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from  
C. ...  
J. ...  
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# Goat rearing in the Homesteads of Kerala



**BY**

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## **FOREWORD**

Livestock is an indispensable component in integrated farming systems. The sustainability of the system is highly dependent on the animal and poultry components. In the small scale farming systems such as homesteads, goat rearing is an ideal and profitable venture. From the published statistical data, a decrease in trend of goat population in the state has been observed. The Kerala Agricultural University through Krishi Vigyan Kendra, Sadanandapuram is encouraging the farmers of Kollam district in goat rearing through the RKVY project by establishing a model goat farm in the KVK campus. The Kendra aims at imparting technical training in goat rearing and also support in supply of Malabari breed kids, Veterinary consultancy and literature support.

I am sure that the book on goat rearing in the homesteads of Kerala will serve as a guide on the management and technical aspects in profitable goat rearing and encourage farmers to initiate new goat rearing units in their homesteads.

**DIRECTOR OF EXTENSION**

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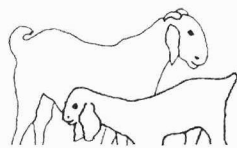
## **Introduction**

### ***The scope of goat rearing in homesteads and its national importance***

The goat is one among the first animals domesticated by man. Today, there are nearly 200 different breeds of goats in the world that produce a variety of products, including milk, meat and fibre.

Traditionally goat rearing has been accepted as an easy income source for the poor farmer in terms of milk and meat. Hence goats are popularly termed as poor man's cow. Our country ranks first in the world in goat population and has 20 percent of world goat population with over 20 breeds. Goat meat production stands at the level of 0.47 million tonne. Goat also produces 2.55 million tonnes of milk and 0.1288 million tonne of skin (F.A.O 2002).

Goats play a significant role in the economy and nutrition of landless, small and marginal farmers of the country. Goat rearing is an enterprise which is being practiced by a large section of progressive farmers in the rural community. These animals can survive on the available shrubs and trees growing in adverse harsh environments, in low fertility lands where no other crop can be survive. In



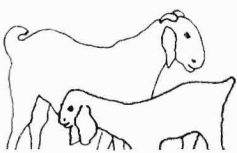
pastoral and agricultural subsistence societies in India, goats are kept as a source of additional income and as an insurance against disaster. In village ceremonial feasting, goats are also used for the payment of their social dues. In addition to this, goat has religious and ritualistic importance in many rural societies.

Raising goats can be a valuable part of a sustainable farm. Integrating livestock components into farming system will increase economic growth and improve environmental health and diversity, thereby making important contributions to the farm's sustainability. Goats fit well in the biological and economic niches on a farm that otherwise go untapped. They can be incorporated into existing grazing operations with other livestock and also be used to control weeds.

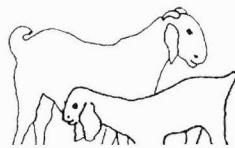
Furthermore while grazing, goats eat the forage, the goats' manure replenish land and interrupts the life cycle of various crop and animal pests. Like other ruminant animals, goats convert the plant materials that are unsuitable for human consumption into high-quality animal products. Goat makes a valuable contribution to the livelihood of economically weaker sections of the society.

### ***Advantages of goat rearing in homesteads***

1. Low initial investment is only needed to start a goat farm.
2. Due to small body size and docile nature, housing requirements and management problems with goats are less.
3. Goats are friendly animals and enjoy being with farmers.
4. Goats are prolific breeders and achieve sexual maturity at the age of 7-12 months. The gestation period in goats is short and at the age of 13-17 months it starts giving milk. Twin birth is a very common feature in goats.



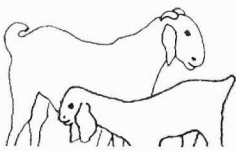
5. Unlike large animals both male and female goats have equal value in commercial farm conditions.
6. Goats are ideal for mixed species grazing. The animal can thrive well on a wide variety of thorny bushes, weeds, crop residues and agricultural by-products unsuitable for human consumption.
7. Under proper management, goats can improve and maintain grazing land and reduce bush encroachment (biological control) without causing harm to the environment.
8. Slaughter, dressing operation and meat disposal can be carried without much environmental problems.
9. The goat meat is more lean (low cholesterol) and relatively good for people who prefer low energy diet especially in summer and sometimes goat meat (chevon) is preferred over mutton because of its "chewability."
10. Goat milk is easy to digest than cow milk because of small fat globules and is naturally homogenized. Goat milk is said to play a role in improving appetite and digestive efficiency. Goat milk is non allergic as compared to cow milk and hence has anti-fungal and anti-bacterial properties and used for treating urogenital diseases of fungal origin.
11. Goat rearing creates employment opportunities for the rural youths besides effective utilization of unpaid family labour. There is ample scope for establishing cottage industries based on goat meat and milk products and value addition to skin and fibre.
12. Goat is termed as a walking refrigerator for the storage of milk and can be milked number of times in a day.





***Common terminologies used in goat production and their meanings***

Buck	Male of an adult goat
Doe	Female of an adult goat
Doeling	Young female goat
Buckling	young male goat
Kid	Young one of a goat
Kidding	parturition of does



## **Selection of Goats**

### ***Physical appearance***

The adult goat should satisfy dairy confirmation such as long, deep, wedge shaped body, well sprung ribs, straight legs, soft shiny hair coat, capacious udder extending below and between thighs with teats medium sized, uniform, sloping slightly forward. After milking, the udder should collapse and become pliable. Prominent milk veins are also desirable. Young goats must also be free from any physical defect.

### ***Body weight***

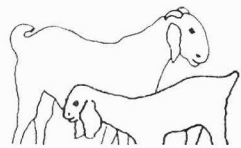
One year doe should weigh about 20 kg and 6 months doeling should weigh at least 10 kg.

### ***Milk Yield***

Selection of goats in dry period should be based on their previous 120's days milk production records. Lactating goats can be selected based on their daily milk yield. Total milk yield per day in two consecutive milkings should be more than 0.5 Kg. It also includes the milk sucked by kids.

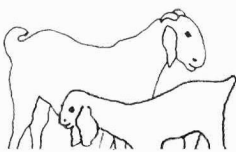
### ***Dentition and aging***

In first year all temporary incisors (milk teeth) are well worn and first permanent pair is just cutting. The ages



two consecutive milkings should be more than ½ litre per day.

6. When purchasing a young goat the production record of its dams may be checked.
7. Identify the newly purchased animals with a suitable identification method like ear tagging.
8. Vaccinate the newly purchased animals against the diseases.
9. Keep the newly purchased animals under observation for about 15 days and then mix with the general flock.
10. Unproductive animals should be culled promptly and should be replaced by the newly purchased animals or farm born one.
11. Avoid kidding during peak periods of summer and winter.



## Housing of goats

Under village condition goats generally do not require any special arrangement for housing. They however should be protected against bad weather, wild animals and pests.

### ***General considerations***

1. Construct shed on dry and properly raised ground.
2. Avoid water-logged and marshy areas.
3. In low lying and heavy rainfall areas, the floor should be preferably elevated.
4. The shed should be 10 ft. high and should have good ventilation.
5. Bucks should be housed in individual pens.
6. Does can be housed in groups up to 60 per pen.
7. Provide proper shade and cool drinking water in summer season.
8. Dispose of dung and urine properly.
9. Avoid over stocking or crowding to give adequate space for the animals.



## ***Plan for housing***

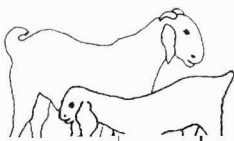
Goat housing not have to be fancy but should consist of a sturdy, dry, draft-free structure that can provide protection from the sun, wind and rain.

### **Goat shed with elevated wooden flooring**



### ***Small scale goat rearing***

In small scale goat rearing, the shelter will be the lean – to - type of shed placed at the side of the existing building. A model plan for two goats and their kids require a plinth area of 60 sq.ft. The floor should be made of raised platform at a height of 3 to 4 feet from the ground level. For the floor wooden plank or bamboo can be used. External parasitic infestation is usually less in the raised platform floor.

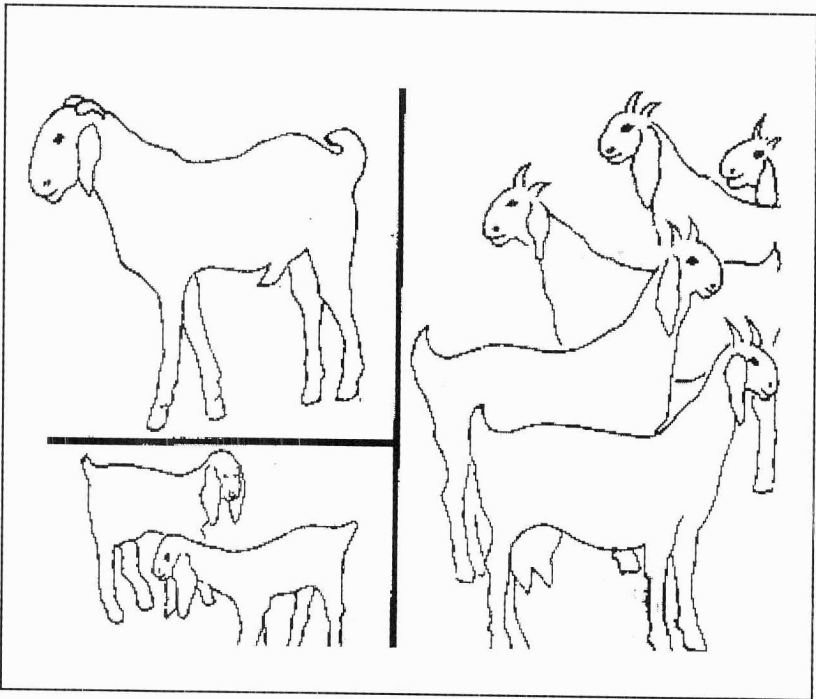


The storage space for fodder can be made overhead below the roof. Cheap roofing materials can reduce the cost of construction.

### ***Large scale goat rearing***

In large scale goat rearing, sheds can be constructed to accommodate 60 goats in a single shed. Each Goat require 15 square feet floor space requirement. Does, doelings, kids, advanced pregnant does and bucks should be housed in separate compartments within a single shed. If the bucks are housed individually, the floor space requirement will be 25 sq.ft per buck.

### ***Separate compartments in a single shed***

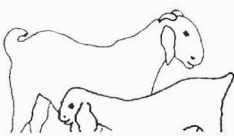


## Model goat shed for large number of goats

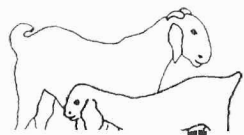
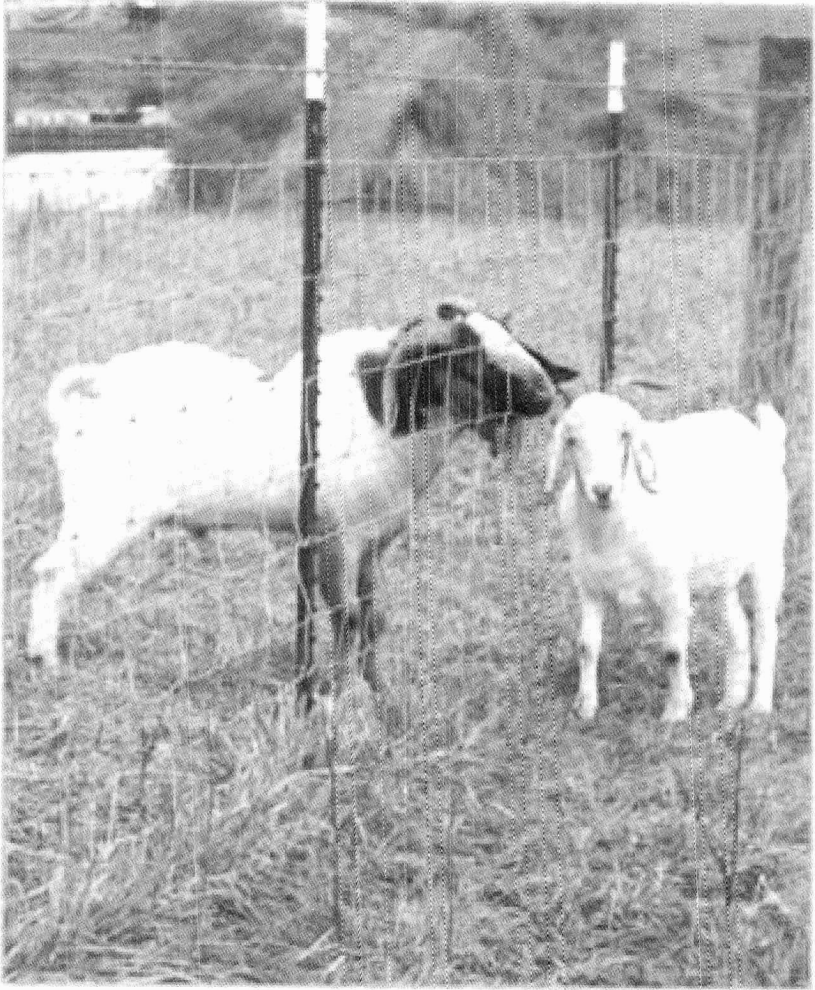


### ***Fencing***

Fencing is the most important and biggest challenge in maintaining goats. Most problems arise from inadequate fencing. Homestead includes a mixed array of crops and other enterprises to meet the basic farm family needs. When fencing is not done they can do considerable damage to standing crops. The browsing nature of the animal interferes with crop growth. Goats are curious and can do tremendous damage in a short period of time. They will jump over, crawl under, squeeze through, stand on, and lean against, all types of fence. Fence can be made of cheap fencing materials available in the locality or chain-link fence, with a minimum of four feet height. The fence for the goat yard or goat pen should provide at least 200 square feet of space per goat. A yard with 20 feet by 20 feet would allow two goats plenty of room to jump and play.



## Fencing with wire mesh



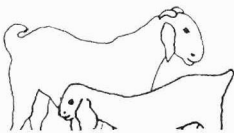


## **Goat production and management practices**

In our State, goats are reared by men and women with diverse working and professional back ground. So the production system is as numerous as are the socio-economic and varied geographical agricultural land holding in the State.

### ***Types of goat production***

- 1. *Tethering.*** This system is commonly practiced by the farmers in homesteads of Kerala. Goats are tied with a rope to trees or pegs and are allowed to browse from the surroundings. The advantages include minimum labour input and utilization of feeds. This system can be adopted for farmers having one or two goats in their homesteads. A variation of this method is combining tethering with grazing upto five goats at a time, led by ropes held by women and children.
- 2. *Extensive production.*** In this system of goat production where vast grass land is available to the farmers, goats are allowed to browse on free range and they are provided with night shelter.
- 3. *Intensive production.*** This method of production is ideally suited for farmers in urban areas, where there



is scarcity of land. Here goats are confined exclusively in sheds and fed on leaves, grasses and concentrates. This system has the advantage of allowing control over the animals.

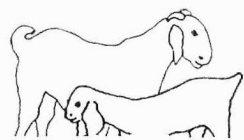
4. ***Semi-intensive production.*** This method represents varying degree of compromise between extensive and intensive production. In this system the goats are allowed to go out of the shed for a few hours daily. The advantages of the system are increased fertility of the land via the returns of dung and urine, control of waste herbage, reduced fertilizer application, possibilities of increase in crop yield and greater economic return.
5. ***Integration with cropping systems.*** In this system goats are allowed to browse under plantation crops. It ensures the fertility of land by not only recycling the dung and urine but also controlling the weeds. The manure out put from an adult goat per day varies from 0.5 to 1 kg.

### ***Marking***

Each goat in a herd should be marked by using some identification mark. The goats in a herd should be marked using metal/ plastic ear tags and tattooing and ear notching. The ear tagging system is commonly used.

### ***Dehorning***

Dehorning or Disbudding should be done when the male kid is two to five days old and the female kid is up to 12 days old. The hair should be clipped from around the bud and this area smeared with petroleum jelly to protect it from caustic potash. Caustic potash should be thoroughly rubbed on the horn –bud until it is blistered. Care should be taken so that it must not come in contact with the eyes. An electric dehorner can also be used safely. Mature goats can be dehorned



by sawing off the horns close to the head with a meat saw or wire saw. The wounds should be dressed. It is better to do it in winter season when flies are not rampant.

### ***Hoof trimming***

Hoof trimming is necessary for the well being of goats. If neglected, it can cause lameness, foot rot and lower milk production. Some goats have faster growing hooves than others. The terrain and environment can influence the amount of wear on the hoof. Sharp pen knives or curved hand – pruning shears can be used effectively. It is better to trim feet four or more times per year.

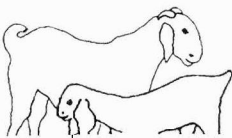
### ***Castration***

Castration is done in male goats raised for meat purpose and not for those kept for breeding programme. Male kids should be castrated at 3 weeks of age. Castration can be done surgically or with the help of an emasculator or torsion forceps. The castration of buck in six months of age can be carried out with burdizzo instrument. This avoids all risks of infection. Castration improves the flesh quality of the adult buck.

### ***Deworming***

Internal parasites are a problem in goats. Failure to deworm goats will result in breeding problems, poor milk production, weak kids, poor performance and death loss in extreme cases. Deworm the kids regularly once in a month up to 6 months and then once in 2 months for the next 6 months. Deworm mature goats every 2- 3 month's and each goat which is purchased newly from the market.

Use different deworming drugs each time while deworming the goats. Before breeding the doe should be dewormed.



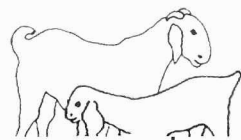
Care should be taken not to deworm goats in first two months of pregnancy. Pregnant goats can be dewormed two weeks before kidding.

### ***Exercise***

The goats require good exercise for maintaining themselves in good condition. Stock on range system receives sufficient exercise while grazing. Stall-fed goats should be let loose in a large paddock for at least three to four hours a day. Goats should not be sent out for exercise / grazing until dew has dried up. Grazing in wet grass can cause digestive problems.

### ***Culling***

Regular culling is to be practiced to maintain a profitable goat rearing. Infertile does, unhealthy goats, low producers and old animals at the age of 6 years and above must be culled. Replace the culled ones with good progeny from the farm itself or from outside.



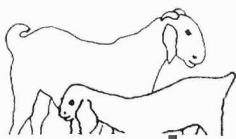
## **Feeding and forages of goat**

Goats are more tolerant to eating feeds containing bitter principles and refuse any soiled feed.

In general goat feeding agrees with the expectations based on universal formula of feeding ruminants. However, it is noted that a goat generally produces more milk than a cow from the same quantity of nutrients. The nutrients conversion efficiency for milk production of a dairy cow on an average is 38%, whereas for goat it ranges between 45-71%. It has been observed that goats were 4.04% superior to sheep, 7.90% to buffaloes and 8.60% to cows in crude fiber utilization.

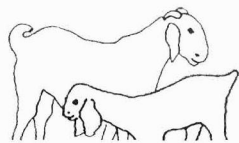
### ***General feeding habits of goat***

1. By means of their mobile upper lips and very prehensile tongues, goats are able to graze on very short grass and to browse on foliage not normally eaten by other domestic livestock
2. Goats are well known for their fastidious eating habits. They will accept a wide variety of feed, appreciate it and thrive on it, but what is acceptable to one goat



may not always be acceptable to others. In general, goats will refuse any kind of feed which has been soiled either by it or by other animals.

3. Goats consume wide varieties of feeds and vegetation than either sheep or cattle.
4. It has been shown that goats can distinguish between bitter, sweet, salty and sour tastes and have higher tolerance for bitter tastes than cattle.
5. Goats will consume certain species of plants at definite stages of maturity.
6. Though the rumen is not developed at birth, but young kids will start picking hay or grass at 2-3 weeks of age and by 3-4 months the rumen is fully functional.
7. Eating of leaves of bushes and trees form an important part of the diet of goats. It has been observed that when goats are allowed to browse for about 8-9 hours a day, the goats can take care of their daily maintenance and achieve slow rate of growth.
8. Despite goat's digestive efficiency similar to other livestock, there is considerable evidence that it is exceptionally efficient at digesting crude fibre.
9. The basal metabolic rate and thyroxine production of goats are higher than in sheep and cattle. So goats require greater maintenance ration than what is usually recommended for sheep and cattle.
10. Goats are fond of leguminous fodders. They do not relish fodders like sorghum and maize silage or straw. They reluctantly eat hay prepared from forest grasses, if cut in early stages, but very much relish the hay prepared from leguminous crops.



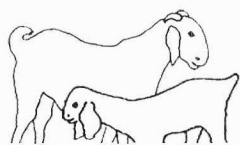
11. Goat has also a high mineral requirement and produce milk richer in minerals than cows.

### ***General feeding management***

1. Ensure bushes/shrubs for browsing around its shelter area/homesteads.
2. As an alternative to above, supply of cultivated fodder from own farm or from surrounding farms may be ensured.
3. Offer roughages and water ad libitum.
4. As a thumb rule, 2/3rds of the energy requirements should be met through roughages. Half of the roughages should be leguminous green fodders and rest half should be grasses/tender tree leaves.
5. In the absence of good quality green fodder, concentrates must be considered to replace them.
6. Kids should be fed colostrum up to 5 days of age. Later on, they can be put on kid starter rations.
7. Green leguminous fodders should be offered ad libitum to kids from 15 days onwards.
8. Provide salt and water to kids at all times.
9. Additional concentrates should be given to bucks and does during breeding season.
10. Care should be taken to meet the nutrient requirements as recommended.

### ***Energy requirement***

Energy is a vital component of goat diets affecting the utilization of other nutrients and overall productivity. Additional energy is needed in the diet for increased activity,



type of terrain, amount of vegetation on range and distance travelled to get feed. Stall fed goats with minimum activity need a basic maintenance level in the diet. Light activity requires about 25% more energy. Goats on hilly land need an increase of about 50% above basic maintenance requirements. When vegetation is sparse and goats must travel long distances to graze, the energy requirement is about 75% above the basic maintenance requirements.

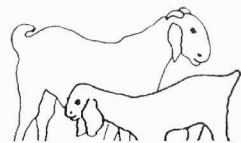
Energy requirements can be met by good quality roughages in the diet, except for early weaned kids, for does during the last two months of gestation and lactating dairy goats. Concentrate needs to be added in the diet to meet the energy requirements of these animals. Goats will also gain weight faster if more energy is provided in the diet.

### ***Protein requirement***

The basic requirement of protein in the diet is that, a minimum of 6% total protein needs to be provided otherwise feed intake will be reduced. This will lead to deficiencies in both energy and protein, which results in reduced rumen activity and thus lowers the efficiency of feed utilization.

Additional protein is required in the diet for growth, pregnancy, lactation and mohair production. Goats on range need higher levels of protein in the diet than do stall fed goats because of the increased activity required to get feed. Adding concentrate to the ration will provide the additional protein needed. An excessive amount of protein in the diet of goats with light activity is also undesirable.

The most commonly used protein supplements are ground nut oil cake and coconut oil cake. Protein deficiency





symptoms in goats are anorexia, loss of weight, poor hair growth, decreased milk yield and impaired reproduction. Severe deficiencies can lead to digestive disturbances, anaemia and oedema.

### ***Mineral requirement***

Generally, feeds used in goat nutrition provide adequate quantities of the necessary minerals. In some instances, deficiencies may occur, especially of the major minerals. The macro minerals supplemented to goats are salt, calcium, phosphorus and sulphur. Mineral supplements can be provided in the form of mineral blocks with rich copper (950-1250ppm).

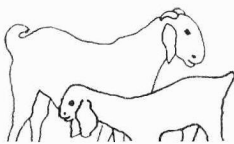
*Sodium Chloride:* Lactating does often require additional salt as milk contains high amounts of sodium.

*Calcium:* Must be added to the diets of lactating goats.

*Phosphorus:* Deficiency may occur in goats grazing on range lands if the forage is deficient in this mineral.

### **FORAGES FOR GOATS**

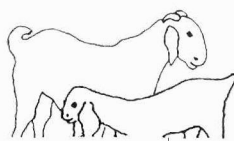
The non availability of quality feed, apart from the scarcity of labourers for animal management is one major factor that hinders commercial livestock production in our State. However, the success of any farming system depends on the livestock components included in the farm and this necessitates the inclusion of suitable feed production units within the system. Popularly known as the poor man's cow, goats are most suited to the small scale farming systems including homesteads. Fodder cultivation is an integral component of all goat farms as these serve as ready sources of feed for the animals. Low growing grasses may be grazed upon and shrubs can be browsed by the animals.





### ***Fodder cultivation***

Among the recommended fodder crops, guinea grass, congo-signal, hybrid napier (after chopping) and fodder cow pea are the suitable fodders that can be grown in homesteads for goats. Goats prefer shrubs suiting their browsing nature. Their small mouths and split upper lips



enable them to pick small leaves, flowers, fruits and other plant parts, thus choosing only the most nutritious available feed.

Fodder crops can be grown

- In rotation with food crops
- As intercrops in coconut gardens
- As hedges
- As fences

## **Guinea grass**

Guinea grass is well adapted to the agro-climatic situations of our state and comes up well under coconut and other trees. The fodder is nutritious, free from oxalates, contains 8-14 per cent protein and 28-36 per cent crude fibre. Guinea grass is a fodder crop ideal to be grown in homesteads in the interspaces, as hedge strips as well near manure pits/ animal sheds. The grass can be raised from slips or seeds, the former being better option. Slips are planted at a spacing of 40 x 20 cm@ 3slips/ hill as intercrop and as pure crop the spacing is 60 x 30 cm. The time of onset of monsoons, May- June is best for planting. The crop responds well to manure application –animal manure and washings from the sheds can be applied in the fields. Frequent interculture is important when organic manures alone are applied to ensure decomposition of the debris. For initial establishment and vigorous growth, fertilizers to supply 200 kg nitrogen, 50 kg phosphorus and 50 kg potassium may be given . Nitrogen should be given in splits. Weeding assumes importance during the early days of establishment. The crop is best suited for cut and carry system and should be cut at 15-20cm from ground level.



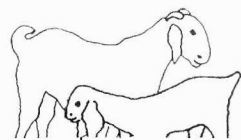
The first cut can be taken 75DAP and later at an interval of 45-60 days. About 7-9 harvests are possible in a year. Though perennial, replacement once in three years should be followed to maintain the vigour of the sward.

Guinea grass is usually fed as cut fodder, can also be converted to hay or silage.

Varieties suitable : Makueni, Haritha, Marathakom

### **Hybrid napier**

Hybrid napier on account of its faster growth, higher herbage yields and palatability has out shadowed napier grass in its popularity as fodder grass. The varieties Killikulam, CO3 and CO4 have been well accepted by the farmers and are being promoted by the extension workers. Rooted slips or stem cuttings (setts) are best for planting. The crop requires a deep weed free compact bed for planting. Incorporate organic manures at the time of land preparation. Phosphorus and potassium (50 kg each/ha) are also applied basally, nitrogen (200 kg/ha) in splits. Planting is done with the onset of South West monsoon in furrows/pits at a spacing of 60 cm x 60 cm. Irrigation is crucial when rains fail but water stagnation should be avoided. Care should be taken to maintain the area weed free. Hybrid napier is commonly used in cut and carry system, first harvest 75DAP and later at 30-45 days interval. Stubble of 10-15 cm should be maintained at each cut. The cultivar CO3 can be harvested at lesser intervals of 25-30 days. Cutting during rainy months should be done with care as rain water that gets accumulated in the cut ends may cause rotting. Avoid harvesting during heavy downpours. The fodder needs to be chopped before feeding to the goats.

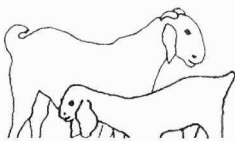


## Congo Signal

Contrary to the erect growing habit of guinea grass and hybrid napier, congo signal is a creeping perennial with dense foliage and is suited for grazing. Congo signal grass is recommended for soil conservation especially in sloppy lands. The grass is highly shade tolerant and hence very much suited for homestead farming. The ideal time for planting is May-June and September- October, with the onset of rains. Both seeds and slips can be used. The seed rate is 2 – 5 kg/ha, can be drilled in rows 40-60 cm apart or broadcasted. Slips if used are to spaced at 40 cm x 20 cm. Basal application of organic manures, 50 kg/ha each of phosphorus and potassium should be followed by nitrogen 100 kg in two to three splits. The dense mat is ready for grazing for the first time 50DAP and subsequently at 30-40 days interval. Cut and carry system can also be practiced. The herbage is highly palatable with 13 per cent crude protein and 27 per cent crude fibre.

## Fodder cow pea

Cow pea is an important pulse crop of high protein content which can be grown as fodder too. Varieties specific for fodder production have been evolved- Karnataka local, Russian giant. It can be grown as a floor crop in coconut gardens and homesteads. The leguminous organic residues left after the harvest of the crop also enriches soil. Cow pea is tolerant to moderate shade and can be successfully grown as intercrop with guinea grass, napier grass etc to get nutrient rich fodder. Seeds may be broadcasted (40-50 kg/ha) or dibbled in lines, 35-40 kg/ha. Spacing for line sowing is 30cm x 10 cm. Organic manures @ 10t/ha with basal dose of fertilizers supplying 25 kg nitrogen, 60 kg



phosphorus and 30 kg potassium/ ha for rainfed crop and when irrigated, in splits. The crop can be grazed or cut and fed. The first cut should be done 45 DAP and subsequently two more at 30 days interval. For quick regeneration, cut the crop leaving four to six buds per plant.

The fodder is of superior quality with no toxic contents but 16 percent crude protein and 20 per cent crude fibre.

## **Tree fodders**

Tree legumes serve as browse plants. The leaves, twigs, tender shoots and sprouts are browse for the goats. The important browse and fodder legumes that can be included in homesteads are include Subabul, Agathi, Glyricidia, Hedge Lucerne and Erythrina.

However, care should be taken that these components do not exceed 30 percent of the diet of the animals and prolonged feeding is avoided. If it exceeds 30 percent, ill effects such as excessive salivation, poor growth and tainted milk can result. In Kerala, Erythrina leaves that are palatable and nutritious are widely used for goat feeding.

## **Other forages**

**Jack** A traditional fruit crop of the homesteads in Kerala, jack stands first among the non conventional forages recommended. The leaves are lopped and used as feed for goats. The animals relish the forage. However, the leaf contains appreciable amounts of tannin which may decrease the digestibility and crude protein - content and hence prolonged feeding should be avoided. In addition, the seeds and of the fruits are used locally as feed.

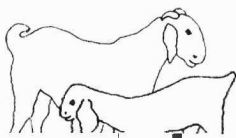
Other non conventional forages that are locally used as feed for goats include banana leaves, anjali fruits, coconut

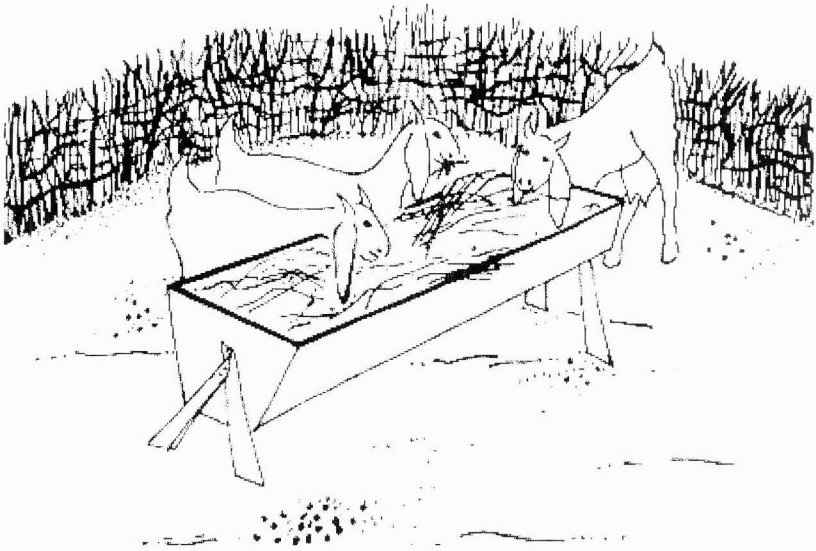


leaves, mango seed kernel, cashew apple and other grasses commonly referred to as weeds. The beauty of the feeding nature of goats is that they feed on almost everything they are given. They like variety in their diet and need plenty of fresh, clean fodder each day. Trees and shrubs, which normally represent poor quality roughage sources for cattle, because of their highly lignified stems and bitter taste, may be adequate in quality for goats. The goats may avoid eating the stems and do not mind the taste; they benefit from the relatively high levels of protein and cell solubles in the leaves of these plants. On the other hand, straw, which is of poor quality due to high cell wall and low protein, can be used by cattle but will not provide even maintenance needs for goats because goats utilize the cell wall even less. The ability to utilize browse species, which often have thorns and small leaves tucked among woody stems and an upright growth habit, is a unique characteristic of the goat compared to heavier, less agile ruminants. Goats have been observed to stand on their hind legs and stretch up to browse tree leaves or throw their bodies against saplings to bring the tops within reach. Goats are very active foragers, able to cover a wide area in search of scarce plant materials.

A homestead is complete with the inclusion of livestock components so that almost all the basic requirements of the family is met from within the farm. In this goats are the ideal choice as these animals are easily manageable by the farm women. Fodder cultivation ensures the partial fulfillment of the animal feed requirement and further the manure offers scope for organic recycling.

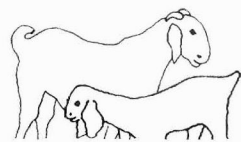
On an average goats require 3-4 kg green fodder/day.





### ***Kids feeding***

Kids should be fed with colostrum within half an hour after birth to ensure supply of antibodies for disease resistance. It should be continued for 3 to 4 days. In case of the death of dam, another doe's milk which has kidded more or less at the same time may be used to feed the kid. If this is not available, goats milk or cows milk fortified with Vitamin A (10,000I.U./ litre) may be given. After 4 days, the kids may be given whole milk at the rate of  $1/6^{\text{th}}$  of their body weight for first 30 days. The quantity of milk is distributed in 4 equal feedings. The quantity of milk fed to kids can be reduced to  $1/8^{\text{th}}$  of their body weight during the next 4 weeks. After this 4 weeks,  $1/10^{\text{th}}$  to  $1/15^{\text{th}}$  of the body weight during the third month. From 2<sup>nd</sup> month onwards an easily digestible concentrate mixture of high nutritive value (kid starter) with 20 percent digestible crude protein and 70 percent digestible nutrients may be fed to kids. As the kids start consuming the kid starter, the quantity of milk recommended above may be correspondingly reduced. Milk feeding can be completely stopped after the third month.



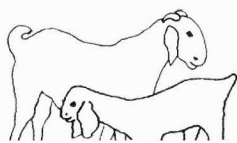


### ***Kid starter-1***

<b>Ingredients</b>	<b>Parts</b>
De-oiled cake	12
Horse gram	30
Wheat/Maize	30
Rice polish/ Wheat bran	15
Dried unsalted fish	10
Mineral mixture	1.5
Common salt	1.5
Vitamin AB <sub>2</sub> D <sub>3</sub>	25g/100 Kg of concentrate mixture

### ***Kid starter -2***

<b>Ingredients</b>	<b>Parts</b>
Gingelly oil cake	14
Soya bean meal	20
Horse gram	20
Rice polish/wheat bran	15
Wheat/maize	20
Dried unsalted fish	8
Mineral mixture	1.5
Salt	1.5
Vitamin A B <sub>2</sub> D <sub>3</sub>	25g/100kg of concentrate mixture

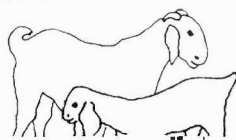


## Kids feeding



***Feeding schedule for kids of different age is given below***

Age of the kid	Approx.body wt(Kg)	Qty. of milk given (g)	Qty.of kid starter given(g)	Qty. of green fodder given(g)
Birth to 4 days	1.5- 2.0	Colostrum	-	-
5- 30 days	2.0 -3.0	300-500	Small qty	Small qty
30- 60 days	3.0- 5.0	400-500	50-100	Small qty
60-90 days	5.0-7.5	350-400	100-150	250-500
90-120 days	7.5-10.0	-	200-250	500-750
5 <sup>th</sup> & 6 <sup>th</sup> month	10.0-15.0	-	250-300	750-1000



## ***Adult goat feeding***

Goats consume more dry matter (up to 5 to 7%) when compared to other livestock. Almost the whole dry matter requirement of an adult non lactating goat can be met by the consumption of the grass and tree leaves. Adult goats can be maintained on good quality forage like jack leaves alone, if they can be fed adequate quantities of the same (3 to 4 kg). When roughage supply is less, some concentrates must be fed to goats for maintaining the adult stock.

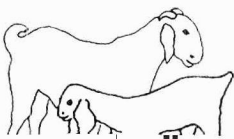
Adult goats can be fed with a mixture of oil cakes, brans and grains as concentrate part of the ration supplemented with salt and mineral mixture. Unconventional feeds such as dried tapioca leaves, rubber seed cake, tapioca starch waste can be incorporated in the concentrate mixture of goats. Mouldy and spoiled concentrates should not be fed to goats since they may lead to diseases due to fungal toxins.

## ***Feeding schedule of different categories of goats***

Category of goat	Approx. body wt. (Kg)	Concentrate (g)	Greenfodder (Kg)
Growing (6-12 months)	15-20	300-400	1-2
Adult goats	25-30	200-300	2-3
Breeding bucks	30- 40	400 -500	3-5

## ***Feeding of pregnant goats***

High quality roughages provide the basic nutrients needed during the last 6 to 8 weeks of gestation when 70 to 80% gain in foetal mass is made. Therefore, liberal



feeding of quality leguminous fodder and 400 to 500g concentrate having 25% protein should be offered depending upon the condition of doe. A free choice lick of mineral mixture will take care for the calcium and phosphorus requirement of dam and foetus. Allow good grazing if available and make sure that does get plenty of exercise.

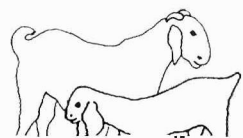
Several days before kidding reduce the quantum of concentrate ration to one half and add bran to provide more bulk. After kidding, feed a bran mash for a few days, gradually bringing the doe to the full feed for milk production.

### ***Feeding of lactating goats***

Nutrient requirements are higher during lactation. The ration for lactating does should contain high quality roughage. To supplement more nutrients particularly of energy, cereal grains at the rate of 350 g for each litre of milk must be provided. The protein percent may vary from 14 to 16 %, the feed may be fed in two lots, at the time of morning and evening milking.

Add 1% trace mineralized salt and 1% calcium phosphorus mineral mixture to concentrate mixture. Molasses (5-7% of concentrate mixture) may be used to increase palatability and to reduce dustiness of feed.

Keep a clean, fresh supply of water available at all times. After two weeks gradually increase the concentrate level to that suggested by milk yield. As soon as the doe leaves some concentrate, reduce the amount until she again cleans it up. The concentrate should be fed on individual requirement basis of each doe. This can be done most easily by feeding the concentrate at milking times.



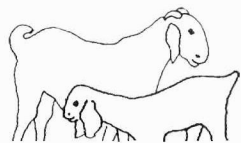


### ***Feeding of breeding bucks***

During the non-breeding season, the buck does not require additional grain if he is on good pasture. During the breeding season, the same concentrate mixture fed to the



does may be fed at the rate of 450-900 g (depending on the body weight) daily. Provide roughage free choice along with clean fresh water and minerals. Care must be taken not to allow the buck to get too fat. Reduce the intake of energy feeds as needed to prevent this. Make sure the buck gets plenty of exercise.

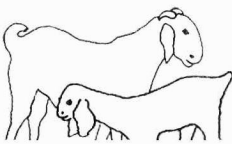


## Health of Goats

The goats in the herd should be closely watched and if there is any symptom of a disease, treatment is needed with the help of a Veterinarian. A healthy goat is an asset to the farm. Proper vaccination, dehorning and feed supplement results in a healthy goat and thus a healthy farm. Provide balanced diet as concentrates and green fodder. Feed mother's milk for new born kids as sufficient as possible.

### *Signs of a healthy goat*

1. Shiny coat.
2. Lively manner.
3. Easy movement (no limping, no swollen joints or misshapen udders).
4. No abscesses.
5. Proper conditioning (not fat or excessively thin).
6. Dropping of goat in firm pellets.
7. Well-shaped udder and teat.

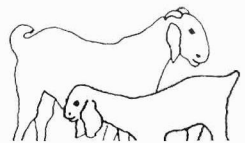


# Healthy goats



## Normal health parameters of goat

Species	Temperature	Pulse/ minute	Respiration/ minute	Rumen motility/ minute	Dung out put/day	Urine out put/day
Caprine (goat)	101.5-105 (103°F)	70 - 80	12 - 20	1 - 2	1.3 kg	0.5 -1.5 litres





## ***Management of goat against diseases***

1. Be alert on signs of illness such as reduced feed intake, fever, abnormal discharge from natural orifice unusual behavior.
2. Consult the nearest Veterinary aid centre for help if any illness is suspected.
3. Protect the animals against common diseases.
4. In case of outbreak of contagious diseases, immediately separate the sick animals from healthy ones and take necessary disease control measures.
5. Routinely examine the dung of adult animals to detect eggs of internal parasites and treat the animals with suitable deworming drugs.
6. Provide clean uncontaminated feed and water for minimizing the health disorders.
7. Care should be taken to reduce the external parasitic infestation. Regular dipping in malathion (5 to 10 ml/ litre of water) once in 2 months will help to remove ticks, lice and fleas.
8. Strictly follow the recommended vaccine schedule as given in vaccination Programme Section.
9. Keep some amount of essential medicines in the goat farm for emergency purpose to treat parasitic infection and wound dressing. Antiseptic lotions must be readily available to clean the goat shed.

## ***Common diseases found in goats***

### **1. Bloat**

The animal will show distended abdomen on left side, respiratory difficulty, and restlessness. Bloat can be prevented by not feeding too much leguminous grass. Oral administration of mineral oil can give some relief. In acute cases rumen puncture is needed to expel the gas formed in the stomach.



## **2. External parasites**

There will be restlessness, scratching, loss of weight and reduction in milk yield. Regular application of chemicals as dust or dip or spray can cure the external parasitic infestation.

## **3. Internal parasites.**

Affected goats will be anaemic, followed by reduction in body weight and milk yield. Diarrhoea is a common symptom. Regular deworming and supply of good quality food and water will cure the internal parasitic infestation.

## **4. Mastitis**

The udder of the affected goat will be enlarged, hot and painful. Milk from the teat will be watery and contain flakes of pus. The animal will be having fever. Improving the hygienic standards of the milker and goat shed can prevent mastitis. Treat the affected goats with proper antibiotics.

## **5. Foot rot**

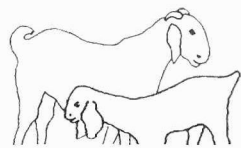
Hoof will be rotten along with bad smell. The animal cannot walk properly. Goat will show signs of pain, if pressed. Soaking the hoof in a bath of water containing copper sulphate solution and regular hoof trimming will improve the condition.

## **6. Poisoning**

The movement of the animal will be unsteady followed by dullness and unconsciousness. The animal will also exhibit signs of pain, vomiting, and convulsions. In severe condition there will be death of animal. Keep goats away from poisonous plants and chemicals. Give immediate antidote treatment.

## **7.Abortion**

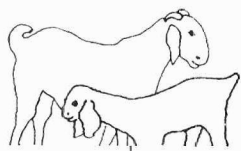
Abortion due to brucellosis is common in goats. It is



observed in late pregnancy. Retention of placenta and metritis is associated with brucella abortion in does. In bucks, infertility, orchitis and swollen joints are seen. Isolate of the infected animals from rest of the herd. Blood test should be conducted to identify affected animals and positive animals should be culled from the herd.

### Vaccination schedule for goats

Name of disease	Adult Goat dose	Kids (above dose 6 months)	Remarks
Contagious Caprine pleuro pneumonia (C.C.P.P.)	0.2 ml I/dermal	0.2 ml I/dermal	Once in a year
Hemorrhagic Septicemia	5 ml S/c	2.5 ml S/c	Annually before the onset of rain
F.M.D.	5 ml s/c	0.5 ml S/c	At an interval of 6months
Enterotoxaemia	5 ml S/c	2.5 ml s/c	Once in a year



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## Reproduction in goats

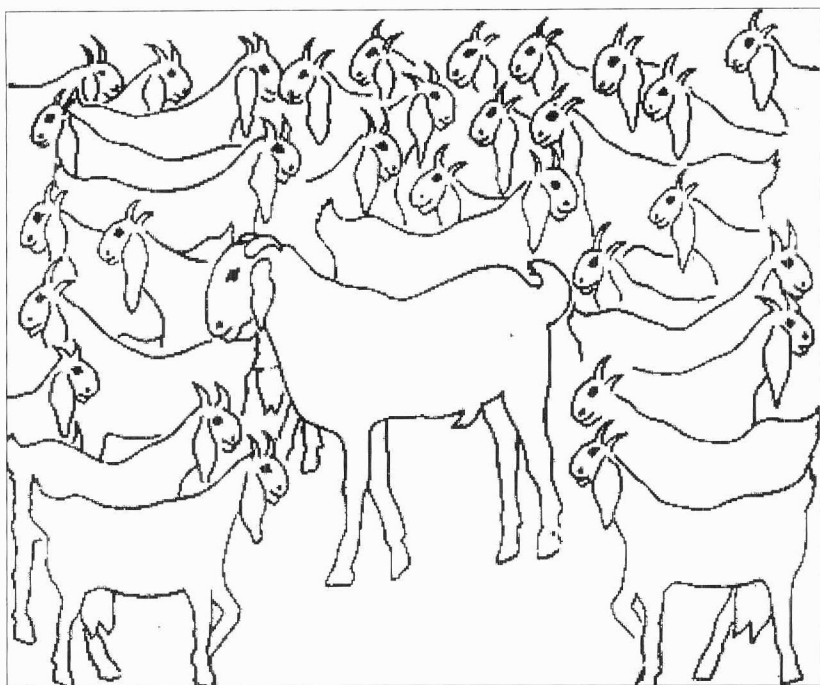
### *General breeding management*

1. It should be planned to obtain 3 kidding in 2 years period by adopting optimal management conditions.
2. For every 25 does, one buck should be provided in one breeding season.
3. Breed the animals one day after the onset of the first symptoms of heat for maximum conception.
4. Mating should be so timed that, the kids are born in a season where adequate amount of feed is available for nourishment and growth.
5. Does should be bred after 45 days of kidding.
6. Infertile does must be examined and treated. If it is not responding to fertility treatment, cull it and replace a new doe in the herd.

### *Signs of heat*

1. Wagging the tail. The frequency of tail movement increases in the presence of males.
2. Frequent bleating, more so when the doe is alone.
3. Excitement or restlessness.
4. Lack of interest in food.



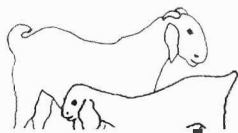


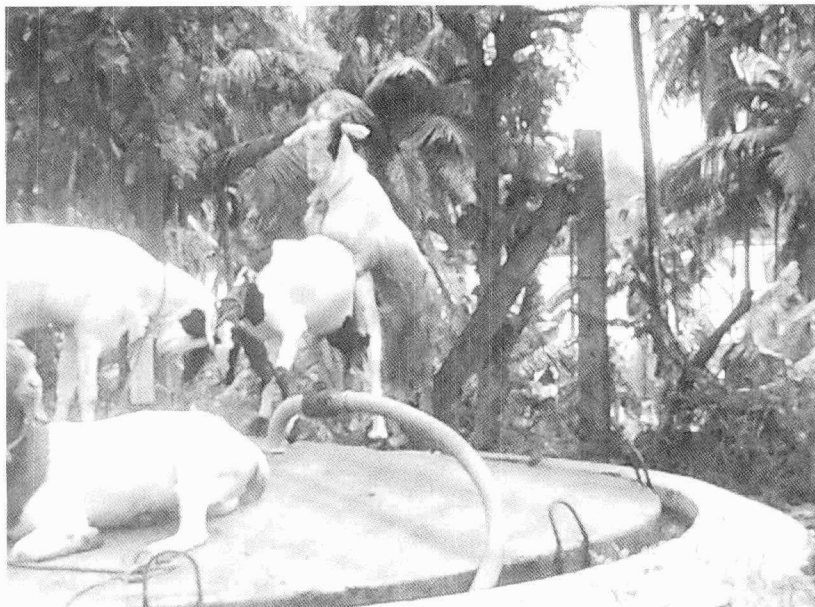
***One buck for every 25 does***

5. Drop in milk yield.
6. Vulva becomes swollen and oedematous.
7. Clear discharge from the vulva.
8. It remains close to the buck and allows mounting.
9. It mounts on other goats and allows to be mounted by others.

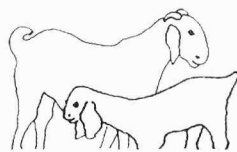
### ***Buck used for breeding purpose***

A young buck may be selected based on the production performance of its dam or its sisters. Their yield must be 1.5kg /day. Bucks should be masculine and virile with straight legs and long feet. Preference may be given to the one in the twins or triplets. Buck must possess good libido and good semen quality. While selecting male goats for meat purpose, weight at 6 months should not be less than 12 kg. The buck attains puberty in 5 to 7 months, but it should be put into service only when it is 10 to 12 months of age.





The goat attains maturity in between 7 months to 1 year. Mating can be performed in between 8 and 12 months. The approximate body weight at the time of breeding must range in between 18 – 20 kg. The duration oestrus cycle is 18 to 21 days. Duration of heat lasts for 14 to 48 hours. Best time for breeding is 24 hours after the onset of heat. Age at first kidding must be in between 13 to 17 months. Ideal kidding rate is 3 kidding in 24 months, even though the gestation period is 5 months. The ideal service period for the doe is 45 days and dry period is 30 days. Mating between the close relatives should be avoided. It is seen that progeny from such mating will have poor growth rate and low fertility rate.



## **Pregnancy and parturition in goats**

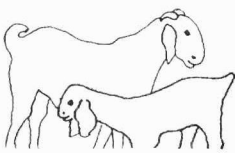
The gestation period of goat is 5 months (145 to 156 days) and average kids per kidding are 1.6. In this period special attention must be given in care, management and nutrition of goats.

### ***Care of goats during pregnancy***

In advanced stage of pregnancy the does must be transferred either to a kidding pen or a separately earmarked space for kidding within the main shed after thoroughly disinfecting it. The floor must be dry with sufficient bedding. Kidding pen should be quiet and free from disturbances. The doe should be under close observation. Provide adequate nutrition, easily digestible and laxative diet. Do not allow the pregnant goats to fight with each other and mix with recently aborted animals. Shortly before the doe is due, clip hair around the udder, hind quarters and tail for more cleanliness.

### ***Signs of approaching parturition***

We can observe sharp hollows at the flank region on both sides and raising the base of the tail. There will be restlessness, pawing at the bedding provided, bleating, rapid filling of the udder, add udder turning pink and shiny before



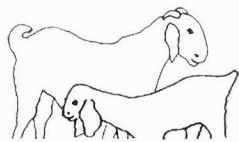
kidding. The vulva will become oedematous and enlarged with mucus discharge.

### ***Stages of kidding***

1. *Stage of uterine contraction.* It will last for 1 to 6 hours. During this period the doe becomes anxious and restless with heavy breathing. It will frequently get up and lies down, looks at the flank and paws at bedding. Slight and thick vaginal discharge is also observed.
2. *Stage of expulsion of the foetus.* The duration of this stage lasts for  $\frac{1}{2}$  to  $1\frac{1}{2}$  hour. In this stage the first water bag breaks and fluid comes out. Animal shows forceful abdominal contractions. Foetal body parts appear at the vulva and kidding takes place. This process repeats, when there are more kids. Care should be taken to prevent the wedging of rear quarters against the wall or corners. If the kids are not born within two hours after the onset of second stage, Veterinary medical care must be sought.
3. *Stage of expulsion of the placenta.* The duration of this stage is between 2 to 6 hours. In this stage placenta will get expelled. Do not allow the hanging placenta to twist around the legs or body of the dam. Care should be taken not to allow eating of placenta by the dam. If the placenta is not expelled within 12 hours, Veterinary aid should be sought. After kidding, the does should be provided with warm bran mash for two days.

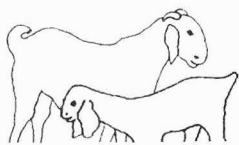
### ***Care of kids at the time of birth***

1. Take care of new born kids by providing guard rails.
2. Treat / disinfect the naval cord with tincture iodine by immersing the end portion/ cut portion of the umbilical cord and repeat it after 12 hours .
3. Protect the kids from extreme weather conditions, particularly during the first two months.





4. Clean the nostrils and remove the placental membranes sticking to the kid by rubbing with a clean towel.
5. In order to clear the respiratory tract, hold the kid upside down by holding its hindlimbs for a few seconds.
6. Allow the doe to lick its kids.
7. Kid should drink the colostrum within half an hour after birth.
8. If the kids are not sucking milk, we should help the kids to suck milk from the dam's teat by holding the dam's teat to the kid's mouth.



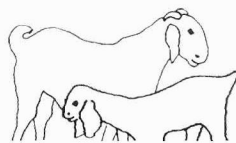
## **Management of kids, milch goats and its marketing**

### ***General management of kids***

1. Vaccinate the kids as per the recommended schedule.
2. Wean the kids at the age of 8-12 weeks. This will allow the doe to gain weight before her next kidding. You do not want a doe to be in poor condition when her next kids are born because of her reduced milk production and there is a possibility of kids being born weak.
3. Proper selection of kids on the basis of initial body weight and weaning weight should be initiated by maintaining appropriate records for replacing the culled adult stock as breeders.
4. Diarrhoea is a common problem in kids. You need to be able to identify the cause of the diarrhoea in order to administer the proper treatment.

### ***Care of milking goats***

The lactating doe must be kept away from the buck. Bruising of the teats and udder of goat should be avoided. Generally goats are milked twice in a day. Prepare the goat for milking by washing the udder with luke warm water and keep it dry with clothing.



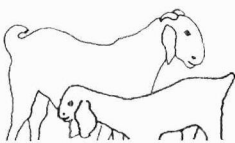


### **Healthy Kids**

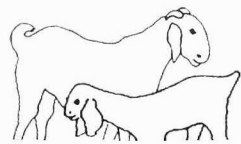
To prevent injury to the udder, first close the thumb and first finger, then close the second finger followed by the third finger. Use a steady pressure. Finally close the little finger and squeeze with the entire hand until the milk is drawn. Now release the pressure on the teat and open the finger so that the teat can refill. Repeat the process until very little milk comes out. Both the hands can be simultaneously used for milking. Immediately after milking, remove the milk from the shed, sieve it through a strainer and cool.

### **Marketing**

The marketable products of goat farming include the fattened kids, manure, culled animals. Marketing avenues for the above products are slaughter houses



and individual meat consuming customers and Agriculture farms. Therefore availability of either slaughtering facilities or traders who will purchase live animals should be ensured to convert the fatteners into wholesome meat and meat products. Further, demand for manure from nearby Agriculture farms must also be ensured.



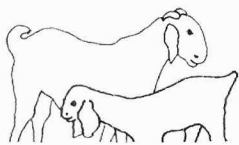
## **Guide lines for goat scheme formulation**

For goat rearing schemes with very large outlays, detailed reports will have to be prepared. The items of finance would include costs of assets like development of land, construction of goats sheds, purchase of goat caring equipments, purchase of breeding stock, rearing cost of animals till it generates income etc. The cost of land is not considered for loan. However, if land is purchased for setting up a goat farm its cost can be treated as party's margin as per the norms.

### ***Scheme formulation***

A scheme can be prepared by a beneficiary after consulting local technical persons of State Animal Husbandry Department, commercial farmers etc. If possible the beneficiaries should read and collect available literature on goat rearing. Gain practical knowledge from progressive goat farmers, government/Agricultural University farms in the vicinity and discuss the profitability of goat rearing. A good practical training and experience in goat rearing will be highly desirable. Nearness of the goat farm to a Veterinary aid centre and breeding centre should be ensured.

The scheme should include information about land, livestock markets, availability of water, feed, fodders,



Veterinary aid, breeding facilities, marketing aspects, training facilities, experience of the farmer and the type of assistance available from State Government. The scheme should also include information on number and types of animals to be purchased, their breeds, production performance, cost and other relevant input and output costs with their description. Based on this, the total cost of the project, margin money to be provided by the beneficiary, requirement of the bank loan, estimated annual expenditure, income, profit and loss statement, repayment period etc, can be worked out and included in the scheme.

### ***Technical feasibility of the scheme***

- 1) Nearness of the selected area to Veterinary dispensary, goat breeding centre, marketing outlets for fattened kids/meat and the financing bank's branch.
- 2) Availability of good quality animals in nearby livestock markets.
- 3) Availability of training facilities.
- 4) Availability of good grazing ground/lands.
- 5) Availability of green/dry fodder, concentrate feed, medicines etc.
- 6) Availability of Veterinary aid/breeding centers and marketing facilities near the same area.

### ***Economic viability of the scheme briefly include***

- 1) Unit cost of animals.
- 2) Input cost for feeds and fodders, Veterinary aid, insurance charges, etc.
- 3) Output costs i.e. sale price of live animals, manure/penning charges, etc.
- 4) The average unit cost (indicative only) of goat rearing units is assumed for calculating project cost.
- 5) Income-expenditure statement and annual gross surplus.



- 6) Cash flow analysis.
- 7) Repayment schedule (i.e. repayment of principal loan amount and interest).

### ***Sanction of bank loan***

After ensuring technical feasibility and financial viability, the scheme is sanctioned by the Bank. The loan is disbursed in stages against creation of specific assets, purchase of equipments and animals. The end use of the loan is verified and constant follow-up is done by the bank.

### ***Repayment of bank loan***

Repayment period depends upon the gross surplus in the scheme. The loans will be repaid in suitable half yearly/ annual installments usually within a period of about 5-6 years with a grace period of one year.

### ***Insurance***

The animals may be insured annually or on long term master policy, where ever it is applicable. The present rate of insurance premium for non IRDP schemes is 4% per annum. Goats can be insured from 4 months of age through General Insurance companies. Insurance can be claimed if death occurs due to accident or diseases.

