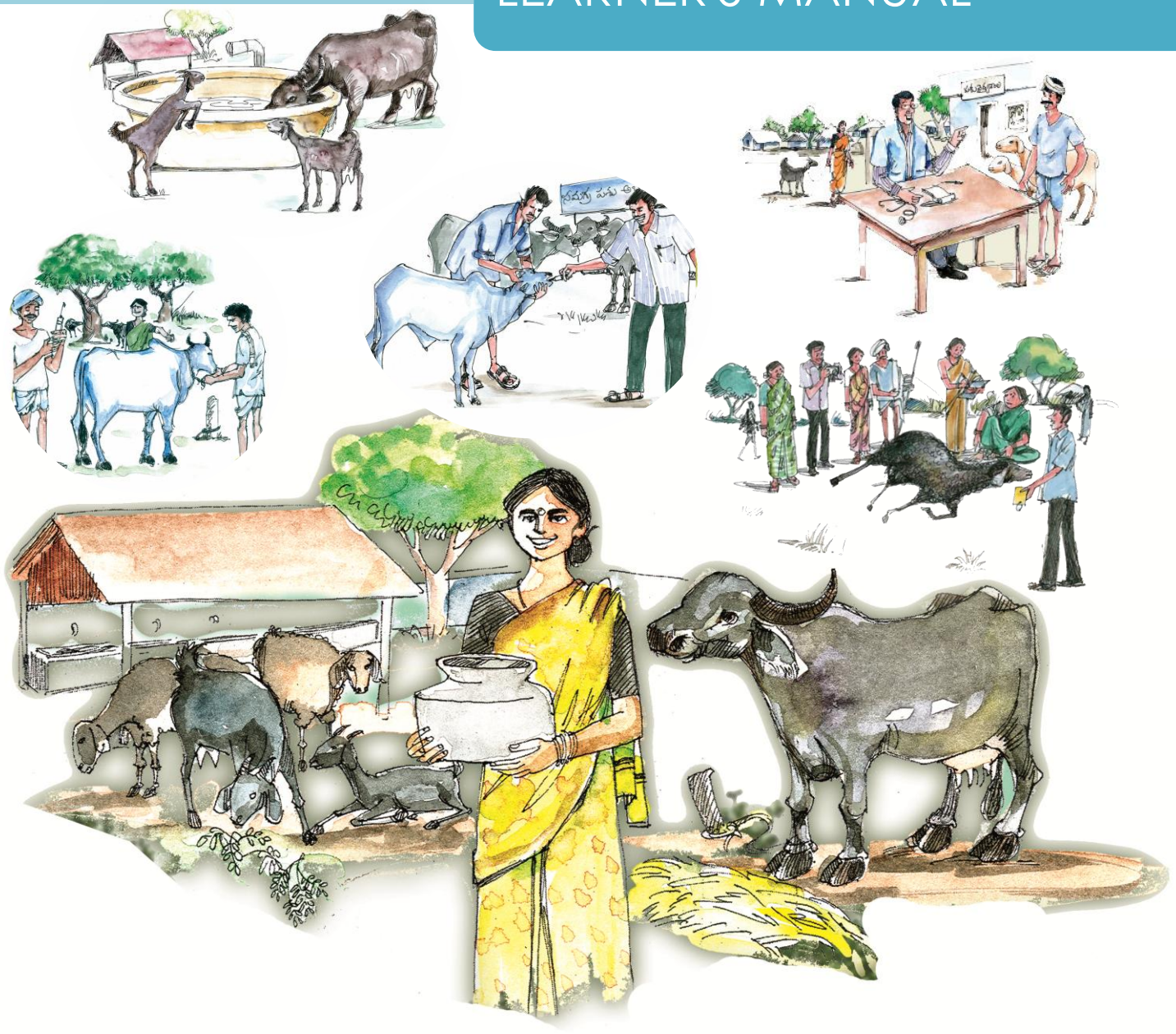
LEARNER'S MANUAL



MANAGEMENT OF LARGE AND SMALL RUMINANTS

Certificate Programme in Rural Livelihoods

WASSAN

WATERSHED SUPPORT SERVICES AND ACTIVITIES NETWORK (WASSAN)

BRLF

BHARAT RURAL LIVELIHOODS FOUNDATION (BRLF)

CONTENTS

1. Introductory Session

BRLF QUESTIONNAIRE FOR PRE-TEST FOR KNOWLEDGE ASSESSMENT OF THE TRAINEES

1. Name :
2. Father's name :
3. NGO :
4. State : *District:* *Taluq:* *Village:*
5. Mobile No. :
6. Land owned(ha) : *Dry:* *Irrigated:*
7. Crops grown :
8. Livestock owned :
9. White Cattle : *Black Cattle:* *Sheep:* *Goats:* *Poultry:* *Others:*

10. Can you name four breeds of livestock

    a. Cattle
    b. Sheep
    c. Goat
    d. Poultry

11. Name two diseases from animal to animal in cattle, goats and poultry
12. In how many days an egg will hatch?
13. Can a hen give egg without cock?
14. What is the pregnancy period in cow and goat?
15. Name two diseases you have seen in goats, cow and hen.
16. Have you ever visited a veterinary hospital, if so name doctor's name.
17. Specialty of cattle in your area.
18. Is cattle meant for dairy/draft purpose in your area?
19. What are you expected to do after this training?

2. Different Livestock Production Systems in Tribal Areas

DURATION : 4 Hours

SESSION OBJECTIVE :

- ❑ Understand contribution of large and small ruminants in Rural Livelihoods
- ❑ Finding out problems of large and small ruminants production at village level
- ❑ Possible solutions they suggest

SESSION OVERVIEW :

■ **Understanding contribution of large and small ruminants in Rural Livelihoods**

a. **Importance of dairy animals for tribal livelihoods:** Tribals are socio-economically poor people of the country and constitute 8.6% of India's total population. Around 70 million rural households are engaged in milk production with high proportion being landless, marginal and small farmers; hence dairy can be used as a tool for poverty alleviation. Dairy animals provide a steady income that may be quite substantial. Historically, livestock is integrated into a mixed agriculture-livestock system. Livestock tilled fields, fed on crop residues, and fertilised the fields with their manure, and provided milk and meat for household consumption, celebrations and religious festivals.

b. **Draught power:** Access to draught power is critical during tilling period. Ninety percentage of land holdings are distributed in marginal to semi-medium farm holdings. It covers about 50 per cent of total cultivable land. This asset has been cultivated using farm animals like bullocks, buffaloes and camels, where tractors and tillers use is not possible, uneconomic, besides being too expensive for small farmers. Fragmentation of land is also continuing. In such situation draught animal power is important for timely sowing and other agriculture operations

c. **Importance of small ruminants for tribal livelihoods:**

   - **Meat:** Small ruminants play an important role in the food and nutritional security of millions of rural people especially the landless, marginal and small farmers in arid and semiarid rainfed regions. They are also adaptable to harsh climates. Goat and sheep are also among the main meat-producing animals in India, whose meat (chevon/

mutton) is readily preferred irrespective of caste, creed and religion. Goats and sheep rearing is an important means of income and employment generation for the millions of resource poor rural households and significantly contribute in ensuring food and nutritional security for their families. Thus help alleviate poverty and smoothen income distribution. The goat and sheep are mainly dependent on common property resources (CPRs) for meeting their feed and fodder requirements.

- **Wool:** is mostly generated from sheep. The sheep flocks are generally raised on the common grazing lands. Feeding of concentrate mixture and mineral supplements are known to have significant positive effect on various production traits of sheep but its adoption is very low due to various economic and institutional constraints. Sheep is easily manageable flock. It has excellent ability to survive under drought conditions. They are less prone to diseases. Sheep require less labour than other livestock.

- **Milk:** Goat is known as poor man's cow. Goat has small land and initial investment requirements and are adaptable to harsh climates. Family labour and common grazing resources are critical and major inputs used in goat production system. Goat milk is easily digestible, alkaline has higher buffering capacity and high therapeutic values. Goat milk is enriched with different types of vitamins.

- The goat is known as moving ATM, to provide money in small amounts to the family needs like children education fee, health problems and other emergency needs of the family.

■ Problems of Large and Small ruminants production at Village Level

Major issues affecting the performance of large ruminants like cattle and buffaloes in the country are presented below:

- Over 65-70% female cattle are low productive, due to indiscriminate breeding and neglect, thereby turning dairy husbandry uneconomical.
- While the cows of most of the draft breeds are very low in milk production, the males have lost their utility as bullocks due to mechanisation in agriculture.
- In the absence of reliable data on the economics of non-descript and draft breeds and loss of opportunity, farmers have no interest in selection and maintenance of high value animals.
- Poor quality bulls used for semen collection and poor semen freezing facilities further affect the productivity of cattle and buffaloes.
- Poor access to breeding and veterinary care at the doorsteps of farmers and is leading to genetic erosion and poor health status.
- Poor skills of para-vets are resulting in infertility and other breeding problems.
- Lack of coordinated efforts for disease containment is causing major health problems.

- Increasing shortage of fodder and feed and poor emphasis on utilisation of crop residues are affecting the production.
- Due to non-availability of superior quality inputs at reasonable price, farmers are exploited by local traders.
- Lack of breeding policy and data on performance is leading to extinction of good native breeds and increasing exotic blood level, causing susceptibility to many diseases.
- Inability to take up biogas production due to outdated technology, poor services and high cost.
- Lack of facilities for housing of unproductive and diseased animals pose burden on small farmers.
- Lack of awareness about clean milk production, poor market linkage, unfair trade practices and consumer-biased pricing for milk, which is non-remunerative for farmers.
- Inadequate facilities for fattening of male buffaloes, particularly males and processing of buffalo meat, resulting in neglect of males and poor price realisation.
- Lack of awareness among small farmers about various opportunities for enhancing the production and increasing communication gap between male extension workers and female livestock owners, causing delay in adopting modern technologies.

■ Major Issues of Small Ruminants

- The control of infestations of small ruminants by internal parasites (especially nematodes) is the most serious problem that challenges the small ruminant industry today. Infestations of these parasites can cause major economic losses to producers because of the cost of treatment, production loss, and death of heavily infested animals.
- More number needed to meet requirements of a household
- More easily stolen
- Susceptible to predators
- Breeding programmes are difficult to control in more extensive systems
- Susceptible to diseases, with poor access to services
- Poor resource allocation for research and development
- Overstocking

■ Issues related to Water

<u>These issues are as follows:</u>

a. Carrying out an assessment of water needs, both direct and indirect;
b. Understanding how do the poor and the underprivileged manage the water needs of livestock. The farm households with access to irrigation engage in more intensive livestock production than those who do not have access to irrigation.
c. Understanding what is the current state regarding quality of water available to animals and what impacts does it seem to have on their health and productivity.

- **Related Assessments (if any)**

Total No. of Learning Hours	**Theory** (2 hours)	**Practical** (NIL)
Learning Outcomes	**Knowledge Outcomes**	**Skill Outcomes**
Learning support material for reference from your learning kit	**Reading Material (In Learner's Kit)** Check list of questions for FGD Web References	
Reflective/Evaluative questions pertaining to higher order and lower order of thinking	**Knowledge / Skill pertaining questions** ○ What are the different large ruminants production systems in India? ○ What are the different small ruminants rearing systems in India? **Reflective / Conceptual questions** ○ What are the best production systems in large ruminants and why? ○ What do you think sheep or goat rearing is better in tribal areas? Explain why?	

SESSION EXERCISE / CASE STUDY:

- **Group Exercises on large ruminants**

1. What are the issues in different large ruminant rearing systems in your area?
   Suggest solutions

2. What are the issues in different large ruminant production systems in your area?
   Suggest solutions

- **Group Exercises on small ruminants**

1. What are the issues in sheep rearing in your area? Suggest solutions
2. What are the issues in goat rearing in your area? Suggest solutions
3. What are the issues in migration of small ruminants?

KEY LEARNING REFLECTIONS:

1. Comparison of draught animals, dairy animals and calf production, herds.
   a. Sustainability of extensive system of livestock rearing.

3. Assessing Livestock Economy in Tribal Villages / Families

DURATION : 3 Hours

SESSION OBJECTIVE :

- ❑ To help the candidates understand contribution of livestock in tribal livelihood
- ❑ To help candidates understand issues related to losses from livestock

SESSION OVERVIEW :

- **Large ruminants:** In a tribal family, the percentage of income from livestock depends upon the animal's maintenance. Income from milk depends upon the marketing facilities in the location like cooperatives, milk collection centres, distance from the urban areas, market for raw milk, ghee etc. it also depends upon the fodder and water availability in the area. In the forests and forest fringes villages the activity depends upon the fodder availability, pastures, biomass and rainfall. Where there are irrigation facilities and agriculture dependence, the farmers can conserve straws and stalks and the agro by products. These products can be best utilised by procuring and conserving (like jowar, maize, rice and wheat straws, brans etc.) If the cow herds are more in number, the male calf production can be taken up economically where the tribal villages are located in the forest under zero input system.

- **Small ruminants:** A goat is known as a moving ATM. They can be reared with less care for more income. The tribals (goat rearers) should assure the forest authorities that the forest will not be degraded or destroyed due to goat rearing by lopping trees and grazing the animals, they can fetch more income because of short gestation periods and quick growth.

  As water is more essential, water bodies have to be identified in grazing areas. The animals are to be protected from seasonal diseases, predators and thefts.

  The importance of fodder procurement and its conservation has to be stressed among tribal communities for improving the incomes from livestock rearing.

Sl,No.	Source	Earning members engaged in	Annual family receipts
1	Agriculture		
2	Cattle		
3	Buffaloes		
4	Small Ruminants		
5	Poultry		
6	Other sources		
7	Total income		

- **Related Assessments (if any)**

Total No. of Learning Hours	**Theory** (2 hours)	**Practical** (NIL)
Learning Outcomes	**Knowledge Outcomes**	**Skill Outcomes**
Learning support material for reference from your learning kit	**Reading Material (In Learner's Kit)** Check list of questions for FGD Web References	
Reflective/Evaluative questions pertaining to higher order and lower order of thinking	**Knowledge/Skill pertaining questions** ○ What facilities we need to improve the milk production? ○ What are the methods to conserve fodder for cattle? ○ What steps should be taken to improve goat production system in tribal areas? **Reflective/Conceptual questions** ○ What are the best production systems in large ruminants and why? ○ What do you think sheep or goat rearing is better in tribal areas? Explain why?	

SESSION EXERCISE / CASE STUDY:

- **Group Exercises**

1. Assessing profits and losses in large ruminants (dairy and draught animals) in tribal villages.
2. Assessing profits and losses in small ruminants (sheep and goat) in tribal villages.

KEY LEARNING REFLECTIONS

1. Socio economic importance of large ruminants in tribal villages.
2. Socio economic importance of small ruminants in tribal villages.

4. Importance of Sheep and Goat rearing among Tribal Communities

DURATION : 2 Hours

SESSION OBJECTIVE :

- ❑ Understanding contribution of sheep and goat rearing in tribal livelihood

SESSION OVERVIEW :

■ The goats are first domesticated animals. Small ruminants (sheep and goat) are part of the tribal community in their livelihood. It is observed that when farmers committed suicides, due to financial losses from crop failures, the farmers having livestock especially small ruminants were not in that group. The small ruminants have saved them from their economic stringencies.

Sheep and goats are also having shorter gestation period of 150 days and produce 130-150%of lambing and kidding capacity. The Indian sheep mostly give single births and goats give 150% twin births. Specially goats produce milk which is equivalent to cow's milk is produced is fulfilling the nutritional requirements In total production of milk 4% is from goats in India. In two years period they produce lamb/kid three times. They are produced with low inputs their maintenance. In two years period a tribal family can get with 5 goats about Rs.20000-25000 as additional income to the family. At the same time he will have his goats as asset even by replacing 1 or two females in future with zero inputs or very low inputs. But the problem of predators and diseases issues will be there. For which timely protection against contagious diseases and, de worming and provision of hygienic surrounding are necessary. The difference between the sheep and goat rearing is in their habits (Sheep grazes near to the land and goat browses the tree leaves and twigs etc.

The income from the small ruminants are useful in emergency and they can sell easily and will be adding nutrition to the families.

■ **WHY GOATS ARE IMORTANT FOR TRIBALS**

1. Small size and domesticated easily.
2. Needs less space to keep.
3. Can be reared with less attention

4. Ready to breed at younger age
5. Gives multiple births
6. Requires less feed and fodder
7. Eats all types of leaves, twigs, grasses etc.
8. Shorter gestation period.
9. Adjusts to environment easily.
10. Inter kidding period is less.
11. Needs less water.
12. Meat having high demand.
13. Can be sold or purchased easily as they cost less.
14. No marketing problem.
15. Can be maintained in small numbers even with children

- **Related Assessments (if any)**

Total No. of Learning Hours	**Theory** (2 hours)	**Practical** (NIL)
Learning Outcomes	**Knowledge Outcomes**	**Skill Outcomes**
Learning support material for reference from your learning kit	**Reading Material (In Learner's Kit)** Check list of questions for FGD Web References	
Reflective/Evaluative questions pertaining to higher order and lower order of thinking	**Knowledge/Skill pertaining questions** ○ How sheep and goat rearing can be beneficial for tribal livelihood? **Reflective/Conceptual questions** ○ How beneficial is sheep rearing in your area? ○ How beneficial is goat rearing in your area?	

SESSION EXERCISE / CASE STUDY:

- **Group Exercises / Practical**

Describe how sheep and goat rearing is important for your villages

KEY LEARNING REFLECTIONS:

What will be the tribal family income from five goats in two year?

5. Important Breeds of Cattle and Buffaloes

DURATION : 3 Hours

SESSION OBJECTIVE :

- ❑ To assist in understanding different breeds and their production capacities and importance of local breeds
- ❑ To impart knowledge on support services required at each stage

SESSION OVERVIEW :

The breeds are evolved themselves depending on ecology, environment and get adapted in that environment. Indian indigenous cattle are divided in two ways:-

a. Depending on productivity
b. Depending on size

The cattle are divided as following:

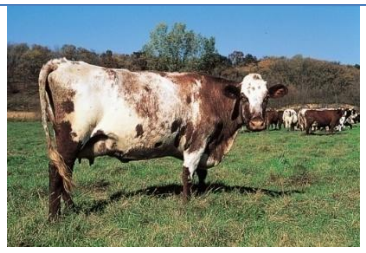
a. **Dairy cattle:** give more than 2500 litres of milk in a period of 300 days of lactation period. Example, Sahiwal Red Kandari, Gir, Red Sindhi. These breeds evolved in plain areas where fodder is abundantly available.

b. **Dual purpose cattle:** the milk yield is 1200 litres in a lactation period and the males are useful as draught animals.

c. The animals that give less than 800 litres are classified as draught animals as they are not economical to maintain for dairy purpose.

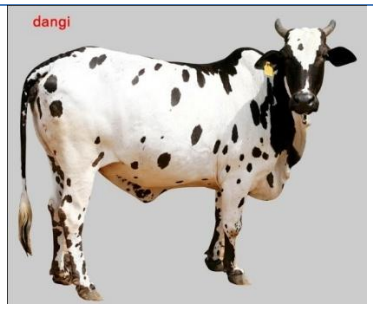
Another classification depends upon the body size. As heavy where bulls and bullocks weight more than 350 kg as heavy animals and below 350 kg and between 200 kg animals are medium sized animals and less than 200 kg animals are small sized animals which evolve in forest and hilly tracts.

- **Dairy breeds**

Breeds	Region	
Red Sindhi	Western Up, Haryana, Rajasthan, and Punjab	
Sahiwal	UP, Delhi, Bihar	
Gir	Gir Forest, Junagad, Western Rajasthan	
Jhasparua	Kutch and Rajasthan	

- **Dual purpose breeds**

Breed	Habitat	Milk Yield (litres)	
Hariana	Rohtak, Hissar	600-800	

Breed	Habitat	Milk Yield (litres)	
Nimari	Narmada and Maharashtra		
Dangi	Ahmednagar, Maharashtra		
Kankrej	Kutch	800	
Mewati	Rajasthan		
Deoni	AP, Maharashtra	600-800	
Rathi	Rajasthan		

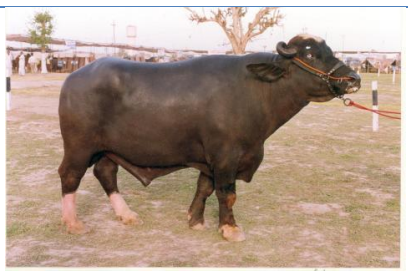
Breed	Habitat	Milk Yield (litres)	
Bachaur	Bihar		
Malvi	MP	400-500	
Hallikar	Karnataka		
Khillar	Maharashtra		
	Remove the photo		
Galao	Maharshtra	400	

Breed	Habitat	Milk Yield (litres)	
Amruth mahal	Karnataka		

All these breeds are diluted with their characteristics because of migration and now known as indigenous or non-descript animals. The breeds are developed according to the needs and availability of feeding resources, utility and ecology. Nowadays breeding policy of the government is to increase the milk production by cross breeding the indigenous cattle with exotic animals. The technology is developed the extent of usage of 'sexed semen' also.

- **Buffalo breeds**

Breeds	Habitat	Milk yield	
Surti	Khaira, Surat, Baroda districts of Gujarat	900-1800	
Murrah	Rohtak-Hissar districts of Haryana and Patiala district of Punjab	1400-2500	
Jaffrabadi	Kutch and Junagad districts of Gjarat	1000-1200	

Breeds	Habitat	Milk yield	
Mehsana	Mehsana district	1200-1500	
Bhadawari	UP	1000	
Banni	Kutch		
Toda	Tamil Nadu		
Chilka	Odisha		
Nagpuri	Maharashtra		

Breeds	Habitat	Milk yield	
Pandaripuri	Maharashtra		

The buffaloes are very hard and used for draught purpose. The buffaloes work well in paddy fields. Their efficiency decreases in hot climate because their heat discrimination power is less.

- **Related Assessments (if any)**

Total No. of Learning Hours	**Theory** (2 hours)	**Practical** (NIL)
Learning Outcomes	**Knowledge Outcomes**	**Skill Outcomes**
Learning support material for reference from your learning kit	**Reading Material (In Learner's Kit)** Check list of questions for FGD Web References	
Reflective/Evaluative questions pertaining to higher order and lower order of thinking	**Knowledge/Skill pertaining questions** o Name some cattle breeds of Gujarat, Rajasthan **Reflective/Conceptual questions** o Importance of different breeds and how are they evolved	

SESSION EXERCISE / CASE STUDY:

- **Group Exercises**

1. What are the different types of breeds in different parts of tribal India?

KEY LEARNING REFLECTIONS:

1. Identifying breeds of different areas
2. Their production abilities

6. Different Indigenous Breeds of Sheep and Goat

DURATION : 2 HOURS

SESSION OBJECTIVE :

- ❑ To know about different sheep and goat breeds in different agro-ecological zones and their uses

SESSION OVERVIEW :

- The breeds are evolved depending upon the environment. It took generations (long periods) depending upon water, temperatures, diseases and land terrain, flora and fauna.

  The breeds of sheep can be divided into woolly and non-woolly breeds. The sheep in temperate zones, and arid regions sheep and goat bear wool. In Himalayan regions the goats of Kashmir produces a fine variety of hair known as PASHMINA. The wool or hair from goat is known as MOHAIR. Most of the Indian indigenous goats sheep produce single offsprings and follow seasonality in lambing. The breeding season is autumn and end of summer. The arid region breeds of sheep produce rough wool (Carpet wool). In peninsular region, Deccan plateau the sheep and goat possess hair only called as non-woolly breeds.

  The fineness of wool depends upon the cold climate in their areas. Smaller breeds of goat produce twins and triplets. Garole, breed of sheep produce twins or triplets from Sunderban areas of West Bengal. Goats like Chathanghadi and Chegu have hair in Himalayan regions and used as pack animals in the hilly Himalayan terrain. And Kashmiri goats produce fine hair (mohair) and Pashmina .

  The goat breeds are classified into Large (Jamnapari, Beetal) medium sized breed (Sirohi, Osmanabadi, Nagpuri, Ganjam, Osmanabadi etc) and small breeds like west Bengal, surti etc.

State	Goat	Sheep
Jharkhand		Chota nagpuri
Odisha	Ganjam	Bolangir, Ganjam, Kendrapode
West Bengal	Black Bengal	Garole

State	Goat	Sheep
Gujarat	Gohilwadi, Kutchi, Mehsana, Surti, Zalwadi	Marwari
Rajasthan	Sirohi, Jakhrana, Marwari	Chokla, Jaiselmeri, Magra, Malpura, Marwari, Nali, Sonadi
Bihar		Shabadi
Telangana		Deccani
Maharashtra	Konkankanyal, Berari, Osmanabadi, Sangamneri	Deccani
Uttar Pradesh and Madhya Pradesh	Pankaja, Barari	Julani

■ Performance of Goats

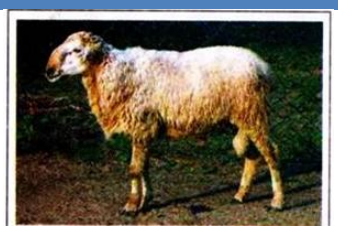
Breed	State	Avg. Weight		Remarks	
		Male	Female		
Sirohi	Rajasthan	50	22.5		
Marwari		33	25		
Beetal	Punjab &Haryana	55	34		
Jhakrana	Rajasthan	57	44	Dairy goat	
Barbari	UP	37	23		

Breed	State	Avg. Weight		Remarks	
		Male	Female		
Jamnapari	UP	44	38		
Mehsana	Gujarat	37	32		
Gohilwadi	Gujarat	38	32		
Zalwadi	Gujarat	38	32		
Kutchi	Gujarat	43	39		
Surthi	Gujarat	29	32		
Sangawani	Maharshtra	38	29		

Breed	State	Avg. Weight		Remarks	
		Male	Female		
Osmanabadi	Maharashtra	34	32		
Shabadi	Bihar	37	27		

- **Performance Of Sheep**

Breed	State	Average Weight		Wool (kg/ year)	
		Male	Female		
Chokla	Rajasthan	34	23	28	
Nali	Rajasthan	34	24	3	
Marwari	Rajasthan	30	26	<2	
Magra	Rajasthan	26	24	2	
Jaiselmeri	Rajasthan	27	29	1.5	

Breed	State	Average Weight		Wool (kg/ year)	
		Male	Female		
Malpura	Rajasthan	41	24	1	
Sonadi	Rajasthan	38	21	1	
Deccani	Telangana and Maharashtra	38	26	0.75	
Nellore	AP	36	30		
Chotanagpuri	Jharkhand	20	19		
Balangir	Odisha	23	19		

Breed	State	Average Weight		Wool (kg/ year)	
		Male	Female		
Ganjam	Odisha	24	24		

■ **Related Assessments (if any)**

Total No. of Learning Hours	**Theory** (2 hours)	**Practical** (NIL)
Learning Outcomes	**Knowledge Outcomes**	**Skill Outcomes**
Learning support material for reference from your learning kit	**Reading Material (In Learner's Kit)** Check list of questions for FGD Web References	
Reflective/Evaluative questions pertaining to higher order and lower order of thinking	**Knowledge/Skill pertaining questions** o Name some breeds of sheep and goat Gujarat, Rajasthan **Reflective/Conceptual questions** o Importance of different breeds and how are they evolved	

SESSION EXERCISE / CASE STUDY:

■ **Group Exercises / Practical**

1. What are the different types of breeds in different parts of tribal India?

KEY LEARNING REFLECTIONS:

1. Identification of breeds in different areas
2. Their production abilities

7. Healthcare Management in Large Ruminants and Small Ruminants Systems

DURATION : 3 HOURS

SESSION OBJECTIVE :

- ❑ To explain the trainees the need for establishing a health care system with the stake holders involved in the village.
- ❑ Steps in establishing a CIG for Animal health care system in village for preventive and first aid services

SESSION OVERVIEW :

A committee should be formed with the livestock owners, with local body member (gram panchayat) and SHG member and local vety person. The diseases occur mostly seasonally depending on the climate. During rainy season the bacterial and viral diseases occur. A focussed group meeting can be conducted with farmers, AH officials and prepare a calendar of diseases for the area. Program needs to be taken for preventive measures. Selection of a para worker who stays in the village has to be done and should be trained in first aid activities, and vaccination work. He/ she should be able to reach the vety institution and transmit the knowledge and vaccines etc to the farmers. The service charges are to be paid to him/her. The committee will meet at least once in a month discuss about the diseases and fodder availability and any other issues regarding the livestock.

■ STEPS

- o Explain the population and its mortality of large and small ruminants and economical losses to the individuals and IN GROUP MEETINGS village completely on paper
- o Importance of organising focus discussion groups in villages with all stake holders
- o Involvement off Gram Panchayats, SHG members and different rearer group members and aged persons of the village and discussions to be initiated by explaining the losses.
- o Involve nearest Animal Husbandry staff also in the meeting
- o Then explain need of timely preventive measures and importance of first aid.
- o Then service charges and forming a non informal group to coordinate
- o After the stock holders meeting form a Common Interest Group of Livestock heath group of village

- The members should be livestock owners of different species, Local Gram panchayat representative, nearest animal Husbandry person, Representative from village women's organisation (SHG Member).
- Selection one or two persons as Para vets/Animal Health worker (whatever name it may be given) for training in first aid, vaccinations etc, who is interested to serve as service provider. He should stay in the village in gramsabhas
- Explain the role of service provider
- Then fixing the service charges for vaccinations and other services commonly occurs in animals
- Select /elect two persons to maintain accounts and conducting meetings etc.
- The service provider will act as bridge between the Govt. AH department and farmers
- Establish the payment system to service providers

Related assessment (If any),

Total no.of learning hours	**Theory (1)**	**Practical (2)**
Learning out comes	Knowledge out comes The trainees knows the situation of animal health services available in the different areas	Skill out comes The trainees will know establish the community based animal health care systems
Learning support materials for reference from your kits	Check lists of questions for FGD web references	
Reflective / Evaluative questions pertaining to higher order and lower order thinking	Knowledge and skill questions: How can we reduce the mortality and increase production? Who should be in the FGD? In formation of a CIG for animal health What are the responsibilities of CIG, Service provider, Local veterinary doctor On what basis the service charges to be fixed	

8. Understanding Important Diseases of large ruminants

DURATION : 6 HOURS (Theory – 2 Hours & Practical – 4 Hours)

SESSION OBJECTIVE :

- ❑ To help the candidates understand common diseases in villages and healthcare and animals issues in large ruminants in tribal areas

SESSION OVERVIEW :

- A committee should be formed with the livestock owners, (Informal group) with local body member (gram panchayat) and SHG member and local vety person. The diseases occur mostly seasonally depending on the climate. During rainy season the bacterial and viral diseases occur. A focussed group meeting can be conducted with farmers, AH officials and prepare a calendar of diseases for the area. Program needs to be taken for preventive measures. Selection of a para worker who stays in the village has to be done and should be trained in first aid activities, and vaccination work. He/ she should be able to reach the vety institution and transmit the knowledge and vaccines etc to the farmers. The service charges are to be paid to him/her. The committee will meet at least once in a month discuss about the diseases and fodder availability and any other issues regarding the livestock.

- **Cross check whether the participants are able to understand the symptoms and diseases properly**

(a) Identification of Sick Animal from Healthy Animal

Sl. No.	Signs/Symptoms	Healthy Animal	Sick Animal	Remarks
1	Activity	Active/ strong looking	Dull/Hide bound condition	
2.	Feed intake	Good &Ruminates	Improper/Off feed and does not ruminate	
3.	Water Intake	Good	Intake is affected	

Sl. No.	Signs/Symptoms	Healthy Animal	Sick Animal	Remarks
4.	Urination	Good, Yellow color	Frequent urination, dark/brown/red color	
5.	Faces	Semisolid and green color	Solid/watery	
6	Ears and Tail	Moving tail, ears respond to the sounds turns the ears and to the owner's call	No movements of tail and dropped ears	
7.	Head	Keeps up even when sits also	Dropped	
8.	Muzzle	Wet with sweat	Dry	
9.	Eyes	Bright, keep moving and observing surroundings	Weak, lachrymator, congested/pale	
10	Skin	Soft and shining	Roughened hair and skin looks blackish	

The diseases can be classified as contagious or infectious diseases and noncontagious diseases. The diseases which are transmissible from one animal to other animal is known as contagious diseases. The causal organism can be virus, bacteria or protozoa and fungi etc.

- **Bacterial Diseases:** Anthrax Haemorrhagic septicaemia, Black quarter
- **Viral Diseases:** Foot and Mouth Disease, Pox
- **Protozoal diseases:** Trypanosomiasis (Surra), Babesiosis.

The non-contagious diseases are caused by SUDDEN change in feeding, sudden change in environment, injuries, water and feed contamination by fungus or bacteria and nutritional deficiencies and internal and external parasites.

Dry Flooring and Green Grass will prevent many diseases.

Main contagious disease in cattle and their symptoms and control measures:

■ ANTHRAX

Name of disease : Anthrax
Type of Animal affected : Sheep, Goat – Cattle
Period (month) : July – After monsoon

Sl.No	Type of measures	Brief description of the measures
1.	Symptoms	Sudden death Blood oozes from nose & anus High Temperature - 104^0 C Swollen neck In dead animals blood do not clot Blood diarrhea High fever
2.	Management practices	Do not open carcass Burry the carcass with feed & fodder in 2 meters depth with lime Separate the flock for two weeks from other flocks Keep clean the sheds
3.	Prevention medicines	Vaccinate the animals for three continuously in the affected areas Do not use milk for (72) hours after vaccination
4.	Ethno veterinary practices	
5.	Curative Treatment	Antibiotics in consultation with veterinarian

This disease will affect sheep and goat also. After rains and floods this disease occurs in rainy season. It is a zoonotic disease which is dangerous.

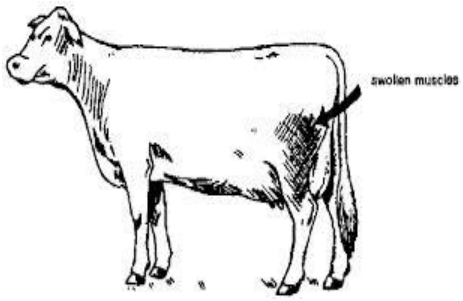
- **Hemorrhagic Septicemia**

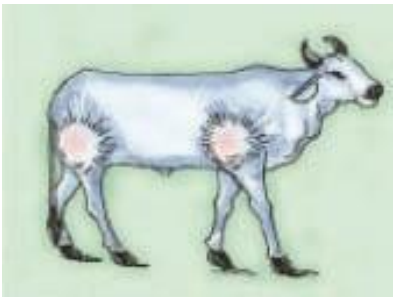
Name of disease : Hemorrhagic septicemia
Type of Animal affected : Buffalos and white cattle
Period (month) :

Sl.No	Type of measures	Brief description of the measures
1.	Symptoms	High fever Appetite loss Respiratory distress Edema of neck

Sl.No	Type of measures	Brief description of the measures
2.	Management practices	In endemic areas vaccinate the animals before rainy season begins Immunity develops in 7-10 days Separate the sick animals Burry the fodder used by sick animals
3.	Prevention medicines	Vaccination before monsoon in endemic areas Booster dose is must Immunity for 6-12 months
4.	Ethno veterinary practices	Do not try to drench medicines Give the medicines in Jaggery as electuary
5.	Curative Treatment	Antibiotic injections like tetracycline and Sulpha drugs

■ **Black Quarter**





Name of disease : Black Quarter
Type of Animal affected : White cattle-Healthy Heifers
Period (month) : Jun – Aug

Sl.No	Type of measures	Brief description of the measures
1.	Symptoms	• Temperature 108^0 F • Loss of appetite • Loss of ruminates • Thighs, shoulders muscles effected (oedema) • Limps (Holds up the effected leg) • Crippling sound of swollen parts.
2.	Management practices	• Separate the effected animals • Dead animals (Carcass)is to be buried or burnt • Do not allow the healthy animals to graze where the affected animals graze.
3.	Prevention medicines	• Vaccinate the animals before rainy season
4.	Ethno veterinary practices	
5.	Curative Treatment	• Penicillin or Tetracycline in the early stages help.

■ Foot and Mouth Disease

Name of disease : Foot and Mouth Disease (FMD)
Type of Animal affected : Large and Small Ruminants
Period (month) : Winter

Sl.No	Type of measures	Brief description of the measures
1.	Symptoms	• Raise in body temperature between 104-105 F • Profuse salivation • Wounds in mouth, on tongue and in between hooves • Lowered milk yeild in milking animals • Effected Bullocks unable to work in hot climate • lock limping seen(Crawls) • Mortality in young flock is more • Abortions occur • Heavy economical loss to dairy industry
2.	Management practices	• Quarantine • Systematic Vaccination • Disinfection of sheds with lime and pesticides
3.	Prevention medicines	• Only symptomatic treatment • Clean mouth lesions with 1% Pot.Permanganate sol and apply Boroglycerine • Clean foot lesions and apply fly repellamts/ Ointments (Neem oil, Nemlent, Himax, Lorexane etc) • Use antibiotics, livertonics glucose infusions under the guidance of Veterinarian • Supportive treatment and nursing is to be provided for quick recovery
4.	Ethno veterinary practices	• Foot baths with copper sulphate or phenol is to be used and nourishing with gruel etc. **TREATMENT:** • **Ingredients required:** *Haldi* (Turmeric) 200 gm (freshly harvested rhizome is preferred), coconut kernel extract (from 1 coconut), gheekumari

Sl.No	Type of measures	Brief description of the measures
		(Aloe vera) – 200 gm, palm jaggery 200 gm, common salt 100 gm, garlic 100 gm, pepper 50 gm, cumin 50 gm, fenugreek 50 gm. • The above ingredients viz. turmeric, gheekumari (Aloe vera), garlic, grated coconut are ground well through grinder/ mixi by using sufficient water and collected in a vessel. Then make powder of pepper, cumin, fenugreek and all ingredients are mixed together thoroughly and add sufficient water to make it about 1 liter. Then filter it and administered orally. **DOSE:** • 100 ml at a time for adult animals or 50 ml for young ones or sheep or goats. Before giving the treatment the animals are to be fed with banana (2 number) soaked in sesame oil (Til ka tel) 50 ml. **FOR TREATMENT OF WOUNDS IN THE FOOT REGION:** <u>A special wound healing thaila can be prepared by using following ingredients:</u> • Sesame oil (Til ka tel) 1 lit, haldi (freshly harvested preferred or turmeric powder 50gm) 100gm, garlic - 50gm; neem leaves 10 gm, leaves of mehanthi (Lawsonia inermis) 10 gm, kuppi (Acalypa indica)10 gm. Ground the herbal items and mix with the oil and boil the oil well and filtered. The oil can be stored in a bottle. This thaila can be applied over the affected foot region of animals for 3 days continuously or till the point of cure. OR • Coconut oil 500 ml. and Datura leaf extract 500ml are taken together and boiled in a vessel till about one hour so as to get oily texture. Then put off the fire and add tuutiya (copper sulphate) 5 gm and stir it well. Now this thaila is stored in a bottle and used for all types of wounds including maggot wounds in animals.

Non contagious diseases caused by sudden change in environment, feedings, injuries, non hygienic Conditions on the surroundings.

The common diseases are bloat or tympany, plant poisoning, diarrhoeas, pneumonia, fever, horn injuries and plough injuries, etc. which are to be treated as per symptoms under the guidance of a veterinarian.

Abortions in cattle may be due to trauma or infections like brucellosis. These diseases can be prevented by using the known source of bull free from this Brucella disease

- **Ethno veterinary practices**:

  - **Herbal masala bolus for all Digestive Problems:** This preparation is good for all digestive problems viz. anorexia, indigestion, off feed, absence of rumination, impaction etc.

  - **Ingredients needed for 5 dairy animals / 10 sheep or goats are given below**:

    - ✓ kalimirch (Black pepper) 10 gm,
    - ✓ jeera (cumin) 10gm,
    - ✓ dhaniya (coriander seeds) 20 gm,
    - ✓ fenugreek (methi) 20 gm,
    - ✓ ajwain (Trachyspermum ammi) 10 gm,
    - ✓ adrak (ginger) 50 gm,
    - ✓ Haldi (turmeric) 50 gm (fresh),
    - ✓ gheekumari (Aloe vera) 100 gm,
    - ✓ galo / batindu (Tinospora cordifolia) stem and leaves 100 gm,
    - ✓ Lahsun (garlic) 50 gm,
    - ✓ lallmirch (red pepper /chillies) 50 gm,
    - ✓ Paan (betel leaves) 10 number,
    - ✓ Kari patta (curry leaf) 100 gm,
    - ✓ Tulsi leaves 50 gm,
    - ✓ tarwar leaves and flowers (Cassia auriculata) 100gm,
    - ✓ Nariyal (coconut)100 gm,
    - ✓ gud(jaggery) 100gm,
    - ✓ rock salt 50 gm,
    - ✓ khaneka soda (sodium bicarbonate) 100 gm.
    - ✓ First grind all dry items in a mixi viz. black pepper, jeera, coriander seeds, fenugreek, ajwain, red chillies).
    - ✓ Then grind all the fresh herbs viz. Aloe vera, curry leaf, garlic, tulsi, ginger, turmeric, coconut (grated), galo and tarwar.
    - ✓ After that mix together both the above items. Now add jaggery (after making into small pieces), and rock salt, (sodium bicarbonate) and mix it thoroughly.

- **Dosage:** At the end make a bolus of 100 gm each (lemon fruit size) and administer orally. For young animals (calf, sheep or goat) give half the quantity or reduce the quantity

according to the body weight of animals. It can be given monthly once preferably in empty stomach. For problematic cases continue the treatment for 2-3 days.

- **Herbal masala bolus will also give some relief for**

  - ✓ Repeat breeding/reproductive problems,
  - ✓ Internal parasites,
  - ✓ Preventive medicine for
  - ✓ Foot and Mouth Disease, Blue Tongue, fever, Mastitis, Hemorrhagic septicemia.

- **Tympany:**

  - ✓ **Symptoms :** Stomach bulged and difficulties in breathing
  - ✓ **Causes :** sudden change in feed materials, excess intake of legumes, dining waste
  - ✓ **Treatment:**
    1. Administer 200 ml each of castor oil (Ricinus communis) and lukewarm water are shaken well and administered orally at an interval of 4-6 hrs for large animals.
    2. Betel leaves(paan) 10 number, ginger (Adrak) 20 gm, pepper (kalimirch) 10 gm,
    3. Garlic(Lahsun) 10 gm, rock salt 50 gm are pounded and mixed in lukewarm water and administer orally at 6 hours interval for large animals.

Reduce the quantity to small animals according to the body weight of animals

- **Diarrhoea:**

  - **Symptoms :** Watery dung
  - **Causes:** Indigestion, intake of spoiled feed or eating toxic plants
  - **Treatment:** Grind one handful each of tender leaves of pomegranate(Anaar), tender leaves of neem, tender leaves of guava along with dried ginger 50 gm, jaggery 100 gm and make 3 bolus and administer one bolus at a time for 3 times until diarrhoea gets cured.

- **Constipation:**

  - **Symptoms :** Lack of defecation or hard pelleted dung
  - **Causes :** Fever, heat stress and dehydration
  - **Treatment:**
    1. Enema can be given (boil 10 litres of water after adding 100 gm neem leaves and cooled and administer through rectum of large animals). Avoid early stage pregnant animals.

2. Laxatives like castor oil, raw lin seed oil (500ml) can be given for 1-2 days according to species and body weight of animal. Given as drench for 2- 3 days or as required.
3. A decoction of 100 gm of *haldi* (turmeric rhizome) in a litre of water may be given once daily for 1-3 days to large animals.

- **Endo parasites (Intestinal worms)**

  - **Symptoms:** Animals emaciated, thick body hairs, foul smelling stools with worms
  - **Causes:** Round worms, tape worms, hook worms infestation
  - **Treatment:**
  - **Ingredients:**
    - ✓ Leaves of *nirgundi* (Vitex negundo),
    - ✓ Leaf petals of *khorpad* (Aloe vera),
    - ✓ Neem seeds,
    - ✓ Leaves *of sangkupi* (Clerodendrum inerme),
    - ✓ Leaves of *akamadar* (Calotrophis gigantea)
    - ✓ They are to be taken at 1 kg each. All are to be ground well by sprinkling little water and filtered and 4 litres of herbal mixture can be obtained. Then 30 ml of the extract is taken and administered for one adult sheep or goat. For younger sheep or goat less than 3 months old 10 ml has to be administered orally. For adult cattle 100 ml has to be administered. This can be stored for more than one month.
    - ✓ The dewomer arrest loose motion and result in solid dung and it is free from obnoxious odor. It increases grazing efficiency of animals and they look healthy.

- **Ecto parasites (Lice, ticks, mites)**

  - **Symptoms:** Presence of parasites visible all over the body, animal emaciated, dull and death in severe cases.
  - **Treatment:**
    1. Lahsun (Garlic), Tulsi, neem leaves, haldi(turmeric), seethapal seeds each 10-20 gm are ground together and boiled in 250 ml of neem oil and applied over the surface of the body of large animal.
    2. Whole plant of Raimuniya (Lantana camara) is chopped and crushed and diluted with the urine of cattle for 3 days and apply externally.
    3. Boil tobacco leaves and stalk 250 gm in 2 lit. of water and add 5 lit. of water and sprayed over the body of 10-20 animals.

- **Respiratory tract Infections:**

  - **Symptoms:** Heavy snoring, difficulty in breathing
  - **Treatment:**

1. Take leaves of *Thulsi* (Ocimum sanctum) 100 gm, leaves of *arusha* (Adhatoda vasica 100 gm, ginger 50 gm, pepper 10 gm, jaggery 100 gm and boil in 1 lit. of water and administer 100 – 250 ml of the decoction 2-3 times daily.
2. Few fruits (6-8 number) of *kantakari / kateli* (Solanum surattense) are crushed and soaked in goat urine overnight and filtered and few drops are squeezed in to the nostrils.

- **Mastitis in Dairy animals:**

  - **Symptoms:** swollen, hot udder; milk discoloured with pus and thread like substances. Saltish taste of milk in early stages (subclinical stage)
  - **Causes:** Microbes
  - **Treatment:**
  - **Ingredients required:**
    1. *Gheekumari* (Aloe vera) - 2 or 3 petals
    2. *Haldi* (Turmeric) powder- 50gm
    3. *Chunna* (Lime stone)- 10 gm

All the above ingredients are ground well and made in to a paste apply over the udder thrice a day for 3-7 days depending upon the disease incidence. Before applying, the udder and teats should be washed with boiled water for 3 times for 5 days. Administer orally 50 gm of khaneka soda (sodium bicarbonate) in the juice of lemon (4 fruits) dissolved in 200 ml of water.

- **Infertility:** For animals suffering repeat breeding, infertility or suboestrus or not coming to heat the following method has to be followed.

  - ✓ Administer orally Gheekumari (Aloe vera) 1-2 petals for 3 days in the empty stomach
  - ✓ Administer orally sprouted *chana dal* (bengal gram) or sprouted bajra or sprouted wheat 200 gm daily for 15 days. When signs of oestrus cycle is noticed
  - ✓ Administer orally neem oil 100-150ml before taking the animal for insemination or natural crossing (insemination shall be within 24 hours of noticing the symptom).
  - ✓ After insemination feed the animals with curry leaves about 2 handfull daily for a week.

- **Retention of Placenta:**

  - **Symptoms:** Non – shedding of placenta beyond 3-5 hours post-partum
  - **Treatment:**
    1. The leaves of two sesame plants (Sesamum indicum) about 250 gm are pounded with 1000 ml of water and drenched; placenta would be shed in 1to 2 hours. (or)
    2. Seeds of sesame 100 gm and jaggery 100 gm are taken and pound together and made into bolus and administered orally. (or)

3. Take *Bada goksur* (Peadlium murex) plant about 200 gm, pound and soaked in 1000 ml of water and stir well and drenched.
4. Administering Aloe vera also increases the body weight of animals as it acts as dewormer against intestinal parasites. This can also be administered as preventive treatment on monthly interval especially during rainy season.

■ **Related Assessments (if any)**

Total No. of Learning Hours	**Theory** (2 hours)	**Practical** (NIL)
Learning Outcomes	**Knowledge Outcomes**	**Skill Outcomes**
Learning support material for reference from your learning kit	**Reading Material (In Learner's Kit)** Check list of questions for FGD Web References	
Reflective/Evaluative questions pertaining to higher order and lower order of thinking	**Knowledge/Skill pertaining questions** o Name two contagious diseases in cattle caused by bacteria? o Are there any veterinary hospitals near or in your village? Please name the staff name and location of the hospital o What are the different ailments you see in calves. What do you give for constipation in calf, if doctor is not available. **Reflective/Conceptual questions** o What are different healthcare practices for large ruminants practiced in your area?	

SESSION EXERCISE / CASE STUDY:

■ **Group Exercises / Practical**

1. List out of different types of local diseases, cattle suffer from in your area
2. Activities calendar preparation

KEY LEARNING REFLECTIONS:

1. Suggest preventive methods for diseases of large ruminants in different tribal villages.

9. Common Diseases of Small Ruminants

DURATION : 6 HOURS (Theory – 2 Hours & Practical – 4 Hours)

SESSION OBJECTIVE :

- ❑ To understand the important diseases of sheep and goat

SESSION OVERVIEW :

- ■ **Exercise**: To identify the sick animal in a flock is very difficult especially in she, as it puts neck down even in healthy condition and eats grass. Even when it sick also it hangs its head and we can think that it is grazing. Hence keen observation of sheep flock is a must. Experienced shepherd only can identify sick sheep easily.

- ■ **Spotting of sick animals**

Sl. no.	Parameter	Healthy animal		Sick animal
		Sheep	Goat	
1.	Look of animal	Alert		Dull
2.	Head	Raised		Bent downwards
3.	Eyes	Wide open, bright		Dull with white deposition at the corners
4.	Conjunctival mm	Normal		Pale or congested
5.	Nose	No discharge		Slimy discharge
6.	Movement	Active		Sluggish, lameness
7.	Response	Quick		Slow
8.	Faeces	Normal		Hard / loose, mucus/blood-stained, discolouration, dysentry
9.	Pulse (/min)	70-90	70-90	Increased
10.	Body temperature (°F)	102.4	103.8	Increased
11.	Respiration (/min)	12-30	12-30	Increased, difficult
12.	Grazing	Normal		Abnormal
13.	Rumination	Regular		Irregular
14.	Feed and water intake	Normal		Reduced
15.	Udder	Normal		May be swollen
16.	Skin	Healthy		Infected, external parasites

The disease of small ruminant can be classified as Contagious diseases and Non=Contagious diseases. Contagious diseases are transmissible from one animal to other through air, water,

contact, food, fodder transmissible through vectors like flies, mosquitoes, contact, humans etc. Exp: Haemorrhagic septicaemia, anthrax, Enterotoxaemia, Sheep and goat pox, PPR, Non-Contagious Diseases: are caused by food poisoning, change in in feed, sudden environmental changes, contamination of water and food and trauma etc. Exp: Trauma, injuries, Cyanide poisoning, cold, drenching in rains, abortions, digestive disorders, parasitic infections

- **Important Diseases:** Morbidity and mortality are the two important factors resulting in heavy losses in sheep production and improvement programmes. Prevention is always better than cure as it is lot cheaper. This has special significance with sheep as they seem to respond less to treatment when sick than other livestock species. Diseases in sheep can be broadly classified as non-infectious and infectious.

  a) Non-infectious diseases: Approximately 80% of deaths in lambs have been estimated due to non-infectious causes. Starvation, primarily from mis-mothering and behaviour, nutritional and environmental stress, reproductive problems and predation are the major causes reported.

  (1) Pneumonia: It is one of the most common and important pathological conditions in sheep. It is characterized clinically by increased respiration, coughing and abdominal breathing. A toll of 20-40% of the mortality has been reported at organized sheep farms due to pneumonia of bacterial or viral origin. Another type of pneumonia is "aspiration" or "drenching" pneumonia caused to wrong and forceful drenching operations. If some fluid has erroneously entered the animal's respiratory tract, its head should be lowered immediately and slapped a few times.

  (2) Ruminal tympany (Bloat): It is the over-distension of the left flank either due to free gas or froth. This is generally encountered in "greedy feeders" when lush green pasture is available. Tying a bitter (eg. neem) stick in the mouth as a bit to increase secretion of saliva is the most practical and can be done immediately. Oral administration of sweet oil with turpentine oil or at times with formalin is advised.

  (3) Poisoning:

  1. **Organopchlorine compounds:** This group includes DDT, BHC, lindane, aldrin, dieldrin, chlordane, toxaphane, methocychlor etc. which are used as pesticides on crops and as ecto and endo parasiticides on sheep. Toxicity symptoms include increased excitability and irritability followed by muscle tremors, weakness, paralysis etc. Treatment consists of administering antidote, usually short-acting barbiturates.

  2. **Organophosporous compounds:** This group consists of malathion, darathion, chlorathion, carbophenothion, demton, dasnon, dimethylparathion, trichlorphon, dioxalthion etc. Symptoms of toxicity are profuse salivation, muscle stiffness,

dyspnoea with open mouth breathing, tremors. Treatment consists of administering antidote, usually atropine sulphate.

3. **Snake bite:** Sheep are usually bitten on the scrotum or udder. The presence of hair may obscure the typical fang marks. Prolonged pain, muscular weakness, impaired vision, nausea and paralysis are generally exhibited along with symptoms of shock. If anti-venom is not available and the bite is located in an area where a tourniquet cannot be applied, excision of an area of skin and sub-cutaneous tissue can be life-saving.

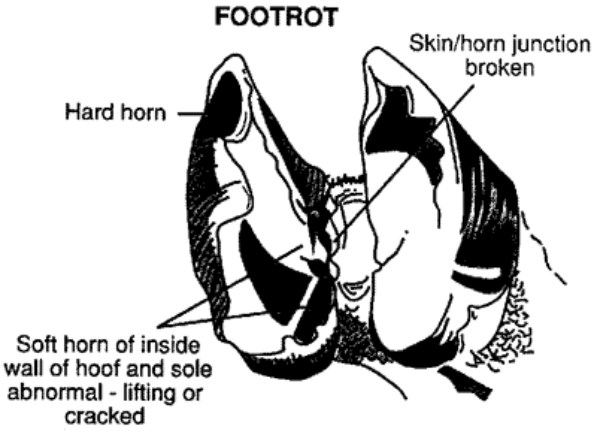
4. **Wounds:** During the monsoon season, a large number of animals suffer from wounds at various sites esp. around the ear, sternum and fore- and hind-legs. The main reason seems to be the awns of *Aristidia* and *Heteropogon* species of grasses, which initially break the continuity of the skin, which is then attacked by flies making the wound infected and maggoty. It causes great stress in young lambs, and may also lead to conjunctivitis, corneal opacity and blindness

■ CONTGEOUS DISEASES

1. **Enterotoxaemia (pulpy kidney):** It is an acute disease of sheep of all ages, but primarily of lambs. It affects animals in a high state of nutrition on a lush feed, grass or grain. Morbidity rates seldom exceed 10% but mortality rate approximates 100%. It is caused by *Clostridium perfringens* type D which normally inhabits the alimentary tract of sheep. Under certain conditions, the organism proliferated rapidly in the intestines and produces lethal quantity of toxin. In lambs, the course of illness is very short, often less than 2 hours and never more than 12 hours, and many are found dead without manifesting early signs. Symptoms include green, pasty diarrhoea, staggering, recumbence, opisthotonus, and acute, clonic convulsions with frothing at the mouth. A history of sudden death of several big lambs justifies a tentative diagnosis of enterotoxaemia. Suphadimidine may be effective for treatment. Two major control measures include reduction in the feed intake and vaccination. Infection with *Cl. Perfringens* type B (lamb dysentery) and type C (struck, hemorrhagic enterotoxaemia) result in severe enteritis with diarrhoea and dysentery in lambs. Occurs usually after the first rains. But during the months of January and February when water receeds in tanks, when green grass grows

Sl.No	Type of measures	Brief description of the measures
1.	Symptoms	• Sudden death in flocks within minutes without showing any symptoms • Weak and diarrhea
2.	Management practices	•
3.	Prevention medicines	• Vaccination before monsoon • Do not allow continuous grazing in the wilted green pastures
4.	Ethno veterinary practices	• Use antibiotics under the guidance of a Veterinarian
5.	Curative Treatment	•

A) Foot Rot : **Local Name:**



Name of disease : Foot Rot
Type of Animal affected :
Period (month) :

Sl.No	Type of measures	Brief description of the measures
1.	Symptoms	• Redness in between hooves • Walks on three legs • Edema and pus • Bad odor wound formation • In severe cases sloughing of hooves may occur
2.	Management practices	•
3.	Prevention medicines	• No vaccine available • Keep the animals in dry grazing lands and dry floor in nights • Take the animals for grazing in dry tracks
4.	Curative Treatment	• With antibiotics and use foot baths
5.	Ethno veterinary practices	• Neem oil and turmeric powder

2. **Tetanus:** It is an acute, infectious disease manifested by tonic convulsions of the voluntary muscles. In sheep, it commonly follows routine operations such as shearing, docking, castration and even vaccination. *Clostridium tetani* form spores which are capable of

persisting in soil for a number of years. The portal of entry is usually through deep, puncture wounds. Symptoms include stiffness of limbs, lock jaw, opisthotonus, followed by death due to asphyxiation. Tetanus antitoxin is usually administered but is of little value when the signs have appeared.

3. **Pasteurellosis:** *Pasteurella haemolytica* in sheep and usually occurs in pneumonic form, although a septicaemia form is not uncommon in lambs. Morbidity and mortality rates may be as high as 40%. Transmission occurs by the inhalation or ingestion of the infected material. Symptoms include pyrexia, muco-purulent discharge from the eyes and nose, coughing, depression and anorexia. Preventive vaccination is recommended, after which the animals should not be sent out for grazing for 2-3 days.

4. **Sheep pox:** It is a highly contagious viral disease characterized by development of vesicles and pustules on the skin and internal lesions. Spread may be by contact with infected animals and contaminated articles, or by inhalation. It often causes death in 50% of affected animals. Infection of the pustules by secondary organisms may cause pyrexia and other complications. The course of the disease is 3-4 weeks, during which time the sheep becomes emaciated and may shed their wool. Vaccination is the best control.

5. **Foot and mouth disease:** It is an extremely contagious, acute viral disease characterized by development of vesicles in the oral cavity and in the interdigital space. Mortality is usually low (3%), but the economic loss is chiefly due to the loss in condition of the affected animal. Transmission is by contact with the diseased animal and incubation period is less than 24 hrs. Antibiotics are recommended to check secondary infections. Vaccination is the best control.

6. **Contagious ecthyma:** It is a viral disease characterized by the formation of papules and pustules and the piling up of thick crusts on the lesions. The virus gains entry through unobserved wounds on the lips. The incubation period is dependant on the amount of virus introduced. The lesions are mostly found on the commissures of the lips and are covered by scabs. The course of the disease is 1-4 weeks. Antibiotics are recommended to check secondary infections.

7. **Blue tongue:** It is an infectious but non-contagious, exotic disease of sheep. Natural transmission takes place through insect vectors viz. *Culicoides* and *Aedes* species, and sheepked *Melophagus ovinus*. Incubation period is less than a week. Pyrexia up to 106°F is the common initial symptom.. The disease has three clinical forms: abortive, acute and sub-acute. The abortive form mostly goes unnoticed. In the acute form, there is fever lasting for 5-6 days with nasal discharge, frothing, marked salivation, highly congested and cyanotic nasal and oral mucosa, epithelial excoriation in the oral cavity and purplish discolouration of

the interdigital space, pasterns and coronets. Symptoms are less severe in the sub-acute from. Morbidity rate may be 50% or more whereas mortality rates very widely. Antibiotics are recommended to check secondary infections.

8. Peste des petites Ruminants

Sl.No	Type of measures	Brief description
1.	Symptoms	• High temperature • Waters & black diarrhea • Cough • Dyspnoea • Pregnant animals may abort.
2.	Management practices	• Vaccination in January in every two years. • Sheds should be disinfected with phenyl of 5% formalin.
3.	Prevention medicines	• PPR vaccination in January
4.	Ethno veterinary practices	•
5.	Curative Treatment	• Symptomatic treatment with antibiotics like, Tetracycline, Gentamycine, paracetamol for fever, for Diclofenac for cough & with available drugs like caflon, neblon

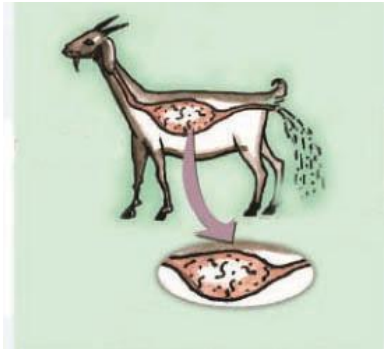
■ ANTHRAX

○ 

Name of disease : Anthrax
Type of Animal affected : Sheep, Goat – Cattle
Period (month) : July – After monsoon

Sl.No	Type of measures	Brief description of the measures
1.	Symptoms	Sudden death Blood oozes from nose & anus High Temperature - 104^0 C Swollen neck In dead animals blood do not clot Blood diarrhea High fever
2.	Management practices	Do not open carcass Burry the carcass with feed & fodder in 2 meters depth with lime Separate the flock for two weeks from other flocks Keep clean the sheds
3.	Prevention medicines	Vaccinate the animals for three continuously in the effected areas Do not use milk for (72) hours after vaccination
4.	Ethno veterinary practices	
5.	Curative Treatment	Antibiotics in consultation with veterinarian

B) Worm Infection **Local Name:**

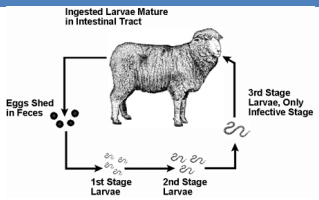
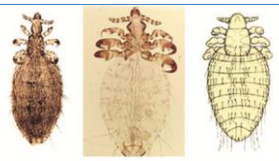


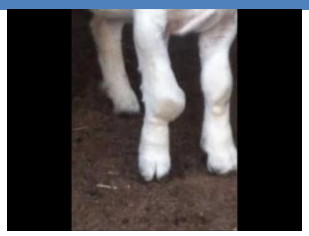
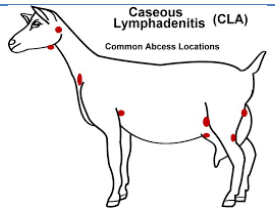
Name of disease : Worm infection
Type of Animal affected : Sheep & Goats
Period (month) : All seasons

Sl.No	Type of measures	Brief description of the measures
1.	Symptoms	• Diarrhoea • Oedema of Jaw • Pale mucous membranes • Anaemia • Weakness • Debility
2.	Management practices	• Examine the sheep when ever needed after faecal examination • First time after (21) days of rains, then after a month & then after two months lastly when water recedes in tank beds and grass comes • Practice rotational grazing
3.	Prevention medicines	• De worm the sheep when ever needed after faecal examination
4.	Ethno veterinary practices	
5.	Curative Treatment	• Proper drugs after faecal examination should be used.

■ Commonly Occurring Diseases in Goats

Sl. No.	Disease	Age	Reasons	Precautions to be taken	Remarks
1.	Diarrhea	0-3 Months	Udder contamination Soil licking Water contamination	Cleanliness of udder Provision of clean water Provision of salt licks Dry flooring	
2.	Pneumonia	0-3 Months	Unhygienic sheds Congestion of animals	Dry, well ventilated sheds	
3.	Orf	0-3 months	Contaminated udders of mothers	Cleaning the udder before allowing the kids to drink milk Clean the mouth of kid with PP lotion and apply Boro glycerine or turmeric in oil. Oral antibiotics like neoxy/Tetracy cline powders.	
4.	Enterotoxaemia	➢ 3 months	Change in eating habits and over eating, infectious disease	Vaccination at 3rd month	
5.	Contagious Ecthyma	Any age	Unhygienic conditions	Apply sulphur ointment and maintain clean sheds	

Sl. No.	Disease	Age	Reasons	Precautions to be taken	Remarks
6.	Diarrhea	Adults	Internal parasites Water and feed contamination Poisonous plants eating	Timely De worming with suitable agents Provide clean water And feed Always observe the grazing area for poisonous plants.	
7.	Foot rot	All ages	Always walking in marshy areas and wet flooring of the sheds Infection with bacteria	Avoid moving of goats in marshy areas as far as possible.	
8.	Goat Pox	All ages	Viral infection More dangerous to kids	Use antibiotics like penicillin and dress with neem oil	
9.	PPR	All ages	Occurs mostly in summer months and more dangerous to kids	Vaccinations during January/February	
10.	External parasites	All ages	Shed infection with cracked walls	Disinfect with pesticides such as Butox or tick-tak etc. Spry the above medicines on the body of animals with sprayer in low/prescribed dilutions	

Sl. No.	Disease	Age	Reasons	Precautions to be taken	Remarks
11.	CAE	Kids below 3 months	Viral infection	Antibiotic treatment and caricide tabs.	
12.	Lymph adenitis	Adult goats	Bacterial infection	Antibiotic treatment under the supervision of veterinarian.	
13	Blue toungue		During rainy season, sheep farmers face economic loss due to sudden death of sheep by a new disease called as blue tongue disease. **Symptoms:** ulcer in the mouth, oozing of fuzz like substance from the mouth and limping while walking and sometimes in the lying position. If the animal is lifted the hairs in the body will fall off. Animals will not take feed but drink little water. In the severity of the disease the animal will die on 15th day or	**Sheep and Goats: Treatment:** Since the animal is not taking any feed the starvation may lead to death. So the animal has to administered orally the following recipe. Banana fruits smeared with sesame oil and fed to animals for 2 to 3 times. Half a litre of oil with 20 bananas are sufficient to treat 20 sheep. By this animal will recover little. However this will not control the disease fully. Next the leaf pulp of Aloe vera (100 gm)	  

Sl. No.	Disease	Age	Reasons	Precautions to be taken	Remarks
			so. This disease is caused by a virus and mosquitoes or insects act as vectors. s	has to be administered daily. Administering of Aloe vera has to be continued for more days till the animal fully recovers from this disease. **Gheekumari** Administering Aloe vera also increases the body weight of animals as it acts as dewormer against intestinal parasites. This can also be administered as preventive treatment on monthly interval especially during rainy season.	

10. Shelter Management for Large and Small Ruminants

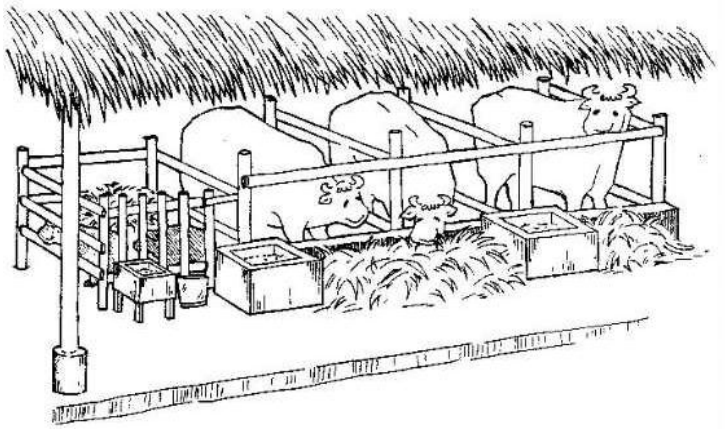
DURATION : 4 HOURS (Theory – 2 Hours & Practical – 2 Hours)

SESSION OBJECTIVE :

- ❑ To help the candidates understand construction of shelter for large ruminants in tribal areas

SESSION OVERVIEW :

- The housing for dairy animals and draught animals is very important. Various types of shelters are being used by the farmers depending upon the climate, purpose, and no. of animals and cost etc.



While constructing the sheds/shelter for large ruminants the objective should be clear, taking into consideration purpose, cost, ventilation, site, size of the animals, safety and comfort of the animals and number of animals etc.

Draught animals does need simple sheds to cast them and feed them. Only thing is they need sheds to protect them from extreme climatic conditions and safety.

- **Construction of simple housing to meet basic needs:** The more productive dairy cattle have a high metabolic rate which results in the production of a considerable amount of heat. Thus they would be more comfortable in a cold, dry climate than in a hot, humid climate because the former would be helpful in getting rid of the extra body heat. However, there are vast areas with hot and humid tropical climates in the region. The basic model presented, therefore, would be one suitable for these unfavourable conditions. Providing adequate ventilation and protection from excessive sunlight and heavy rains is extremely

important under these conditions. This model can be easily modified to meet the needs of the climatic conditions, by providing half walls, curtains etc. where necessary.

The materials used for construction and the construction itself should not be too expensive. Many small farmers cannot afford such luxury even for their own dwellings. However, the material used should be durable. Fortunately in most rural areas less expensive material such as bamboo, coconut and other wood and cadjan (mats made of coconut frond), straw or other seasoned leaves are used traditionally and indigenous technology is available.

It is quite common for small scale producers with one to a few dairy cattle to house them in open sheds with an earth floor. Sometimes cattle may be kept in a basement under the human dwelling or under a stack of straw. Even though the animals may have shelter from sun and rain, and the construction costs are minimal, the other requirements are generally not met.

Convenience for operational activities, e.g. feeding, watering, milking and maintenance of a hygienic environment, has to be provided for in designing the arrangements within the shed and in the actual construction. These are discussed under the layout, floor construction etc. as appropriate

Wastage of feed by trampling, inability to make full use of the urine as a source of fertilizer and inability to maintain a hygienic environment resulting from the formation of pools of mud and urine etc. are some of the problems.

Most of these problems can be overcome to a very great extent by:

a) Constructing the shed in a well-drained area and having a shallow drain around the shed.

b) Having a systematic arrangement within the shed for tying the animals, preferably in a row, with appropriate space between animals and a separate area for the calves.

c) Having a partition between the animals and the feed area to prevent the trampling of roughage feed, and offering concentrates/minerals and water in suitable containers.

- Waste of feed, specially by trampling, is prevented by designing a suitable feed trough from which the animal can conveniently pick up its feed, whether it be cut and preferably chopped roughage or concentrate.
- Making the roof leak-proof i.e. maintaining the roof in a good state of repair, especially during rainy weather.
- Ramming the floor adequately with gravel to have an even floor and attending to the floor regularly to prevent uneven areas developing.

Injury to the animal is prevented by constructing a non-slippery standing, allowing adequate space for the animal to lie down and get up without obstruction. Space between animals has to be restricted, however, to prevent them moving across the standing, dropping dung and urine on the standing.

Providing a sufficient slope to prevent urine and water flowing towards the animal or stagnating in pools.

Providing suitable bedding such as saw dust, left over roughage, straw etc. into which some of the urine may be absorbed and which can subsequently be used for compost making.

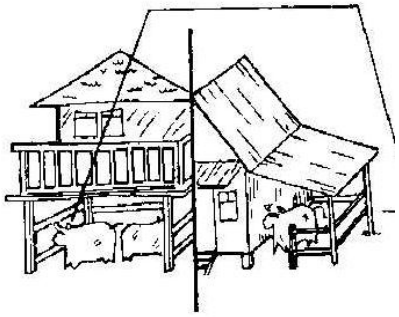
It would be advantageous if dung, urine and other wastes could be disposed of in a manner that would facilitate the production of compost. By arranging for the dung and urine to pass through a bio-gas digester, an additional benefit of a supply of bio-gas can be obtained, at the same time reducing the breeding of flies.
Taking the animal outside the shed for bathing, washing, spraying etc.

Providing curtains made of material available in the area e.g. bamboo strips, cadjan etc. to prevent rain beating in and cold draughts disturbing the animals (where applicable).

Growing few trees at a suitable distance away from the shed to provide shade and also to serve as a wind barrier where appropriate. Fruit trees, tree legumes etc. are suitable.

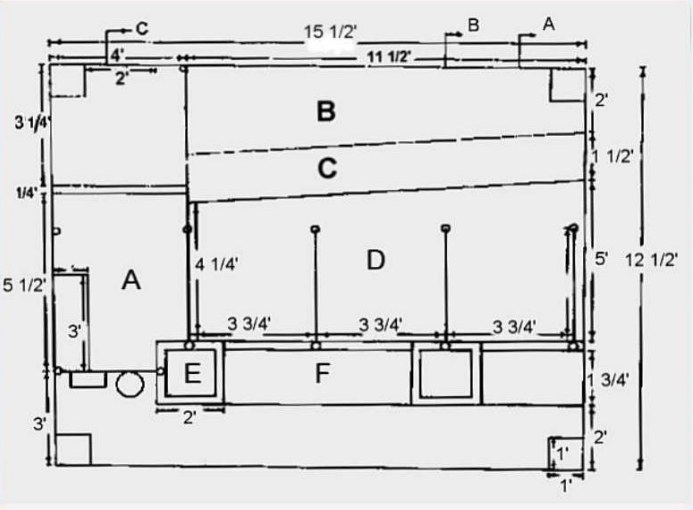
- **Construction of improved housing:** The basic simple model can be improved upon in various ways. Some examples are discussed below. Before making recommendations to farmers, the extension officers should:
  - Understand the benefits of these improvements.
  - Work out their costs, as applicable to the particular situation.
  - Discuss with the respective farmers the relevance of these improvements to their particular situations.

- **Siting the cow shed:** If the cattle/buffalo are to be kept in the basement under the human dwelling or if a shed is to be constructed making use of an existing wall of a house, there will be very little choice in siting the cattle shed. If a choice is available, the following should be taken into account in siting.



  - Well drained and at a higher elevation.
  - Trees for shade and to serve as wind breaks or possibility of growing them if no trees exist.
  - Avoiding direct draught into shed and preventing severe winds blowing off the roof.
  - Convenient access, for supply of feed and water etc. and removal of milk.

- **Siting cowshed (The layout):** The layout is usually constrained by the availability of space and funds in the small farmer situation. Several alternatives can be considered. Flexibility, cost saving and optimum utilization of space (e.g. ceiling to store hay or straw) are important criteria.



  - If making use of an existing wall, an elongated shed can be constructed and an area can be separated for calves etc.
  - If making use of the basement of a human dwelling, an appropriate arrangement has to be devised, keeping in line with floor area.
  - If adequate space is available, several alternatives can be considered. Two of them are presented here.
  - Open cattle shed for 2 cows/1 heifer/2 calves. The design was developed by MLDC/Sri Lanka. (48-51)
  - If you have enough space, you could construct an open cattle shed for 2 cows, 1 heifer and 2 calves

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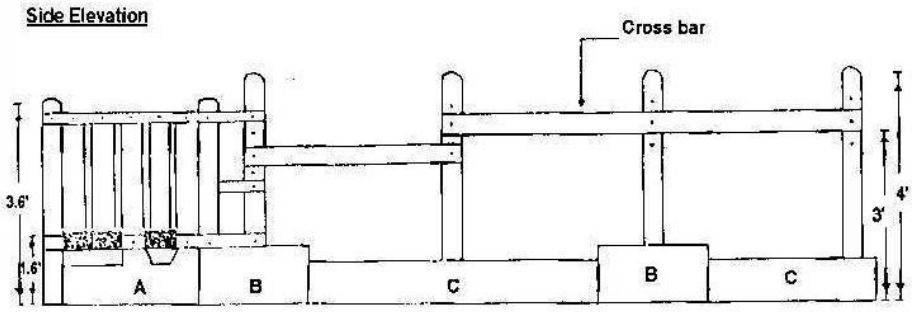


ABRIVIATION

A - calf area with concentrate box/water bucket
B - water trough
C - manager

There are also difficulties in collecting all the urine for fertilizer or compost making because part of it will be absorbed into the floor.

This can be partially overcome by having sufficient bedding e.g. saw dust, straw or left over roughage around the hind quarters of the animals.

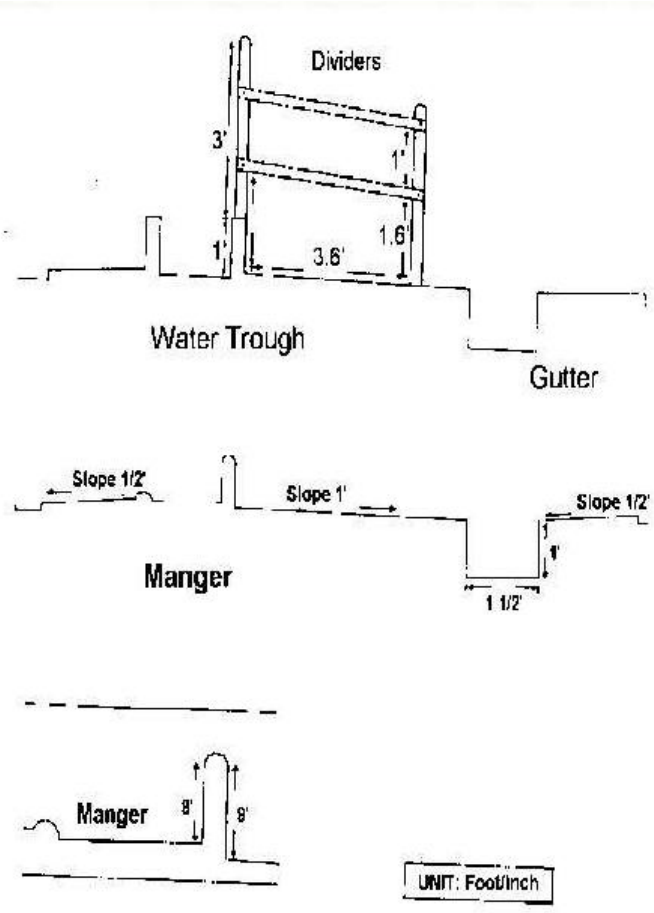
Large pieces of rubble with the flat surface facing up

The rubble is laid on and bound together with a mixture of cement and sand, e.g. 1:3.

7.5 cm layer of concrete

Cement, sand and gravel are mixed in a suitable ratio, e.g. 1:3:3.

The slope can be reduced to about 1.5 % or 1 in 60 when large rubble on cement or concrete is used.



- **Partitioning:** Partitioning within the shed keeps the calves separated from the adult cattle and also restricts the movement of the adult cattle across the standing. If the animals are allowed free movement across the standing, dung and urine will be dropped all over (may affect hygiene and make cleaning more difficult) and injuries may be caused e.g. by one animal trampling another's udder. The partitions can be made of wood available in the area or galvanized piping or a combination of the two. Initial costs and costs of maintenance should be taken into account in deciding what to use. Barbed wire should never be used on

partitions. Nails, or pointed or sharp edges of the material used should not be allowed to protrude because these can injure the animals. Partitions (dividers) between two adult animals are usually placed about 1.10 m apart and may extend only a distance of about 100.0 cm from the head of the standing to allow free access to the animal for milking etc. They may consist of two rafters (e.g. coconut), placed about 30.0 cm apart with the top one at a height of about 75.0 cm., fitted to two wooden posts, one at the head of standing and the other about 100.0 cm from it; or a 40.0 mm. diameter galvanized pipe fitted to a wooden or galvanized post at the head end, and bent about 100.0 cm away so that the other end can be buried in the standing.

- **Tethering arrangements:** The simplest tethering arrangement is to tie the animal by its neck to a wooden post erected on the floor, using a coir (coconut fibre) rope. However, to prevent injuries to the animals and also to restrict its movements various improvements have been made. There are more elaborate tethering arrangements e.g. fixing an iron girdle round the neck which then gets attached by a chain to two points, one on the floor and the other above the animal. Most of the elaborations have been introduced with convenience of operation and the requirements of various feeding arrangement etc. as the basis.

- **The gutter** (also called drain or dung channel). Even when the floor is of rammed earth and gravel, it is best to have the gutter made in rubble and cement or brick and cement. If the sides of the gutter are not strong, they will continuously erode into the gutter and proper maintenance of the floor of the standing will be impossible. By having the gutter finished smooth with cement and sand, cleaning will be convenient and the dung and urine can easily be led into a urine pit or a bio-gas digester outside the shed. The gutter may be about 15.0 cm deep at the start, 40.0 cm wide with a slope of about of 2.5 % or 1 in 40 lengthwise. Gutters of 30.0 cm depth are also being used to prevent animals standing in the gutter and dropping dung and urine on the passage. If cement rendering is used, the edges may be rounded to facilitate cleaning. The gutter may lead to a urine pit about 60.0 cm x 60.0 cm and 40.0 cm deep or to a bio-gas digester.

- **The Manger** (also called as FEEDER). The floor of the feeder can be made with rammed earth, rubble on cement or cement concrete. In its simplest form, the feeder is an area separated out from the standing with a wooden plank. There is a slope away from the animal of about 2.5 % or 1 in 40.

- <u>The disadvantages of this arrangement are:</u>

  - The animal cannot pick up some of the feed which may thus get wasted;

  - A container has to be used for feeding concentrates.

The feeder may be made of wooden planks, bamboo poles, bamboo strips or galvanized sheets. A metal barrel cut into two may also be used as a feeder. This will corrode rapidly if used for silage feed.

When constructing feeders with brick and cement, a rule to remember is that: "The higher the bottom of the trough, the further the animal is able to reach into it to feed." A wooden shaft or galvanized piping may be fitted at a height of 90.0 cm from the ground and over the wooden partition (head rail) to prevent the animal attempting to get into the feeder area. Water requirements are better met by making water available to the animals throughout the day by having a small compartment in a cement/concrete manger or having a small water tank (e.g. 60.0 cm x 50.0 cm and height 20.0 cm) constructed by the side of the manger. (See the MLDC arrangement providing one common tank to two animals).

- **The roof:** When the animals are to be housed in a basement of a human dwelling or under a stack of straw, the material to be used for the roof, roof arrangement etc. is already decided. But when a separate shed is constructed, the most appropriate and least expensive alternatives should be selected. Materials that can be used for the roof are many. The decision has to be made considering various aspects. Cadjans, straw, dried grasses and other seasoned leaves are being used in many areas. The supporting structure can also be very simple in these cases, which makes it quite economical initially. However, these materials need replacement at regular intervals of 1-3 years depending on the material used and how skillfully the job is done. Therefore, maintenance is more costly than roofs made of clay tiles or galvanized sheets. The simplest method is to supply water in buckets several times daily (at least three times a day). Roofs made of clay tiles or galvanized sheets are more expensive and, together with the strong supporting structure required especially for clay tiles, the initial expenditure can be extremely high. In addition, in warm areas with bright sunlight and when there are no shade trees, the temperatures within the shed can be too high to be comfortable for dairy cattle. This effect can be overcome by having an overlay of cadjan or straw or by having a warm air outlet on the roof. The warm air outlet can be provided by having the roof at two levels. When an existing wall is used as one side of the shed, the lean-to roof (with a single slope) is the most convenient arrangement. When a separate shed is constructed away from other structures, a roof sloping in either direction from the centre would be best.

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When an existing wall is used as one side of the shed, the lean-to roof (with a single slope) is the most convenient arrangement. When a separate shed is constructed away from other structures, a roof sloping in either direction from the centre would be best.

The height of the roof at the eaves should be adequate to allow easy access and ventilation, but should not exceed 2.40 m. Excess height can result in rain beating in and may make it easier for the roof to get blown off by severe blowing.

Having the roof extended about 60.0 cm beyond the floor area will also help in reducing the rain beating in. At the same time, curtains can be attached to the roof where necessary.

- **Pillars and posts:** Pillars and posts within the shed can be made of wood, galvanized piping (of appropriate gauge and diameter), bricks and cement or cement concrete. When wood and or galvanized piping is used, durability can be improved by having the bottom of the pillar made of concrete up to a height of about 30.0 cm

- **Side walls, curtains etc.** For most places in the region, the best arrangement would be to have the sides open. When the shed is constructed making use of an existing wall, it automatically gets bounded by a complete wall on one side. Consideration should be given to the possibility of selecting a wall which would also serve as a wind barrier where strong winds are present. It is usual to have the feeder towards the wall end of the standing as more space is required at the hind end of the animal for milking, A.I. etc. In areas with extremely cold winters and/or strong cold winds, it may be necessary to construct half walls or even full walls on one or more sides of the shed. These should be considered only when a temporary curtain is not sufficient.

  The material to be used for curtains can vary from dried grass or straw to cadjan or bamboo strips. The material to be used for the half walls/walls may be bamboo or any other wood, wooden planks, wattle and daub (wood/bamboo structure covered with mud) plastered with lime and sand mixture or brick and cement. The storage container may be made of earth, fibre glass, metal that does not rust easily or brick and cement. Some savings can be made by erecting a brick and cement tank in a corner between two existing walls, provided they are strong enough and leak proof. The sizes and numbers of the containers to be kept on any farm will be determined by the availability of other clean water (and costs of bringing same to the site), the rainfall patterns of the area, the costs of construction/purchase and the investment capability of the farmer.

An estimate for six cattle is given by MGNRG:

- **Related Assessments (if any)**

Total No. of Learning Hours	**Theory** (2 hours)	**Practical** (NIL)
Learning Outcomes	**Knowledge Outcomes**	**Skill Outcomes**
Learning support material for reference from your learning kit	**Reading Material (In Learner's Kit)** Check list of questions for FGD Web References	
Reflective/Evaluative questions pertaining to higher order and lower order of thinking	**Knowledge/Skill pertaining questions** o How can we increase usage of draught animals for different kinds of operations in tribal villages? o What type of breeds is used in different agro-climatic zones for different kinds of operations? o What material used as roof for cattle shed in your area on cost reduction keeping the climate in view o Can you draw and explain for a cattle shed with one side wall of the house for four animals **Reflective/Conceptual questions** o What are the production systems of bullocks in tribal villages? o Explain briefly precautions to be taken for selecting a site o a dairy cattle shed.	

SESSION EXERCISE / CASE STUDY:

- **Group Exercises / Practical**

1. What are the different types of operations for usage of draught animals in your area?

KEY LEARNING REFLECTIONS:

Suggest methods to sustain the bullocks in agriculture in tribal villages.

11. Fodder, Pasture Management and Supplementary Feeding (Cultivation of Fodders for dairy animals)

DURATION : 4 HOURS (3 Hours Practicals + 1 Hour Theory)

SESSION OBJECTIVE :

- ❑ Understanding the package of practices in fodder cultivation

SESSION OVERVIEW :

- ❑ Fodders classification that can be grown in different seasons
- ❑ Cultivation of fodders
- ❑ Supplementary feed requirements

- ❑ **Definitions:**

  - **Grasses:** Naturally grown in the areas in forests and grazing lands allotted by government. It depends on the climate and land, nature and type of lands, unless it is disturbed. Known as pasture lands.
  - **Forages:** Forage is remaining on the land as a consequence of harvest
  - **Fodders:** The crops that are grown for the specific purpose to feed animals
  - **Crop Residues:** The crops are grown for human consumption, after harvest the remaining portion of the products are used as an animal feeding.

- ❑ **Classification of fodders:**

  - **According to physical stage:** *Green:* *Dry:*
  - Feeding is system which is the requirements of the body for all nutrients.
  - Feeds can be divided into Roughages and concentrates
  - Roughages: contain more than 16 percent of fibre i.e., plant material that can be digested by ruminants (Sheep, goat, cattle and buffaloes) only e.g. Straws, stalks, napier, para, etc

- Concentrates: agri by products like grains, cakes, brans etc. Which contain less than 16% fibre and more than 16% protein. Usually the concentrates are mixed rations with grains and cakes, other agri bye products.

❑ **Fodder Classifications:**

- Leguminous fodders:
  - Annual: Cow pea, Guar etc, Berseam, sesbania
  - Perinneal: Alfalfa, sylo scabra, hedge lucern

- Non-Leguminous fodders
  - Annual : SSG, Maize, Fodder Jowar, bajra
  - Perennial: Napier, Para, co-3, co4

- Conservation Methods of fodders:

  As dry, straws, stalks, hay
  As green: Silage
  Enrichment: Rice straw with urea.

- Fodder trees
  - *Subabul*
  - *Avise*
  - *Babul*
  - *Gulmohar*
  - *Allaneradu*
  - *Neem*
  - *Seesham*
  - *Dirisena*

Cultivation procedures and yields are given in the following table:

Particulars	Maize	Jowar	Oats	Cowpea	Guinea Grass	Napier Grass	Rhodes Grass	Buffel Grass	Signal Grass
Botanical Name	Zea mays	Sorghum Sp.	Avenasativa	Vignaunguiculata	Panicum maximum	Pennisetum purpureum	Chlorisgayana	Cenchrusciliaris	Brachiariadecumbens
Type of fodder	Non legume	Non legume	Non legume	Legume	Non legume	Non legume	Non legume	Non legume	Non legume
Crop	Afric	MP	Kent	EC-	Hamil	NB-21, C03,	Callide,	Cloncur	Signal,

Particulars	Maize	Jowar	Oats	Cowpea	Guinea Grass	Napier Grass	Rhodes Grass	Buffel Grass	Signal Grass
varieties	an tall J1006 Vijay composite	Chari, PC-23, CoFS-29	JHO-99-1	4216, BL-1,2	, Makueni Riversdale, Gatton panic, Green panic BG1, BG2	CO4, IGFRI-7, 10	Kotembora	ry, Biloela, Molopo, CO-1 Bundelanjan	Congosignal Kennedy
No. of cuts	Single cut	Single/multicuts	Single/multicuts	Single	Perennial	Perennial	Perennial	Perennial	Perennial
Soil type	Well drained fertile soil	Well drained fertile soil	Medium to Heavy Soil	Light to medium well drained	Light to medium	Well drained medium fertile	Well drained light to medium fertile soil	Light to medium	Well drained fertile and versatile
Sowing season	Entire year under irrigation	Entire year under irrigation	Mid-Oct to Mid-Nov	Entire year under irrigation	Entire year under irrigation	Entire year under irrigation	Entire year under irrigation	Onset of rains	Entire year under irrigation
Seed rate kg/acre	20	15-Single cut 20-Multi cuts	40	5 kg in intercrop 10-15 kg sole crop	Direct sown 5-6 kg Or Rooted Slips-16000	Through Stem Cuttins or Rooted Slips-16000	Direct Sown-6kg Or Rooted Slips-22,222	Direct Sown-6 kgs Or Rooted Slips-22,000	Direct Sown 6 kgs Or Rooted Slips-22,222
Spacing cms	30*25	30*15	20-25	30*10	60*60	60*60	60*30	45*45	60*30
Nutrient Requirement N:P:K kg/acre	48:24:20	36:18:18	36:18:18	8:24:20	60:30:20	60:30:20	60:30:20	60:30:20	60:30:20
Protein %	11	10	10-12	18	6-7	7	9	9	7-9
GFY (t/acre/year)	20-25	15-20	10	4-5	35-40 (6-7 cuts)	5-60 (6-7 cuts)	40-50 (6-7 cuts)	15-20 (6-7 cuts)	30 (6-7 cuts)
Remarks	Best crop for	Do not feed before	Can be fed in any	Best under intercro	Excellent shade	Contains oxalates hence feed	Can be used as green,	Suitable under less	Very good soil binding crop

Particulars	Maize	Jowar	Oats	Cowpea	Guinea Grass	Napier Grass	Rhodes Grass	Buffel Grass	Signal Grass
	silage making	flowering due to HCN Drought tolerant	form – green silage or hay	pping in 4:2 ratio	tolerate crop, free of oxalates	alongwith legumes	hay or dried form	rainfall area, excellent pasture, drought resistant	suitable on bunds, marginal and waste lands

Particulars	Setaria	Dinanath grass	Para grass	Lucerne	Hedge Lucerne	Stylo	Siratro	Subabul	Sesbanis
Botanical Name	Setariaanceps	Pennisetumpedicellatum	Brachiariamutica	Medicagesativa	Desmenthusviratus	Stylosanthes spp.	Macroptiliumatropurpureum	Leucaenaleucocephala	Sesbania spp
Type of fodder	Non legume	Non legume	Non legume	Legume	Legume shrub	Legume	Legume	Legume tree	Legume shrub
Crop varieties	Narok, Nandi, Kazhungula	BD-1,2	Local cultivars	Anand-2, T-9, Co-1		S.hamata cv. Verano S.Scabra	IGFRI-1	Hawaiin salavador Peruvian types K-8	
No. of cuts	Perennial	Annual	Perennial	Multicuts	Perrenial	Perennial	Perennial	Perennial	Perennial
Soil type	Well drained fertile soil	Medium to heavy, Eroded, marginal and wastelands	Medium to Heavy	Well drained fertile	Light to medium	Well drained versatile	Well drained light to medium	Light to medium fertile and heavy	Well drained fertile and heavy
Sowing season	Entire year under irrigation	Onset of rains	Entire year under irrigation	Oct-Nov	Oct-Nov	Onset of rains	Entire year under irrigation	June-July	Entire year under irrigation
Seed rate kg/acre	Direct sown 5 kg or Rooted slips-16000	3	3	6	3	6	3	3	Pure crop-3kg Intercrop-1 kg
Spacing cms	60*60	50*50	60*60	30*15	60*15	30-45	60	1m*0.5 m	3*2
Nutrient Requirement	60:30:20	60:30:20	60:30:20	8:24:20	8:24:20	8:24:20	8:24:20	8:24:20	8:24:20

Particulars	Setaria	Dinanath grass	Para grass	Lucerne	Hedge Lucerne	Stylo	Siratro	Subabul	Sesbanis
N:P:K kg/acre									
Protein %	7	7	7	20	20	18	18	20-30	20
GFY (t/acre/year)	30 (6-7 cuts)	20 (6-7 cuts)	15-20 (6-7 cuts)	35 (7-8 cuts)	15 (6-7 cuts)	25 (6-7 cuts)	25 (6-7 cuts)	40 (5-6 cuts)	30 5 kg/plant/cut (5-6 cuts)
Remarks	Contains oxalate, More cold tolerant	Poor men fodder	Best for marshy and waterlogged soils	Bloat in animals		Drought tolerant		Contains Mimosine	

- **Pasture Grasses:**

Dicathium/Marvel grass

Deenanath grass

Heteropogan (Kashe gaddi)

Arisida (Cheeouru gaddi)

❑ **Non-leguminous forages:**

Co-5 variety napier

Para grass

Maize as fodder

❑ **Leguminous fodders:**

Cow pea (Lobia)

Lucerne

Hedge Lucerne

Stylosanthes hemata

Stylosanthes scabra

Subabul fodder tree

- **Common Agricultural Practices:**
  1. Plough the land and pulvarise the soil to have good tilth.
  2. Apply well de-composed farmyard manure not less than 10 tons/acre and mix with the soil during last ploughing.
  3. All the seeds and fertilisers must be applied within the row, adopting line sowing.
  4. All the grass and legume seeds, being tiny, should be sown at 3 cms deep and should not be sown deeply.
  5. All the legume seeds must be treated with Rhizobium culture.
  6. Buffel grass and Rhodes grass seeds may be mixed with mud, cow dung slurry with less water, dry in shade and make crumbles by hand, individual crumbles will carry the seeds for easy sowing.
  7. Napier grasses contains more of oxalates deplete calcium leading to kidney disorder, must be fed with Lucerne / subabul / cowpea etc.
  8. Feed dry fodder always along with green fodder and legumes for more fat and to avoid digestive complications.
  9. Fodder crops should preferably be harvested at 50% flowering (60-70 DAS)

- **How to grow Azolla:**
  1. An artificial water body is made to grow azolla.
  2. A pit size of 2 meter length, 1 mt width and 20 cm depth should be dug on earth.

3. The pit is then covered with plastic gunnies to prevent growth of roots of nearby trees, protect soil temperature and seepage water.
4. Silpuline plastic sheet/plastic sheet is spread over the lastic gunnies without any fold.
5. About 10-15 kg sieved soil is uniformly spread over the plastic sheet.
6. Five kg of cow dung and 40 gms of azophos and 20 gms of azofert or SSP made into slurry in 10 litres of water and is pour in the pit, then more water is poured to make the water level at about 8 cm.
7. About 1-2 kg of fresh, pest and disease free azolla seed culture is inoculated in the pit.
8. Azolla will fill the pit within 7-10 days. About 1-1.5 kg of Azolla can be harvested daily thereafter.
9. About 2 kg of dung, 25 gms of Azophos and 20 gm of azophert is made into a slurry in 2 litres of water should be given once in 7 days to keep the azolla in rapid multiplication phase and to maintain the daily yield of 1-2 kg pit.

❑ **Harvesting:**

1. Azolla should be harvested with a plastic tray having holes of 1 sqcm mesh size.

❑ **Precaution:**

1. The plant should not be allowed to enter maturation/sporulation stage.
2. Overcrowding should be avoided

❑ **Facilitation steps:**

1. After the introduction the field visit.
2. The procedures for cultivation
3. Identification of fodders and seeds
4. Identification of fodder trees
5. Method of cultivation
6. Group exercises and presentations will be done

Recommended reference material (AV)	**Reading Material** o NDDB fodder cultivations **AV Resources** o PPT
Reflective/ Evaluative questions for students pertaining to higher order and lower order of thinking	**Knowledge/Skill Pertaining Questions** o Explain the differences between forage crops and fodder crops o How napier is cultivated
	Reflective/ Conceptual Questions: o Name four fodder trees grown areas o Estimate the cost of cultivation of maize in dry areas.
Additional Recourses	

- **Benefits of Ration Balancing Programme**

  - Proper use of locally available feed resources at possible least cost
  - Increases milk production with more fat and SNF
  - Increase in net daily income
  - Improves reproduction efficiency
  - Reduces inter-calving period and increases productive life of animals
  - Improves the general health of animals
  - Improves the growth rate in growing calves, leading to early maturity

12. Grazing Land Mapping and Plan Developing in Extensive System

DURATION : 6 HOURS (Theory – 2 Hours and Practical – 4 Hours)

SESSION OBJECTIVE :

- ❑ Understanding Processing of Grazing Land Development

SESSION OVERVIEW :

- ❑ Grazing lands are broadly termed as commons in villages are rapidly declined due to several reasons, policies and programs.
- ❑ **Micro plan to be developed:** Few steps can be followed for making micro plan by starting the process of mapping grazing lands and develop forage lands which ever exist in villages.
- ❑ Mapping exercise can be done with elders and ensure goat and sheep and cattle rearers to participate in this exercise.
- ❑ In the Resource map identify existing common resources for grazing and watering points and also identify scenario of one generation ago (approx. 25 years)
- ❑ Identify possible resources which are used for grazing, tanks, bunds, beds, temple lands, revenue hillocks, forests, panchayat lands, farm bunds and crop residues etc.
- ❑ Identify potential land resources for enhance fodder resources. In the above listed lands do transect land along with rearers.
- ❑ Do the matrix ranking exercise to assess the palatability of fodder species which are identified in above land resources. Do the seasonality mapping exercise to know the seasonal availability of above fodder species.

- Sharing all the documented fodder species with community (with all livestock owners)
- Cross checking with revenue data (tanks, common lands etc)
- Seasonal calendar of fodder species-PRA
- Palatability ranking of Fodder species through PRA exercise.
- Prepare micro action plan to enhance fodder availability
- Adoption of rotational grazing system
- Prioritized fodder species should be encouraged to grow in homestead lands

❑ Farmers involvement towards monitoring and sustainable utilization of lands.

❑ Build proposal- based on the above micro plan and submit to the AHD and ITDA and NREGs, District Collectors and Forest Officials.

NO. OF FACILITATORS REQUIRED (FOR BATCH OF 30) : 3

NO. OF FACILITATORS : 2 HOURS

SESSION GUIDE :

❑ **Learning Objective (Learner's Guide)**
Understanding process of grazing land development

❑ **Knowledge Outcomes**
Preparation of participatory grazing land plan development

❑ **Skill Outcomes**
Building micro plan for grazing land mapping and design plan preparation

❑ **Teaching Aids used**
1. Power point presentation
2. Chart papers
3. White Board and markers
4. Cut cards

❑ **Facilitation Steps**
1. Presentations will be made after group exercises
2. Group Exercises to understand micro plan preparation of grazing land mapping

Recommended reference material (AV)	**Reading Material (In Learner's Kit)** o Note on grazing land mapping **AV Resources (In Learner's Kit)** o PPT
Reflective/ Evaluative questions for students pertaining to higher order and lower order of thinking	**Knowledge/Skill Pertaining Questions** o What are the grassesavailable in grazing areas in surrounding of your village? o What might be the reason for forest people not allowing goats into forest?
	Reflective/ Conceptual Questions: o Who should be contacted to improve fodder resources in grazing areas?
Additional Recourses	

13. Economic Development through Large Ruminant - Planning

DURATION : 2 HOURS

SESSION OBJECTIVE :

- ❑ Understanding the Importance and Healthcare of Calf

SESSION OVERVIEW :

- Today's calves are tomorrows dairy animals
- Farm economy depends upon the calf production and adding dairy animals from the own farm.
- So take precautions from pregnancy to calving
- Reducing calf mortality.

❑ **Common causes for calf mortality**:

- Non-availability of colostrums immediately after birth
- Non-availability of milk from mother
- Licking of soil, licking of other animals and unhygienic shed
- Mineral deficiencies
- Climatic vagaries, such as drenching in rains, severe cold
- Infections through umbilicus

❑ **Importance of COLOSTRUM:**

- The calves must drink the colostrums milk with in eight hours. Colostum contains disease resistance antibodies (Gama globulins)
- Colostrum provides disease resistance and easy defecation to calf.
- It should be provided one tenth of calves weight.

Feeding schedule for calves up to 6 months

Age of calf	Approx. body weight (kg)	Quantity of milk (kg)		Green grass (kg)
4 days to 4 weeks	25	2.5		Small qty.
4-6 weeks	30	3.0		Small qty.
6-8 weeks	35	2.5		Small qty.
8-10 weeks	40	2.0		Small qty.
10-12 weeks	45	1.5		1-0
12-16 weeks	55	-		1-2
16-20 weeks	65	-	750-1000	2-3
20-24 weeks	75	-	1000-1500	3-5

- **Management**

A. Most of the calves lick walls, soils which causes digestive tract troubles, worminous infection. The soil licking habit can be restricted by tying the mouth with a basket Cleaning the sheds daily and spraying fresh lime in the shed.
Calf feed should contain sufficient minerals and vitamins, which prevents anaemia.
Soil licking can be avoided by hanging mineral licks.

B. Calves are very sensitive to climatic vagaries such as cold, rain and hot sun. Cold winds and drenching, which causes pneumonia and other diseases. Hence it a must to protect them by hanging curtains with gunny bags or turpeline et when required.

C. Diarrhoea is the main problem which is caused by bacterial infections seen mostly in 2 to 4 months of age. Indigestion may be due to excess milk or bacterial infection. WHITE DIARHOEA is usually due to leaving excess milk to the calf causing indigestion. In such situation reduce the suckling time and glucose and salt mixed water with one spoonful of antibiotic is to be given to the calf

Sometimes calves suffer with coccidiosis (Bloody diarrhoea). It can be prevented by sprinkling lime in sheds once in fortnight. It occurs mostly in winter. The problem can be solved by mixture of egg white, pinch of *hingi* (Asafoetida) and jiggery in milk.

D. Worm nous infestation causes severe debility, anaemia leads to calf mortality. Potbelly, [ale mucous membranes of eye, bottle jaw, erected hair on the body are symptoms of worm burden in the calf. For controlling the worms first deworming should be done at 7-10 days. Later monthly once for four months regularly. Them once in three months.

E. At the time of birth umbellicus is to be cut with sterile blade at two inches and ligate. Apply tincture of iodine, otherwise there is chance of infection.

F. Foot and mouth vaccination at 6-8 weeks first time and then at 6 months age second time.

At 4 to six months age, Anthrax, BQ and HS vaccination, Brucella vaccine for female calves only.

G. If we take care from calf stage by feeding and health care we can get good cows from our own farm/house which will be more economical

NO. OF FACILITATORS REQUIRED (FOR BATCH OF 30) : 3

NO. OF FACILITATORS : 2 HOURS

SESSION GUIDE :

- **Learning Objective (Learner's Guide)**
  Understanding the importance of calf rearing

- **Knowledge Outcomes**
  Precautions needed to reduce the mortality

- **Skill Outcomes**
  Identify the symptoms in diseased calves

- **Teaching Aids used**
  1. Power point presentation
  2. Chart papers
  3. White Board and markers
  4. Cut cards

- **Facilitation Steps**
  1. Presentations will be made after group exercises
  2. Group Exercises to understand the importance of calf rearing and management

Recommended reference material (AV)	**Reading Material (In Learner's Kit)** o Note on calf importance **AV Resources (In Learner's Kit)** o PPT
Reflective/ Evaluative questions for students pertaining to higher order and lower order of thinking	**Knowledge/Skill Pertaining Questions** o What are the common practices followed in villages after the birth of calves? o What are the reasons for calf mortality?
	Reflective/ Conceptual Questions: o Importance of colostrums? o What happens if excess milk left for calfs?
Additional Recourses	

14. Clean Milk Production

DURATION : 2 HOURS

SESSION OBJECTIVE :

- ❑ Understanding the importance of clean milk production
- ❑ Role of clean milk production in public health

SESSION OVERVIEW :

Milk is considered to be the mammary secretion of a healthy animal. Hence animal health is an important aspect in the production of clean milk. Good hygiene and sanitation practices would keep it free from bacterial contamination. Thus both these aspects discussed mainly from the point of clean milk production.

❑ **Clean milk production process:**

WHAT STEPS		HOW / STANDARDS
Essential steps for Clean Milk Production	1.	Give sufficient, quantity of feed and drinking water to cattle prior to milking
	2.	Remove accumulated cow dung.
	3.	Cattle shall be bathed and if bath is not possible dry cleaning by broom / duster should be done.
	4.	Maintain the cattle clean and healthy.
	5.	In case animal is under treatment, discard the milk during the withdrawal period of the treatment. Do not bring the milk to DCS/MPI, if the cattle is suffering from any disease.
	6.	Clean the cattle shed floor either by washing with water or dry cleaning 10 – 15 minutes before milking.
	7.	The floor should not be slippery. It should be firm and dry so as to provide a proper foothold to the animal while rising or standing.
	8.	Clean the udder and teats of the cattle by clean (potable) water and wipe using a dry & clean cloth.
	9.	Use separate vessel for washing of udder and teats & for milking
	10.	Teats should be cleaned after sucking, if cattle is letting down the milk by calf sucking.

WHAT STEPS		HOW / STANDARDS
	11.	Clean thoroughly the milk collection vessel preferably with detergent and hot water etc and keep it inverted to dry before milking.
	12.	Milker should wash his/her hands with soap to make them clean and germ free.
	13.	Milker should wear clean clothes.
	14.	Milker should avoid contact between milk and his body parts, clothes and other belongings.
	15.	Chewing and spitting with tobacco, smoking and gutka should be avoided during milking.
	16.	Sneezing/ coughing towards udder/vessel during milking should be avoided.
	17.	Milker should not be suffering from any respiratory ailment or contagious disease.
	18.	Milker should not have any open sores or cuts.
	19.	Discard the initial milk from all the four teats to minimize the bacterial load.
	20.	Flies, hay, husk, dry cow dung cake or other extraneous matter should not get into the milking vessel.
	21.	After milking rinsing of teats in a dis-infective solution (with water, iodophor etc.) shall be done to avoid post- milking infection.
	22.	It is good to keep the animals standing for at least half an hour after milking. Feed may be provided to encourage this.
	23.	Avoid use of measures, tumbler etc. in the milking vessel for removing or to transfer milk from milking pail.
Milking Utensils and Storage Vessels	1.	The utensils and the storage vessels should be of SS 304 construction and free from sharp edges.
	2.	A suitable size lid should always be used to cover the utensils and the vessel.
	3.	They should be cleaned and sanitize before and after their use and kept dry.
	4.	They should be exclusively used for milking.
	5.	The milk should be filtered before pouring into the vessel.

NO. OF FACILITATORS REQUIRED (FOR BATCH OF 30) : 3

NO. OF FACILITATORS : 2 HOURS

SESSION GUIDE :

- **Learning Objective (Learner's Guide)**
  Understanding the process of clean milk production
- **Knowledge Outcomes**
  Hygienic practices to be adopted while milking the animal
- **Skill Outcomes**
  Hands on experience of clean milk production

- **Teaching Aids used**
  1. Power point presentation
  2. Chart papers
  3. White Board and markers
  4. Cut cards
  5. Videos

- **Facilitation Steps**
  1. PPT & video presentations
  2. Practical if possible

Recommended reference material (AV)	**Reading Material (In Learner's Kit)** o Note on clean milk production **AV Resources (In Learner's Kit)** o PPT
Reflective/ Evaluative questions for students pertaining to higher order and lower order of thinking	**Knowledge/Skill Pertaining Questions** o What should be bacterial load at milking and at users point ? o What are the animal feeding and watering should be done?
	Reflective/ Conceptual Questions: o Importance of clean milk production? o Cleaning of utensils?
Additional Recourses	

15. Small ruminant Production

DURATION : 6 HOURS (Theory – 4 Hours & Practical – 2 Hours)

SESSION OBJECTIVE :

- ❑ Understanding Package of Practices in Sheep and Goat Rearing

SESSION OVERVIEW :

The sheep and goat are two different species even though they are domesticated for meat, milk and wool production. By seeing them from distance, only one can tell whether it is a sheep flock or goat flock.

The reasons for sheep and goat selected for rearing are:

a. Where cows cannot survive
b. Sheep will eat weeds
c. Profits from sheep and goat per acre is equivalent to cow

SHEEP	GOAT
Tail down and hang	Tails go up
Heads down	Heads up
Grazes more, Eats short grasses, weeds, eats close to the soil surface	Browses more, eat leaves, twigs stands on their hind legs to eat leaves from trees and bushes
RF locks together. Survival in wild predators attacking grazing areas	In grazing areas they are spread- Curious and inquisitive
Sheep says baa	Goat says may
Meat from sheep is called lamb	Meat from goat is known as chevon
Sheep is a seasonal breeders	Goats in semiarid region and south peninsular regions the goats breed though out the year
In India indigenous sheep breeds give mostly Give single off spring	Goats give mostly give twins or triplets,

- **PRODUCTION SYSTEMS:**

- **EXTENSIVE SYSTEM:** The sheep is maintained in flocks. The size of flock ranges from 30-300 or more and reared by same communities. They are maintained mostly under extensive system of grazing only. In the event of scarcity they migrate to long distances where fodder and water is available. The goats are maintained in tribal villages in small numbers flock because of their eating habits. The goats spread widely in the grazing lands and runs away actively from the flock. Hence it is difficult in maintenance of goat flocks. Usually the goats do not migrate.

- **SEMI-INTENSIVE SYSTEM:** The animals are allowed to graze maximum time only in lean periods they are fed with groundnuts helms and bhoosa of dal seed etc. As finishing rations the ram lambs or male kids are fed with concentrate before marketing. There is need to provide better nutrition to expected mothers and lactating animals from 4th month of pregnancy to the two months after lambing, which will effect positively on lamb/kid growth.

- **INTENSIVE SYSTEM:** Intensive system is not usually practiced in village's specially tribal villages. In this system all the animals are fed on the farm by providing nutritional needs, water and health services.

    - **Management Practices:** It consists of feeding, watering, housing, breeding, health care and marketing. Management practices varies for adults and kids

    - **Selection of goats:** Selection of breed / animal should be based on the available resources like trees, grazing lands, local crops grown, housing and rainfall in the area etc. Before selecting the animal, farmers should know the purpose for which rearing is taken place (meat, milk, fiber)

    - **Selection of Female stock (Does):** Farmers should know the characters of good female stock, while purchasing. Purchase the goat, aged in between 1 to 2 years (2 to 4 teeth), once kidded or ready to kid, healthy and active, mothers should have twinning quality, preferably from twin birth, shining skin, should have quick eating habit, udder should be soft and teats should be straight

    - **Selection of male stock (Bucks):** As the male is the half of the flock, more care is to be taken while selecting the Buck. A good buck should have breed characters. . . Purchase the buck from the known sources like government farms or private recognized farms. One should know the body weights at 3, 6 and 12 months of age of that particular breed

- **Characters:**
  - Large in size, with more weight and chest should be wide.
  - Aged in between 1.5 to 2.5 years. (2 to 4 teeth)
  - Without any physical deformities and with strong back legs
  - Should be vigorous, more active
  - Rough hair on shoulders and neck will exhibit more male vigor.
  - Reproductive organs should be healthy, and without any deformities.
  - It should be from twins
  - Bucks mothers should have good milking quality.

- **Precautions to be taken while purchasing:** Enquire about the disease position in the area and also local veterinary hospital, better to purchase from flock owners even though it costs more. Know the reasons for selling in mass by one seller, bargain and purchase. And try to avoid middleman.
  - Care is to be taken in trucks while transportation by avoiding overcrowding, jolting and sunny hours.
  - Male and female ratio is to be 1:25 to get good results in good percentage of off springs
  - Good rams and bucks are needed in the villages

- **Breeding:** Male (buck), female (does) ratio in flock should be 1:30 to get more number of kids.

- **Maintenance of breeding buck:** Special feeding is to be done to the bucks in breeding season by giving 200 Gms of concentrates as supplementary feed.

Using the kids born in the same flock for breeding purpose will cause inbreeding and resulting in reduction of flock productivity and disease resistance. Hence the buck should be from outside of the flock with known pedigree. It should be changed every two years. So that it will not cross its off springs.

The bucks don't allow the does to eat and tease the does, hence bucks should allow in to the flocks in breeding season only. A buck can be used up to six years, if maintained well.

It is better to test the buck for contagious diseases like brucellosis, which causes abortions in the flock.

Does management

The doe in heat will Show the following symptoms.

1) Restless, 2) wagging of the tail, 3) off feed (Not completely), 4) frequent urination, 5) reduction in milk yield and 6) enlarged vulva with glass like excretions

The Interval between two estrus cycles is 21 days. The heat period is 24 hours. Hence the doe should be mated with in that period.

A good Doe should come into heat between 10-12 months, inter kidding period should be 8-9 months, should conceive within 3 months of parturition. Does, unlike sheep come into heat throughout the year, but maximum is in between July and September.

- **Precautions to be taken for pregnant animals:** The pregnant animals are to be separated from the flock in the fourth month and should not be sent out for distant places for grazing. Provide a shed with proper flooring. Give water and feed separately. Pregnant does should be kept away from bucks to prevent abortions and de-worm the animals before fortnight of parturition.

- **Pre parturient symptoms:** Udder becomes hard and engorged, restless movements, hollowness of flank and above the tail

- **At the time of parturition**
  - After the appearance of the water bag, the kid will come out within 6 hours and after the rupture of water bag the doe will deliver within 2 hours. If it is delayed, take the help of nearest veterinarian or an experienced person.
  - In the process of delivery first fore legs and head will come. The second kid will come within half an hour
  - In case Difficulty in delivery or expulsion of placenta, take the help of veterinarian.
  - Usually placenta is expelled within 24 hours. Sometimes placenta is eaten by the mother, so observe the goat carefully and not allow the mother to eat.

- **Steps to be followed just after the Parturition:**
  - Ligate and Cut the umbilicus with a sharp blade / knife and apply tincture iodine or turmeric (Haldi)
  - Remove and clean the membranes from nostrils. See that kid respires well.
  - Healthy kids will stand within 10 minutes of birth, and drink milk, If they don't drink help them. The first milk (Colostrums) is rich in Proteins, antibodies, gama globulins etc. and gives resistance to the kids.
  - Allow the mother to lick the kid
  - Just after the delivery process is completed, clean the udder to prevent diarrhea and pneumonia in kids.
  - Weaning after three months will facilitate the does to come into heat early
  - Rough hair on shoulders and neck will exhibit more male vigor.
  - Reproductive organs should be healthy, and without any deformities.
  - It should be from twins
  - Bucks mothers should have good milking quality.

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- **Steps:** Select elite flock in the village good ewes/does and rams/bucks
- If it does are not good bring good rams/bucks from known source and introduce either by purchase or barter system or exchange basis. All the old males are to be replaced.
- In the off springs all the female stock should be retained by limiting the stock depending upon the resources available.
- The males are to be selected at all stages of birth, weaning, 6 months and yearlings and breed characters by strict culling.
- After one year or 15 months keep the required males replace the older ones.
- Excess male stock should be supplied to another flock to build a new nucleus flock.
- The entire process may take about 18 months to 2years.

- **Feed:** Feed is required for growth of the animal. The goats require 4% of total feed of their body weight on dry matter basis. For example - a goat weighing 30 Kg, requires about 1.2 Kg of dry matter i.e. about 5 kg in terms of greens.

  Feed consists of proteins, carbohydrates, fats, mineral and vitamins. Proteins are required for building of body tissues and musculature and blood formation mainly.

  Carbohydrates play active role in the activities of the life and energy for metabolic activities.

  Minerals are required for bone formation, hemoglobin and other body tissues.

- **Feeding habit:** Goats are mainly browsers. The goats can recognize the taste well. They can tolerate the bitterness. They can digest more cellulose and lignin than other ruminants. Goats like tree leaves and like to browse than grazing. Their upper lip movement helps in browsing to eat medium height grasses and in plucking leaves. Usually other animals cannot. Six to eight hours grazing / browsing is sufficient for maintenance of the goat. They eat many types of grasses but they don't eat the fodder contaminated with urine and feces, which smells. For good growth 40% leaves, 40% grasses and 20% concentrates are required in the feed

  Goat can differentiate the tastes of sweet, sour, bitter and salt etc. They can eat aromatic grasses also. They like leguminous grasses which are bitter in taste than cereal grasses.

  Fodders can be natural grasses, cultivated Crops, top feeds. Source of the fodder is forests, common lands, agriculture lands of fallow and cultivable lands.

  Fodder related problems: Shrinkage of grazing lands, increased area under commercial crops, decline in common lands and lack of social regulations, continuation of drought situations, erratic rains, decrease in availability of fodder from inter crops and trees, increased stocking rates and goats are not allowed to graze in forests

- **Probable solutions:** Implementation of social regulations to protect the commons, enhancing the production by bio-mass plantation and broadcasting the fodder seed, plantation and protection in own lands, private lands, tank beds and tank bunds, Stocking rate according to bio-mass availability, increasing the area under inter crops, efficient usage of available fodder.

  Trees which give fodder like Neem, Glyrecedia, Acacia, Subabul, Peepal, Avisa (Sesbania), Arudu (peddamanu), Naravepi (Hardwikia binata) etc can be grown

  Results of in sufficient feed: Under nutrition/Nutritional defficiencies leads to stunted growth, low productivity, low disease resistance and prone for diseases, low birth weights in kids, mothers will not have sufficient milk to feed kids, results in more kid mortality

- **Supplementary feeding:** The situation where the availability of fodder is low, supplementary feeding is needed.

  Supplementary feeding for lactating mothers and breeding bucks in the mating season will give good results. 100- 200 gms with 114-16% protein should be given to each animal. Good leguminous fodder like Lucerne, horse gram, cowpea, subabul leaf meal etc. also can be given instead of concentrated feed. Azolla can be grown and used as an alternative for concentrates. 300-400 gms of fresh azolla is equivalent to 100 gms of concentrate feed.

S.NO	Source of supplementary feed	Bi-products
1	Tree based fodder	Leaves- Subabul, Neem, Peepal, Sesbania, Arudu, Hardwikia bianta(naravepi), Ber, Acasia
2	Cultivated crops – legumes	Cow pea, lecern, pilli pesara, crotalaria, horse gram
3	Cereals	Maize, jowar, bajra, broken grains
4	Bi-products	Ground nut helms, Oil cakes, Acacia pods, molasses, broken dhal and seed coat and pod

- **CHEAP FEED FORMULAE FOR GOATS:**

Sl.No.	Ingredients	I	II	III
1.	Kancha hay/or any grass	40		
2.	Cotton seed coverings		40	
3.	Sun flower heads after removal of seed			40
4.	Ground nut cake	10	15	10
5.	De oiled Rice Bran	17	13.5	18.5
6.	Dried poultry cage litter		10	10
7.	Maize/Jowar	20	10	10

Sl.No.	Ingredients	I	II	III
8.	Cotton seed cake	10		
9.	Molasses		10	
10.	Mineral Mixture	1.0	1.0	1.0
11.	Salt	1.0	0.5	0.5
	TOTAL	**100**	**100**	**100**

Note: Can be used in drought conditions

- **WATER:** Water constitutes about 70% of the body. It plays an important role in metabolism, transportation of nutrients to various organs

  In sufficient drinking water leads to early exhaustion of the animals, kids born with low birth weights, stunted growth and the productivity of the flock is lowered. Digestion of the nutrients is affected.

  Animals acquire many diseases like coccidiosis, E .coli and worm infestation through contaminated water. So, Clean, potable water is a must to maintain the animal healthy. On an average 3 to 5 litres of water is required for each goat depending upon the environment and fodder.

  Providing water in the grazing lands or on the ways to grazing lands with hand bore wells, small tanks, wells etc is a good practice and necessary. Stagnated water will be the source of pathogenic organism, internal parasites.

  - Rough hair on shoulders and neck will exhibit more male vigor.
  - Reproductive organs should be healthy, and without any deformities.
  - It should be from twins
  - Bucks mothers should have good milking quality.
  - MIGRATION TAKES PLACE DUE TO WATER SCARCITY THAN FEED SCARCITY

- **SHED MANAGEMENT:**
  - Mud flooring is necessary. Orientation should be east to west so that the sheds will be cooler.
  - Clean the shed daily, keep the shed dry as the dampness in the shed encourages pathogenic bacteria. The flooring should be free of pits, otherwise they will breed bacteria.
  - Mud flooring is necessary; orientation should be east to west so that the sheds will be cooler. Mud flooring and slant towards one side will provide drainage.
  - Sprinkle dry lime on the floor, walls will reduce the infection chances and external parasite menace. The lime powder will act as bactericidal, deodorant and absorbs moisture also
  - Compost pit should be away from the shed. So that mosquito menace will be reduced in rainy season

- The goat and sheep urine contains more ammonia than large ruminants. To overcome the breathing related disorders, well ventilated house/ shed is necessary
- Protect the kids from inclement weather. Kids shed should be free of dust, well ventilated and dry. If kept under basket / Jallas the place should shift daily from one place to other, to maintain dry flooring.
- The shed should not be congested, fill the pits formed in on the floor immediately, other wise they may breed the bacteria.
- Sprinkle the lime should be done once in a week at least. The lime powder will act as antiseptic, deodorant, and absorbs moisture on the floor.
- Spray insecticides on the floor and on wall to prevent ticks, lice and mites etc.
- Fumigate the sheds frequently to prevent mosquito menance
- Unhygienic sheds will cause ecthyma and oral infections.
- Compost pit should ber as far awy as p[ossible from the shelter
- Separate the ailing animals and treat as per the advice of veterinarian.
- Where there are more rain fall and marshy areas are there the elevated sheds may be planned with locally available material at low cost.

- **Kids Management:** Allow the doe to deliver in a dust free hygienic place, clean the nostrils just after birth, cut the umbilicus 4 inches from the body and apply Tincture Iodine or any antiseptic like haldi, let the mother smell and lick the kid, if mother is not having milk fosters it, kid should drink colostrums milk within half an hour of birth and if more than one kid is there let them drink milk one after another.

- **Housing for Kids**
  - Protect the kids from inclement weather. Kids shed should be free of dust, well ventilated and dry. If kept under basket / Jallas the place should shift daily from one place to other, to maintain dry flooring. The shed should not be congested, clean the shed daily, fill the pits formed in on the floor immediately, otherwise they may breed the bacteria. Sprinkle the lime should be done once in a week at least. The lime powder will act as antiseptic, deodorant, and absorbs moisture on the floor. Spray insecticides on the floor and on wall to prevent ticks, lice and mites etc. Unhygienic sheds will cause ecthyma and oral infections. Separate the ailing animals and treat as per the advice of veterinarian.

    Growth rate depends upon the availability of milk- Additional feeding with concentrates to mothers is necessary to give more milk to kids

  - **Feed & water:** Feed formula for kids below one year

Sl.No.	Ingredients	0-3 months kids		3 to 6 months	6 Months and above	
1	Maize /Jowar/ Bajra	20	30	25	40	30
2	Broken rice	--	20	15	10	20
3.	Wheat/Rice Bran	17	--	10	10	--
4.	Broken Pulses	20	-	10	10	--
5.	Sunflower/groundnut/ cake	30	15	20	15	20
6.	Fish meal	10	-	7	-	7
7.	Mineral Mixture	2	2	2	2	2
8.	SALT	1	1	1	1	1
	TOTAL	**100**	**100**	**100**	**100**	**100**

- Tie tender green leaves in the shed; adjust it to the height of the kids. Hang mineral bricks in the shed. It will help in growth rate and reduces the mud licking habit.
- Give oral antibiotics for first three days with the consultation of veterinarian.
- For the first two weeks give creep feed and then start feeding of concentrated feed.
- Give the drinking water mixed with haldi/ turmric or Potassium Permanganate twice a week

■ **Health:** PREVENTION IS BETTER THAN CURE. Consult the veterinarian before the use of any medicine. Sick animals are to be segregated and kept separately

Common diseases that occur in kids: 1) Diarrhoea, 2) Pneumonia (Sneezing, Cough), 3) CAE (Caprine arthro Encephalitis), 4) Contagious Ecthyma, 5) Orf, 6) PPR (Peste Petis Ruminants), and 7) Goat Pox

COMMON CAUSES OF KID MORTALITY (0 TO 90 DAYS)

Sl.No.	CAUSE OF DEATH	AGE	Remarks
1.	Hypothermia	1-5 hrs	Provide warm atmosphere or wrap in a blanket
2.	Collibacillosis	1-20 days	Can be prevented by mud licking/provision of potable, dust free water
3	Joint Ill (CAE)	3 days+	
4.	Contagious ecthyma	7 days +	Hygienic shed+ separation of sick animals/treatment
5.	Pneumonia	1 day+	Pre vent over crowding and provide good ventilation and dry shed flooring
6.	Enterotoxaemia	7 days +	Restricted feeding
7.	Coccidiosis	20 days	Use coccidiostats

Sl.No.	CAUSE OF DEATH	AGE	Remarks
8.	E.Coli	20-40 days	Prevent mud licking and treatment
9.	Tape worms	60-90 days	De worm
10.	Worm infection	30 days+	De worm
11.	Foot Rot	30 days +	Clean the leg with Pot. Permanganate lotion and apply dressing with neem oil.

- Tie tender green leaves in the shed; adjust it to the height of the kids. Hang mineral bricks in the shed. It will help in growth rate and reduces the mud licking habit.
- Give oral antibiotics for first three days with the consultation of veterinarian.
- For the first two weeks give creep feed and then start feeding of concentrated feed.
- Give the drinking water mixed with haldi/ turmeric or Potassium Permanganate twice a week

■ Marketing

1. If the goat is not too heavy, pick it up and stand on a bathroom scale. Subtracting your weight from the total will determine the goat's weight. The following methods use measurements of body size to estimate the weight of the goat. While these are quite accurate for average sized goats, goats that are extremely thin, obese, or pregnant will vary from the estimated weights.

2. With a cloth measuring tape, measure in inches around the goat's heart girth and the distance from the point of the shoulder to the pinbone. Use the following formula to estimate the weight in pounds:

   Heart girth (inches) X heart girth (inches) X shoulder to pin distance (inches)

   For example, a mature doe that has a 36 inch heart girth and is 33 inches from the point of shoulder to the pinbone, weighs approximately 143 pounds:

   (36 X 36 X 33)/300 = 143 pounds[1]/2.2 = 65 Kg

   Enquire the market value of meat and then calculate or assess the body weight of the animal then bargain. You should get atleast 60% of the (39 kgs) mutton value you should get, That is how you should bargain with purchaser.

3. With a cloth tape, measure around the heart girth in inches. Use the following table to look up the goat's estimated weight:

[1] The weight comes in pounds. It has to be divided by 2.2 to get weight in kilograms.

Heart girth (inches)	Weight (pounds)	Heart girth (inches)	Weight (pounds)	Heart girth (inches)	Weight (pounds)
10 3/4	5	20	30	32	100
11 3/4	6	21	34	33	105
12 3/4	7	22	38	34	115
13 1/4	8	23	43	35	125
13 3/4	9	24	50	36	140
14 1/4	10	25	56	37	150
14 3/4	11	26	62	38	160
15 1/4	12	27	68	39	170
16	14	28	73	40	180
17	16	29	80	41	190
18	22	30	85	42	200
19	26	31	90	43	215

The girth measurement is taken by placing a tape or thin piece of material around the animal's girth. The tape encircles the animal just behind the withers on top and just behind the elbows on the bottom.

The length of the animal from the point of the shoulder to the pinbone is also measured. The tape must be pliable enough to bend around to the point of the shoulder and to the pinbone (identified by the black arrows) as shown in this picture.

■ **Related Assessments (if any)**

Total No. of Learning Hours	**Theory** (2 hours)	**Practical** (NIL)
Learning Outcomes	**Knowledge Outcomes**	**Skill Outcomes**
Learning support material for reference from your learning kit	**Reading Material (In Learner's Kit)** Check list of questions for FGD Web References	
Reflective/Evaluative questions pertaining to higher order and lower order of thinking	**Knowledge/Skill pertaining questions** o Explain the steps for establishing open nucleus farm for sheep. o Explain the importance of colostrum. How is it useful? **Reflective/Conceptual questions** o What are the trees useful for goat feed? o What are common contagious diseases of sheep and goat?	

SESSION EXERCISE / CASE STUDY:

- **Group Exercises:** Diseases with symptoms and seasons of diseases

Species	Seasons (months)	Symptoms	Local name	Treatment given locally	Remarks

KEY LEARNING REFLECTIONS:

1. Economics of sheep and goat rearing.
2. Goat management.
3. Marketing skills.
4. Calculation of bodyweight of live animal

16. Draught Animal Utilization

DURATION : 3 HOURS

SESSION OBJECTIVE :

- ❑ To help the candidates understand importance of draught animals in farming
- ❑ To help the candidates understand other uses of draught animals in tribal areas

SESSION OVERVIEW :

The draught animals usage depend upon the soil structure, terrain, season and purposes. Depending on size, draught animals are divided into

a. Large or heavy animals (More than 400 kg.)
b. Medium sized animals (200 kg to 400 Kg.)
c. Small sized animals (Less than 200 Kg.)

Depending on soil and terrain, the large sized animals are used in plain areas, black cotton soils and heavy soils. The medium sized animals are used in light and medium soils where the terrain is not level. Small medium sized animals are used in hilly terrain. The farmers produce animals in following ways

a. Purchasing bullocks/bulls and use them in agriculture
b. Purchase calves at lower cost and rear them for one or two years and train them and use
c. The household produce the calves in the house from cows and rear them and use them in agriculture.
d. The hard hooved breed of bullocks are used in wet lands.
e. Usually the buffaloes which are having black skin absorb heat easily, are used in wet fields as they does not tire easily.

The draught animals are used for ploughing, sowing, intercultivation, watering in critical times (to protect the crops from drought situations). Fertiliser and manure transportation to fields, threshing, transport of grains to markets and emergency transport of human beings also.

After mechanisation also, 60% of the agricultural operations are carried out by draught animals. The draught animals are used for following:

a. Produce organic manure
b. Timely agricultural operations
c. Short distance transportation

Since draught animals work only for around 100 days in a year, their maintenance is somewhat costly. For combating this problem, custom hiring, insurance can be worked on.

The draught animals also need improved implements to ease their work in different geographical areas.

Custom hiring systems under community management can also be a solution.

■ **Related Assessments (if any)**

Total No. of Learning Hours	**Theory** (2 hours)	**Practical** (NIL)
Learning Outcomes	**Knowledge Outcomes**	**Skill Outcomes**
Learning support material for reference from your learning kit	**Reading Material (In Learner's Kit)** Check list of questions for FGD Web References	
Reflective/Evaluative questions pertaining to higher order and lower order of thinking	**Knowledge/Skill pertaining questions** o How can we increase usage of draught animals for different kinds of operations in tribal villages? o What type of breeds are used in different agro-climatic zones for different kinds of operations? **Reflective/Conceptual questions** o What are the production systems of bullocks in tribal villages?	

SESSION EXERCISE / CASE STUDY:

■ **Group Exercises**

1. What are the different types of operations for usage of draught animals in your area? Economics calculation per year by a pair in different location

KEY LEARNING REFLECTIONS:

1. Suggest methods to sustain the bullocks in agriculture in tribal villages

17. Developing Large Ruminant Programme for Tribal Livelihood

STEPS :

- List out the dairy animal owners
- Assess the milk produced in area
- Assess the extra market surplus milk.
- Economics of milk production in the village
- Estimate the cost of production of milk per liter
- Now the assess the needs of nearest market place/town/city/milk collection center Hotels, hostels, tea stalls, home supply etc.
- Facilities for milk transportation
- Market demand
- Clean milk production

Presentation and discussions in detail

18. Developing Small Ruminant Programme for Tribal Livelihood

DURATION : 3 HOURS

SESSION OBJECTIVE :

- Understanding tools for project development for small ruminants

SESSION OVERVIEW :

- Small ruminants make valuable contribution to the poor in rural areas. The contributions range from animal proteins (meat and milk), wool, draught power in highlands and food security. They are closely linked with the poorest people in pastoral systems and complex crop livestock systems and convert low quality resources to high quality protein. Small ruminant production is facing a number of problems in India. The important ones are:

  Poor awareness regarding the importance of small ruminants in the livelihood system:
  - Absence /lack of active rearer organizations
  - Pressure on fodder resource base
  - Inadequate veterinary health services
  - Lack of adequate focus on genetic improvement
  - Reduced access to credit and insurance
  - Lack of efficient marketing mechanisms
  - Poor inter-departmental coordination

- **What can be done:**
  - Goat rearing communities can be made into clusters
  - Existing breeds in the area can be identified with participatory exercises
  - Priority ranking of goats for promotion
  - Production losses – flock dynamics exercise
  - Identification of major problems/ risk in goat rearing and sheep rearing
  - Reduction in mortality by 10% from current mortality rate
  - Increase production atleast 2kg from existing productivity/
  - Vaccine and health care management
  - Housing and shelter

- **Approach:**
  1. 250 families or goat rearers can be grouped together as a cluster
  2. Build cadre of community vaccinator
  3. Generate Membership and goat fund
  4. Good housing – elevated night shelters
  5. Establishing disease surveillance system
  6. Vaccinators trg and develop support service system for vaccinators
  7. Rotational grazing system
  8. Care of pregnant animals and goat kids
  9. Supplementary feed
  10. Crops and forage crops
  11. Best lopping methods- sustainable utilization of fodder trees and shrubs
  12. Formation of FPO for collective marketing and procurement of deworming medicine and feed if any

- **Related Assessments (if any)**

Total No. of Learning Hours	**Theory** (2 hours)	**Practical** (NIL)
Learning Outcomes	**Knowledge Outcomes**	**Skill Outcomes**
Learning support material for reference from your learning kit	**Reading Material (In Learner's Kit)** Check list of questions for FGD Web References	
Reflective/Evaluative questions pertaining to higher order and lower order of thinking	**Knowledge/Skill pertaining questions** o What are the different sheep development programmes in your area? o How much income you can expect in two years period with goats? **Reflective/Conceptual questions** 1. In your views, what more can be done for development of small ruminant programme in your area?	

SESSION EXERCISE / CASE STUDY:

- **Group Exercises**
  1. Identify problems / risks involved in goat rearing in your area
  2. Identify problems / risks involved in sheep rearing in your area

KEY LEARNING REFLECTIONS:

1. How can funds be generated in a tribal village for sheep development programme?
2. How can funds be generated in a tribal village for goat development programme?