

A Comprehensive Approach of Scientific Goat Production and Management in North Eastern Hill Region of India

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Introduction

Goats are one of the earliest discoveries of mankind in prehistoric times as the ready and easy source of meat. Goats play a significant role in the economy and nutrition of landless, small and marginal farmers in the country. Goat rearing is a traditional occupation of small, marginal farmers and landless labourers in hilly and mountain regions of the country. It is an integral component of hill agriculture and suitable for poor resource farmers in the region due to effective utilization of exiting high biomass, low input and minimum management care needed with a high market value. Goat meat is widely accepted and has a good market share. The North Eastern (NE) region is one of the meat consuming zones of the country where demand for goat meat is very high with a huge gap between production and supply. The total goat population in the entire NE region is 15.28 million, which is 11% of the total population of India. Goats can efficiently survive on available shrubs and trees in an adverse, harsh environment in low fertility lands where no other crop can be grown. In pastoral and agricultural subsistence societies in India, goats are kept as a source of additional income and as an insurance against disaster. Goat meat is also being used in ceremonial feastings.

Socio-economic importance of goat rearing

- In India, goats provide a dependable source of income to 40% of the rural population below the poverty line.
- In spite of annual slaughter of about 42% goats, the population continues to increase at an average rate of about 3.4% per year.
- Due to small body size and docile nature of the animal, lesser housing requirements and managemental problems, the initial investment needed for goat farming is low.
- Goats are prolific breeders and achieve sexual maturity at the age of 10-12 months with a short gestation period (5 months). Twinning (37%) and triplets (5%) are very common in the goats found in this area.
- In drought prone areas, risk of goat farming is very much less as compared to other livestock species, and unlike large animals, in commercial farm conditions both male and female goats have equal values. Goats are 2.5 times more economical than sheep on free-range grazing under semi-arid conditions.
- 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 other livestock and human consumption.
- Under proper management, goats can improve and maintain grazing land and reduce bush encroachment (biological control) without causing harm to the environment.
- No religious taboo against goat slaughter and meat consumption is prevalent in the country.
- Slaughter and dressing operations and meat disposal can be carried out without many environmental problems.
- The goat meat (chevon) is leaner with low fat and cholesterol; therefore, it is relatively better for people who prefer low-energy diet.
- Goat milk is easy to digest than cow milk due to its smaller fat globules and as it is naturally homogenized, which plays a role in improving appetite and digestive efficiency. Goat milk is non-allergic as compared to cow milk and it has anti-fungal and antibacterial properties, and can be used for treating urogenital diseases of fungal origin.

• Goat creates employment to the rural poor besides effectively utilizing 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.

Characteristics of a healthy goat

Before you buy your goats, it is important to ensure that they are healthy. Goats are inquisitive animals and a healthy goat will usually come up near you whereas a sick goat may hang back and be disinterested. You may also find the following checklist helpful:

- Ears should be erect (except in some breeds whose ears naturally drooping).
- The eyes should be clear and free of discharge and the conjunctiva (the membranes around the edges of the eye) should be a healthy pink colour.
- The coat should be clean and glossy and you should look out for areas of hair loss or scab formation as this may indicate a parasitic problem.
- Check the rear end for any evidence of diarrhoea.

Common Management Practices for Goat Rearing

Livestock management as science has achieved far less recognition than other disciplines of production. The science and art of goat management like any livestock management incorporates the management of breeding behaviour and reproduction, feeding habits and feeding, disease surveillance and prevention, perinatal prudence of does and neonatal kid care, besides management of personnel shelter and other infrastructures at the farm complex. Modern and wellestablished scientific principles, practices and skills should be used to obtain maximum economic benefits from goat rearing. Some of the recommended practices are given here:

Sheds and their management

Housing instinct is widely prevalent in the animal kingdom and goats are no exception. Construct shed on a dry and properly raised ground and avoid water-logging, marshy areas.

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- Orientation of sheds with long axis running east-west provides a cooler environment underneath than the one with north-south orientation. North-south orientation keeps the shed dry and promotes sanitation as sun rays falling directly inside for a longer time
- In low-lying and heavy rainfall areas, the floors should be preferably elevated and made up of wood.
- The shed should be 10 ft. high and should have good ventilation.
- Bucks should be housed in individual pens.
- Does can be housed in groups up to 60 per pen.
- Proper Disposal of dung and urine should be ensured.
- Avoid over-stocking or crowding.

Feeding management

- Goats are ruminants and have four compartments in the stomach, the largest being the rumen. They feed for much of the day and spend periods of rest regurgitating food to chew it further and swallowing again as part of a process called rumination.
- Goats are browsing animals and eat a varied diet of grass, weeds, shrubs, branches and hedgerow. If fenced in a grass paddock, you can bring branches and (non-poisonous) hedge trimmings for your goats to allow them to continue to display their natural behaviour. This type of diet must be balanced, particularly in the winter months, with good quality hay, straw and either a commercial pellet feed, both of which should contain vitamins and minerals.
- In addition to long fibrous food, such as hay, you can also feed your goats cereals such as wheat, barley or oats, but such a diet will need to be balanced with vitamin and mineral supplements. However, it can lead to dietary upset, if fed in excess or introduced suddenly.
- Ensure bushes/shrubs for browsing OR supply cultivated fodder from your own farm or from surrounding farms.

- As a thumb rule, 2/3rds of the energy requirements of goats should be met through roughages. Half of the roughages should be leguminous green fodders and the rest half should be grasses/tender tree leaves.
- In the absence of good quality green fodders, concentrates must be considered to replace them.
- Kids should be fed colostrum up to 5 days of age. Later on, they can be put on Kid starter rations.
- Green leguminous fodders should be offered *ad lib* to kids from 15 days onwards.
- Provide salt and water to kids at all times
- Additional concentrates should be given to bucks and does during the breeding season.

Important tips

- The energetic grazing behavior of goats should be exploited by allowing them to acquire most of the needed dry matter through free-range vegetation and green fodders.
- A balanced diet for stall-fed goats normally contains dry matter through concentrates, dry fodders and green fodders in the ratio of 1:1:1.
- Goats relish leguminous cultivated fodders like lobia, berseem and Lucerne, and nonleguminous fodders can also be fed in the ratio of 1:1.
- Goats in the later part of pregnancy, the peak of location or during active growth would essentially require supplementary feeding of concentrate @1 to 2% of their body weights depending upon the stage of production.
- The concentrate mixture should be formulated with alternative cheaper ingredients incorporating agro-forest by-products and organic wastes, where applicable, avoiding any compromise in respect of DCP and TDN.

SELECTION AND MANAGEMENT OF BREEDING STOCK

- In order to achieve high efficiency of reproduction, the management has to ensure heat detection, preferably twice daily (morning and evening) during the entire breeding season.
- Breeding should be done at 12 hours intervals twice.
- Animals in good health and having good physical features, ready to breed and in prime stage of production must be purchased.
- Vaccinate the newly purchased animals against the diseases.
- Keep the newly purchased animals under observation for about 15 days and then mix with the general flock.
- Unproductive animals should be culled promptly and should be replaced by the newly purchased animals or farm-born one.
- Animals are to be bred at the interval of 8-9 months for maximum productivity
- Cull the old animals at the age of 6 years and above.
- Avoid kidding during peak periods of winter.

Reproductive physiology of goats

- It should be planned to obtain 3 kidding in 2 years by adopting optimal management conditions with a kidding interval of 8 months.
- Puberty in female goats is denoted by the age at which the growing kids show first oestrus behaviour, depending upon the breed, management, level of nutrition, etc.
- Small and dwarf breeds attain puberty as early as 150 days in an optimum environment with a body weight of 9 to 20 kg.

• To gain the maximum reproductive life span, breeding should be done at 2nd or 3rd oestrus.

Estrous cycle profile

- Length of oestrous cycle in goat is 21 days.
- The symptoms of oestrus are more conspicuous than that of sheep. In both, a teaser is needed for detection of heat. In oestrus, both are restless with oedematous vulva and discharge. Homosexual mounting is also observed in goats.
- Estrous goat bleats and wags her tail constantly.
- Breed the animals 12 hours after the onset of the first symptoms of heat for maximum rate of conception.
- For every 25 does, one buck should be provided in one breeding season.
- Anoestrous animals must be examined thoroughly as directed by a qualified veterinary doctor for prompt elimination of the causes of anoestrus or cull them if, necessary.

Care of Goats during pregnancy

The gestation period in goat is around 5 months. In the advanced stage of pregnancy, the does must get proper care for pregnancy toxaemia in twinning, and transferred to either kidding pens or a separately earmarked space for kidding within the main shed after thoroughly disinfecting it. After kidding, the does should be provided with warm bran mash for two days. If there is retention of fetal membranes up to 8 hours post-kidding, consult your nearby veterinary doctor.

Neonatal Care

- The attending staff has to ensure feeding of colostrum within 10 30 minutes after kidding.
- Should help the neonate to promote the first act of breathing by rubbing the chest.

- Treat/disinfect the naval cord with a tincture of iodine as soon as it is cut with a sharp knife.
- Within the multiple births, special attention should be given to the weaker kids, particularly at the time of suckling.
- It is good to clean the udder with potassium permanganate (KMnO₄) solution each time prior to suckling.
- It becomes essential to detect and isolate the kids suffering from diarrhea or other ailments, and to place the cases under veterinarian care.
- Healthy kids become playful within 72 hours, and require soft bedding and clean grazy paddocks.
- Protect the kids from extreme weather conditions, particularly during the first two months.
- Dehorn the kids during the first two weeks of age and the male kids should be castrated for better quality meat production.
- Vaccinate the kids as per the recommended schedule.
- Wean (separate from their mothers) the kids at the age of 8 weeks.
- For replacing the culled adult stock as breeders, proper selection of kids on the basis of initial body weight and weaning weight should be initiated by maintaining appropriate records.
- Additional feed requirements of lactating does must be ensured for proper nursing of all the kids born.

HEALTHCARE MANAGEMENT

• The recommended vaccine schedule as given in the table below should be followed **Vaccination schedule for goats**

Months	Vaccine	Adult Goat	Kids (above 6 months)
January	Contagious pleuro pneumonia (C.C.P.P.)	0.2 ml I/dermal	0.2 ml I/dermal
March	Hemorrhagic Septicemia	5 ml S/c	2.5 ml S/c
April	Goat Pox	Scratch Method	Scratch Method
May	Entero toxaemia F.M.D.	5 ml S/c 5 ml S/c	2.5 ml S/c 5 ml S/c
June	Rinderpest	1 ml S/c	1 ml s/c
July	Black Quarter	5 ml s/c	2.5 ml s/c
August	F.M.D.	5 ml s/c	0.5 ml S/c
September	Enterotoxaemia	5 ml S/c	2.5 ml S/c

- Provide clean and uncontaminated feed and water for minimizing the health disorders
- Deworm the animals regularly
- Examine the faeces of adult animals to detect eggs of internal parasites and treat the animals with suitable drugs, if found infected.
- In case of an outbreak of contagious diseases, immediately segregate the sick animals from healthy ones and take necessary disease control measures.
- Consult the nearest veterinary aid center for help, if illness is suspected.

COMMON HEALTH PROBLEMS

1. Worms are a common and potentially serious problem in goats, particularly those with limited grazing. Signs include severe diarrhoea, rapid weight loss, dehydration and kidney failure; one worm (*Haemonchus contortus*) causes severe anaemia as the parasite sucks blood from the stomach wall. Most of the worms that cause problems in goats are shared with sheep. Unlike sheep, however, goats do not become immune, and can remain susceptible throughout their lives. You will need to discuss a control strategy with your veterinarian.

- 2. Clostridial diseases the bacteria that cause this condition are part of the normal gut flora, and can only cause problems, if a gut upset triggers overgrowth resulting toxin production. Signs include profuse diarrhoea often with blood and mucus, and in severe cases, goats can be found dead with no previous signs of illness. Control is based on vaccination, with six-monthly booster doses recommended. You should also avoid any sudden diet change that may upset the gut bacteria.
- 3. Skin disease goats are susceptible to a wide range of skin diseases including lice, mange, ringworm and orf infections. Treatment and control rely on early recognition, and quick confirmation of the cause to ensure that suitable treatment can be given. Some of these conditions may be picked up by anyone handling the affected goat.
- 4. Zoonoses—these diseases that can be picked up by humans in close contact with animals such as goats. Goats with skin problems can transmit ringworm, orf or mange to humans in contact. Young kids with diarrhoea may have a parasite called *Cryptosporidium* that can potentially cause diarrhoea in people, particularly young children. Other infections, such as *Escherichia coli* O157, can cause serious illness in humans and may be carried by healthy goats. The golden rule is to ensure that anyone handling goats is aware of the need to wash their hands before eating or drinking. If you are milking your goat, be aware of the risk of drinking milk that could potentially be harbouring micro-organisms. These bugs are normally destroyed in milk sold in shops by the process of pasteurisation.

Conclusion

The goat producers are advised to adopt improved breeding bucks at a lower cost. Another major bottleneck in the implementation of scientific goat husbandry is in terms of lack of balance ration and medicines in the remote villages of this region.

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