TRENDS IN AGRICULTURE SCIENCE
ISSN:2583-7850

Popular Article
Domain: Agriculture Science
Vol 4 Issue 12, December 2025, 6086-6094

Integrated Goat Production Systems in India: Breeds and Management Practices

R.K. Deepikarani, N.S. Nidhishree , Irusappan Ilayaraja and Anil Chitra
Animal Genetics and Breeding Division, ICAR-NDRI, Karnal
DOI:10.5281/TrendsinAgri.18156514

Introduction:

Goat production plays a crucial role in the livestock sector of many developing countries, particularly in India, where goats contribute significantly to food security, rural livelihoods, and socioeconomic stability of smallholder and marginal farmers. Owing to their remarkable adaptability to diverse agro-climatic conditions, low input requirements, and ability to thrive under extensive and semi-intensive production systems, goats are often referred to as the "poor man's cow." They provide a steady source of meat, milk, fibre, and manure, while also serving as a valuable asset during periods of economic distress.

Management of Goat:

1. Housing management:

Main aim of housing is to protect animals from harsh, inclement weather such as rains, excessive heat during summer and cold during winter in addition to protection from predator attacks.

Creating an environment suitable for the animal's physiological and to modify the physical surroundings of the animals form their environment. It could be micro environment which immediately surrounds the animal or macro environment which is broader area in which animal inhabits. Climate is the unique combination of various metrological components which includes temperature, humidity, precipitation, winds and sunlight. Proper combination of all these components is necessary to provide needed comfort to animals.

Separate goat/sheep housing arrangements for different categories of animal-like growers, adult females, breeding males, etc. are required in order to ensure proper care and management as per requirement.

The type of goat house to be selected varies with:

1. Goat Farming System

2. Size of herd
3. Resources available.

Goat houses may be built using cheap materials, which are locally available. Different groups of goats have special housing requirements *viz.* Breeding males, Pregnant Does in the last stage, Goat kids, Sick goats.

Recommended specifications:

1. Permanent Housing: 1.5 m2 (1.22 x 1.22 m) per goat with an exercise yard and space for feed and water troughs
2. Night Housing: 1.0 m2 (1 x 1 m) per goat 3. Kidding pen: 3.0 m2 (1.73 x 1.73 m) per doe

The animals' sheds should be located on a well-drained area, a floor 1-1.5 ft above the ground, area should not be prone to waterlogging or prone to flooding, soil has to be fertile, Sandy loam, to keep surroundings clean, avoid cracks and grow green fodder along with an appropriate flock development plan has to be made to anticipate future construction needs.

The orientation of the shed is an important factor depending on the climate. In dry arid region (north Indian conditions) one can prevent the entry of sunlight inside the shed for preventing heating up of stall too much by placing the longitudinal axis of the goat shed east–west. In humid and high rainfall area, to keep floor of the shed dry and disease free, construct goat shed with long axis in north– south direction for allowing of sunlight to enter inside the shed sufficiently to keep the house warm and dry.

Houses should be well ventilated with free access of sunlight particularly during winter. The purpose of ventilation is to provide the desired amount of fresh air, without drafts, to all parts of the shelter; to maintain temperatures within desired limits (25 to 30°C); and to maintain ammonia levels below specified levels. It is, therefore, necessary to make the shed sufficiently high and with openings for ventilation in the roof or walls. Height of roof of the goat shed should be 3 m at the periphery and 3.5 m at the center for proper ventilation. Height of roof for ewe should be 2.5 m at the periphery and height at ridge should be 3.5 m.

The roof provides protection from sun and rain and can be of gable or modified gable style. "A" type of roof is ideal for arid region. The roof should be light, waterproof with sufficient overhang to prevent rain from blowing in with 12 feet height being ideal for roof construction, 8-9 feet height at the sides for the double slope type and 3 feet overhang on both the sides is recommended. GI sheet, asbestos, earthen tiles, grass/bushes, wood depending on production system, material availability and climate can be used as roofing materials.
Thatched roof is best suited one due to cheaper cost and durability and requires a greater slope than iron sheeting which is beneficial in areas with high rainfall.

The floor could either be packed earth, concrete or slatted. Packed earth or concrete floors should have a slope of about 5% for good drainage. Pucca floor is most recommended from hygienic point of view. Breeding and dry stock can be maintained with some bedding material on pucca floor. Raised platforms where goats can lie above the floor and away from manure and urine are beneficial. Slatted floors should be raised about 1-1.5 meters above ground for easy cleaning and collecting of dung and urine with the gap between the slats being 1.4 to 1.6 cm to allow easy passage of fecal material and safe footing for the animals. Newborn and young should not be put on slatted floors. The flooring may be either of moorum or of strong wooden battens and, where the rainfall is quite heavy in which the width of each plank shall vary from 7.5 to 10.0 cm and the thickness between 2.5 cm and 4.0 cm along with the sides of the planks being well rounded and the clearance between two planks shall range between 1.0 cm and1.5 cm to facilitate the disposal of dung and urine. Rearing can also be done in mud floor where 1-2 inches of the mud surface should be removed once in a year and application of lime powder once in a month will reduce the disease occurrence in the shed.

2. Feeding Management

In the Indian context, feeding management of goats is predominantly shaped by smallholder and landless farming systems where goats are reared under extensive or semi-intensive conditions using locally available and low-cost feed resources. Goats mainly depend on grazing and browsing on community lands, fallow fields, forest fringes, and roadside vegetation, efficiently utilizing a wide variety of grasses, shrubs, weeds, and tree leaves.

Crop residues such as paddy straw, wheat bhusa, sorghum and maize stovers, and groundnut haulms form an important component of the diet, especially during the dry and winter seasons, though their low nutritive value necessitates supplementation. Green fodders like Napier, Guinea grass, anjan grass, berseem, lucerne, cowpea, and stylo are provided wherever fodder cultivation is possible, while tree fodders such as subabul, neem, ber, banyan, peepal, sesbania, and prosopis play a crucial role in meeting protein and mineral requirements, particularly during fodder scarcity. Concentrate feeding is practiced selectively for nutritionally demanding categories such as late-pregnant does, lactating does, growing kids, and breeding bucks, using regionally available ingredients like maize, broken rice, barley, oil cakes, wheat bran, rice bran, mineral mixture, and common salt. Special emphasis is placed on the last 6–8 weeks of pregnancy and early lactation, when nutrient requirements increase sharply, to prevent pregnancy toxemia, improve milk yield, and enhance kid survival and growth.

Seasonal variations strongly influence feeding practices, with reliance on tree leaves, hay, and conserved fodder during summer, abundant but parasite-risk grazing during

monsoon, and greater use of crop residues in winter, along with strategic supplementation throughout the year. Adequate supply of clean drinking water and regular mineral supplementation are essential components of feeding management.

3. Breeding management

In the Indian scenario, where goats are mostly reared under extensive and semi-intensive systems, effective breeding management plays a crucial role in improving kidding rate, reducing mortality, and enhancing farmer income.

Breeding management begins with the selection of breeding stock. Does should be healthy, free from hereditary defects, have good body conformation, regular estrus cycles, and a history of good mothering ability. Bucks are more important genetically and should be selected from high-performing dams, possess strong libido, good body size, sound legs, and well-developed testes. Use of inferior or diseased bucks should be strictly avoided. The following factors are considered:

a. Age and body weight at breeding: Although goats attain puberty at about 6–8 months of age, breeding should be done only when does reach around 60–70% of their adult body weight, usually at 10–12 months of age, to avoid poor conception and weak kids. Bucks are generally used for breeding after 12 months of age.

b. Estrus detection and breeding timing: These are essential for successful conception. Goats have an estrus cycle of about 21 days, with estrus lasting 24–48 hours. Common signs include restlessness, tail wagging, bleating, swollen vulva, and clear mucous discharge. Mating is ideally carried out 12–18 hours after the onset of heat to ensure higher conception rates.

c. Mating systems: Natural service is the most common method and artificial insemination (AI), which is gradually gaining importance. Under natural mating, a buck-to-doe ratio of 1:25–30 is recommended, and controlled mating is preferred over uncontrolled grazing to prevent indiscriminate breeding and inbreeding. AI, though limited due to semen availability and infrastructure, is useful for rapid genetic improvement, disease control, and conservation of superior germplasm.

d. Breeding season management: Although goats are capable of breeding throughout the year, higher conception rates are observed during cooler months. Planned breeding helps achieve synchronized kidding, better kid survival, and efficient utilization of feed resources.

e. Pregnancy management: This includes proper nutrition, stress avoidance, and health care of pregnant does. Pregnancy diagnosis using ultrasonography or abdominal

palpation helps identify pregnant and non-pregnant animals early. Adequate care during the last trimester is crucial, as this period accounts for maximum fetal growth.

f. Prevention of inbreeding: It is vital for maintaining herd productivity. Regular replacement of breeding bucks, use of community buck systems, proper identification, and maintenance of breeding records help minimize inbreeding depression.

g. Record keeping and culling: Maintaining records of breeding dates, kidding, litter size, and performance helps in selection decisions. Infertile, repeat-breeder, or low-producing animals should be culled in a timely manner.

Recent advances in goat breeding management include the use of ultrasonography for early pregnancy diagnosis, estrus synchronization protocols, marker-assisted and genomic selection for traits like growth, milk yield, and disease resistance, and mobile-based record-keeping and advisory systems for farmers. Community-based breeding programs and conservation of indigenous goat breeds are also gaining importance in India.

4. Health Management

Health management of goats is a critical component of goat production, aimed at preventing diseases, reducing mortality, and ensuring optimum growth, reproduction, and productivity. In a developing country like India, effective health management focuses mainly on preventive measures, as most goat rearing is practiced under extensive or semi-intensive systems where disease risk is high.

Health management begins with housing hygiene and biosecurity, including clean, dry, and well-ventilated sheds, proper drainage, regular removal of dung, and protection from extreme weather conditions. Newly purchased or sick animals should be quarantined for 2–3 weeks to prevent the introduction and spread of diseases. Proper sanitation of feeders, water troughs, and equipment is essential to reduce infection load.

Disease prevention through vaccination is a key aspect of goat health management in India. Goats are commonly vaccinated against major infectious diseases such as Peste des Petits Ruminants (PPR), Foot and Mouth Disease (FMD), Enterotoxaemia (ET), Goat pox, and Haemorrhagic septicaemia (HS), following state or ICAR-recommended vaccination schedules. Regular vaccination significantly reduces mortality and economic losses. Parasitic control is especially important due to the grazing and browsing habits of goats. Internal parasites such as gastrointestinal worms and liver flukes are controlled through strategic deworming every 3–4 months, preferably based on fecal examination, while external parasites like ticks, lice, and mites are managed using acaricides, sprays, or dips. Overcrowding and wet grazing areas should be avoided to reduce parasite load.

Proper nutrition and mineral supplementation play a vital role in maintaining immunity and preventing metabolic and deficiency disorders. Regular supplementation of mineral mixture and common salt helps prevent conditions such as anemia, poor growth, infertility, and weak kids. Adequate clean drinking water is essential for overall health and disease resistance.

Kid health management is a crucial part of the program, as kid mortality is a major constraint in goat farming. Timely feeding of colostrum within the first 30 minutes after birth provides passive immunity. Kids should be kept warm, protected from dampness, and vaccinated and dewormed as per schedule. Navel disinfection at birth helps prevent infections. Routine health monitoring and management practices such as regular observation of animals for signs of illness, hoof trimming to prevent foot rot, control of ectoparasites, and prompt treatment of sick animals are essential. Maintenance of health records, including vaccination, deworming, treatment, and mortality records, supports effective disease control and management decisions.

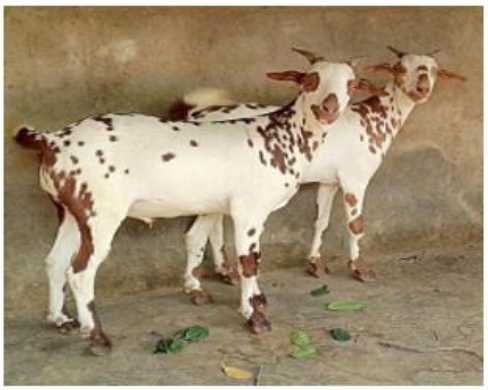
Recent advances in goat health management include use of diagnostic tools such as ultrasonography and rapid disease detection kits, community-based disease surveillance, mobile veterinary advisory services, and improved access to vaccines and veterinary care through government livestock health programs. Overall, an integrated health management strategy combining hygiene, nutrition, vaccination, parasite control, and early disease detection is essential for sustainable and profitable goat production in India.

Beetal

Male

Female

Barbari



Jamunapari

Male

Female

Jakhrana

Male

Female

Black Bengal

Male

Female

Sirohi

Male

Female

Andamani

Male

Female

Conclusion:

Indigenous goat breeds of India possess significant genetic potential, but their productivity remains constrained by traditional management practices. Adoption of scientific housing, feeding, breeding, and health management can markedly improve performance while conserving genetic diversity. An integrated management approach is essential for sustainable and profitable goat production.

Name of the breed	Breeding tract	Peculiar character	Average Milk Yield per lactation (Kg)	Average Body weight (Kg)				
				Birth Weight	3 months	6 months	9 months	12 months
Beetal (Amritsari)	Punjab	Black coat(common), Brown with white spots of different sizes is also available.Ears are flat long curled and drooping.	157	3.3	12-14	30-32	45-46	60-62
Barbari (Sai bari, Titri bari, Wadi bari, Bari)	Rajasthan and UP	White with tan spots, black spots in few. Horns are twisted, directed upward and outward. Ears - small and erect, tubular or almost tubular with slit. This short breed is mainly known for Early Sexual maturity and the ability to produce multiple kids in each gestation.	78.5	2.5	7	16	25	34
Jamunapari (Etawah)	Uttar Pradesh (Etawah)	Coat colour of this breed is predominantly black with white spots on ear muzzle. White ears, White face mask.	201.96	3-3.5	10-12	22-24	30-36	45-50
Jakhrana (Kali Kotri)	Rajasthan (Alwar)	Coat colour of this breed is predominantly black with white spots on ear muzzle. White ears, White face mask.	152.8	2.5	12-13	16-17	18-22	26-28
Black Bengal (Bengal, Desi)	West Bengal	Predominantly black, brown, grey and white are also found. This is the **most prolific breed of goat**. The breed is famous for excellent chevon and morocco leather production.	144	2	7	11	16	21
Sirohi(Majithi, Devgarhi)	Rajasthan (Ajmer, Bhilwara, Sirohi)	Coat colour is predominantly brown with light or dark brown patches. Horns are slightly twisted and curved, directed upward and backward. Flat and leaf like drooping ears.	81.5	3*	10-12	22-24	30-36	42-45
Andamani	Andaman and Nicobar	Mostly black in Colour. Horns are small and flat at base and pointing towards backward	81.5	3*	-	-	-	-

*- depends on the number of kids