

# Scientific Goat Management Practices for the Semi-Arid Tropics



## Introduction

Goats have proven to be useful through the ages due to their productivity, small size and because they don't compete for food with humans.

Popularly known as the poor man's cow, goats hold tremendous potential for rural prosperity under changing agroclimatic conditions and depleting resources for crop-based livelihoods. In semi-arid India, goat husbandry is taken up by millions of smallholders who rear animals on crop residue and common property resources, providing them meat, milk, fiber, hide, etc, with virtually no capital, resource and training. In recent years, decreasing common property

resources have driven farmers to take up intensive systems more seriously.

Newer goat breeding, feeding, management and disease control technologies are now available. Therefore, it is necessary to adopt scientific goat farming in different agro-climatic zones, including the semi-arid tropics. Key to making goat farming more profitable and sustainable are increasing the production and efficiency of goat production through improved animal health, fertility, longevity and nutrition. These hold the most potential for enhancing nutrition security and thereby ensuring food security.

## Choosing the Right Goat Breed

Buying a goat starts with choosing a breed that fits with your goals: meat or milk. If it is for the milk, choose a milch breed and if for meat, then a locally available meat breed is best. It is inadvisable to bring a breed from afar; rather choose one from the breeding tract of the breed

selected. Normally, goats purchased for breeding stock are one to two year old.

India has about 28 goat breeds distributed across the country and agro-climatic zones. The home tract of breeds associated with the semi-arid tropics are given in the map.



Photo: ICAR-NBAGR, Karnal

*Jamunapari female.*

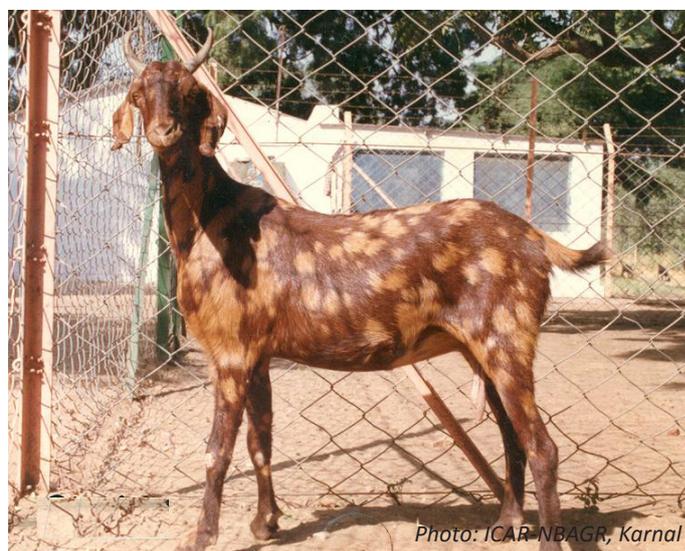


Photo: ICAR-NBAGR, Karnal

*Sirohi female.*

## Goat breeds distributed across the country and their characteristics

Breed	Breeding tract	Important features
Attapady Black	Palakkad (Kerala)	Well adapted to Attapady and maintained mainly on grazing.
Barbari	Bharatpur (Rajasthan); Aigarh, Mathura, Agra, Etawah, Hathras (Uttar Pradesh)	Prolific and non-seasonal breed well suited for rearing under restrained and stall feeding conditions.
Berari	Akola, Amravati, Wardha, Nagpur (Maharashtra)	The breed does well in Vidarbha region of Maharashtra where the temperature is extremely high in the summer.
Gohilwadi	Amreli, Bhavnagar, Junagadh, Rajkot, Porbandar (Gujarat)	Adapted to the hot semi-arid climate. Has slightly twisted horns, a convex noseline and coarse long hair.
Jakhrana	Alwar (Rajasthan)	Has a straight faceline and narrow and slightly bulging forehead. Large udder with conical teats.
Jamunapari	Etawah (Uttar Pradesh)	The best dairy breed in South-East Asia and the tallest breed in India.
Kanni Adu	Tirunelveli, Virudhunagar/ Kamarajar, Thoothukudi (Tamil Nadu)	Has white stripes on both sides of the face extending from the base of the horn to the corner of the muzzle. Also has a white patch or line on either side of the neck.
Kodi Adu	Ramanathapuram, Thoothukudi (Tamil Nadu)	Adapted to cover long distances during browsing and reared primarily for meat. Possesses white coat with black or reddish brown splashes.
Kutchi	Banas Kantha, Mehsana, Kuchchh, Patan (Gujarat)	Predominantly reared for meat and milk. Has predominantly black long coat with coarse hair, slightly roman nose, and corkscrew type horns.
Marwari	Barmer, Bikaner, Jaisalmer, Jalore, Jodhpur, Nagaur, Pali (Rajasthan)	The breed is well adapted to the inhospitable agro-climatic conditions of the hot arid region.
Mehsana	Ahmedabad, Banas Kantha, Mehsana, Gandhinagar, Sabar Kantha, Patan (Gujarat)	Well adapted to inhospitable agro-climatic conditions of the region. Possess black ears with a white base; a few are reddish brown with a white ear base.
Osmanabadi	Osmanabad, Latur, Ahmadnagar, Solapur, Parbhani (Maharashtra)	The breed is known for its early maturity, prolificacy and good dressing percentage.
Salem Black	Salem, Dharmapuri, Erode, Krishnagiri (Tamil Nadu)	Well adapted to the harsh climatic conditions of North-western Tamil Nadu. Its meat is very tasty compared to that of other goats.
Sangamneri	Nashik, Pune, Ahmadnagar (Maharashtra)	Its white coat is extensively coarse and short, and sometimes mixed with black and brown colour. Horns are thin, pointed, directed backwards and upwards.
Sirohi	Ajmer, Bhilwara, Chittaurgarh, Sirohi, Udaipur, Rajsamand (Rajasthan)	A hardy animal adapted to the harsh agro-climatic conditions of Rajasthan.
Surti	Vadodara, Bharuch, Valsad, Surat, Narmada, Navsari (Gujarat)	Good milch animals with milk production ranging from 1.5 – 4 litres/ day. They are good breeders and possess 50-60% twinning percentage but rarely (5%) are triplets born. They are suited to stall feeding or complete confinement.
Zalawadi	Rajkot, Surendranagar (Gujarat)	Well adapted to harsh climatic conditions and wider range of vegetation in the region. Possess long, wide, leaf-like droopy ears and well developed udder with distinctly placed long, cylindrical-shaped teat.

## Housing

Goat housing is simple. The semi-intensive (grazing and closed enclosure) system of rearing is suitable for the semi-arid tropics compared to the extensive (grazing) and intensive (zero grazing) systems. Lately, raised platforms or elevated housing systems have gained popularity compared to open housing to prevent foot rot and also to enable the farmer to collect pellets. The floor may be elevated with bamboo or wooden slats about 1.0 to 1.5 metres high. Commercial farmers may use fibre sheets or slats as a platform.

The space required for goats in intensive/stall feeding.

Category of goats	Average space (Sq m) required per goat
Kids	0.5
Adult females (doe)	1.0
Pregnant and lactating	1.5-2.0
Adult male (buck)	3.0-4.0



*Osmanabadi male.*



*Raised/elevated shelters.*

## Feeding

- Goat diet must include approximately 60-70% of green fodder, 20-30% of dry fodder and 5-10% of concentrate/supplementary feed, providing it about 16-20% of Crude Protein (CP) and 65% of Total Digestible Nutrients (TDN). Additional concentrate/supplementary feed must be provided to pregnant and lactating animals and breeding bucks.
- Green fodder should include legumes (guar, berseem, cowpea, lucerne, stylosanthes); non-legumes/cereals (maize, pearl millet, sorghum, oat); grasses (hybrid napier, guinea grass, anjan grass), and fodder trees (Subabul, Sesbania, glyricidia, etc.)
- Concentrate/supplementary feed may be prepared using a combination of maize/soybean/green gram/cereals (broken/ground/mashed) (30-40%), any oilcake (20-30%), husk/bran (30-40%) and mineral mixture and salt (1-2%).
- Goats can also be fed low grade roughage/residues which are treated in the following methods: physical and mechanical (soaking, chopping, grinding, pelleting, steaming and irradiation); chemical (sodium hydroxide, urea/ammonia, etc.); and biological (fungi).
- Ensure a minimum 250 grams of concentrate and 5 grams each of common salt and mineral mixture in the daily diet of the goat.



**Nutrient composition and feed formulation of supplementary feed (concentrate mixture) for goats.**

First combination		Second combination	
Ingredients	Quantity for 100 kg	Ingredients	Quantity for 100 kg
Maize	30	Maize/soybean/ green gram/cereal (broken/ground) mash	30-40
Groundnut cake	5		
Soybean	5		
Green gram chuni	10	Any oilcake	20-30
Rice polish	5	Husk/bran	30-40
Wheat bran	40	Mineral mixture and salt	01-02
Limestone	2	<b>Total</b>	<b>100</b>
Mineral mixture	1	<i>Goats should be fed about 250-400 gms daily based on their growth stage.</i>	
Salt	2		
<b>Total</b>	<b>100</b>		

**Major raw materials and their sources used in making supplementary/concentrate feed.**

Raw materials	Sources
Cereals and millets	Sorghum (jowar), maize, pearl millet (bajra), finger millet (ragi), rice, oats, wheat, etc.
Oilseed cake	Soybean meal, groundnut cake, cotton seed cake, sunflower cake, silkworm pupae meal, coconut cake
Agro-industrial by-products	Rice bran, wheat bran, rice polish, deoiled rice bran, chuni
Mineral and vitamin mixture	Calcite grit, calcium carbonate, ground limestone, oyster shell, steamed bone meal, monosodium phosphate, dicalcium phosphate, defluorinated rock phosphate, soft rock phosphate

## Care and Management

When ill, goats need to be isolated. Symptoms of illness could be manifest in the form weakness, lagging behind in the flock, reduced feed and water consumption, etc. Vaccination and deworming are the best options for farmers to keep their goats healthy. Hygienic living conditions on the farm and keeping them free of parasitic infestations is important. Dipping may be followed under the local veterinarian's guidance.

## Common Diseases, Vaccination and Deworming Schedule

### Common goat diseases and vaccination schedules.

Disease	Age at vaccination	Periodicity of vaccination
Enterotoxaemia	> 4 months	Biannual (January and July)
Foot & Mouth Disease (FMD)	> 4-6 months	Biannual (Feb/March and August/September)
Black quarter	> 4-6 months	Annually (March/April)
Hemorrhagic septicemia	> 4-6 months	Annually (April/May)
Anthrax	> 6 months	Annually (April/May or in affected areas)
Peste des petits ruminants (PPR)	> 4 months	Annually (June/July)
Blue tongue	> 4-6 months	Annually (August)
Pox	> 4 months	Annually (December)
Deworming	<ul style="list-style-type: none"> <li>• 15-20 days after birth</li> <li>• Every two months for the first year</li> <li>• Thrice a year (April, July and November)</li> <li>• Repeat deworming as required.</li> </ul>	



*Timely vaccination key to disease prevention.*



*Deworming.*



## Caring for Kids

- Cut the umbilicus to 1.5-2.0 inches length and apply tincture of iodine.
- Clean the mucous from the nose, mouth, etc, with a clean cloth if the mother has not cleaned the kid.
- Feed the kid colostrum @ 1/10<sup>th</sup> of the kid's body weight within half an hour of kidding.
- If the doe has given birth to twins or triplets, make sure there is sufficient milk either from the mother or from the foster mother. Reconstituted milk can also be fed if natural milk is not available.
- Allow kids to suckle from the foster mother if the mother has health issues.
- Record the weight of the kid at birth and every 15 days.



*Osmanabadi kids.*

## Reproductive Management

- Most Indian goat breeds exhibit oestrus throughout the year. A few breeds are seasonally polyestrous with the extended breeding season.



*Photo: ICAR-NBAGR, Karnal.*

*Surti female.*

- Under extensive conditions, rearing of bucks (males) with females leads to mating throughout the year.
- Goats usually come to heat between September and November and March and April.
- Depending on the body condition, flush them with 300-350 g of concentrate feed daily along with ample green fodder to improve body condition. Flushing around breeding increases the kid crop by 10-20%, increasing the number of twins born.
- During pregnancy, feed the doe about 300-400 g of concentrate daily during late gestation (2 months). This transition feeding should continue for 2 months after kidding.
- Transition feeding helps improve milk yield, nursing ability, health condition, birth weight of kids, reduces stillbirths, and improves twinning and triplet percentage.
- During pregnancy, an increase of about 10-12 kg body weight is desirable.
- A doe can be first bred after it attains 65-70% of adult body weight. The age at first kidding is 12-14 months and the gestation period of goats is 5 months and 5 days. Take steps to avoid inbreeding.
- Be watchful for a shiny udder, restlessness, sunken tail and hip, heavy breathing, and constant looking sideways, which are signs of approaching parturition .
- Post kidding, provide the doe a bucket of clean water. Keep the doe and kid in the same cubicle for 3-4 days. Thereafter, the doe may be allowed to graze with other goats.



*Photo: ICAR-NBAGR, Karnal.*

*Barbari male.*

## Management of Breeding Bucks

- Breeding bucks or males contribute predominantly to production and reproduction potential.
- Semen production in males starts at 6-8 months. Bucks for breeding should be selected on the basis of 9-12 months of body weight. However, the optimum age of bucks for breeding is 2 years.
- The male to female ratio is very important in breeding. A ratio of 10 females to 1 male of one year and 20 females to 1 male of two years and above are ideal.
- The buck should have a good history/record, and should be shifted every 2 to 2.5 years from the flock to avoid inbreeding.
- Do not overfeed bucks. Do not allow them to run with the does. House the males and females apart.
- Avoid choosing a breeding buck from the same flock for several generations to avoid inbreeding.
- Feed bucks an extra concentrate @300-400 gm/day during the breeding season.
- Castration: Male kids not required for breeding can be castrated. This is known to increase the growth rate and feed utilization, and also believed to reduce the goat-like smell of meat, thereby increasing its acceptability.



Photo: ICAR-NBAGR, Karnal

*Salem black male.*

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