.

Veterinary equipment

- Stethoscope
- Automatic vaccination syringes, size 20 m_ with corresponding needles
- Dosing gun for anthelmintic treatment
- Blood collection tubes with no additive (for serum) or with Ethylene Diamine Tetra acetic Acid (EDTA) (for whole blood).
- Water-based lubricant gel
- Disposable gloves
- Bacterial culture swabs
- Rope halter
- Hoof shears or trimmer
- Elastrator and rubber rings or Burdizzo for castrating and docking
- Sterilization kit
- Knapsack sprayers
- Plastic buckets of 5, 10, 20 liters capacity
- Knives

Drugs, chemicals and reagents

- Sterile 50% dextrose solution
- Sterile calcium-magnesium-phosphorus-dextrose solution (CAMPD)
- Iodine solution, with cotton or other materials for applying iodine to wounds
- Oxytetracycline aerosol sprays, wound powder, etc.
- Injectable antibiotics (long- and short-acting oxytetracycline, penicillin and sulfonamides, antibiotic ointments)
- Anthelmintics
- Acaricides
- Anticeptics
- Vaccines
- Vitamins and mineral supplement
- Denatured alcohol

1.2.2. Preparing treatment site

The place of treatment may include yards, plunge dips, jetting races, in paddock, spray dips/shower dips. Preparation may involve cleaning and determining the method of site drainage.

The advantage of treatment site

- Isolating sick animals during the time of occurrence of disease
- If an animal is sick it should be separated from the rest of the flock to prevent the disease spreading to the other animals. Appropriate action should be taken to control the disease. This may mean treatment or may mean slaughter.
- When new animals are brought in to the flock they should be kept in isolation for two weeks.

Treatment facilities:

Dipping vat

Mobile dip vats have replaced the conventional dip vats made of concrete. Several years of effort to introduce dipping vats into tropical countries have had limited success, the major problem being maintaining the vats. Mobile dip vats made of plastic

are meant to overcome the shortcomings of conventional, permanently placed dip vats. The size of plastic, mobile dip vats could vary according to flock sizes.

Crush

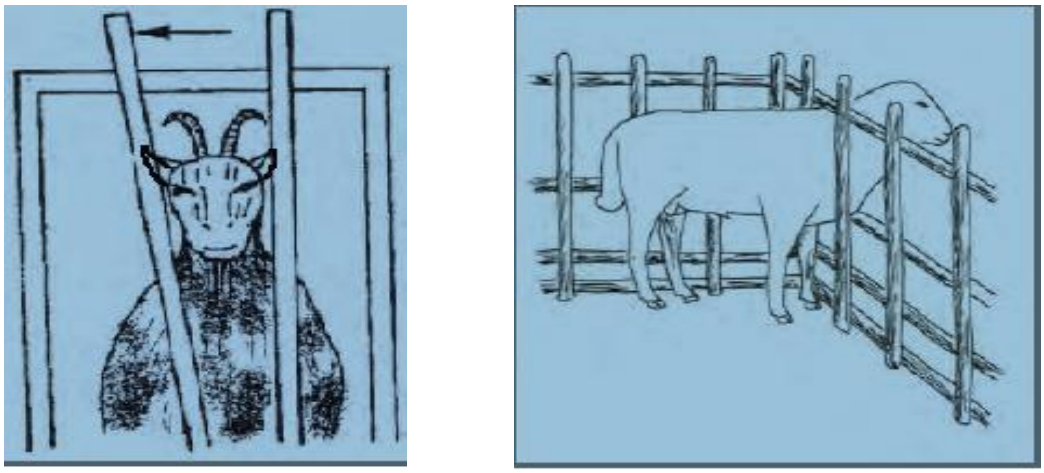


Fig11. Restraining of an individual goat or sheep in standing position in a neck crush

Handling pens

Sheep and goats need to be handled, either in groups or individually, for vaccination, treatment, mating, weighing, etc. Handling pens are useful in reducing injury and stress on animals and workers. An ideal layout for a handling pen includes a receiving pen, forcing pen, crush, sorting gate, foot bath, dip or spray race (long and narrow passage wide enough for only one sheep or goat), draining pens and a holding pen. In particular, the receiving pen should match the number of animals expected to be handled at one time. Under the current smallholder conditions of Ethiopia, one handling pen per village may serve the purpose as long as complications with disease transmissions are minimal.

The way of controlling and calming techniques:

- To minimize stress to sheep and goats
- To prevent risks on young sheep and goats of smothering

Feeding trough and hay racks

Use for concentrate and hay racks for forage feeding and to give treatments with feed. The size of racks and troughs is determined by the body size of sheep and goats and by animal numbers. Approximately 30 to 40 cm per animal space is the minimum. Movable troughs are usually 2 to 4 m long. ‘tombstone or keyhole barrier’, each animal

puts its head through an individual wooden barrier to eat without being able to push its body into the trough. Suggested dimensions for a concentrate trough are a width of 30 cm with a depth of 15 cm, with the trough standing on 15 cm legs.

Watering trough

The need for watering troughs depends on the size of the flock. For small flocks, water tight tins, buckets or bowls can be adequate. Any type of watering trough used should be easy to clean.

Self-check 1	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What are the methods to identify infected animal and their advantage? (3points)
2. What is the advantage of determining severity of the infection? (3points)
3. What is treatment site? (3 points)
4. Write al list 3 sheep and goat disease in your village clinical sing prevention, control and treatment? (6 points)
5. What treatment facilities? (4 points)

Note: **Satisfactory rating - 19 points** **Unsatisfactory - below 19 points**

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

Information sheet 2 – Recognizing all existing potential OHS hazards and Assessing and controlling risk

1.1. Recognizing all existing potential OHS hazards and Assessing and controlling risk

1.1.2. Recognizing all potential and existing OHS hazards

Occupational health and safety (OHS): actions to be taken to ensure safe operation and maintenance of machinery and equipment. In every activity of livestock rearing process must;

- Follow appropriate (safe) work procedure
- Use PPE when every necessary
- Identify and control hazards that occur when we work with livestock feed
- Use appropriate machine (equipment) and understand how to use

Safety and Health Considerations

When performing veterinary procedures, the clinician must recognize the potential for zoonosis. An assessment of the herd's health status through histories and physical examinations guards clinicians, technicians, and farm personnel and families against zoonotic infections. Stress and trauma to the livestock are to be avoided. Producers who are able to have frequent, nonthreatening interactions with their goats will reduce the herd's apprehension of being handled.

Contaminated raw materials present a more serious problem:

- It is difficult to determine whether or not a shipment is contaminated.
- Testing is costly, and the means are not always available.

The possible strategies to deal with this problem are:

- Avoiding the use of risky raw materials (poor quality peanuts and oil meal). This solution is not very realistic in the context of a generalized lack of raw materials for animal feed.

- Chemical detoxification of the risky raw materials. This treatment is expensive and difficult (pressurized ammonia), but it is effective. It can only be used by large industries that wish to be able to export oil meal that meets the standards of Western countries.
- Attempting to efficiently manage the supply of raw materials according to knowledge of contamination risk factors. This solution is difficult to implement in developing countries (poorly structured supply chains, small-scale producers). Furthermore, “risky” raw materials will always be used in some way, which does not resolve the public health problem.
- Using additives that supposedly absorb aflatoxins and thus prevent their absorption by the animal. Such additives (specific types of clay, activated carbon) exist on the Countries with hot climates are more exposed to microbial and fungal contamination. Furthermore, there are often residues (pesticides, etc.) in raw vegetable matter. For countries with less structured supply chains, it is also difficult to prevent contamination via inappropriate additives.

Furthermore, in developing countries, it is difficult to undertake the monitoring and testing necessary to protect the population: these measures are often difficult and costly to implement for small-scale farmers.

2.1.2. Assessing and controlling risk

Potential hazards like animal movement and handling, exposure to hazardous noise, dust and solar radiation and veterinarian chemicals, and zoonotic diseases in the workplace are recognized, risk assessed and controlled by using suitable personal protective equipment , by disposing appropriately residues like fly blown fleece, maggots and chemical residues and Properly move animals including giving animal time to settle post-treatment, conducting the move in a controlled and quiet manner to correct paddock or sickbay according to OHS requirements.

Plant toxins and pesticide poisoning

Cause

- Several plants, including some grasses and legumes, contain toxic substances.
- When consumed, may cause animals to suffer from the toxins.
- An animal that has consumed a toxic plant or poison may:

- ✓ Foam at the mouth
- ✓ Have muscle spasms
- ✓ Have blue spots on mucous glands
- ✓ Have peeling skin
- ✓ Have bloody feces
- ✓ Have lesions on the face

Treatment

Make sure the animal has plenty of water to drink and try one of the following treatments:

- Boil strong tea or coffee and let it cool. Give it to the animal to drink or force-feed it.
- Mix a small (handful) of fine charcoal powder in about one liter of water, given by mouth. Give daily for a few days if needed.
- Give vegetable oil by mouth.
- Give milk by mouth.
- Mix six eggs and ½ kg sugar with about 1 liter of water and give by mouth.

Prevention

- Do not graze animals where poisonous plants are present. Remove any toxic plants from grazing areas.
- Avoid pasture that has just been sprayed with herbicides or pesticides.
- Do not let animals graze near rubbish where people have thrown things that may be poisonous.

Self-check 2	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What are the OHS must ensure safe operation and maintenance of machinery and equipment in every activity of livestock rearing process? (4 points)
2. What are the common relevant hazards? (4 points)
3. What are hazards at time of sheep and goat treatment their controlling method? (3points)

Note: **Satisfactory rating - 11 points** **Unsatisfactory – below 11 points**

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

Information sheet 3 – Mustering safely, yarding, controlling, inspecting and identifying

3.1. Mustering safely, yarding, controlling, inspecting and identifying

3.1.1. Identify infected animal and determine type and severity of infestation

Identifying ill sheep and goats

It may not easy to find out the ill sheep/goats which are at the beginning of illness, we need to scrutinize in the daily management.

Whether the goat or sheep is ill or not, we can judge from the following aspects:

In-taking and pasturing: Healthy sheep and goats have a good appetite (eating fast and happily), and go quickly in accordance with the flock, and are sensitive to the command word/watchword. Ill sheep and goats usually lag behind the whole flock, have a bad appetite, stand stupidly, or lie on the ground drearily.

Appearance and gesture: Checkup the spiritual statue, nutritional situation and body gesture by visual examination and palpation. If the sheep and goats are bad mood, with heads and ears bending down and eyes semi-opening and semi-closing, and stand movelessly and stupidly, some acute disease may occur, if sheep and goats grow thin quickly, acute diarrhea/scours may happened; if sheep and goats grow thin slowly and gradually, it is often seen in chronic disease and parasitism; if sheep and goats are compelled to rotate in circle, maybe encephalitis/cerebritis or coenurosis/brain worm disease happened.

Resting situation: Healthy sheep and goats lie in the pen scatterly, when they have a rest, with the right parts of belly on the ground and a slanting gesture, with quarters/four legs bending under the belly or left hind leg stretching towards left side, and with head raising up and frequently ruminating, and standing up at once when some comes near. The ill sheep and goats often crowd together with the fore and hind legs bending under the belly, head and neck bending towards belly, less or no rumination, not evading when someone comes near. At some time, the ill sheep and goats do not have a rest, running in the pen, rubbing their heads or bodies on the wall or the gate.

Skins or coats: The healthy sheep and goats have a bright coat hair and a elastic skin, their wool/hair is not easy to shed. The coat hair of the ill sheep or goat is often coarse and in disorder, easy to wither and shed; its skin is dry, with no elasticity.

Feces: The feces of healthy sheep and goat are soft and in the shape of oval/ellipse and in bright black; when feces drop into the ground, one piece is not stick to the other. The feces of the ill sheep and goats are either dry or stick together or thin often mixed mucus, pus blood, and in yellow or gray, malodorous. They often dirty the hips and tails.

Eyes, nose, and mouth: Mucous membrane/tunica mucosa of healthy sheep and goats are reddish, nostrils are clean. Mucous membrane of ill sheep and goats may be in red, pale, yellow, blue or purple; there is mucus around nostrils, malodorous smell emitted from mouth and nose, there is dirty matters around eyes.

Rumination: Healthy sheep or goat ruminates 2-4 times per minute, you can feel that the rumen is soft and elastic through palpation with your hand/palm touching and pressing the left belly. The ill sheep or goat ruminates less or even ceases to ruminate, the rumen become rigid or tympanic.

Body temperature: Normal range is 38℃-40℃. Body temperature may be examined with a thermometer through rectal examination. You can examine whether a sheep or goat is in fever or not through touching the ears, the inside of body trunk or hind limbs, and skin by your hand.

Pulse and heart: Normal pulse is 70-80times per minute, which is even/uniform. The heart sound/cardiac sound is clear. Cardiac sound auscultation site lies in the third to the sixth ribs inside of the breast from the front to the behind. For pulse palpation, it is accurate and convenient to palpate the artery inside of the hind leg.

Lung: Normal respiration is 18-24 times per minute. You can hear the normal respiration sound “fu fu”. If you hear “fu lu, fu lu” or other sound, it indicates that there is something wrong with respiration system.

Body surface lymph node: You should pay attention to the size, hardness, soreness and mobility of the lymph node. In clinical diagnosis, usually examine the jowl lymph node, and the lymph nodes under ears, in front of shoulders and inguen/groin, etc. if one lymph node swells , we can judge that there is inflammation around this lymph.

Self-check 3	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

4. What is handling facilities? (4 points)
5. What is the importance of controlling and calming during treatment? (4pts.)

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

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

Information sheet 4 - Administering treatment

4.1. Administering treatment

4.1.1. Restraining animals for treatment

A. Mass handling

Without a handling system, health programs or activities will be delayed or not accomplished.

- Handling systems that are properly designed allow sheep or goats to flow through smoothly with minimal stress and injury.
- When have to work with sheep and goats and there is no handling system, it is necessary to pack them into a small, fenced space or in a long working pen, 1 to 1.5 meters wide. Work way (vaccinating, spraying, other health activities) along the pen, keeping the treated animals behind you. Make sure to separate treated from untreated animals.
- Weighing scales, tipping cradles and treatment crates can all be arranged in the line of traffic of animal flow.

B. Catching and restraining individual sheep/goats

A group of sheep or goats can be herded into a collecting pen or enclosure from where individual animals can be caught. Approach an animal from the side and attempt to bribe it with some kind of feed and be fast to catch the horn, legs or neck. Get assistance to hold it firmly so that you can examine the head, the neck, eyes, and other parts of the body. Adult animals and big lambs/kids can be individually restrained by holding the skin under the chin and by holding the tail head on its rump. The easiest technique to hold a sheep or goat is in the following way:

- Grasp the animal by the neck or upper part of a back leg.
- Put your right hand on its muzzle and turn its head slowly but firmly sideways. The animal will fall to the ground. Shift it into a sitting position with it leaning slightly against your legs keeping its feet off the ground.
- The animal should now be relaxed and you can examine its udder or testes, collect various samples such as ticks, lice and other external parasites (maggots), take blood from the jugular or ear veins, trim its hooves, etc.

There is an alternative way of handling a sheep/goat in a sitting position. First, reach under the belly and gently pull the two furthest legs towards you. With the animal on its side lean over to catch both front legs, and turn the body towards you so that it sits on its bottom.

To restrain a sheep or goat in a standing position, its head can be held in a loop of rope or strong string. The loop should be about 50 cm in circumference and tied to a tree or a post at the same height as the sheep's shoulder. Tying a knot that does not slip but holds the loop at a fixed size prevents the animal from being strangled. Catching and restraining of sheep (rams) is easy when they have collars. Under these conditions, you can simply collect fecal samples directly from the rectum and other samples from different preferred sites.

Animals can also be restrained in a standing position using a neck crush. The neck is trapped between two pieces of strong, upright planking.

Step 1 **step 2** **step 3** **step 4**

Fig9. Restraining a goat

Step 1 **step 2** **step 3** **step 4**

Figure10. Holding and twisting a sheep to restrain it in a sitting position

4.1.2. Deworming

Deworming of animals is needed when:

- An animal is thin, probably poorly-fed;
- An animal is not growing well;
- An animal eats less than normal;
- An animal is weak, tires easily and lags behind the flock;
- An animal has rough coats;
- Observe a number of animals with diarrhea and dehydration; and
- Observe swellings or edema (e.g., bottle jaw) or see animals with pale mucous membranes.

A. Drenching and dosing:

A variety of routes exist for administration of medications to sheep and goats, including several methods for the oral dosing of small ruminants.

- When dosing a sheep or goat orally, the head of the animal should be kept in a reasonably normal position to enable the animal swallow the drench:
- Administration is easily accomplished using dosing guns. However, dosing guns are often expensive for farmers to buy and cheaper means are available.
- Use a syringe to drench animals. This prevents animals, particularly older ones that recognize drugs in boluses or pills, from spitting them out minutes later.
- When administering a drug or anthelmintic, the dosing gun or syringe should be placed on the base of the tongue. The drug will then go to the rumen.

Fig12. Drenching an animal using a syringe

B. Bolus/pill administration

Boluses are one of the easiest and most reliable ways to administer medicines. Always follow the maker's instructions when preparing the dose. Break boluses into two or four parts to get the correct dose.

Use the balling gun to administer boluses or pills to sheep and goats. The bolus is inserted into the opening of the balling gun and pushed out by the plunger. Care should be taken to place the bolus behind the tongue in order to activate the swallowing reflex.

In the absence of a balling-gun, boluses/tablets are simply given to sheep and goats by hand with or without wetting them with drinking water. Dip boluses in edible oil so that animals can easily swallow them.

Hold the animal securely, with one hand firmly over the top jaw to open the mouth and place the bolus behind the tongue of the animal. Hold the mouth closed and keep the head tilted upwards stroking the throat to stimulate swallowing. For both procedures, observe the animal for a few minutes to make certain the bolus was swallowed and not spit out.

Fig12. How to give a bolus using a tube (balling gun)

4.1.3. Proper equipment, dosage and injections

There are various types of syringes and needles with different gauges and sizes:

- Disposable syringes, 3 m_, 5 m_, 10 m_, 20 m_
- Hypodermic syringes, 12 or 15 mm, 16 or 18 gauge needles.

Dosage

Careful use of anthelmintic and antibiotics, as well as other medicines, is necessary if drugs are to remain effective. Under dosing or overdosing and frequent use of drugs may lead to the development of resistance.

Therefore, it is always good to give accurate doses by calculating the weight of individual animals. For group treatment, some people estimate the dose based on the weight of the heaviest animal or the average weight. In this case, some animals will be overdosed and some under dosed. Accurately estimate the weight of animals you treat. Weigh some of them if you can. There is a useful technique to correctly estimate the weight of an animal. This is known as girth measurement.

Dose calculation for antibiotics

Dosage should be measured according to the manufacturer's recommendations based on the weight of the animal. The following example shows the steps needed to calculate how much medicine to give:

- Estimate that an animal weighs 50 kg.
- The manufacturer's dose tells you to give 10 mg/kg bodyweight of oxytetracycline.
- Multiply the animal's weight, 50 kg, by the dose rate (10 mg/kg). This shows you that the animal needs 500 mg of actual medicine
- (50×10=500).
- The medicine you have contains 50 mg/m_ of oxytetracycline (which means that 50 mg of actual medicine is available in each m_ of the injection).
- Divide the amount of actual medicine the animal needs (500 mg) by the strength of the medicine (50 mg/m_) to find that the animal needs 10 m_ of medicine (500/50=10).

Injections

- Assemble the syringe and needle, shake the bottle, and swab the cap with clean surgical spirit.
- Always check the recommended dose on the bottle label.
- Draw a volume of air into the syringe slightly more than the volume of liquid to be withdrawn.

- Thrust the needle through the rubber cap of the bottle.
- Turn the bottle upside down and push the plunger to inject the air in the syringe into the bottle (you will have difficulty withdrawing the dose if
- Make sure that the needle tip is below the surface of the fluid.
- Pull the plunger down, drawing slightly more liquid into the syringe than required.
- Push the plunger slightly to expel any air bubbles and adjust the right dose.
- Detach the syringe, leaving the needle in the cap for next dose withdrawal.
- Finally, attach a second needle to the syringe; expel any air from the needle.
- Needles should be changed between every 5–10 sheep/goats. If a blood-borne disease is suspected in the flock, a new needle must be used with each animal.
- Always discard partly-used bottles of medicine at the end of the day.

Types of injections and procedures

A. **Intramuscular (IM)** is the most common injection method. Use an 18-gauge needle, 2–3 cm long, to inject antibiotics. In small, young lambs and goats, a smaller 20-gauge needle should be used. Inject into the neck muscle just in front of the shoulder or the fleshy part of the shoulder itself. Injections should not be given in the hind leg or quadriceps muscles of the thigh. Injections can leave injection-site lesions that could decrease the value of the meat. To give an injection:

- Gently tap/hit the muscle two or three times with your fist to accustom the sheep/goat.
- Insert the needle quickly, straight into the muscle.
- Before injecting, draw the plunger out slightly to check if the needle has entered a blood vessel. If blood enters the syringe, withdraw the needle slightly and redirect into the muscle.
- When a correct spot has been entered, slowly press the plunger down. Volumes of no greater than 2 to 4 m should be injected into a single IM site.
- Remove the needle from the animal and rub the injection site or press with cotton to prevent excess bleeding. This will also help the medicine to stay in the muscle.

B. **Subcutaneous (SC)** injections are given under the skin, often in the skin just behind the shoulder or in the neck or inside the elbow of the front leg. A short needle, 1–2.5 cm, should be used to inject under the skin:

- Pull out a fold of skin and insert the needle at a right angle to the skin-fold. Care must be taken to ensure that the needle does not pass through the skin and exit on the other side.
- Gently press the plunger down.

C. **Intravenous (IV)** injections are given into veins in order for the antibiotics to enter the blood stream as quickly as possible. Common sites for intravenous injections include the cephalic vein and the jugular vein. Use an 18-gauge or 20-gauge hypodermic needle.

- During an IV injection, the compound is administered slowly and the animal monitored for evidence of respiratory or cardiac distress. If there is any adverse reaction, the injection should be stopped.
- An intravenous injection should only be given by a veterinarian or experienced animal health technician.

Self-check 4	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What is the consideration during handling and restraining animals humanly? (3points)
2. What is the deference between routes of drug administration? (3points)
3. What is withholding period? (3 points)

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

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

Information sheet 5 - Monitoring sheep and goats for treatment

6.1. Monitoring sheep and goats for treatment

Sheep and goat health and condition are monitored post-treatment and abnormalities reported according to enterprise requirements.

Identify, assess and control environmental implications of treatment

Environmental implications associated with the treatment of sheep and goats are identified, assessed and controlled according to enterprise requirements. Negative environmental impacts may result from the unsafe use and disposal of veterinarian chemicals (dipping, jetting, parasite control) and any consequent residual chemicals. Impacts may also result from high concentrations of animals on ground cover causing run-off flows, loss of ground cover, soil disturbance, pugging, dust problems, weed seeds in animal manure, contamination of ground and surface water supplies, and odors.

Clean equipment and worksite and dispose waste

Equipment and worksite are cleaned and waste including sheep and goats residues include fly blown fleece, maggots and chemical residues is disposed according to OHS and enterprise requirements.

Store health treatments

Health treatments are stored to manufacturer's recommendations, industry and enterprise requirements like Storage requirements safety, access, warning signs, temperature control, and security for spillage is mandatory at time of sheep and goat treatment completing, to control hazards associated with treatment.

Document relevant information

It includes details of equipment and materials used, the performance of equipment, faults and malfunctions, number of treated sheep and goat details of treatment, any testing carried out and results, evaluation of treatment effectiveness and observed abnormalities or behavior in sheep and goats.

Self-check 5	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What is the consideration during storing of treatment? (3points)
2. What are the cause and prevention of environmental impacts in sheep and goat treatment? (3 points)

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

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

Operation Sheet- 1	Identifying infected animals

Direction: Perform the following the Procedure given below.

1. Use personal protective clothes
2. Collect the necessary materials and equipment required for the practical, like estatoscoph, thermometer,
3. Prepare 4 animals for identification
4. Examine each animal one by one
5. Record the result and identify infected animal, type of disease and their severity
6. Clean the equipment thoroughly and store them so that they will be ready for use next time

Operation Sheet- 2	Administrating drug

Direction: Perform the following the Procedure given below.

1. Use personal protective clothes
2. Collect the necessary materials and equipment required for the practical, like mouth gag, syringe, medicine glove, disinfectant and others
3. Prepare 4 animals for treatment
4. Restrain the animal.
5. Adjust the dose
6. Administered the drug to the animal
7. Record the type, dose and rate of treatment for each animal
8. Clean the equipment thoroughly and store them so that they will be ready for use next time

LAP TEST	Performance Test

Name…… ID…… Date……

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **2** hour. The project is expected from each student to do it.

Task 1

- **Identifying infected animals**
- **Administrating drug**

LG #49	LO #3- Identify conditions, facilitate and complete mating procedures and parturition

Instruction sheet

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

- Determining, scoring and ranking condition.
- Carry out estrus inducement and detection procedures.
- Use mating areas, procedures and handling techniques
- Carry out artificial insemination techniques.
- Applying pregnancy detection techniques
- Monitoring predators to newborn animals and implementing measures
- Preparing animals for giving birth
- Determining and administering preventative health treatments.
- Preparing and implementing contingency measures

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

- Determine, score and rank condition.
- Carry out estrus inducement and detection procedures.
- Use mating areas, procedures and handling techniques
- Carry out artificial insemination techniques.
- Apply pregnancy detection techniques
- Monitor predators to newborn animals and implementing measures
- Prepare animals for giving birth
- Determine and administer preventative health treatments.
- Prepare and implement contingency measures

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets

7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, ask your trainer for further instructions or go back to “Operation sheets”.

Information sheet 1 - Determining, scoring and ranking condition

1.1. Introduction

Breeding Systems used in Sheep and Goat Production

The most common breeding systems in sheep and goat production are upgrading, out crossing, line breeding, crossbreeding, inbreeding and substitution.

Upgrading: involves successive use of pure bred rams or bucks on the indigenous ewes or does flocks to produce a high grade flock that resembles the characteristics of the pure-bred rams or bucks.

Out crossing: Mating of rams/bucks from distantly related animals with ewes/does of the same breed. The system helps to produce animals with the desired characters from the two strains.

Line breeding: Mating of cousins or more distantly related animals that trace to the same parents in the pedigree. This system avoids the decrease of fertility and vigour as the result of inbreeding.

Crossbreeding: Mating of two separate or different pure-breed individuals when two pure-breeds are crossed the F_1 generation may show unusually superior performance than the parents which is due to heterosis effect or hybrid vigor as the result of favorable gene combination brought about by the cross. If not superior, they express intermediate performance between the parent types and may show phenotypic similarities to one of the parents. Crossbreeding is the system that is widely used in the tropics to improve productive and reproductive performances of the indigenous sheep and goat breeds. The objective of crossbreeding is to produce offspring with superior performance to both the parents and that have vigor and thrift.

Inbreeding: Involves the mating of closely related animals such as sire and daughter or brother and sister. It is used to produce a uniform flock characteristics or a flock with uniform genetic make-up. It increases animals with homozygous genes with dominant or recessive genes (AA or aa) combinations but reduces animals with heterozygous gene combinations (Aa). It results in reduced fertility, vigor, poor growth rate of animals due to absence of heterosis effect.

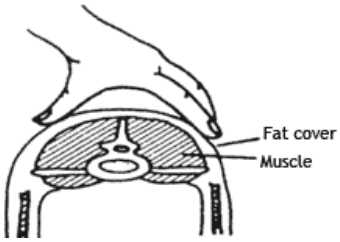
Substitution: Refers to the replacement of the existing flocks/breeds with introduced breeds. The system is very expensive to replace the whole flock and hence not often employed. The system can be only employed under certain circumstances, when the existing population size of indigenous sheep and goat are small and where the level of productivity of indigenous animals is low. However, it is rarely advisable to substitute the existing indigenous flock based on their low productivity because native breeds are well adapted to their environment and have good heat tolerance and disease resistance and have high fertility. These are important merits of indigenous flock that do not permit their substitution.

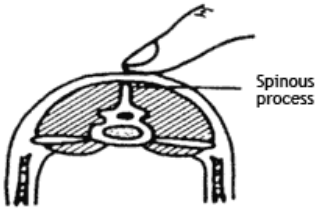
1.2. Determining, scoring and ranking condition

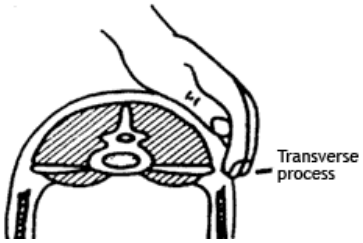
Determining, scoring and ranking animal's condition

Body condition scoring (BCS)

- A valuable management tool that can be used to evaluate the feeding program and the need for changes.
- Body condition is a better indicator of condition than weight.
- The most important times to body condition score are breeding, late gestation, and weaning.
- Body condition scoring estimates fat and muscle on a scale of 1 to 5. Half scores are commonly used. The cattle system (1-9) can also be used.
- 1 BCS equals 13% of the live weight of a female in moderate condition (3-3.5).
- Exact score is not important as the relative scores and the differences between scores.







- 1 – emaciated
- 2 – thin
- 3 – average
- 4 – fat
- 5 – obese

Males:

They should be the heaviest/largest animals in the flock with a wide chest and well developed body parts, have straight body, excellent health condition and strong legs to carry their large body size. There should be a complete absence of any physical defect e.g. twisted legs, overshot or undershot jaws. They should be a twin, should be aggressive, and should possess a rugged/rough mane on the neck and shoulder. Good semen characteristics, absence of abnormalities and with good motility of sperms.

Female:

They should be large animals with excellent physical conformation and well developed body parts. For meat animals the rectangular body conformation should be apparent whereas the dairy animals should display the wedge-shape (V-shape) or the triangular body conformation. The legs should be long to give the udder good ground clearance and the udder should be well formed with no pendulous and without supernumerary/extra teats and should be a twin. The temperament should be good/ docile particularly for dairy breeds because it reflects good mothering ability. Docility

and good mothering ability are desirable characteristics of a dairy animal. It should be a good milker.

For wool breeds: they should have a uniform wool color. The wool cover around the eyes should be very little because it may cover the eyes and protects an animal from seeing into the surrounding and predisposes to predators reduces the ability of an animal to look into and select the forage it eats. Physical features or body conformation of animals can be judged by visual observation on their body size, udder size and body shape But performance/productive traits cannot be judged by visual observation of an animal without recording systems. Therefore, when animals are selected for traits of economic importance, such as milk yield, growth rate reproductive performances, recording of performance is the most accurate basis of selection.

Self-check 1	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. Define out crossing, line breeding, crossbreeding and inbreeding? (4 points)
2. What is assessing sheep and goat condition means? (4 points)

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

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

Information sheet 2 - Carry out estrus inducement and detection procedures.

2.1. Carry out estrus inducement and detection procedures

Estrus cycle: From puberty onwards, females show repeatedly recurring sexual cycle. A repeatedly occurring sexual cycle after an age of puberty is termed as estrus cycle (sexual cycle). A hormone estrogen from follicles (ovaries) regulates it. Estrogen induces in female's estrus cycle. Estrus cycle culminates in ovulation, i.e. estrus cycle will be completed when a female animal ovulates or when a mature egg is released from follicles into one of the oviducts. Release of ova into one of the oviducts is called Ovulation.

Characteristics of Estrus in ewes and does

Average duration

	Ewes	Does
1. Length of estrus	15 - 19 days.	18 - 21 days.
2. Duration of heat (heat period)	18 - 24 hrs.	24 - 36 hrs.
3. Time of ovulation (After onset of estrus)	25 - 30hrs.	21 - 36 hrs.
4. Time of service	18 – 24 hrs.	15 – 26 hrs.

Service or mating should be carried out late in heat period and before ovulation to ensure high rate of fertilization, sperm and ova are viable only for certain period of time. An ovum remains viable in the oviduct for 10-12 hrs. A sperm may be able to fertilize an ovum for 24-36 hrs.

Signs of Estrus/heat in do:

- Bleating
- Wagging /rhythmic movement/ of the tail (flicks its tail)
- Pushing the buck
- Standing to be mounted (mated)
- Redness & Swelling of the vulva/vagina b/c physiological & psychological changes in females due to estrus cycle

- Discharge of mucus from the vagina
- Lack of interest in feeding (eating)
- Drop in milk production, if lactating
- Apart from these visible signs, female goats release (odors) pheromones to stimulate the male to sexual excitement.

A teaser ram

- It can be a castrated ram male used to identify females in heat but cannot be used for mating to control unwanted mating. An apron male is a ram/buck whose abdomen is covered with leather material to protect mating. If they are too young they should not be permitted. A teaser buck can be also used to detect heat in goats, if there is time limitation to detect heat where goats graze on a fenced pasture without an attendant.

Signs of male sexual excitement:

- Using the female, i.e., makes an effort to search females based on the smell of pheromones.
- Smells /sniffs/ the vulva - to distinguish whether the female is releasing Pheromones
- Pawing the females with front legs (touches with front legs, checks up whether a female stands for mounting & mating.
- Curling of the upper lip (or opens the lip) i.e., make curves (circles) to attract the female.
- Produces a loud snorting sound checking up whether the female stands or not breathing air through noses produces loud sound.
- Mounts & mates.

Heat period/Duration of heat (18-24):

It is the time duration from onset of estrus/heat up to an animal stops showing signs of heat (estrus). Mating (service) should be done late in this period & before ovulation.

Self-check 2	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. Why acclimating prawn fry before stocking?(4pts)

2. Write the steps acclimating for fry transported in plastic bag?(8pts)

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

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

Information sheet 3 - Use mating areas, procedures and handling techniques

3.1. Use mating areas, procedures and handling techniques

3.1.1. Mating area

Mating areas are secure and provide for access during joining and the matting area must be closed to control the iterance of other male animals rather than the selected one to control in breeding, cross breeding, transmit ion of disease and to keep the keep the exact record.

3.1.2. Mating procedures and handling techniques

Mating

Several methods of mating:

Random mating: one or more rams are left permanently with the ewes. Mating and lambing take place all year round:

- Suitable for the a seasonal nature of the sexual activity
- Enable to exploit the maximum reproductive potential of animals
- Difficult to organize selective breeding
- Rams are not always with the best conformation
- There is no rotation of rams, same ram stays for more than 2 years, which leads to inbreeding

Organized mating: ewes are put to the ram at regular intervals (every 7-9 months) for a predetermined period of time (40-45 days on average). There is usually one ram to every 25-30 ewes.

Controlled mating: a group of ewes (25-30) is left with one ram for a predetermined period (40-45 days on average)

Service and mating management: If males are kept with females, males will detect the occurrence of heat/estrus and may mate repeatedly females in heat (estrus). If males are not kept with females, females should be observed for signs of estrus depending on the signs of heat, especially for goats. In sheep heat detection is difficult, b/c of their behaviors to show signs of heat and b/c of their fat tail that covers the vulva to observe the discharge on the vulva, especially for artificial insemination. Therefore,

heat detection, in sheep is carried out by the use of a teaser ram. It is a male animal that detects heat (i.e. in the absence of the right type of ram in the flock).

The proportion of male to female depends on:

- Breed (species): Some breeds are sexually active and produce high quality semen and able to mate more females. Aggressive males are able to serve more females reflects breeding ability.
- Age: Quality and Quantity of semen from very young and old males are poor compared to matured males. Difference in quantity and Quality of semen matters also the no of females assigned to one male.
- Nutrition of males: nutritional deficiencies depress production and characteristics of semen like mobility, volume of ejaculation or concentration of sperm. Under and overfed animals will not be in a position to produce frequently & to mate more females. Under and over feeding affect testosterone production and sexual activity of males.
- Mating season: change in the length if daylight affects quality and quantity of semen.

I.e., when light period is longer fertility or sexual interest reduces. A hormone inhibin will be released in excess amount and reduced in testosterone or estrogen and FSH.

In order to get a good reproductive efficiency the proportion of male to female is about 1:20 - 30 for goats and 1:10 - 20 for sheep. But, if the management is good 1:40-50 is also possible.

Fertility and Prolificacy

Normally, fertility is defined as the regular production of viable offspring, ability to produce sperm & ova capable of fertilization. Prolificacy refers to the (ability) capacity of sheep and goats to produce many progeny (offspring). Fertility and prolificacy are used simultaneously to describe the reproductive capacity of individual breeds.

Expression of fertility:

Fertility in sheep and goats is most commonly expressed as:

1. Services per conception: Refers to the average number of services/mating required per conception or per birth. This assumes that females will be mated under

controlled conditions, which allow recording of the males used and services performed. The services per conception recorded for sheep and goats vary from 1.1 to 2.3.

2. Litter size: It is expressed as the number of kids/lambs born per doe (ewe), or per 100 does /ewes/ per year or per litter (per birth). The higher the figure, the better is the fertility of the flock.

3. Kidding /lambing/ rate or percentage: It is used to measure number of kids/lambs born in relation to the number of does/ewes exposed to the bucks or rams (mated). It can be also used to measure the number of kids weaned in relation to the number of does/ewes mated. The 2nd method is influenced by management in the herd. If the management is good & if there is no loss of young's both will give you the same figure.

4. Kidding or lambing interval: It is the number of days between two successive kidding and lambing. The interval comprises the service period and the gestation period. It is influenced by service period because gestation period is constant. Gestation period studied in several breeds of goats in the tropics is on average 146 days, but can range from 144 to 153 days. This variation is related to Breed difference and Environmental factors such as temperature, feeding, size of animals and litter size.

5. Service Period: It is time interval between kidding /lambing/ & the first estrus or post-partum estrus. It affects the kidding /lambing/ interval. Short kidding /lambing/ interval is desirable if the fertility and productivity of flock is to be maintained. The breed and accuracy in heat detection influences the length of the service period and accuracy of heat detection can be managed by careful husbandry practice. The kidding interval for indigenous breeds of goats in the tropics is shorter (90-150 days) than that for European breeds (169-327 days) imported into the same hot environment, because the indigenous breeds show estrus all the year round, twice a year or three times in 2 years, while the European breeds are seasonally polyesters and usually show estrus only once a year. In the tropics, day light hours are fairly consistent whereas the variation in day length characteristics of temperate areas affects sexual activity in goats and sheep.

6. Age at first kidding/lambing/: It is the time interval between date of their own kidding /lambing/ to the first kidding /lambing/. It is dependent on Age at first service/mating, because gestation period is constant. Young females should not be

permitted for mating till they are 10 - 12 months old. 10 - 12 months + 5 months (gestation period) = 15 - 17 months, which is an age at first kidding. But in most tropics it can vary up to 15 - 26 months of age.

7. Non-Return Rate (NRR): Female animals that are not returning to estrus after first mating (service) during the time period of 60-90 days are termed as non-return animals ("pregnant" animals). The non-returns (pregnant animals) expressed as a percentage of the exposed animals are termed as non-return rate. Its efficiency is dependent on the accuracy of estrus detection in the herd, because if animals are incorrectly detected, then they cannot be pregnant (they cannot conceive). Non-return rate doesn't necessarily mean that an animal is pregnant, rather non-return rate or not returning or not showing estrus could be due to some other reasons.

Silent estrus

Females may be in normal estrus cycle, but may not show clear signs of estrus, due to different reasons:

- Sickness
- Lactation.
- Poor nutrition
- Infertility

Self-check3	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What are characteristics of male and female for mating? (3points)
2. What are estrus cycle and their detection methods? (3points)
3. What is poverty? (3 points)
4. Write al list 3 factors affecting male to female ratio in mating? (6 points)
5. What are the relevant hazards which are common when mate small ruminant? (3 points)

Note: **Satisfactory rating - 18 points** **Unsatisfactory - below 18 points**

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

Information sheet 4 - Carry out artificial insemination techniques

4.1. Carry out artificial insemination techniques

Artificial insemination is a process whereby the sperm from a male is collected and used to inseminate a female artificially (or by man). In AI, sperm may be used fresh or can be frozen and stored for longer periods in liquid nitrogen at -196^{o}c.

Semen collection and evaluation

In trained rams and bucks, this is achieved using an artificial vagina, but in most instances an electro ejaculator must be used. The method of collection has some effect on the ejaculate characteristics, the volume generally being larger when an electro ejaculator is used, but at times the semen may get mixed with urine. The ejaculate is immediately scored for gross motility under low (mass motility) and high (percentage of motile sperm) magnification of a light microscope on a pre-warmed slide. Morphological abnormalities and viability are determined from stained semen smears. At least 70% of the sperm should have normal morphological characteristics. In the final part of the examination, rams/bucks are allowed access to estrous ewes/does to evaluate libido and mating behavior.

Bucks/rams are classified as either sound, questionable or unsatisfactory, based on all components of the examination. No firm guidelines have been developed to assign bucks into these categories and interpretation rests largely with the experience of the examiner. Animals deficient in any part of the examination should be considered questionable and retested after several weeks. A second failed test would indicate reproductive deficiencies and such a buck should not be used in natural mating.

Three methods of insemination are available depending on the site of semen deposition during the process of insemination:

- Vaginal
- Cervical
- Intrauterine

Vaginal insemination is successful for fresh semen, whereas intra-cervical insemination is used for refrigerated and frozen semen. However, in order to achieve high pregnancy rates (>70%) with frozen semen, intrauterine deposition of semen is required.

Fresh semen can be used when the male is present in the flock. The use of chilled, refrigerated semen is a useful strategy when the male is shared among groups of producers located within a relatively small area. In such cases, semen is stored at -4^{o}C and can be used up to 24 hours from collection.

Semen may be inserted though the cervix using a speculum or inserted into the horn of the uterus using a surgical procedure:

- Open the abdomen & put the semen in the oviduct.
- Speculum is a glass tube, through which one can look into the uterus when sperm deposition takes place.
- A pipit with semen is inserted (introduced) though speculum to deposit sperm.
- A thin glass tube in a form of syringe to press & push the sperm.

Fig5. Locating the cervical opening with the aid of a speculum and pen light and Semen deposition

AI is not wide spread in sheep, because detection of estrus (heat) is difficult due to their sexual behavior to show signs of estrus and the fat fail that covers the vulva. can have in fact a teaser ram marked with raddle marks to indicate females in estrus, but still this will not tell the time of occurrence of estrus and you will have a problem with optimum time of insemination.

Advantages of AI over natural mating

- It reduces transmission of reproductive diseases, because semen collection and preparation for AI are carried out under most hygienic conditions.
- Reduces cost of feeding and management of males, because few males are sufficient for many females
- Rapid improvement of the breeds can be achieved by using AI, because semen that may be ejaculated in one mating can be used for many inseminations.
- If testing the performance of a sire on the basis of its progeny (offspring) you can get more offspring within short period of time.
- It is cheaper to import semen than importing a live animal - reduces investment in large number of males and reduces risks of illness or death of male animals.
- Extensive dissemination of superior genotypes can be achieved, because every farmer can afford to buy semen than live animal.

Disadvantages: The disadvantages are few, if properly done.

- Well trained personnel for proper service are required.
- Detection of heat may be a difficult task when animals are kept in fenced pastures (corrals) without an attendant unless a teaser ram/buck used to run with females.

Estrus synchronization in the females

It is a method thorough which estrus is induced artificially in a group of females at one time (at pre-determined time). An induction of estrus artificially in a group of females to occur at a time is called estrus synchronization.

The purposes are:

- To inseminate a group of females at one time,
- It allows AI to be used more efficiently. The Synchronization of estrus forces the use AI, because it may not be possible to get males to serve all the females.
- It helps to have many young animals at a certain time when there is surplus feed
- It reduces time and labor cost to detect heat (estrus) every day, because in sheep or goat farming one of the difficult tasks is estrus

Disadvantages:

- It requires well trained /qualified man power (personal)
- Hormones used may be also expansive

Estrus synchronization can be done by the use of hormone progesterone. Synchronization of estrus can be done by inserting hormone progesterone into the vagina. About 5mg progesterone which is impregnated in small sponges is inserted into vagina. May be also implanted or injected intramuscularly. The sponges with progesterone are then removed 16-18 days after insertion (in goats) and 12-14 days in sheep. Progesterone is used because it inhibits the release of FSH & estrogen, which induce estrus cycle. Following the withdrawal/removal of progesterone, a single dose (400-800 IU of PMSG) of pregnant mare serum gonadotropin (PMSG) is injected. PMSG mimics the release of FSH and stimulates follicular growth. 2 - 3 days after removal of progesterone or injection of PMSG, females will show signs of estrus/heat. At this time they can be mated or inseminated.

Synchronization can be also done by a daily injection of progesterone and feeding melengestrol acetate for the same time of duration (16-18 days in goats and 12-14 days in sheep).

Self-check 4	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What is artificial insemination? (3points)
2. What is the advantage and disadvantage of artificial insemination? (3points)
3. What are the techniques of AI? (3 points)

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

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

4.2. Applying pregnancy detection techniques

Importance of pregnancy diagnosis

Knowing the status of an animal whether an animal is pregnant or not is of considerable economic importance. Undertaking an early diagnosis of pregnancy is necessary for an early identification of non-pregnant animals, because, production cost (time) lost as the result of infertility may be reduced by employing appropriate measures, such as treatment of animals with hormones or improving feeding practices or culling of infertile animals.

Pregnancy diagnosis is also required to certify animals for sale or insurance purposes. Because pregnant animals are expensive, when they are sold and the insurance of pregnant animals is also higher than non-pregnant animals.

Methods of Pregnancy Diagnosis (PD)

There are Clinical and Laboratory methods of PD.

A**. Clinical methods:**

Clinical methods rely on the detection of the fetus or fetal membranes and fetal fluids. The detection can be accomplished by:

a) Rectal examination or palpation

In this method, uterus is palpated though rectal wall to detect the uterine enlargement occurring during pregnancy. It is used for pregnancy diagnosis of large animals (cow, mare, Buffalo). It is not applied for ewes and does, because size of pelvic cavity is small in ewes and does.

b) Radiography

This method can be used in detecting pregnancy in sheep and goats. It is based on the identification of the fetal skeleton on an x-ray plate. I.e. when the skeleton is displayed or seen on an x-ray plate, then an animal will be considered as pregnant.

The method has got some disadvantages:

- It can be applied only during the last 1/3 of pregnancy when the fetal skeleton is properly developed. If an animal is detected to be non-pregnant, the animal will have long service and kidding /lambing/ (parturition) interval, which will be unprofitable for the farmer.
- The method is expensive for most of sheep and goat farms to have the equipment and skilled person to operate it. It causes also a radiation hazard to the operator. (An x-ray radiation emits cancerogenic substances which result the disease known as cancer.

c) Ultrasonic fetal pulse detection

In this method, sounds coming from fetal heart and umbilical vessels are detected by placing an ultrasonography on the dam's abdominal wall or by inserting into the rectum of the dam.

A. Laboratory Methods

These methods rely on the determination of hormones produced by the maternal tissues and fetus. Hormones are determined from the blood, milk & urine of the dam.

The hormones that are commonly used are:

a) Progesterone

Progesterone levels are measured in the milk and blood of the dam. Samples can be collected at the next expected estrus cycle, I.e. following the 1st estrus after mating (18 -21 days after mating) in case of goats and (17-19 days) in case of sheep. Milk samples are preferred than blood samples, as far as an animal is lactating, if not take blood samples. The reasons are:

- Progesterone levels are high in milk than in blood and urine,
- Collection of milk has no any discomfort (pain) or harm on the animal.

If progesterone level of pregnant animals is lower than the standard progesterone level, an animal is not pregnant, but if progesterone level is high, an animal can be considered as pregnant. However, high levels of progesterone do not always necessarily mean pregnancy. Because:

- If in case, a female had longer estrus cycle length than the normal length after mating, regression of a corpus luteum has not yet taken place. Hence, produces

progesterone. Prostaglandin has not yet released from uterus which results in the regression of corpus luteum. That means, a corpus luteum would be present on the day of sampling (18-22 days) and progesterone level would be higher, which is not related with the pregnancy of an animal. As such a female can be considered as pregnant, because of high levels of progesterone but not in the reality.

- If early embryonic mortality occurs after sampling, a female would be incorrectly diagnosed as pregnant and a female would be incorrectly considered as pregnant. Due to these reasons, the accuracy of this method is different from breed to breed (species to species). In goats the test can be as accurate as 98% but in sheep as 87%.
- If progesterone test is carried out 20-21 days after mating of goats 98 % conception rate accuracy of diagnosis can be an achieved. In sheep, if progesterone test is carried out 17-19 days after mating 87% accuracy of diagnosis is achieved.

b) Estrone sulphate test

This hormone is the major estrogen released by the fetus. This can be measured (detected) from the maternal blood milk or urine. Estrone sulphate is detected in the blood and milk 40-50 days after mating in goats and sheep. If estrone sulphate is detected the female animal is pregnant because estrone sulphate is produced only by the fetus. This method is more accurate than progesterone test.

Which method one may use, depends on the availability of necessary facilities. From clinical methods ultrasonic fetal pulse detection has no any harm to the operator and from laboratory methods estrone sulphate test is more accurate method of pregnancy diagnosis.

Self-check 5	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What are the Clinical methods pregnancy diagnosis?(6pts)
2. What are types hormone used in laboratory methods of pregnancy diagnosis?(6pts)

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

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

Information sheet 6 - Monitoring predators to newborn animals and implementing measures

6.1. Monitoring predators to newborn animals and implementing measures

If ewes/does are giving birth unobserved on the range, the newborns are exposed to predators or kids/lambs may be abandoned by their dams. Abandonment may happen frequently with first time mothers. Losses due to predators have been reported to be a major cause of kid loss in the Alaba Woreda of the SNNPRS. According to the key informants, the breeding time of the fox, a time of high nutrient demand, coincides with the major lambing/kidding season; thus, kids become prey.

Predators (Fox, Tiger, Hyena, Dogs (domestic and wild) to newborn animals are monitored, risk assessed and reported in line with workplace procedures i.e. the accurate Measurement of feed quantities, the use of precise measurement devices and apparatus, and the accurate determination of animal feed requirements.

For most shepherds, wolves and foxes are less problematic than coyotes, though both are similar to coyotes in their style of predation and feeding. Wolves tend to hunt in packs of two to four animals and can easily take down adult sheep. Because of their small size, foxes take only fairly small lambs.

Wildcats (lions, Tiger, lynx, or bobcats) are common in more remote areas. These animals can kill perfectly healthy, strong adult sheep as easily as they can a young or an old sheep. They often kill more than one animal in a single attack and then feed on their favorite parts of each kill.

Cats generally attack by biting the top of the head or neck. Bears usually use their massive tiger to strike a sheep down. Eagles and other birds of prey occasionally kill lambs. They attack by dropping out of the air at high speed and closing their talons into the head.

Dogs attack rather indiscriminately—they grab at any part of a sheep they can.

Sheep often survive dog attacks but may be badly injured. Even dogs that are too small to kill or maim a sheep can still cause heart failure in older ewes and abortion in pregnant ewes. Broken legs may also result when dogs chase sheep.

Predators can be discouraged by the following techniques:

- Keep guardian animals, like dogs, donkeys, or llamas.
- Use a lighted night corral with a high, predator-tight fence.
- Put high-frequency bells on some of your sheep; you can hear the bells if the sheep are being chased, and predators are less likely to chase sheep that are wearing bells.
- Keep the sheep in an open field in sight of the house.
- Use snares along fence lines to catch both predators. First check the legality of using snares in the area.
- Have a gun and know how to use it. Even a pellet gun can drive off an attacking dog. A dog running through a flock of sheep is not an easy target, but like most predators a dog will spook at the sound of a gun shot into the air.
- Use a live trap, which is a cage that allows the trapped animal to be set free. Such traps work well with dogs but are of little value with other because they are too wily to be caught.
- Use a propane exploder (which produces a loud explosion), a radio, or other noise-making device and frequently change its placement, volume, and timing to prevent predators from getting used to the device and losing their fear of it.

Self-check 6	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What is the method of controlling Predators? (10points)

2. What are the common shoat predators? (4 points)

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

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

Information sheet 7 - Preparing animals for giving birth

7.1. Preparing animals for giving birth

Care in this time, the gain in mass of the fetus amounts to 85% of its birth weight. Nutrient intake should be increased during this period. Concentrate sources of energy should be available as the rumen size is limited because of the developing fetus. However, care should be taken to avoid excessive feeding to reduce the chance of difficult birth. Multiple-bearing dams should receive more feed than single-bearing dams. It is advisable to separate dams at an advanced stage of pregnancy from the main flock. This will help to give them effective care.

During the first three months of pregnancy, the development of fetus is low; hence no appreciable increase in the food is required. They can stay on the diet of dry animals. However, during the last 4 – 6 weeks of pregnancy, the fetus grows rapidly and can deplete the food reserves of the dam. So the quantity and quality of food given during this period should be sufficient to meet requirements of both the fetus and the dam.
This includes:

- Good feeding during this pregnancy period produces greater development of udder tissues that increase milk yield.
- It results in a higher birth weight of kids and lambs.
- It also reduces kid and dam mortality due to increased birth weight, kids will be less susceptible and will have higher survival rates.
- Due to less mobilization of the fat reserves of the dams, the possibility that ketosis/pregnancy disease may occur in dams will be minimized.
- It results in a greater live weight gain of the kids after birth, due to increased milk yield and higher birth weight.

During the pregnancy period about 0.25 – 0.335 kg concentrate feed per day should be provided depending on the quality of pasture. Care should be taken in feeding pregnant dams to avoid overfeeding which leads to overweight and causes

kidding/lambing difficulties/dystocia and avoid underfeeding which results pregnancy disease.

Example Mineral requirement for pregnancy

P= 1.9g/day

Mg = 0.77=0.8g/day = are required

Deficiency may reduce growth rate and may result in death of embryos. In general if one or more of the macro-minerals are deficient in the diet, deficiency symptoms can occur such as:

- Eating of soils
- Diarrhea
- Low growth rate
- Loss of appetite
- Poor fertility
- Loss of hair

Water requirement Pregnancy

In the last months of pregnancy, water requirement rises to 140% of the pre-pregnancy level, if she is carrying 1 lamb/kid but if she is carrying twins, the requirement rises to 200 %(due to requirement of the fetus).

Bring pregnant animals into lambing/kidding corrals 4 to 6 days before parturition and provide the maximum possible comfort. If possible, provide bedding material. It is not advisable to handle pregnant animals too frequently.

Parturition

The process of parturition in sheep and goats is complex. In the ewe, maternal plasma progesterone declines 7 to 15 days before delivery while in goats such a decline is noted 24 hours before delivery. Estrogens increase during the last days in ewes and gradually in goats. These events stimulate the muscles in the uterus to contract. The fetus and placenta are expelled and this is followed by the involution (shrinking of the uterus to normal size).

Signs of approaching parturition: Approximately 2 weeks before lambing/kidding some changes occur: the udder and teats swell (more prominent in dairy breeds) and the vulva becomes loose.

Important management practice during late pregnancy:

- Proper feeding (without under and over feeding)
- Water and mineral licks should be available at all times.
- Pregnant dams should be kept in an individual pen towards the end of pregnancy till they give birth.

Fig6. Kept in an individual pen towards the end of pregnancy till they give birth

- This avoids trampling of kids and lambs and others may bother/butt the dam.
- The floor should be bedded to give more comfort to the dam.
- Lambing/kidding pens and equipment should be disinfected.
- Ewes should be sheared before lambing to maintain the wool clean and wool around udder and teats should be also removed otherwise prevents suckling of lambs.
- In a majority of cases, ewes and does give birth normally without assistance. However, a few may need assistance. Assistance should be given if the following abnormal presentations are observed:
  - ✓ one leg held back
  - ✓ two legs held back and only head is presented
  - ✓ kid/lamb upside down
  - ✓ Back to front presentation/breech birth, i.e. if two hind legs are presented.

Fig7. Normal presentations, the nose and two feet appears

When parturition approaches the female shows the following signs of kidding/ lambing:

- Restlessness
- Sitting down and getting up
- Smelling the ground
- Kidding/lambing with 1 – 2 hrs.
- Appearance of the water bag
- Onset of contraction and
- Appearance of parts of the kid/lamb

Self-check 7	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What is the prepare sheep and goat for giving birth means? (3points)
2. What are signs of kidding/ lambing that female shoats show when parturition approaches? (7points)
3. Write the management practice provided to female shoats during late pregnancy(10points)

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

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

Information sheet 8 - Determining and administering preventative health treatments

8.1. Determining and administering preventative health treatments.

Preventative health treatments are determined and administered to animals to manufacturer specifications and recorded in line with enterprise requirements. Preventative health treatments include Vaccinations, drenching, and diet adjustment.

Prevention methods

Prevention of disease is better than cure. Disease prevention involves various measures to keep infection out of healthy flocks or population of animals:

A. **Proper feeding**; - insufficient or in correct feeding weakens animals and can cause serious disorders like bloat.

- Bloat: - an excessive intake of feed, which quickly starts to ferment in the rumen causing accumulation of gasses in the rumen of the goat.

  Goats are fussy eaters and will waste food by pulling it from racks to the ground and spoiling it they will also jump in to racks and contaminate forage. Feeding racks and troughs for fodder should be designed so that food does not fall on to the floor so that animals cannot stand in the food nor contaminate it with dung and urine.

B. **hygienic prophylaxis**:- prophylaxis means a set of methods intended to prevent the appearance and propagation of transmissible disease

Two forms of prophylaxis can be distinguished.

- Hygienic prophylaxis: - based on hygienic measure
- Medical prophylaxis: - based on the use of sera vaccines and chemical products

Hygienic prophylaxis involves two types of measures:

I. General prophylaxis measures: - there are every day hygienic measures irrespective of the ambient health status this conditions this applies of course to all aspects of flock management such as:

- Housing hygiene
- Hygiene in feeding and drinking water

- Reproductive hygiene
- Hygiene in neonatal out young animals

II. More specific prophylactic measures:- those are used to prevent the introduction or spread of transmissible diseases in country or region

C. Vaccinations

Lambs should be vaccinated at an early age. Consult the veterinarian, a county Extension agent, or an experienced shepherd about vaccinations for your sheep.

Sheep are commonly vaccinated against diseases that infect the lungs, the digestive system, and the reproductive tract. For example, lambs (as well as ewes and rams) can be vaccinated to protect them against pneumonia, and all lambs should receive immunizations against enterotoxemia, a clostridial disease caused by overeating. Ewes should be vaccinated or given booster shots for clostridial diseases before lambing. This vaccine not only protects the ewe but also increases the disease-fighting antibodies she passes on to her newborn lambs when they nurse. Take this opportunity to vaccinate the ram, too; will be less likely to forget any sheep if do them all at once.

These measures include:

- Notification of disease
- Quarantine measures
- Disinfections
- Quarantine in order to prevent the spread of infectious diseases many countries have regulations, which control the importation and movement of animals. In some cases imported animals are put in to quarantine i.e. detained in an official isolation unit for a specific period to establish that they are disease free.

Self-check8	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What are preventive shoat health treatments? (8points)
2. What are the two Hygienic prophylaxis measures involved in disease prevention? Explain it? (6points)

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

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

Information sheet 9 - Preparing and implementing contingency measures

9.1. Preparing and implementing contingency measures

Contingency measures are prepared and implemented as required. Contingency measures include Emergency procedures in the event of adverse weather conditions, difficulties in birth giving requiring veterinarian assistance, and moving into furrowing or delivering facilities few days prior to due date.

First-Aid Kit for shoat

If assemble a first-aid kit ahead of time, will be ready to handle most emergencies. Keep the items listed below clean and dry in a large lunch box, tackle box, ammunition case, or any sturdy plastic or metal container with a tight lid. Inside the cover, tape the names and phone numbers of at least three goatoriented veterinarians. In an emergency, you may not be able to reach your regular vet.

Include the following items in the first-aid kit:

- 1 rectal thermometer, to take temperature
- 1 quart (1 L) isopropyl alcohol, to sterilize thermometer
- 6 disposable syringes (3 mL and 5 mL), to give shots
- 6 needles (18 gauge), to go with syringes
- 3 clean towels or diapers, to stop bleeding
- 1 bottle tetanus antitoxin, in case of wounds
- 1 pint (500 mL) saline solution wound wash
- 1 tube antibiotic ointment, to dress wounds
- 1 container tamed iodine (such as Betadine), to treat wounds
- 1 quart (1 L) mineral oil, to treat bloat
- 1 quart (1 L) propylene glycol, to treat ketosis
- 1 package powdered electrolytes, to treat scouring kids
- 1 jar udder balm, for chapped udders (and hands)
- Deworming medication, as recommended by your vet
- Dairy-approved pesticide spray or powder, if needed to treat lice and ticks

Self-check 8	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What is importance of contingency measure? (6 point)

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

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

Operation Sheet 1	Artificial insemination

Direction: Perform the following the Procedure given below.

1. use personal protective clothes
2. Collect the necessary materials and equipments required for the practical (Semen, inseminate gun, glove, lubricant, disinfectant, ropes and other)
3. Understand each material depending its use
4. restrain the animals
5. detect the oestrus
6. insemination
7. Inseminate A super-ovulated female or doe is inseminated (mated) two or three times at 12-hours interval to ensure fertilization of all ova.
8. Clean, disinfect, store each material and record the information.

LAP TEST	Performance Test

Name…… ID…… Date……

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within **1** hour. The project is expected from each student to do it.

Task 1

- **Performing Artificial insemination**

LG #50	LO #4- Identify and monitor feeding

Instruction sheet

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

- Identifying and confirming nutritional needs for pregnant animals
- Implementing procedures to minimize feed wastage and spoilage
- Monitoring feeding process and recording and reporting abnormalities
- Monitoring and maintaining condition and security of paddocks.

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

- Identify and confirm nutritional needs for pregnant animals
- Implement procedures to minimize feed wastage and spoilage
- Monitor feeding process and record and report abnormalities
- Monitor and maintain condition and security of paddocks.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work..
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, ask your trainer for further instructions or go back to “Operation sheets”.

Information sheet 1 - Identifying and confirming nutritional needs for pregnant animals

1.1. Identifying and confirming nutritional needs for pregnant animals

Animals need nutrients for different purposes:

Maintenance: - for maintaining the life of the animal. The animal must have energy for the functioning of the heart, for breathing & for other vital body processes

Growth: - for the increase in the size of muscle, bones, organs & connective tissue different nutrients are required.

Production: - milk, wool/hair.

Fattening: -if an animal is not being fed enough feeds, fat will not be stored.

Reproduction: - the animal may not be fertile if it does not get an adequate level of nutrients. Additional amounts of nutrients are needed during pregnancy.

Nutrition of males- nutritional deficiencies depresses production and characteristics of semen like mobility, volume of ejaculation or concentration of sperm. Under and overfed animals will not be in a position to produce semen frequently and to mate more females

Feeding Ewes and does

- Ewes and does are the backbone of the sheep and goat enterprise.
- The nutritional status of the ewe and does during the all stages of production is critical for optimum production, even though breeding and selection programs should not be overlooked.
  - ✓ Nutrition during pregnancy- Determine the number of lambs and kids are born alive and lamb birth weight, and also survivability
  - ✓ Nutrition during lactation- Critical for milk production.
- Optimum feeding systems vary based on the production system, i.e., intense feeding of "confined sheep" to supplementation of flocks "on range forage."
- How the ewe should be fed – Monitoring changes in body weight during lactation.
  - ✓ Should lose about 5 to 7% of the body wt. during lactation; recover this during the post weaning period, and then gain weight appropriately during gestation.

- ✓ Nutritional needs differ depending on the size, body conditions, and levels of production, thus may be useful to divide the flock into groups of ewes with similar needs.

Flushing & Breeding

Flushing

Increase the intake of ewes prior to and during mating to increase ovulation. Start about 2 weeks before breeding until 2-3 weeks into the breeding season. Accomplished by:

- Turning ewes onto a lush high-quality pasture just prior to breeding, if not,
- Can be done by supplementing ¼ to ½ lb. of grain or pellets/day

Gestation

Many lamb deaths shortly after birth can be attributed to nutrition during gestation because of placental growth, fetal development, and mammary gland development. The mature (3 to 8 years) ewe during the first 15 weeks of pregnancy, nutritional needs are slightly higher than the maintenance, but severe under- or over-nutrition during this phase can be detrimental.

Poor nutrition results in:

- Lighter lambs at birth,
- No uniform birth weight in twin and triplets,
- Impaired wool follicle development,
- Lower energy reserves of newborns, etc.

Parturition

Generally, recommended to provide good-quality forage and plenty of fresh water.

Start feeding grain or supplement about 12 to 24 hrs. after lambing.

Lactation

Nutrient needs usually 2 to 3 times greater during lactation than during maintenance. Ewes with twin lambs produce 20 to 40% more milk than those with singles, thus have higher nutrient requirements.

Self-check 1	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What are the purposes of animals need nutrients?(5 points)
2. What are the factors that affect nutrient requirement of shoat for what nutrient? (4 points)
3. What are the results of poor nutrition on pregnant ewes or does(3 points)

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

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

Information sheet 2 - Implementing procedures to minimize feed wastage and spoilage

2.1. Implementing procedures to minimize feed wastage and spoilage

2.1.1. Minimize feed wastage

A. **Sanitation**: Under confined or tethered feeding situations, a clean and dry floor will mean less wastage. Feed that falls to a clean floor is more likely to be acceptable if offered again than feed contaminated by mud and feces. Sheep and goats are selective feeders and easily refuse to eat dirty or smelly feed. Feed that is refused by sheep and goats may, in most instances, be used for cattle, which are generally less selective. This is one way of effectively utilizing available feed resources

B. **Chopping:** Feeding roughages in the chopped form reduces wastage and improves feed utilization:

- Chopping green feed and Stover has the following advantages:
- Reduces selectivity
- Permits thick-stemmed material to be easily eaten.
- Can increase consumption of unpalatable feeds.
- Allows for mixing with other ration components.
- Uneaten, coarse bits of chopped fodder may be added to dung cakes and so are used as fuel.

C. Poor feeding techniques:

- When dry fodder is fed loose in the field, wastage will be less if distributed little by little so that the stock eat it all and wait for more.
- Long hay and straw should be fed from racks or mangers; feeding on the ground, apart from being wasteful, is a health hazard.

D. Provision of appropriate feeders:

- Feeding on the ground results in considerable feed wastage and contributes greatly to the spread of disease, especially internal parasites. If sheep and goats are able to stand in their feed or in their feeders, they will inevitably defecate and urinate in the feed. Feeders need to be raised off the ground and constructed in such a way to keep the animals out as much as possible.

Provision of appropriate feeders also reduces competition. There must be enough space at the feeder for all sheep and goats to be fed easily without fighting. Young animals should be fed separately from older ones to avoid competition and trampling.

- Feed racks: Racks should be used wherever possible. Hay, crop residue, as well as cut green vegetation (if using cut-and-carry system), can most easily be fed in racks made with slatted sides and hung so that the feed is presented off the ground and at approximately head height

Fig4. A hay rack made of wood

E. Provision of shades:

- Appetite of animals will be depressed if the place where they are fed is hot and exposed to the sun. They will eat more in a cool and shady place than in a place exposed to direct sunlight. It is, therefore, advisable to locate feeders under the shade.

2.1.2. minimize feed spoilage

Proper storage of feed

- Stored feed must be kept dry and protected from animals, moisture and fire.
- Cover hay stacks with thatching or other material.
- Store feed in a well-ventilated area to avoid mold development and excessive heating.

- Feeds, especially concentrates, should be stored on pallets to avoid direct contact with the floor, which could cause spoilage.
- Buy concentrate feeds only in quantities required for one month.
- If possible, concentrate feeds should be stored as individual ingredients. Mixing should be in quantities that can be used in a one-week period. Mixed feeds spoil faster.
- Baled fodder is simpler to handle and requires less storage space compared with loose fodder. It is, therefore, advisable to bale roughages. Baling can be done on small farms using a box baler without requiring expensive equipment.

Self-check 2	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. Minimize feed wastage?(4pts)
2. How to minimize feed spoilage(4pts)

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

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

Information sheet 3 - Monitoring feeding process and recording and reporting abnormalities

3.1. Monitoring feeding process

Feeding sheep and goats is both a science and an art. While diets are scientifically formulated, experience in the feeding and management of small ruminants is important in gaining optimum feed utilization.

Feed should be stored and used as carefully and economically as possible. Proper care should be taken during storage and handling to avoid spoilage and loss; in feeding techniques and livestock management to avoid wastage; and in ensuring that different types of feeds are used in the context of a balanced feeding system. Some principles and applications of feeding management of sheep and goats are presented below.

Improving feed utilization and efficiency:

- If livestock are to make the best use of feed, they must be healthy and correctly handled. Routine control of epizootic diseases and internal and external parasites are important to achieve efficient use of feedstuff.
- Feed animals based on their requirements. Both overfeeding and underfeeding result in feed wastage.

Adapting sheep and goats to new feeds and increasing consumption of less palatable feeds

Sudden diet changes, especially switching from a diet high in roughage to concentrate, should be avoided. Dietary changes should be gradual. The micro-organisms in the reticulo-rumen that help sheep and goats utilize feed require time for adaptation. The sudden introduction of a new feed can lead to scouring and loss of condition or even death in severe cases. A new feed or a feed that is not highly palatable should first be given in very small amounts with the quantity being increased progressively over a period of up to 15 days.

Some suggestions for use of new feeds are given below:

- Always present the new feed when animals are hungry.
- Mix new or less palatable feed with feeds the animals like to consume. The level of the new feed can be increased gradually. Mixing with feeds such as molasses or salt can shorten the adaptation period.
- If the above strategies do not work, one can try forcing the animals to eat the new feed or go hungry. If they are persistent in their refusal, another approach or a different feedstuff may need to be used.

Sheep and goats differ in their feeding habits. Selection and intake of forage depends not only on the available plant resources but also on the feeding behavior of animals. Knowledge of feeding habits that have nutritional implications is important in improving sheep and goat nutrition.

Goats prefer to consume a wide variety of feedstuffs. Goats are more selective and browse more, especially under extensive conditions, than sheep. The selectivity of goats is reduced under intensive management.

Goats generally have better body condition compared to sheep under the same grazing conditions, mainly due to their ability to select a nutritious diet.

Fig2. Goats browsing

Goats prefer to eat feed at a height of 20–120 cm. They have the ability to stand on their hind legs for long periods and can even climb trees in order to reach parts of trees they prefer. They also have mobile upper lips and tongues that enable them to consume leaves between thorns.

Feeding Method

Pasture feeding - Pasture can be used for the entire fattening period or for the early part and then placed in the feedlot for finishing:

- Plants must be palatable and nutritious, and generally the most nutritious ones are the legumes or a mixture of legumes and grasses, which can reduce bloat problems.
- May be less expensive per pound of gain, but it takes longer to finish lambs.

Hand feeding - Fed twice daily on a regular basis:

- Has the advantage of being able to identify sick or off feed animals easily.
- Feeding silage - Usually the method of choice.

Self-feeding:

- Rations generally contain between 60 and 85% concentrate.
- In recent years, grain, as a source of energy, has become less costly in relation to hay, and the current practice is to feed rations containing more grain.

3.2. Recording and reporting abnormalities

Regardless of feeding method used, care should be taken in changing from high-forage to high-grain diets (i.e., change "gradually"). If not, may have problems with acidosis, diarrhea, and enterotoxemia.

Potential nutritional problems

Enterotoxemia

The most common nutritionally related problem, which is caused by the toxins produced by Clostridium perfringens type D, and usually affects larger, fast-gaining lambs.

Treatments/prevention:

For young lambs less than 2 month of age, should use antitoxin to provide an immediate immunity, which can last 2 to 3 wk.

- Being used to stop death losses following an outbreak of entertoxemia.
- Being used to immunize feedlot lambs on a short-term feeding for up to 3 wk.

Vaccination - With bacteria or toxoid will provide a more long-term prevention.

- The vaccination program is effective for 5-6 months. Some producers will vaccinate the pregnant ewe about a month before lambing.
- Early-weaned should be vaccinated twice (2 to 3 wks. apart) prior to weaning.
- Older feeder lambs that are transported to the finishing area should be vaccinated twice during the first 2 wks. after arrival.

Urinary Calculi

Commonly occur in rams or weathers in dry lot.

Prevention

- Maintaining a proper Ca to P ratio would help. The ratio closer to 1:1 - Greater the probability of having the problem.
- Providing a continuous supply of clean, cool water with adequate water space can be useful in prevention. Addition of salt or trace mineral salt may enhance water intake, thus less calculi problem?
- Ammonium chloride or ammonium sulfate at 0.5% may reduce the incidence

Rectal Prolapse

- The tendency to develop prolapse may be associated with genetics
- Feeding pelleted, high-roughage rations may increase the incidence of rectal prolapse.
- Excessive dustiness of the ration may lead to increase coughing, thus increase prolapse?
- Lambs with short-docked tails are more prone to develop prolapse vs. long docks

Self-check 3	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What are the potential nutritional problem in sheep and goat? (4 points)
2. What are the factors affecting feed intake? (9 points)

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

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

Information sheet 4 - Monitoring and maintaining condition and security of paddocks

Paddocks should be small enough for uniform forage grazing. Paddocks can then be adjusted in size as the season progresses and forage growth slows down. If you have to keep animals on a paddock for more than five days to graze to a set stubble height, this probably indicates surplus forage, which can occur early in the season. If the animals cannot keep up with forage growth during the early season, consider cutting some of the forage as hay. The livestock can be turned onto the mowed fields after appropriate rest and recovery of the grass.

Paddock design

Most people think of paddocks as flat, symmetrical squares. Unfortunately, most farms are not flat. They have hills, streams and often trees. A general recommendation is to allow cattle access to water within 800 feet of any point on the pasture. Research has shown that if cattle have to walk more than this distance to water, they tend to under graze farther from the water source.

Livestock may prefer to graze some slopes or flat areas over other parts of the paddock. If a paddock has a lot of variation in this aspect, it may be poorly used because some areas will be overgrazed and others under grazed.

In this case, it is best to fence according to the landscape or use temporary fencing to control access within the paddock.

When designing a grazing system, also consider differences in the productivity of the land. For example, in a two-day rotation, some paddocks may need to be larger than others to have the same amount of forage available.

Fencing

Electric fencing is very popular among grazers. Electric fencing systems offer many benefits over conventional wire or wooden fences. Light weight, ease of installation and adaptability characterize electric fencing systems.

Electric interior fences (that divide paddocks within a grazing pasture or cell) can be single-stranded poly wire or poly tape with portable posts that can be easily installed and removed to make the paddock bigger or smaller, depending on forage quantity.

Some of the necessary equipment for designing and constructing electric fences includes:

- Charger (energizer) and grounding rods
- High-tensile wire, 10, 12.5 or 14 gauge
- Tensioners and insulators
- Poly tape and poly wire for sectioning off paddocks
- Tools, including volt meters, crimping devices, lighting arrestors and surge protectors
- Posts, such as wood and steel (for permanent and corner braces) and step-in posts (temporary)

Water systems

Water systems should be designed for ease of operation and maintenance. A typical watering system includes a water source (pond, well, municipal water supply), a pump, a pressure gauge, piping and fittings, water troughs and automatic watering valves. Pipe can be made from various kinds of plastic.

Black poly plastic is relatively inexpensive, easily to install, comes in 100-foot rolls and can be buried in trenches.

Self-check 2	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What are necessary equipment for designing and constructing electric fences?(6pts)

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

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

LG #51	LO #5- Identify sheep and goat housing and facilities

Instruction sheet

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

- Assessing and clarifying requirement of housing
- Obtaining plans from different sources and assessing
- Confirming sheep and goat housing with budget
- Assessing and determining facilities

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

- Assess and clarify requirement of housing.
- Obtain plans from different sources and assessing
- Confirm sheep and goat housing with budget
- Assess and determine facilities

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
6. If you earned a satisfactory evaluation proceed to “Operation sheets
7. Perform “the Learning activity performance test” which is placed following “Operation sheets” ,
8. If your performance is satisfactory proceed to the next learning guide,
9. If your performance is unsatisfactory, ask your trainer for further instructions or go back to “Operation sheets”.

Information sheet 1 - Assessing and clarifying requirement of housing

1.1. Assessing and clarifying requirement of housing

The type of housing varies with the production system, the objective of raising sheep and goats and perhaps tradition. Housing can range from very simple structures made of a roof and partial walls to complex structures fitted with automatic feeders and waterers. Animals may be kept either in an area within the family home or in a separate animal shed.

A separate house for sheep and goats with a raised wooden floor 30 cm above the ground is observed in some areas (Konso). The animal shed could be located outside the homestead or it could be adjacent or attached to the family home.

Despite variation in types, the common purposes of housing are to:

- Protect animals from climatic stress (extreme heat, cold, rain, wind, etc.), thus creating an environment suitable for the animals' physiological state;
- Provide protection against losses by predators and theft; and
- Make management easier and save labor.

Sheep housing is very important for rising sheep farming. To raise animals has its science. In the case of sheep, they can be the enterprise, wool will protect it from weather agents. However, for sheep housing is necessary to have some constructions that allow the protection of the sheep in rainy seasons or in the season of winter.

So the sheep will not die or affect their health. Following some standards for building establishment according to the number of sheep that intend to raise, is one of the very important factors, and do not exceed that limit.

Types of Sheep Housing:

Corrals:

Housing corrals are mainly used for females shortly before calving, until weaning of young, and for fattening lambs.

Next to the corral is a ship that is frequently open on one side. The ship serves to protect the animals against inclement weather. Individual parts are installed in a part of the ship. When it is very cold, these can be provided with heating.

The pens should be constructed in such a way that they reach for groups of 50 to 100 sheep with their offspring. It should take into account an area of about 4 square meters per female.

Godson:

In order to force the sheep to adopt orphaned offspring, special cages are used. In this type of cage, the sheep and the brood remain together for a day or two until the sheep accept it. You May Also Like To Read Suffolk Sheep.

Open Sheep Housing:

Sheep need little shelter because they have the protection of wool. They generally take advantage of the natural protection of trees, shrubs, and hills. If the sheep are in an open field without natural wind protection, it is recommended that objects be placed for this purpose. Large round bales of hay feeders can provide the necessary protection. Another alternative is to install windbreaks such as sheets of pressed wood or metal anchored in the ground.

Large round bales of hay feeders can provide the necessary protection. Another alternative is to install windbreaks such as sheets of pressed wood or metal anchored in the ground. For their wool does not need to be in stables, you can be in open spaces.

However, according to the climatic conditions where the activity takes place they have to foresee the construction of a barn or a stable so that the sheep are protected in rainy weather, or winters season, and thus prevent diseases in sheep.

Bound Sheep Housing:

Sheds:

A shed protects sheep from predators, from inclement weather such as rain, snow, and wind causing illness and death. The shed because of the shelter it provides, makes more efficient the use of the energy consumed by the animals by reducing the mortality of lambs and the nutritional requirements of the sheep. On the other

hand, this infrastructure will allow working on rainy days with animals on foot treatments, vaccinations, and other management activities.

When building a shed you should have some basic considerations like:

- **Orientation:** The orientation of the shed is in direct relation to the predominance of the winds. For the construction of the shed is ideal to take advantage of a place where the soil has some slope as this will allow a better drainage of liquids and therefore a better management of guano.
- **Ventilation:** The purpose of ventilation is to provide fresh air throughout the shed, to maintain optimum temperature and humidity, and to maintain low levels of ammonia. It is important to avoid drafts, which is also detrimental to sheep health, and they are responsible for pneumonia in lambs.
- **Surface:** The construction of a shed should consider a minimum area of 1 m² per adult ewe, and 1.3 m² per ewe with breeding, ie for every 10 ewes with offspring will be required 13 m² of the shed built.

Floor-space requirements

Floor space requirements depend mainly on the size of goats. Tropical goats are generally smaller than temperate.

Category	Requirement per animal (m²)
Kid	0.3
Doe (non-pregnant)	1.5
Doe (pregnant)	1.9
Buck	2.8

Floor space requirements for medium-sized breeds of sheep

	With yard	Without yard
Adult	0.20-0.40	0.40-0.80
Ewe with lamb	0.30-0.50	0.60-1.00
Young sheep	0.15-0.20	0.30-0.40
Ram	0.50-0.75	1.00-1.50

If the sheep are able to get out during day time on a yard (2-3 m²/head) they don't require much room in the shelter.

The minimum height of fences is 1 m, as tropical sheep have remarkable jumping ability.

Wired fences should be spaced at intervals of 5, 10, 10, 15, 20, 20 and 20 cm (going upwards from ground level). Barbed wire should not be used as it is more expensive to buy, no more effective and is difficult to handle. It can also cause injuries to sheep.

Wire netting is preferable. Posts should be spaced at intervals of 5-10 m, depending on how solid they are, the type of fence used and the density of stocking in the yard.

It is important to provide gates of sufficient width (> 2m) so as to reduce the jostling that inevitable takes place when sheep leave or enter the yard, and which can cause ewes near the end of gestation to abort.

Self-check 1	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What are the materials roofing used for construction in different locations?(5pts)

2. What are Space requirements for permanent conferment and night housing and day time grazing types of house for breeding male, breeding female and young stock?(6pts)

Note: **Satisfactory rating - 11 points** **Unsatisfactory – below 11 points**

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

Information sheet 2 - Obtaining plans from different sources and assessing

Shelter and Facilities Design

In simple terms, handling facilities comprise the following: low density holding areas, high density holding areas, forcing (or crowding) area, drafting (sorting) race, and handling (working) race.

Most producers can use nearby pastures and laneways as their low density holding areas. These areas need to be secure enough to prevent escapes (particularly lambs) from one area to the next. Consider using net wire fencing with openings no larger than 15 cm by 15 cm, secured to closely spaced posts.

High-density holding areas need to be built with medium to strong fencing materials. Densities of 2 sheep in full fleece per square meter allows enough room to drive the group into the yards, while leaving space for gates to swing, and dogs to work where they are used. It is particularly important that these areas are long and narrow so that groups are easily controlled while being driven up into the forcing (crowding) race.

Floor /Floor plan

- The flooring may be either of moorum or of strong wooden battens and, where the rainfall is quite heavy; the latter type of flooring may be preferred.
- In the case of wooden-batten flooring, the width of each plank shall vary from 7.5 to 10.0 cm and the thickness between 2.5 cm and 4.0 cm.
- The sides of the planks shall be well rounded and the clearance between two planks shall range between 1.0 cm and 1.5 cm to facilitate the disposal of dung and urine.
- The wooden-batten flooring shall be constructed at a height of at least one metre above the ground level.
- In this case, a suitable ramp or steps of wooden planks shall be provided.
- In the case of moorum flooring, a plinth wall between 15 cm and 30 cm in height shall be provided.

- For the shearing and store room and shepherd's house, the flooring may be of moorum or brick in cement mortar, and the floor shall be levelled properly.

Fig15. Ground Floor shed

Roof

- The roof is important as it protects animals against the sun and rain. The under-surface of the roof should remain cool and watertight.
- To ensure adequate ventilation, the height of the roof and the design should be considered. A high roof encourages air movement but is more likely to be damaged by strong winds. In some cases a design with a chimney or roof vent could be useful to assist ventilation and remove ammonia that could easily accumulate.
- The following materials are used for roof construction in different locations: Iron sheet Grass/bushes Wood Stone/brick Earth.The majority of houses have roofing made of grass/bushes.

Gate

- Each shed may be provided with one or more gates either on the long or broad sides of the sheds depending upon the dimensions of the shed.
- The dimensions of each gate may be 0.8 m broad and one meter high. The gate leaf and frame may be made of wooden battens. It shall fit the entrance closely.

Elevated floor

- Its initial investment is high.
- In the wooden floor sheds, in a distance of 3m from the floor, the animals are reared.
- This requires less labor and more irrigation land for the fodder production.
- The elevated sheds will be clean and urine and dung will be collected in the floor and periodical removing is required once in six months.

Fig16. Elevated floor for goat

Walls

- In warm climates walls are partially open to allow movement of air through the house. In some cases, however, complete walling is needed to keep out predators. Ventilation is important to remove heat, moisture and pollutants so that animals stay cool, dry and clean.
- Outer walls protect the animals from external influences while separation walls within the house prevent mixing among the animals.
- Attention needs to be given to construction of pens within the house. Pens serve as a means of controlling animals and for management purposes, such as controlling breeding. Areas for lambing/kidding and isolation of sick animals should be included.

- It is always wise to keep in mind the possibility of expansion when building houses for sheep and goats.
- An appropriate flock development plan has to be made to anticipate future construction needs.

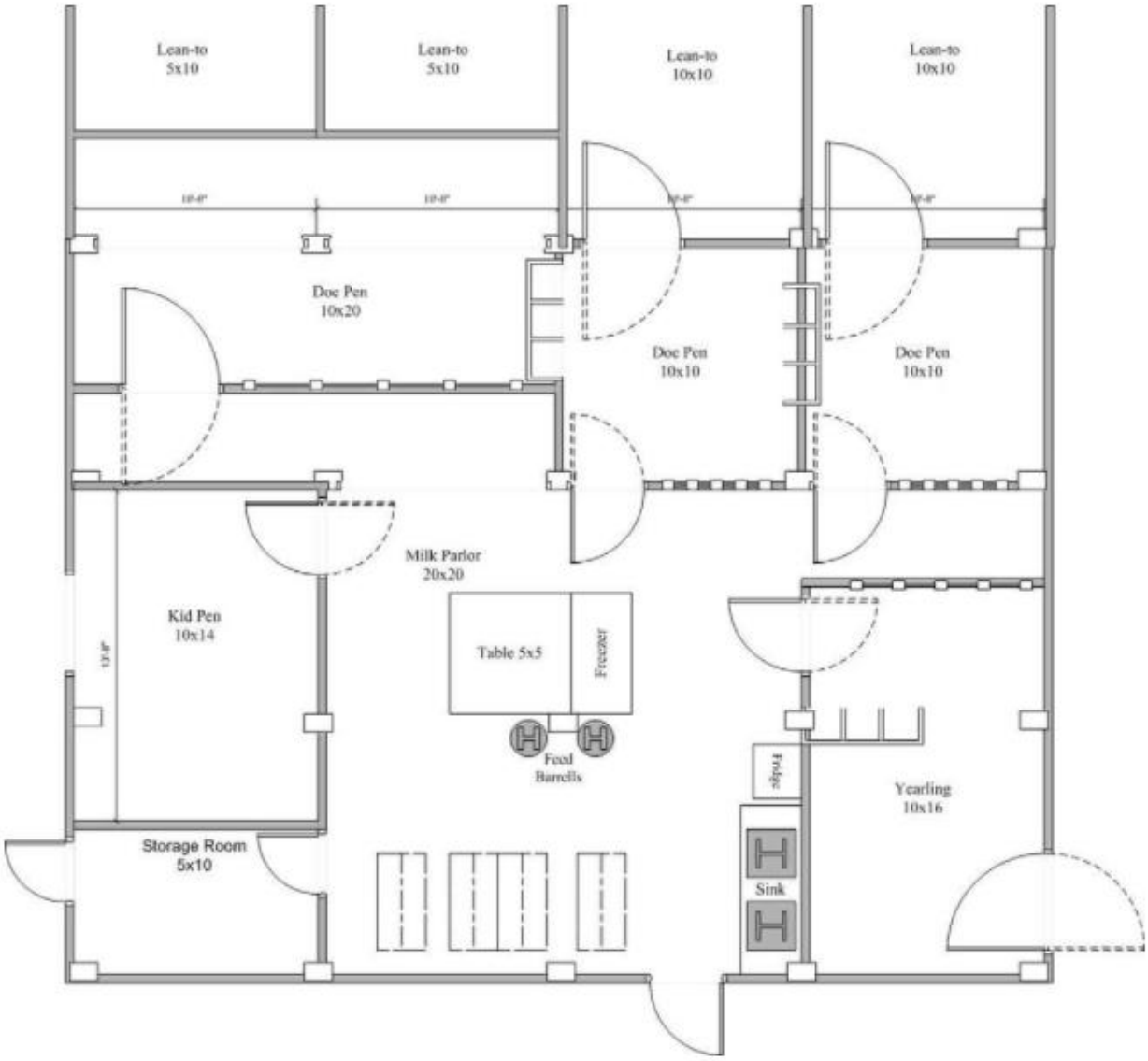


Fig16. Barn and Pasture Plans of Dairy Goat

Self-check 2	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What is the advantage of grading?(3pts)

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

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

Information sheet 3 - Confirming sheep and goat housing with budget

A suitable and effective business plan is a must for starting any business. As goat farming is a proven highly profitable business idea so, it is very necessary to make a proper goat farming business plan before starting this business. Make a clear and up to date plan before investing your money in this market.

The shoat farming project requires less capital and investment than raising any other livestock.

- High profit within a very short time,
- Little investment,
- Huge global demand is the main reasons of spreading this business rapidly throughout the world.

If you want to start this business and if you have the ability of making a plan perfectly then you will defiantly be able to achieve the highest profit from goat farming business.

If you are a beginner in this market then first of all meet with some successful goat producers and visit some farms.

By visiting some farms and producers you will get some clear idea about the pros and corns of this business. This will help you running your business perfectly.

Self-check1	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. Write the procedures of Packaging of fish?(4pts)

2. What are the Specific requirements for processed fresh fish?(6pts)

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

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

Information sheet 4 - Assessing and determining facilities

4.1. Assessing and determining facilities

Essential sheep and goat facilities differ according to the system of management and climatic conditions. In modern production systems, where large flocks of sheep or goats are raised and managed, facilities to handle sheep and goats are essential for efficient management.

Some of these facilities are:

- Fences
- Handling pens
- Housing (house/barn – different kinds of buildings)
- Dipping vats/spraying area
- Isolation ward for sick animals
- Manure disposal pit (away from the house), and
- Equipment (feeding and watering troughs, etc.)

A. Feeding trough and hay racks

Feed troughs for concentrate and hay racks for forage feeding are required where these practices are conducted. The size of racks and troughs is determined by the body size of sheep and goats and by animal numbers. Approximately 30 to 40 cm per animal space is the minimum. Movable troughs are usually 2 to 4 m long. Fodder should not be put on the ground for sheep and goats. A feeding rack can be made from wood or other locally available material such as bamboo. The rack should be high enough to prevent adult sheep and goats from putting their heads in it and from jumping into the rack. The bottom should be above normal head height.

It should be noted that the feeding behavior of goats is different from that of sheep and a barrier is needed to prevent animals from jumping into the trough. In a system called ‘tombstone or keyhole barrier’, each animal puts its head through an individual wooden barrier to eat without being able to push its body into the trough.

Suggested dimensions for a concentrate trough are a width of 30 cm with a depth of 15 cm, with the trough standing on 15 cm legs.

In general, troughs placed directly on the ground are not desirable because mud or soil can get into the trough, and sheep and goats are tempted to put their feet in. When only a limited amount of supplementary feed is given, it is essential that the trough is long enough to allow all animals to eat at once. Some troughs are fitted with a yoke to restrain animals during the short period of supplementary feeding. Such structures allow individual recording of the amount of concentrate consumed by each animal.

B. Watering trough

The need for watering troughs depends on the size of the flock. For small flocks, water tight tins, buckets or bowls can be adequate. Any type of watering trough used should be easy to clean.

C. Dipping vat

Mobile dip vats have replaced the conventional dip vats made of concrete. Several years of effort to introduce dipping vats into tropical countries have had limited success, the major problem being maintaining the vats.

Mobile dip vats made of plastic are meant to overcome the shortcomings of conventional, permanently placed dip vats. The size of plastic, mobile dip vats could vary according to flock sizes.

Fig14. Mobile dipping vat

Isolation ward for sick animals

- There shall be a sick animal shed for segregating ailing and disabled animals.
- Away from the other sheds one or more sick animal sheds may be constructed with a dimension of 3m (l) ×2m (w) × 3 m (h).
- The lower half of the door may be made of wooden planks and the upper half of wire-netting.
- There may also be a window of 0.7 m broad and 1.2 m high with a wire net covering.

Kidding/ lambing Shed

- These sheds shall be used as maternity rooms for pregnant doe and are housed individually in these sheds.
- The shed shall be 1.5m(l)×1.2m(w)×3.0m(h), to manage for holding feed and hay and a bucket for keeping water shall be provided in the shed.
- These sheds shall be made drought-free.
- In cold climates, some warming devices, like a room heater shall be fixed in maternity pens, so that the newborn is protected from cold during winter.

Attendant's Room

- The labor house meant for the caretaker shall be located at a convenient place in the yard.
- The house may be 6m (l) X 4m (w) X 3 m (h). There shall be a door of one meter wide and two meters high on the long side of the shed facing the passage of the yard.
- The door leaf may be of wooden planks. There may be four windows; one of these facing the passage of the yard and the other three facing outside.
- Each window maybe 0.7 m broad and 1.2 m high and covered with wire netting.

Footbath

- A footbath made of galvanized steel sheets or brick in cement mortar shall be provided at the entrance to the yard to protect the animals from foot-rot disease.
- These baths may be embedded in the soil suitably.

Fences

- Fences are important not only to protect animals against predators or theft but

also to isolate them from other animals. Fences could be constructed from locally available materials with considerations for cost and durability. Materials resistant against termites are most durable. Alternatively, wooden posts of treated eucalyptus could be used. Barbed wire is commonly used but can damage the skin when animals try to squeeze through an opening. Fences require regular supervision and maintenance. In some instances trees or brush may be grown and fashioned into a live fence.

Handling pens

- Sheep and goats need to be handled, either in groups or individually, for vaccination, treatment, mating, weighing, etc. Handling pens are useful in reducing injury and stress on animals and workers. An ideal layout for a handling pen includes a receiving pen, forcing pen, crush, sorting gate, foot bath, dip or spray race (long and narrow passage wide enough for only one sheep or goat), draining pens and a holding pen. In particular, the receiving pen should match the number of animals expected to be handled at one time. Under the current smallholder conditions of Ethiopia, one handling pen per village may serve the purpose as long as complications with disease transmissions are minimal.

Self-check 5	Written test

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I Short Answer Questions

1. What are the essential sheep and goat facilities? (8pts)
2. What is the advantage of mobile dip vats? (2pts)

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

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

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