

## MODULE IV

Breeds of Dairy Cattle and Buffaloes – Definition of breed; Classification of Indian Cattle breeds, exotic breeds and Indian buffalo breeds. Systems of inbreeding and crossbreeding. Housing of dairy animals – Selection of site for dairy farm; systems of housing – loose, housing system. Conventional dairy barn. Cleaning and sanitation of dairy farm. Weaning of calf. Castration and dehorning. Deworming and Vaccination programme. Records to be maintained in a dairyfarm

The cows of these breeds are high milk yields and the male animals are slow or poor work animals. The examples of Indian milch breeds are Sahiwal,

## Definition of Breed and types of Breeds

A breed is a group of animals having similar characters like general appearance, size, features and configuration etc. Often, breeds resemble each other with slight morphological differences, because of constant inbreeding in one locality. There are total 231 breeds of cattle in the world out of which 26 are in India.

Indian cattle breeds of cattle classified in to three types

### a) MILCH BREEDS:

The cows of these breeds are high milk yielders and the male animals are slow or poor workers. The milk production of milk breeds is on the average more than 1600 kg. per lactation. The examples of Indian milch breeds are Sahiwal, Red Sindhi, Gir and Deoni.

### b) DUAL PURPOSE BREEDS:

The cows in these breeds are average milk yielder and male animals are very useful for work. Their milk production per lactation is 500 kg to 1500 kg. The example of this group are Ongole, Hariana, Kankrej, Deoni, Rathi , Mewathi, Dangi and Nimari.

### c) DRAUGHT BREEDS:

The male animals are good for work and cows are poor milk yielders and their milk yield on an average is less than 500 kg per lactation. They are usually white in colour. The example of this group is Hallikar, Amritmahal, Khillari, Bargur, Nagori, Bachaur, Malvi, Kenkatha, Kherigarh, Kangayam, Ponwar, Siri, Gaolao, Krishna Valley

Cattle breeds are also classified based on the place of their origin as indigenous and exotic. Indigenous cattle breeds are native to India where as exotic species are imported from other countries.

## Indigenous Cattle breeds.

### 1 MILCH BREEDS /MILK BREEDS

Red Sindhi, Gir and Deoni The milk production of milk breeds is on the average more than 1600 kg. per lactation.

### **Sahiwal**

- The original tract of this breed is Montgomery district in Pakistan, but animals of this breed are found in Punjab and Haryana.
- It is the highest milk yielding cattle breed in Indian sub continent.
- It is a medium sized breed, having symmetrical body, broad fore head, thick short horns and fine loose skin.
- Chest is broad and deep. Legs proportionate to size with good feet. In the male the sheath is pendulous.
- The tails is long with a black switch. Udder is large, broad and fine. Teats are good, uniform in size . Milk veins are large and prominent.
- Milk yield – 1400-2500 kgs
- Age at first calving -37-48 months; Calving interval – 430-580 days



**Fig. 2.1 Sahiwal Cow**

### **Red Sindhi**

- This breed is from Sindh in Pakistan and found in Orissa, Tamil Nadu, Karnataka
- The colour of the breed is deep dark red. The bulls are much darker than cows. A white marking on the forehead is common.



**Fig.2.2 Red Sindhi Cow**

- The animals are medium sized, compact and symmetrical. The head is of moderate size, forehead is broad and poll is prominent in between horns.

- Eyes are fairly large, and clear. Ears are medium sized, fine and alert.
- The horns are short and thick.
- Dewlap is abundant in both males and females and hangs in folds, chest is broad and deep. Legs are medium in size.
- Tail is slender with black switch.
- The udder is large size with medium sized teats and well developed milk veins.
- Average weight of the male is 420 kg and the average weight of the female is 341 kg. The milk yield of selected village animal is 1.100 kg in a lactation period (300 days) and milk yield of well bred herds is 1800 kg in lactation

### **Gir**

- The native tract of this breed is Gir forest of Gujarat state. Animals of this breed are found in Punjab and Haryana.
- The popular colour is white with dark red or chocolate brown patches distributed over the body.
- The animals are medium sized with proportionate body. The head is moderately long, and massive and the forehead bulging. The face is narrow and clean. The nuzzle is square and black.
- The eyes are placed higher up in line with root of ears. Ears are large and pendulous.
- The horns are black, medium sized, shapely round, well set apart, and peculiarly curved.
- Dewlap is thin and hanging, not pendulous. Chest is deep, full and well developed. Legs are well proportionate and muscular. The hump is medium sized and markedly developed.
- The barrel is deep, long and proportionate.
- The back is long, strong and wide. The tail is long



**Fig. 2..3. Gir Cow**

- touching the ground.
- The udder is of medium size. Average weight of the male is 545 kg. and that of the female is 386 kg.
- The average milk yield is 1590 kg. • The bullocks are heavy and good for work

### **Deoni**

- The home of this breed is Marathwada now in Maharastra state.
- This breed is considered as a strain of Gir.
- The colour of the animal is white and black patches or red and white patches. The animals resemble Gir breed to some extent.
- The forehead is less prominent.

- The ears are long and pendulous.
- The chest is heavy and deep, the dewlap is well developed and in the males the sheath is pendulous.
- The head is medium sized, prominent forehead, the horns curving outwards and backwards. A wedge shaped barrel and well placed.



Fig. 2.4 Deoni Bull

- Deoni animals are fairly good milk producers and the average being 700 kg in 300 days, and in well breed herds, the average milk yield is 1000 kgs.
- The bullocks are large sized and good for heavy work

## 2. DUAL PURPOSE BREEDS

The cows in these breeds are average milk yielders and male animals are good work animals. Their milk production per lactation is 500 kg to 1500 kg.

The example of this group are Tharparker, Ongole, Hariana, Kankrej, Rathi and Gaoalo and Mewathi.

### Tharparker

- Originated from Sind of Pakistan. Herds are found in Jodhpur, Jaisalmer of Rajesthan. Average animals of the Tharparker breed are deep, strongly built, medium-sized, with straight limbs and good feet.
- The usual color of the cattle is white or gray. In males, the gray color may deepen, particularly on the



Fig. 2.5. Tharparkarcow

fore and hind quarters. All along the backbone there is a light gray stripe..

- The head is of medium size, the forehead broad and flat or slightly convex above eyes: the front of the horns and face are practically on one plane.
- Horns are set well apart curving gradually upwards and outwards
- The dewlap is of medium size and the skin is fine and mellow.
- The sheath in the males is of moderate length, and is semi-pendulous.
- The navel flap in the females is prominent. Shoulders are light and legs are comparatively short, but in good proportion to the body.
- The colour of the skin is black, except on the udder, under the belly, on the lower part of the dewlap and inside the ears where it is rich yellow.
- Tharparker cows average 138 cm in height and an average weight of 408 kg. When left on arid pasture the milk production is approximately 1135 kg per lactation, while those animals maintained in the villages average 1980kg

### Ongole

- The home of this breed is Ongole tract comprising of Ongole, Guntur, and Nellore districts of Andhra Pradesh.
- The cows are good for milk production and the



males are for good for work.

- The colour of the animal is white.
- The bullocks are very powerful and good for heavy plough and cart work India.
- The forehead is broad and prominent between eyes; Black Kazal marking around the eyes is common.
- Face is moderately long, with wide nostril and black nuzzle. Ears are moderately long
- The horns are short and stumpy. Loose horns are common in this breed.
- Hump is well developed and erect, dewlap is well developed and folds extending to navel flap.
- Chest is deep and barrel is deep and long
- The tail is long with black switch reaching below the hocks.
- The udder is broad, extends well forwards and high up with moderate even sized quarters and teats are average size.
- The bullocks are very powerful and good for heavy work.

- Ongole is one of the heaviest breeds in India. The weight of the male is on the average of 545 kg to 682 kg. and that of the female is 432 to 455 kg. The average milk yield is 1600 kg in lactation

### **Hariana**

- The home of this breed is Haryana state of India and distributed in Punjab, Rajasthan and Uttarpradesh.
- The colour of the breed is white or light grey.
- The head is light and the face is long and narrow, flat forehead.
- This eyes are large and bright expressive but not prominent in mature bulls.
- The horns are short and fine or moderately long, and they are generally 4 to 9 inches long
- Dewlap is small without flashy folds and large in males.
- The chest well developed. Hump is large in males and medium sized in females.
- Legs are moderately long and lean and feet are small, hard and well shaped.
- In the males the sheath is short and tight and in the



Fig. 2.7 Hariana Bull and Cow

females the navel flap is not prominent. Tail is short and thin

- Udder' is large with milk veins. Teats are medium sized and proportionate.
- The average weight of males is 371 to 490 kgs and that of the females is 265 kg.
- The average milk yield of cows is 909 to 1364 kg. The bullocks are good for ploughing and road transport

### **Kankrej**

- The home of this breed is Gujarat and distributed in Ahmedabad, Bombay and kutch. The colour of the female is silver grey or black.
- The males are darker than the females.
- It is one of the heaviest breed in India.
- The forehead is broad slightly dished in the centre.
- The horns are thick, strong and curved and slightly symmetrical.
- The body is powerful, with broad chest. Straight back, well developed hump, pendulous sheath in males and the tail is of moderate length with black switch extending below the hock.
- Dewlap is thin and pendulous and hump is large and prominent.
- In cow the udder is well shaped and slightly developed The average weight of the male is 455 to

682 kg and of the female is 409 to 455 kg. The average milk yield is 1333 kg. in a lactation. The male are active, strong and good both for plough and cart

## **2. Draught Breeds**

The male animals are good for work and cows are poor milk yielders. Their milk yield on an average is less than 500 kg per lactation. They are usually white/grey in colour. A pair of bullocks can pull 1000 kg. with a walking speed of 5 to 7 km per hour and cover a distance of 30 to 40 km per day.



Fig. 2.8 Kankrej bull

### **Malvi**

- The breed is found in Malwa tract in Madhya Pradesh and Rajasthan.
- The bullocks are known for their draft qualities and the cows are poor milkers.



Fig 2.9 Malvi bull

The colour of the animals is white to light grey, with black markings on neck, shoulders, • The head is small and the face dished.

- The body is deep, short and compact with short legs and the tail
- Ears are short and alert.
- The sheath in the male and navel flap in the female are short.
- The horns are massively built, black, upright and pointed at tips.
- Cows are poor milkers but bullocks are good work animals

## Hallikar

- The home tract of this breed is Mysore, and Tumkur districts of Karnataka State
- The colour of the animal is dark or light grey with white patches round the face and dewlap. The bullocks are good for work and the cows are poor milkers and the bullocks are suitable for both for road and field work.



**Fig. 2.10 Hallikar Cow**

- The head is long with bulging forehead furrowed in the middle.
- Horns are close together and sprung perpendicularly from the head. The body is long and compact with long and slender legs. The novel flap is tucked up and tail is thin

## Amrit Mahal

- The home of this breed is Karnataka state.
- The colour of the animal is White and Grey.
- This is the best breed in India for drought purpose.
- The bullocks are suited for quick transport and the cows poor milkers.
- The animals are active and fine in temperament.



**Fig. 2.11 Amritmahal bull**

- The head is well shaped, narrow, and the forehead is deeply furrowed.
- The eyes are bright.
- The legs are well proportioned and medium in length.

- The hooves are hard, black with narrow clefts. The tail is fine and moderate in length. The udder is small, compact with small hard teats.

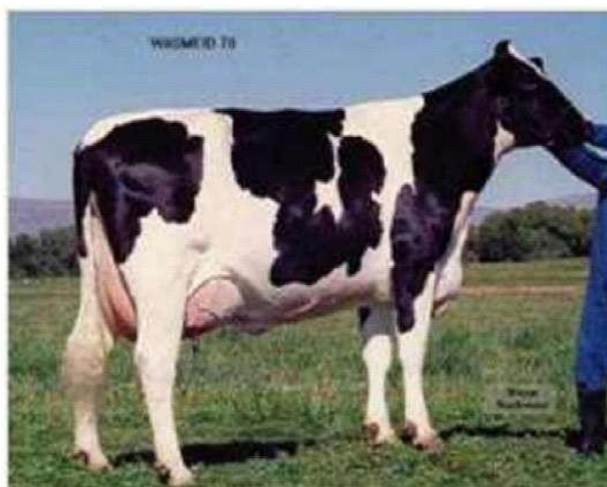
## Exotic Dairy Breeds

The European breeds of dairy cattle belong to the species of *Bos Taurus*. They are hump less, generally large, short ears, without a pendulous dewlap. They are less heat tolerant and less disease resistant when compared to Indian cattle, but are superior in milk production.

The important European breeds of dairy cattle are Holstein Friesian, Brown Swiss, Jersey Guernsey and Ayrshire. Out of the above breeds there is greater demand and use of H.F and Jersey

## Holstein Friesian

- This is the world's highest milk yielding breed through the fat percentage of milk is very low. The home of this breed is Holland
- Animals of this breed are the largest among the European breeds.
- This breed of animals is imported by many countries in the world.
- The colour of the animal is with black and white markings



**Fig. 2.14 Holstein Friesian**

- The animals are with the largest udders
- The head is long and narrow.
- The cows are docile.
- The ideal body weight of a cow is 682 kg and that of bull is 1000 kg.
- The cows are heavy milkers and the average lactation yield is 4295 kg
- Individual animals touched 19,995 kg of milk in a lactation period of 365 days.
- The milk of these animals are used for cheese making as the fat percentage is low.
- This breed is also good for beef production, because of its fast growth and body fat.

## Jersey

- The home of this breed is England
- This breed is popular and widely distributed all over the world.
- The colour of the animals is brown with variation of brown to black and vary from white spotted to solid in marking.
- The animal is small in size, with a good capacity for milk production.

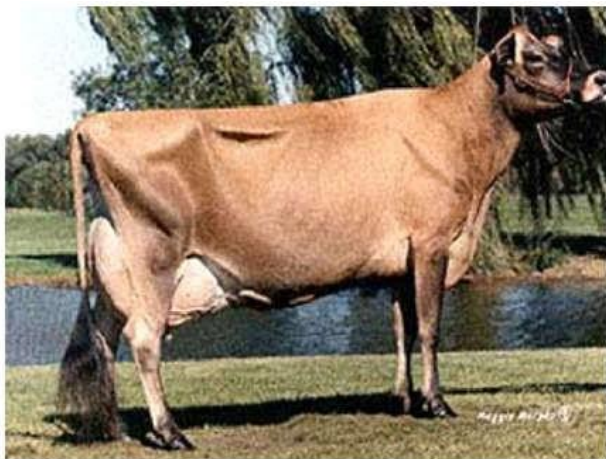


Fig. 2.16 Jersey Cow

- The milk fat is high i.e. 5.3% and milk solids are 15 %.
- Compared to other European milch breeds, Jersey milk has the highest milk fat
- Jersey milk is yellow in colour due to high carotene and is good for butter making.
- Jersey animals are extensively used for cross breeding programme in India.
- The average milk yield of the cow is 2727 kg in lactation. Individual yielded 13,296 kg in 365 days.

## Indian Buffalo Breeds

There are 14 buffalo breeds present in India. But the most important breeds are Murrah, Jaffrabadi, Nili, Ravi, Mehsana.

### **Murrah**

- The home tract of this breed is Hariyana State, Punjab and Delhi. This breed is distributed throughout India.



Fig. 2.19 Murrah Bull and Buffalo

The animals are noted for good milk yield and fat per cent.

- The colour of the animal is jet black with white switch of the tail which is long and reaching the fetlock. The skin is soft and smooth.
- The she buffalo had a deep massive frame with a comparatively light neck and head.
- The horns are short and tightly curled. The forehead is broad
- Face is fine without white markings and eyes prominent and bright in females.
- The udder is well developed with prominent milk veins and good sized teats.
- Average weight of the buffalo is from 490 kg to 500 kg and that of a buffalo bull is 545 kg to 682 kg.

- The average milk yield is 1364 kg to 1820 kg for a lactation period of 300 days. The milk fat per cent is about 7-9 %

## **Nagpuri**

- This breed is of lighter type and comes from Central India.
- The head is long with a broad forehead, and the horns are long, curved back on each side of neck behind the shoulders.
- Barrel is long and deep with light limbs.



Fig. 2.24 Nagpuri Bull and Buffalo

The bull is comparatively short. The males are largely used for draft purpose and the females are fair milkers and the daily average milk yield is 5 to 8 kg

## **IMPORTANT ASPECTS FOR THE SELECTION OF DAIRY CATTLE**

Breeding is defined as the crossing of the male and the female parents to get the off spring for the characters desired. The best organisms are for breeding so that best offspring will be produced.

### **Aspects for selecting dairy cattle**

#### **Young animals**

Those that have not given birth for more than 3-times, should be selected. They have a longer productive life. Old animals are poor breeders and low producers. Production and breeding efficiency decline with age.

#### **Level of performance**

Animals with highest production level selected. Performance best indicated by records. Good performance of animal indicated by; High milk, wool and egg production, Good mothering ability  
The animals with poor performance should be culled. (Avoided)  
Good records kept and used by the farmer for this purpose.

#### **Physical Fitness**

Animals selected should be free from any physical defect e.g. mono-eyed, limping, irregular number of teats, defective and weak backline etc.

#### **Health**

Sick animals do not breed well and are expensive to keep.  
Animals that are resistant to diseases pass these characteristics to their offspring's

#### **Body Conformation**

Animals for breeding to be selected according to proper body conformation. A dairy cow should be with a large udder, thin legs, long neck.

#### **Temperament or Behaviour**

Animals with bad behaviors should be culled. e.g aggressiveness, kicking

#### **Quality of products**

Select animals that give products of high quality such as meat, milk.

#### **Mothering Ability**

Animals selected should have a good mothering ability  
That is animals with good natural instinct towards their young ones. This will enable them to rear the young ones up to weaning.

#### **Adaptability**

Animals selected should be well adapted to the prevailing climatic condition in the area e.g Arid and semi arid areas.

### **Selection Methods of Animals**

Selection is a process in which certain individuals in a population are preferred to others for the production of next generation.

There are different methods of selection being used for dairy animals. These are

#### **Individual Selection**

Selection is based on the individuals own milk yield and physical characters. This method is not a good method because the characters of the parents may not come to the offspring.

#### **Family Selection**

Whole families are selected for breeding. This means the siblings are allowed to mate themselves so that the good characters may be retained in to the next generation.

#### **Progeny Testing**

The criterion of selection is the mean value of an individual's progeny which comes closest to the breeding value. The value of an individual is judged by the mean value of its progeny

#### **Production Records**

In advanced dairy countries large numbers of breeds are tested in dairy herd improvement programmes. During 1972 more than 2, 66,001 lactation records were reported by supervisors of cattle houses. These records are analyzed and best breeders are selected.

#### **Culling of animals**

· Culling is elimination of undesirable animals from the herd, for reasons of uneconomic, poor production, or very poor reproductive ability, with sterility problems and breeding irregularities, very poor body conditions, stunted growth, suffering from incurable illness, or disease.

## **Breeding**

Process of mating selected males and females to produce offspring with the desired characteristics.

#### **Terms Used in Breeding**

Inheritance; Genetic transmission of characteristics from parents to offsprings.

#### **Hybrid and Hybrid Vigour**

Hybrid vigour or heterosis is increased vigour and performance resulting from crossing two superior breeds. When two superior breeds e.g Pedigree Friesian and Jersey breeds are mated the resultant offspring have both the character of high milk yield and high butterfat content.

## **BREEDING SYSTEMS**

They are categorized into two namely; Inbreeding and Outbreeding

### **1. Inbreeding**

Inbreeding is the mating of closely related individuals. Inbreeding is again divided into two types as

**Close Breeding:** mating between very closely related animals, for example sib-mating and parents sib-mating.

**Line Breeding:** mating of distantly related animals that had a common ancestor for example cousins, halfbrothers/sisters, grand daughters and grand sires.

#### **Advantages**

To increase genetic uniformity in a herd.

To increase phenotypic uniformity.

It brings about the uniformity of the required type.

#### **Limitations**

It can bring about loss of hybrid vigour.

It may lead to decline in fertility.

It may lead to high rate of pre-natal mortality.

### **2. Outbreeding**

Mating unrelated animals is known as outbreeding.

It is divided into 6 types as Line Crossing, Out Crossing, Cross Breeding, Grading up, Species Hybridisation

#### **Line Crossing**

In this method of breeding, inbred lines of male and females were developed by intensive inbreeding for more than 5 generations. The unrelated inbred lines of male and female are mated and the offspring born out of such mating becomes a hybrid which exhibits hybrid vigour and are superior to either of the parents

#### **Out Crossing**

It is the mating of unrelated pure bred animals of the same breed. The animals do not have common ancestors on either side of their pedigree up to 4 to 6 generations and the offspring of such a mating is known as out cross. It is an effective system for genetic improvement. It is also called as pure breeding.

#### **Cross Breeding**

It is the mating of animals belongs to different breeds. Cross breeding is an important tool for breeding animals for high milk and meat production. In India, zebu breeds of cows are crossed with exotic breeds

like Holstein Friesian or Jersey bulls to produce high milk yielding offspring.

In India Cross-breeding of cow is done by using the exotic bulls and the progeny inherit the desirable characters of the parent like high milk yield, early maturity, higher birth weight of calves, better growth rates, better reproductive efficiency and indigenous parents characters like heat tolerance, disease resistance, ability to thrive on scanty feeding and coarse fodder etc.

**Disadvantages** Adaptability of the crossbred under tropical climate of India is poor when the exotic inheritance exceeds more than 50%

#### **Grading Up**

Grading up is the practice of breeding in which the superior breeds are mated with the normal individuals for several generations. After five or six generations of grading up, the normal individual population gets improved and resembling the superior breed. This is the breeding policy for buffaloes

**Advantages:** After 5 to 6 generations, grades resembling pure bred animals in matter of physical appearance and milk production.

Grading up avoids the expenditure of purchasing the high producing pure animals

It proves the breeding merit of the exotic bulls  
The value of the non-descript animals is much enhanced.

#### **Artificial insemination**

Introduction of semen into the female reproductive tract by artificial means is called artificial insemination.

#### **Advantages**

There is economical use of semen. It reduces the expenses of keeping a male animal.

Semen can be stored for long. It helps to control inbreeding.

#### **Disadvantages**

It requires skilled labour. Low chance of conception due to death of semen during storage. It is laborious



## HOUSING OF DIARY ANIMALS

### Selection of site for dairy Farm

The points, which should be considered before the erection of dairy buildings, are as follows:

#### 1. Topography

A dairy building should be at a higher elevation than the surrounding ground to offer a good slope for rainfall and drainage for the wastes of the dairy to avoid stagnation within.

#### 2. Soil Type

The soil should not be too dehydrated or desiccated. Such a soil is susceptible to considerable swelling during rainy season and exhibit numerous cracks and fissures.

#### 3. Exposure to the sun and protection from wind

A dairy Building should be placed so that direct sunlight can reach the platforms, in the shed. It should protect the cattle from strong wind currents whether hot or cold.

#### 4. Accessibility

Situation of a cattle shed by the side of the main road preferably a distance of about 100 meters for easy transport of cattle, feed or milk

#### 5. Durability

Durability of the structure is obviously an important criterion in building a dairy farm.

#### 6. Water Supply

Abundant supply of fresh, clean and soft water should be available at a cheap rate.

#### 7. Surrounding

Areas with wild animal should be avoided. Narrow gates, smooth finished floor in the areas where the cows move should be eliminated.

#### 8. Labour

Honest, economic and regular supply of labour should be available.

#### 9. Marketing

Dairy buildings should only be in those areas from where the owner can sell his products profitably and regularly.

#### 10. Electricity

Electricity is the most important sanitary method of lighting a dairy. Since a modern dairy always handles electric equipments

#### 11. Facilities for Improved labour Efficiency

Cattle yards should be so constructed and situated in relation to feed storages, hay stacks, silo and manure pits as to effect the most efficient utilisation of labour and land.

## Systems of Housing

The most widely prevalent practice in this country is to tie the cows with rope on a katcha floor. The animals will be exposed to extreme weather conditions leading to bad health and lower production. Dairy cattle may be successfully housed a wide variety of condition, ranging from close confinement to little restrictions except at milking time.

The housing systems of cattle are of two types. The loose housing and The conventional barn.

### Loose Housing System

Loose housing may be defined as a system where animals are kept loose except at the time of milking and at the time of treatment. The system is most economical. Some features of loose housing system are as follows.

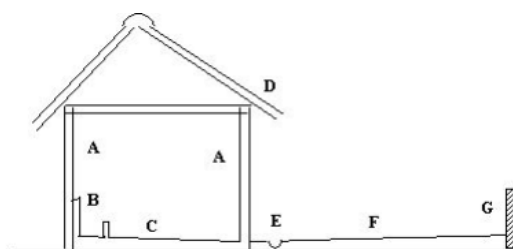


Fig. 4.1 Loose Housing System

Section of loose house showing internal details

A. Roof supporting structures B. Manger C. Covered Area D. Roof  
E. Gutter F. Open area and G. Compound Wall

In loose housing dairy animals are keeping loose in an open paddock expect at milking time. The open paddock is provided shelter along one side and enclosed with half walls / wire fences / GI pipes.

Common watering tank and manger (Feeding trough) is provided.

Space requirements for different classes of animals in loose housing system (BSI)

Type of Animal	Space Requirement	
	Covered area (m <sup>2</sup> )	Open area (m <sup>2</sup> )
Cattle	3.5	7.0
Buffalo	4.0	8.0
Breeding bull	12.0	120.0
Advanced Pregnant	12.0	12.0
Young calves	1.0	2.0
Heifers	2.0	4.0

Separate milking parlor is constructed for milking purpose.

**Advantages of loose housing system:** Cost of construction is significantly lower than conventional type.

It is possible to make further expansion without change

Facilitate easy detection of animal in heat.

Animals get optimum exercise which is extremely important for better health and production.

Space requirements for different classes of animals in loose housing

### **Conventional Barn**

Animals are confined on a platform and secured at neck by neck chains.

The barns are completely roofed and the walls are also complete with windows / ventilators located at suitable places.



Animals are fed and milked in the same place.

There shall be individual standings in one or two rows.

The floor should have a gentle slope and a central drain one in 40 from centre towards the drain.<sup>56</sup>  
Dairying

The Conventional Barn housing contains;

**Feeding passage**

**Manger**

**Standing space**

**Gutter or drainage channel**

**Milking passage**

**Single row system:** In single row system, 12-16 numbers of animals can be kept.

**Double row system** In double row system up to 50 animals can be maintained in a single shed.

### **Advantages**

The animals and men caring for animals are less exposed to harsh environment.

The animals can be kept clean.

Diseases are better controlled.

Individual care can be given.

Separate milking barn is not required.

## **CLEANING AND SANITATION OF DAIRY FARM.**

### **Cleaning of Animal Sheds**

The easy and quick method of cleaning animal house is with liberal use of tap water, proper lifting and disposal of dung and straw bedding, providing drainage to the animal house for complete removal of liquid waste and urine.

The daily removal of feed and fodder left over in the manger reduces the fly nuisance. Periodical cleaning of water trough eliminates the growth of algae, bacterial and viral contamination and thus keeps the animal healthy.

### **Sanitation in Dairy Farm**

Sanitation is necessary in the dairy farm houses for eliminations of all micro organism that are capable of causing disease in the animals.

Milk produced in an unclean environment is likely to transmit diseases which affect human health.

Dry floorings keeps the houses dry and protects from foot injury.

Similarly, the presence of flies and other insects in the dairy farm area are not only disturbs the animals but also spreads deadly diseases to the animals

### **Sanitizers**

Disinfection of animal sheds means making them free from disease producing bacteria and is mainly carried out by sprinkling chemical agents such as bleaching powder, Iodine , sodium carbonate, Washing soda, Slaked Lime, Quick Lime and phenol.

Sunlight is the most potent and powerful sanitizer which destroy most of the disease producing organism

### **Insecticides**

Insecticides are the substances or preparations used for killing insects. In order to control flies and disease transmitting ticks, insecticides are used in dairy farms.

Ticks usually hide in cracks and crevices of the walls and mangers. Smaller quantities of insecticide solutions are required for spraying.

Liquid insecticides can be applied with a powerful sprayer, hand sprayer, a sponge or brush.

Commonly used insecticides are BHC, DDT, Gamaxane wettable powders, Dairying malathion, sumithion etc.

These are highly poisonous and need to be handled carefully and should not come in contact with food material, drinking, water, milk etc.

### **Precautions in cleaning**

- Remove dung and used bedding completely.
- Avoid the use of dirty water in cleaning the sheds.

- Never put the fresh fodder over the previous day's left over fodder in the manger.
- Prevent algae to grow in the water troughs
- Avoid the use of disinfectant solution at the milking time as milk absorbs these quickly.
- Scrape the floor with a brush and broom and wash with water.
- Remove the cobwebs periodically with the help of a wall brush.
- Whitewash the walls periodically by mixing insecticides in it to eliminate ticks and mites living in cracks and crevices.

## **Weaning of calf**

### **Weaning of Calf or Management of Calf**

Good feeding and management are essential for the calves during their growth, so that they attain mature body weight earliest and will be useful as replacement stock. The feeding and care of the calf begins before its birth.

#### **Early Management**

- Immediately after birth remove any mucous or phlegm from those nose and mouth.
- Normally the cow licks the calf immediately after birth. This helps in dry off the calf and also stimulates breathing and circulation.
- The naval should be tied about 2-4 cms away from the body and cut 1 cm below the ligature and apply Tr. Iodine or boric acid or any antibiotic.
- The weight of the calf should be recorded.
- Wash the cow's udder and teats preferably with chlorine solution and dry off with a clean cloth. Allow the calf to suckle the first milk of the mother i.e. Colostrum.

#### **Feeding of Calves**

- Feed colostrum i.e. the first milk of the cow for the first 3 days. The colostrum is thick and viscous. It contains higher proportions of Vit A and proteins. The colostrum which gives protection against many diseases.
- Whole milk should be given after 3 days. It is better to teach the calf to drink milk from the pail or bucket.
- The limit of liquid milk feeding is 10 % of its body weight
- Give calf starter after one month of age.
- Provide good quality green fodder and hay from one month afterwards for the early development of the rumen.
- Feeding of antibiotics to calves improves its immunity and makes it resistant to diseases.

#### **Other management practices**

- Identify the calf by tattooing on inside of the ear after birth and tagging after one year.

- Deworm the calf regularly to eliminate internal parasites
- Fresh water should be given from 2nd week onwards.
- House the calves in individual calf pens up to 3 months and afterwards in groups. After six months males and females calves should be housed separately.
- Mortality in calves is more during first month due to worms (Ascariasis), Diarrhea (calf scous) and pneumonia.
- Extra teats beyond 4 should be removed at 1-2 months of age in the female calves.
- At 8-9 weeks of age all the surplus male calves should be castrated.
- Keep the body of the calves clean and dry to avoid fungal infection.
- Mineral-block licks should be provided to the calves to prevent mineral deficiency.

## **Castration and dehorning**

To castrate a male animal means that the functioning of the testicles is stopped by preventing production of male hormones so that the animal is unable to reproduce. Castration may be accomplished by physical, chemical or hormonal techniques. Physical methods are most common. Testicles may be removed surgically or killed by obstructing the blood supply.

Young calves may be castrated with rubber rings, or by surgery. Surgical castration may be more appropriate

#### **Reasons for castration**

- Stop the production of male hormones and semen in unwanted bulls
- Helps in taming the oxen for draught purposes
- Produce docile cattle that are easier to handle compared to bulls
- Decrease aggressiveness, mounting activity, injuries
- Enhance on-farm safety for animals, producers and employees

#### **Time of castration**

- Castration can be done at any age up to 12 months.
- It is, however, better to do it when the animals are very young (before 2 months of age).

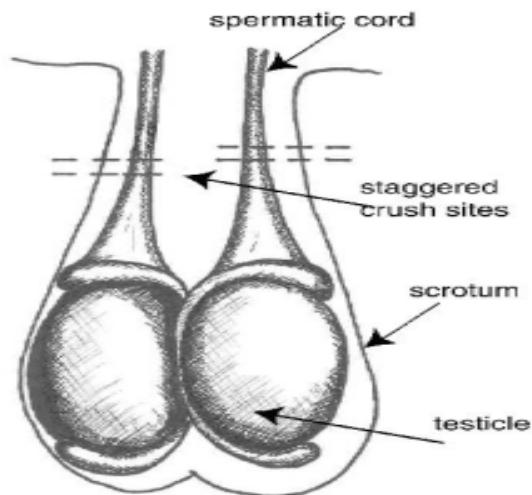
#### **Methods of castration**

**Burdizzo method of castration** : It is the Common method of castration in cattle

#### **Technique**

- Use this technique when the spermatic cord can be palpated - one month and older.

- Find the spermatic cord on one side of the scrotum. The spermatic cord runs from the testicle into the



**Fig. 6.49 Burdizzo Castration Sites**

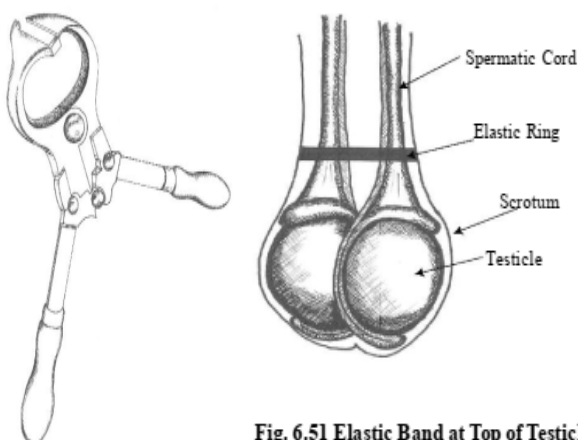
calf's body. It is about the size of a pencil. Pinch the cord to the outside edge of the scrotum between your thumb and forefinger.

- With the help of Burdizzo crush the spermatic cord.
- Release the Burdizzo, move it to a new site 1 cm below your first site, and repeat steps four and five times.
- Repeat the procedure on the opposite side.
- The testicles swell initially and then degenerate and shrink in size.

### Elastrator Method

Elastic band castration cuts off blood supply to the testicles. A lack of blood supply kills the testicles.

An elastrator is the tool used to apply an elastic band to the neck of the scrotum. The elastic band obstructs blood flow to the testicles and the scrotum. In time, the scrotum and testicles fall from the body. The elastrator band is most reliable for calves



**Fig. 6.51 Elastic Band at Top of Testicles**

**Fig. 6.48 Burdizzo castrator**

### Dehorning

Dehorning of horned cattle is the process of removal of their horns or the process of preventing their growth.

### Methods of dehorning

1. Chemical method
2. Electrical method

### Chemical Dehorning

Caustic chemicals will prevent the growth of horns when properly applied to the horn buds of new-born (less than 10 days age) calves. The chemical destroys the horn-producing cells around the horn bud. The chemicals are available as sticks or pastes



**Fig. 6.54 Horn bud in young Calf**

### Hot Iron Dehorning

Hot iron dehorning tools are available in versions heated by a furnace or fire, 12-volt battery, 120-volt electricity, power packs.

The head of the iron is a hollow circle and it fits over the horn bud. Proper application of the hot iron will destroy the horn-producing skin at the base of the horn.

This technique works well for calves up to 12 weeks old. There are several sizes of dehorning irons.

The proper size is one where the burner makes a complete ring around the base of the horn.

### Electronic Hot Iron Dehorner

An electric hot-iron dehorner will destroy the horn-producing skin at the base of the horn bud.

### Deworming and vaccination Program

Elimination of internal parasites is called deworming. The following is the deworming schedule in calves.

Advantages of deworming

- Improves feed efficiency and body weight in calves

- Prevents death in calves due to Ascariasis

Age of the calf	Deworming drug	Dose/kg body weight	Against
7 days	Piperzine adepate	200-400 mg	Ascariasis
30 days	Piperzine adepate	200-400 mg	Ascariasis
60 days	Albendazole	7.5-15mg	Round worms
90 days	Fenbendazole	5-10mg	Round worms
120 days	Oxyclozanide	5.10mg	Liverflukes
150 days	Albendazole	7.5 – 15mg	Round worms
180 days	Fenbendazole	5-10mg	Round worms

After 6 months deworming should be carried out for every 3 months up to 1 year and for every 6 months thereafter.

Improves resistance in calves for other infectious diseases

- Prevents anaemia in calves

### Precautions During Deworming

- Dose should be appropriate
- Deworming should not be carried out in sick calves

## Vaccination Schedule

### 6.9.2 Vaccination Schedules in Cattle and Buffalo

Sr.No	Disease	Vaccine	Dose(ml)	Schedule
1.	Foot and Mouth disease	FMD Vaccine Raksha FMD vaccine	5 ml 3 ml	Twice in a year September & March
2.	Haemorrhagic Septicaemia	Alum ppt. H.S. Vaccine H.S. vaccine	5 ml 3 ml	Annually before monsoon (twice a year in endemic areas)
3.	Black quarter	Alum ppt. B.Q. vaccine	5 ml	Annually before monsoon
4.	Brucellosis	Brucella cotton - 19 strain vaccine	5 ml	Only once i.e. at 4-8 months of age in females in problem herds.
5.	Theileriosis	Rakshavac-T- vaccine	3 ml	Annually.

## RECORDS TO BE MAINTAINED IN THE DAIRY FARM

Maintenance of farm records is important for

- Effective monitoring of animal performance right from birth.
- Evaluation of management and feeding systems.
- Individual animal comparisons to assist in breeding, culling and other decisions.
- Milk recording of individual animals.

The following records are necessary

### 1. Daily income and expenditure statement

Daily Income expenditure statement in dairy farms

Date	Description of the item	Income	Total income	Expenditure	Total expenditure	Balance
01.01.2011	Milk	20,000	45,000			+ 35,000
01.01.2011	Culled cows	25,000				
01.01.2011	Feed			8,000	10,000	
01.01.2011	Medicines			2,000		

## 2. Individual animal record

### 2. Individual Animal record

Animal number				
Lactation order	I	II	III	IV
Date of service				
1 <sup>st</sup>				
2 <sup>nd</sup>				
3 <sup>rd</sup>				
Date of calving				
Sex of the calf				
Days in milk				
Milk yield				
Days dry				
Remarks				

### 3. Individual Mother register

#### 3. Calving register

Animal Number	Due date of calving	Date of Calving	Calf Number	Sex of the Calf	Birth weight of Calf

### 4. Calf Register (Sire=Bull, Dam= Mother)

#### 4. Calf Register

Calf Number	Date of birth	Sex of the calf	Sire Number	Dam Number	Dispos-able

### 5. Growth record of the young calf

#### 5. Growth record of the young Stock

Calf Number	Birth weight	Fort nightly weight	Weight of 1st service	Weight of 1st calving	Remarks

### 6. Daily Feeding Register

#### 7. Daily Feeding Register

Date	No. of Animals	Concentrate			Green Folder	others
		Received	issued	Balance	R I B	R I B

**7. Daily milk Record**

**8. Daily milk record**

Animal Number	Date of calving	01		02		03	
		AM	PM	AM	PM	AM	PM

**8. Individual Health Register**

**9. Health Register**

Animal Number	History and Symptoms	Diagnosis	Treatment	Remarks

**9. Deworming and Vaccination register**

**10. Deworming and Vaccination Register**

Animal Number	Deworming date	Next due date	Vaccination for	Date of Vaccination	Next due date

**10. Daily total animal count in the cattle farm**  
(Heifer = Cow that has not given birth to calf yet)

**11. Daily Livestock Register**

Date	Cows	Calves		Heifers	Breeding bulls
	Males Females	M	F		

The above records are to be maintained in cattle farm for proper management of farming.