

Parameter	Signs of healthy goat	Signs of sickness
Hair and hair coat	Shining, smooth, downward	Dirty, rough, erected
Eyes	Bright in appearance,	Looks dull,
Group behaviour	Likes to remain in group	Likes to get isolated
Respiration rate	Normal (20-30)	Deviation from normal range, laboured breathing
Appetitive and feeding behavior	Normal, show prompt feeding activity upon offering feed	Loss of appetite, shows reluctance to get feed even after offering
Rumination	Present (chewing cud)	Absent (not chewing cud) or reduced
Physical appearance	Alert	Dull, lethargic, listless
Body temperature	Normal (101-102 °F)	Abnormally low and high

### Common diseases in goats and their preventive management

#### Peste des Petits Ruminants (PPR)

- ❖ PPR, also known as 'goat plague', is a viral disease of goats and sheep characterized by fever, sores in the mouth, diarrhea, pneumonia, and sometimes death.
- ❖ Vaccination against PPR should be routinely followed. The goats above 3 months should be vaccinated in the flock to develop active immunity.

#### Foot and Mouth Disease (FMD)

- ❖ Highly contagious viral disease of cloven-footed animals (cattle, buffalo, goats, sheep, pigs etc), caused by Picorna virus. It spreads through direct contact of infected animals, carriers of disease and through air. Virus may gain entry into flock through contaminated feed and water, feeding utensils, bedding materials etc.
- ❖ All goats above 3 months of age should be vaccinated once in 4-6 months intervals preferably during pre-monsoon and post-monsoon seasons. Infected animals should be treated with antibiotics and other suitable drugs based on symptoms.

#### Goat pox

- ❖ It is a contagious viral skin disease of goats which spreads by aerosol (respiratory secretions) between animals, direct contact or indirectly by fomites. The scabs from skin lesions are also contagious and may be present in dust or soil.
- ❖ Any new animals entering the farm should be quarantined from the rest of the flock until it is determined that they are healthy and there is no risk.

#### Tetanus

- ❖ Goats are very susceptible to tetanus, particularly the kids. It is caused by bacteria, *Clostridium tetani*. These bacteria live in the soil, in faeces and in dust on the goat's skin. Signs of illness includes muscle stiffness, unsteady gait, drooping eyelids, changed voice, erect ears and tail and inability to eat or drink.
- ❖ Prevention is more effective and economical than treatment. The vaccine, Tetanus toxoid is recommended. Use of sterilized surgical instruments and proper hygienic conditions is required.

#### Enterotoxaemia

- ❖ Also known as *overeating* or *pulpy kidney* disease, caused by *Clostridium perfringens* type-D; normally found in the soil and as part of the normal microflora in the gastrointestinal tract of healthy goats. Infection may occur due to excessive consumption of milk or feed with high concentrations of grain; signs of illness include loss of appetite, abdominal discomfort and profuse and/or watery diarrhea that may be bloody.
- ❖ All goats (especially the kids) within the flock should be vaccinated with enterotoxaemia vaccine.

#### Bloat

- ❖ It occurs due to excessive production of gases in rumen i.e. due to ingestion of large quantities of green, leafy grasses particularly the legumes. Administration of vegetable oil (50-100 ml) orally in a careful manner can help in control of bloat as first aid and then get veterinary doctor help. In many cases, oral anti-foaming solutions like de-bloat, blotonil, blotosil along with rumentorics drugs are given.

#### Endo parasitic infestations

- ❖ It affects the digestive and respiratory system hence called internal parasite (round worm, tape worm and liver flukes). Typical signs are weight loss, stunted growth, diarrhea, rough hair coat, depression, weakness, anemia, fever, and pot belly appearance.
- ❖ Regular deworming with suitable anthelmintics should be done at interval of 4-6 months. Albendazole @ 10 mg per kg body weight may be given to adult goats whereas Piperazine @ 110 mg per kg body may be given in kids above 10 days old.

#### Ectoparasitic infestations

- ❖ Ectoparasites (flies, lice, ticks, mites, mosquito etc) are found on skin, hair and body surfaces. They suck nutrients (blood, body tissues etc) and cause annoyance, disturbance and loss of body conditions in goats.

- ❖ Goats should be treated with acaricidal or dipping solution like cypermethrin (0.5 to 1% solution), deltamethrin or any suitable pyrethroid compounds. Spraying or dusting powder may also help to remove lice in kids.

### Vaccination schedule for goats

S.No.	Name of disease	Time table	Regular vaccination
1.	P.P.R.	Primary vaccination At the age of 3 month for kids & above	Once in three years
2.	Foot & mouth disease (F.M.D.)	At the age of 4 month for kids & above	Twice a year Pre-monsoon (May-June) Post-monsoon (Oct-Nov)
3.	Enterotoxaemia	At the age of 4 month for kids (if dam is vaccinated) At the age of 1 <sup>st</sup> week for kids (if dam is not vaccinated)	Before monsoon (Preferably in May). Booster vaccination after 15 days of first vaccination.
4.	Goat pox	At the age of 3 month & above for kid	Once annually (December)

### Marketing of goat and goat products

Proper marketing of goat or goat product (live goat, goat meat i.e. chevon, milk, goat manure) is the prime importance to achieve maximum benefit from goat farming. In Bihar, village marketing is very common where marketing of goat is mostly done at the door and local market with the involvement of the middlemen. Due to this, the profit margin to producers is decreased hence there is a need of proper marketing linkage between goat farmers and consumers.

Keeping in view the importance of goat farming in Bihar, if the proper management practices and scientific suggestions are followed, farmers can increase their income and livelihood.

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## Scientific goat farming for enhancing livelihood of farmers in north Bihar



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Among all livestock species, goat rearing is very common in rural areas as most of the farmers belong to the small, marginal or landless laborers. The goat can thrive well and produce good products under variable climatic conditions. Goat produces valuable meat (chevon) which is preferred by almost all non-vegetarians. The price of goat meat is the highest in local market. Mostly the small and marginal farmers rear goat as a source of income during crisis time, the goat husbandry in rural sector is not optimum due to several constraints like low genetic merits, stunted growth, and mortality due to the incidence of diseases, poor housing and nutritional disorders. There is lack of scientific husbandry practices in north Bihar conditions. If scientific management practices are followed, the goater has ample potential of being a profitable enterprise to improve the livelihood of the farmers in waterlogged areas of Bihar.

### Potential goat breeds of north Bihar

At present 34 breeds of goat have been recognized and registered by the ICAR- National Bureau of Animal Genetic Resources (NBAGR), Karnal. The 'Black Bengal' goat is the best suited for Bihar and its adjoining states. The breed has derived its name from its native habitat of West Bengal state.

### Morphological characteristics of Black Bengal goat

- ❖ The common coat colour: black followed by brown with white spots of different sizes; horn size- usually small (<15 cm) and shape is directed upward and sometimes backward; small-legged; short and lustrous hair coat; slightly depressed nose line; generally bearded in both the sexes; most prolific among Indian breeds; multiple births; kidding may occur twice in a year; excellent meat quality
- ❖ Apart from the 'Black Bengal' some other potential goat breeds are: 'Beetal', 'Barbari', 'Sirohi'



Black Bengal goat

### Housing management of goats

- ❖ To provide shelter to animals for maximum comfort
- ❖ To protect the animals from harsh climate and environmental stress
- ❖ To make feeding, watering and other farm practices easier
- ❖ To support good health and longevity, thereby optimum productivity

**Floor of goat house:** The floor surface may be covered with roof called covered area or indoor area whereas floor surface without roof is called open area or outdoor area. Covered area protects the goat from bad weather like high temperature, chilled weather and heavy rain while open space is required for free-roaming, exercise and expression of natural behavior. Few important points to be taken care.

- ❖ It may be made up of concrete, brick or earthen.
- ❖ The floor should be cleaned, dry and hygienic and free from dung and urine
- ❖ In water-logged conditions elevated floor of wooden is preferred over concrete floor.
- ❖ In wooden-batten flooring (slatted), the width of each plank may vary from 7.5 to 10.0 cm and the clearance between two planks may range between 1.0 and 1.5 cm to facilitate the disposal of dung and urine. The flooring should be constructed at a height of at least one metre above. In winter proper bedding materials like straw should be provided.

### The minimum floor space requirement (per animal)

Age group/category of goat	Covered space requirement (sq.m)	Open space requirement (sq.m)
Upto 3 months old/kid	0.3	0.6
3-6 months/grower	0.6	1.2
6-12 months	1.0	2.0
Above 12 months or adults	1.5	3.0
Buck, pregnant and lactating goat (doe)	2.0	4.0

**The roof of goat house:** The roof may be constructed of locally available materials like thatch, asbestos or corrugated cement sheet etc. The thatch roof provides maximum comfort to animals during the summer but it needs regular repairing whereas concrete is very costly but durable. Asbestos and plastic sheet roofing may be the option for medium comfort and cost. The height of roof depends upon the local climate, however in heavy rainfall or cold climatic condition 8-10 ft height and in summer 10-12 ft height is desirable.

**The pillar** may be made of bamboo, wooden, galvanised iron (GI) pipes or brick and cement depending upon the availability and economic condition of the goat farmers.

**Sidewall** may be 4-6 ft; it provides protection to the animals from the predators, theft and support to the pillar and roof. It may be made of brick, wooden, wire-mesh etc. In general a combination of brick-cement at bottom and wire-mesh above to it is the best for plain area whereas in waterlogged conditions,

the side wall may also be made of wooden or bamboo.

### General considerations while making a goat house



View of raised slatted house of goat



Straw bedding during winter

- Should be made at higher level than normal road surface; i.e. at elevated place
- The orientation should be in east-west direction to maximize comfort during the summer
- Should be kept free from dumping for disease control
- Should have proper ventilation, optimum light and air
- Male and female goats above three months be kept separately
- Buck should be in single pen to avoid fighting with other male
- Sick animals be kept in isolation

### Manger dimension

Category	Width (cm)	Depth (cm)	Height of inner wall (cm)
Adults	50	30	35
Kids	50	20	25



**Dipping tank** is ancillary structure to protect the animals from external parasitic infestation like lice, ticks, mites etc. It may be made either of galvanized steel sheets or constructed of stone or brick in cement mortar.

**Footbath** may be made of galvanized steel sheets or brick in cement mortar. It is provided at the entrance to protect the animals from foot-rot disease and outside infection coming through foot of the visitors. Potassium permanganate or betadine is used on the foot bath.

**Open paddock** is an area surrounded by fencing materials with provision of manger and drinker for feeding and watering to animals.

### Feeding management of goats

Goat is a small ruminant which requires three types of feed in the form of green fodder, dry roughage and concentrates mixture. There should be balance of energy, protein, fat, mineral and vitamin requirement in feed. They need plenty of green roughage or fodder as per their need, however the dry feed and concentrate should be given based on minimal requirement basis. In order to achieve the maximum profit from goat farming, feeding to goats should be done properly with balanced nutrition.



### Important tips for feeding to goats

- ❖ A meat type goat requires 3-4% dry matter of its live body weight; a 20 kg goat requires approximately 0.6-0.8 kg dry matter per day which can be fulfilled through intake of 2-3 kg green fodder, 200-300 g dry fodder and 200-300 g concentrate mixture.
- ❖ A dairy type of goat requires 4-6% dry matter intake of her live weight.
- ❖ Green fodder consists of maize, berseem, lucerne, jowar, tree leaves.
- ❖ The dry roughages are hay (dried grass), husk (bhusa), rice or wheat straw.
- ❖ The concentrate mixtures are: grain (50-60%), oil cakes (20-25%), wheat or rice bran (20-30%), mineral mixture (2%) and common salts (1%).
- ❖ Minimum 4-5 hour grazing time should be given to goat for better health, and nutrition.
- ❖ Provide additional ration to pregnant doe or lactating mother.
- ❖ During the breeding time extra supplement of 100-200 g concentrate will help to better ovulation and increase the multiple births.

### Breeding management of goat

- ❖ Breeding is very important to get the new progeny and increasing the flock strength at the goat farm. A male breeding goat (buck) is allowed to mate the adult female individually or kept in a compartment with group of 6-10 goats. Breeding can also be done through artificial method.

### Some important tips for scientific mating at goat farm

- ❖ Always use good quality buck for mating
- ❖ Goat should be properly and regularly watched for estrous or heat period for optimum breeding potential
- ❖ A goat in estrus may be identified by the change in behavior like loss of appetite, mounting to other goat, bleating, restlessness, frequent urination and white discharge from the vagina.
- ❖ Same male should not be used repeatedly.
- ❖ The male and female ratio should be maintained as 1:20 to 1:30
- ❖ Always keep additional male for breeding if any regular buck do not able to breed, accidentally die, or become unhealthy.
- ❖ Selection of breeding male goat (buck) for goat farm
- ❖ Should bear breed characteristics, healthy, physically fit and free from ant defects
- ❖ Should have good libido or mating potential, from high parental line with genetic merit

### Selection of female goat for farm

- Should have high genetic merit, healthy, shiny and free from any defect
- Twinning or triplets should be common
- It should produce healthy kids
- Meat, milk and fibre quality should be superior

### Kidding management:

the farmers should watch kidding carefully as sometime it may lead to difficulty while giving the birth which is called as dystokia.

### Some important tips are:

- Separate the advance pregnant goat 1-2 weeks from the group and keep in separate pen/compartment
- Do not disturb the animal while kidding
- Keep a close watch while kidding; an expert or veterinary doctor may be consulted in case of emergency

Placenta should be removed immediately after expulsion and it should not be allowed to eat by the goat, otherwise it may disturb metabolism

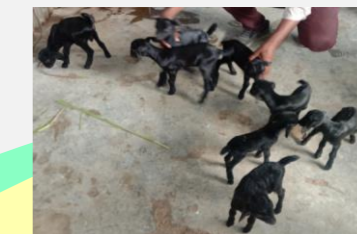


### Management of newly born kids

- Kid should be cleaned properly by dry cloth in case of licking not done by the goat
- Naval of the kid should be cut with sterilized blade. A tie knot with cotton thread and tincture Iodine should be applied over the naval cord.
- The kid should be allowed to suck its dam for the first three or four days so that they can get good amount of colostrum.
- Colostrum (first milk) of mother should be given to kid immediately after the birth within 30 minute
- Colostrum feeding is a main factor in limiting kid mortality, and be given at the rate of 100 ml per kg live weight.

### Creep feeding for kids

The creep feed is a first solid concentrate feed having high protein content (22-24%) which may be started from 2-3 weeks of age. The main purpose of creep feeding is to give more nutrients for their rapid growth. The quantity is 50 – 100 g/day. The creep feed may be made by using the feed ingredients like maize 40%, groundnut cake 30%, wheat bran 10%, deoiled rice bran 13%, molasses 5%, mineral mixture 2%, salt 1% fortified with vitamins A, B2 and D3 and antibiotic feed supplements.



### Health management of goats

Health management is very important for maximum profitability from goat farming. Therefore, sick goats must be identified based on the following parameters.