
UNIT 5 LIVESTOCK MANAGEMENT IN ORGANIC FARMING

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5.0 OBJECTIVES

After going through this Unit, you will be in a position to :

- identify the different breeds of Cattle and Buffalo;
- explain the importance of livestock housing, hygiene and nutrition; and
- enumerate the national and international norms for organic livestock.

5.1 INTRODUCTION

We know organic farming has traditionally embraced a holistic food quality concept that includes all aspects of food from soil management and environmental and social impact at primary production level through processing

to sale and distribution of food. We also know that domestic livestock such as farm animals and pets are the part of our cultural heritage. Livestock is an integral part of the organic farming and help in achieving a balanced relationship between soil, plant and animals under the system. Cattle, buffalo, sheep, goat, poultry and pig are the major component of it. These livestock provide valuable inputs and services to the crop husbandry as depicted in Figure 5.1.

The national and international standards have been prescribed to maintain livestock organically. Under organic farming, the livestock should be maintained with good health and proper hygiene and given proper management. However, the basic requirements for livestock management are provision of comfortable sheds to accommodate the livestock, hygiene, uncontaminated drinking water and nutritionally adequate and safe food.

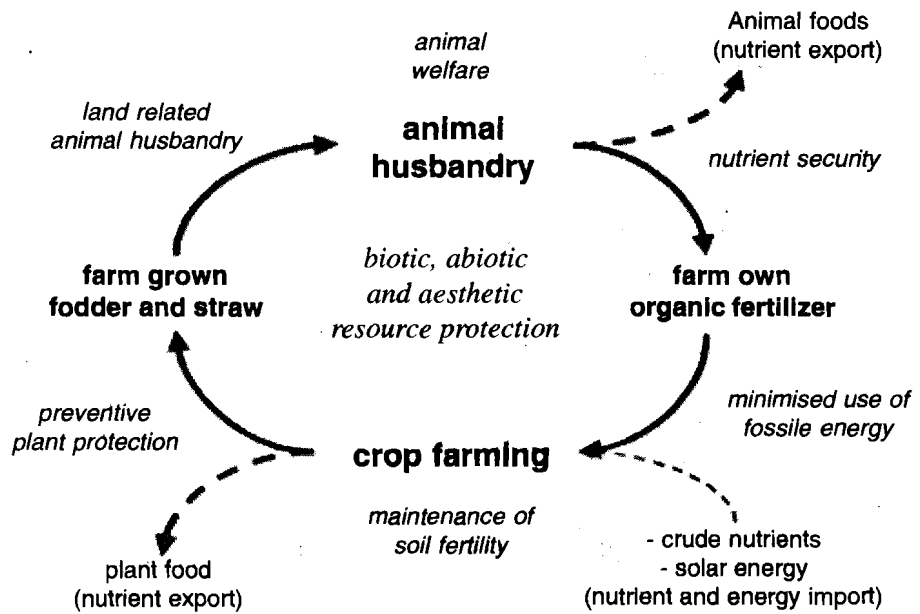


Fig. 5.1: Animal Husbandry at the Production Level of an Organic Farming System (Rahmann, 2003)

In general, the farm livestock generates various products and functions as listed in the following table:

Food Products	Meat, milk, eggs, honey
Non-Food Products	Feathers, wool, skin hair, bones, silk, medicine, biogas, wax, propolis
Off-farm Services	Transport, therapy, recreation, landscape maintenance, hunting, protection, sports, status, research, religion
On-farm Functions	Manure production, utilization of by-products from crop farming and processing, pollination, pest control (e.g., insects, rodents, snails), herding, marketing, attraction of guest, biodynamic preparation processing (e.g., horns).

So you have seen that the livestock not only provide different products but also various services. In this Unit, we shall study different breeds of cattle and buffalo, national (NPOP) and international norms for organic livestock and also the livestock nutrition.



5.2 CATTLE AND BUFFALO BREEDS

There are 24 cattle (cow) and 6 buffalo breeds in India. Further, a large number of non-descript cattle, which are small in size and of low productivity, are also available.

Some important breeds of cattle and their geographical distribution are presented below:

5.2.1 Cattle Breeds

The following are the common breeds of Indian cow:

Kankrej: These are fast and powerful draught cattle and average milk yielder. Kankrej yield about 1,400 kg milk in one lactation. These are geographically distributed in south-east of Rann of Kutch, south-west of Tharparkar district (now in Pakistan) to Ahmadabad and Dessa to Radhanpur in Gujarat.

Hissar: It is a powerful draught breed. It is not a pure breed. The influence of Kankrej dominates. The breed is distributed in Hissar and Hansi districts of Haryana.

Kenwariya or Kenkatha: The breed is small, but sturdy and powerful. It is distributed along the Ken River of Banda district of Uttar Pradesh and in certain adjoining areas of Madhya Pradesh. The breed is grey on the barrel and dark grey on the rest of the body.

Kherigarh: This breed is very active and good for light draught and trotting. It is white in colour, with narrow face and thick upstanding horns. It is distributed in Kheri district of Uttar Pradesh.

Malvi: The breed is massively built and compact. These are good draught animal. The breed is of grey colour. The breed is distributed in parts of Madhya Pradesh and Andhra Pradesh.

Tharparkar: The breed is medium sized and compact. These are good milch and draught animals. It is distributed in Sind (Pakistan), Kutch(Gujarat), Jodhpur and Jaisalmer.

Bachaur: It is a draught breed and found in Sitamarhi district of Bihar.

Gaolao: The breed is a draught animal distributed in Wardha and Chhindwara districts of Madhya Pradesh. Its colour is white with medium height and light body build up.

Haryana: It is a dual-purpose breed presenting powerful work animals and good milk yielders. These are distributed in Rohtak, Hissar, Karnal and Gurgaon districts of Haryana.

Krishna Valley: The bullocks are massive and powerful. These are good for slow draught and heavy ploughing. The breed is distributed in Maharashtra-Andhra Pradesh border.

Mewati: The breed is powerful, but docile. It is suitable for heavy ploughing and carting. It is distributed in West Alwar and Bharatpur districts of Rajasthan.

Nagori: The breed is known for trotting. It is distributed in North-East parts of Jodhpur (Rajasthan).

Ongole: The animals are large and muscular. They are draught breeds suitable for heavy work, but not suitable for fast trotting. The breed is distributed in Guntur district of Andhra Pradesh.

Rathi: It is a mixed breed of Haryana, Nagori and Mewati. The breed is distributed in Alwar and adjacent areas of Rajasthan. The animals are medium sized, powerful animals and adapted to moderately heavy plough.

Dangi: The breed is known as moderately active workers and good in areas with heavy rainfall. The breed is distributed in some areas of Ahmednagar and Nasik districts of Maharashtra.

Deoni: The bullocks of this breed are suitable for heavy cultivation and the cows are good milk yielder. The breed is distributed in western Andhra Pradesh.

Gir: The bullocks of this breed are large and powerful, but slow and lethargic in action. The cows are high milk yielder. The breed is distributed in Kathiawar and Baroda districts of Gujarat, northern Maharashtra and adjoining areas of Rajasthan.

Sahiwal and Red Sindhi: The breeds are found in Pakistan and India. These are dual breeds.

Hallikar: This breed is a good draught cattle. Body colour is grey. The breed is distributed in Hassan, Mysore and Tumkur districts of Karnataka.

Alambadi: The breed is not clearly marked but resembles Hallikar. It is distributed in Hilly areas of Selam and Coimbatore districts of Tamil Nadu.

Amritmahal: The breed is small grey cattle and active. They are known for power of endurance.

Bargur: The breed is fiery, fierce restive and difficult to train. The animals are distributed in Coimbatore district of Tamil Nadu.

Kangayam: The animals of the breed are of moderate size but active and powerful draught animals. The breed is distributed in Coimbatore district of Tamil Nadu.

Khillari: The breed is similar to Amrit mahal and distributed in southern Maharashtra.

5.2.2 Buffalo Breeds

The major breeds of Indian buffalo are as follows:

Jaffarabadi: This breed has large and massive body and are best milk yielder. The breed is distributed in Gir forests of Gujarat.

Mehsana: It belongs to Baroda district of Gujarat. The breed has medium sized buffalo known for good milk yield with early maturity, regular breeding quality and persistency in milk production.

Nagpuri: The bullocks of this breed are slow. The breed is used mostly for draught. The breed is distributed in parts of Madhya Pradesh and Maharashtra.

Surti: The animals are economical producers of milk with high fat percentage. The breed is distributed in Gujarat.

Murrah: The animals are massive, black with infrequent white marking. The breed is used as milch animals almost throughout the country. The breed belongs to Haryana, Punjab and Delhi.

Nili Ravi: The animals are almost equally good milk producers similar to Murrah, but more massive and having whiter marking on their bodies. The breeds belong to Pakistan and also distributed in few districts of Haryana and Punjab.

Check Your Progress Exercise 1

Note: a) Space is given below for the answer.

b) Compare your answer with that given at the end of the Unit.

1) Describe the characteristics different cattle breeds of your locality?

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- 2) What are the basic amenities should be provided for livestock under organic farming?

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- 3) Describe the role of roughages in the animal nutrition.

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5.3 LIVESTOCK HOUSING

We shall be describing the housing structures and space for accommodation for cattle and poultry separately.

5.3.1 Sheds for Cattle and Other Livestock

Sheds for animals should be built in an open, well-drained site with further scope for expansion. It should be easily accessible. Use of trees as wind-break or planting of quick growing trees near the shed is recommended. A moderate floor slope helps drainage of animal feed and dung. The structure should be oriented east to west, if possible.

The cattle shed protect the animals from rain, winds, heat and cold. While designing the shed, consideration should be given to the comfort and health of animals, the economic use of labour while milking, feeding, cleaning and hygienic conditions for milk production.

A stall of 1.5 m in length and 1.2 m in width is considered suitable for Indian cows. Mangers and gutters should be of 0.75 m and 0.45 m wide, respectively, with all corners rounded up by cement. The entire construction should have no projections to scratch and tear the skin, legs or udder, nor should any part of the shed be favourable for the accumulation of dust or dirt. Cattle shed should be close to the farmer's house in order to attend to the animals at night time and in bad weather. The site should have a good water supply.

The conventional cattle sheds have roof of ordinary chappar, thatch work or flat roofs made with timber and earth. The floor of the shed may be a bed of broken bricks, gravel, sand, lime and coal cinders well rammed to make a compact layer of over 15 cm thickness.

Stables for horses, pens for sheep and goats, sties for swine, kennels for dogs and sheds for camels, and other animal habitations should generally conform to basic hygienic principles as are prescribed in the case of buildings for cattle and buffaloes under organic farming system.

5.3.2 Poultry House

The poultry house must provide adequate space for birds. Light breeds may require about 0.2 m² floor area per adult bird while heavy breeds require a floor space of about 0.3-0.4 m² per bird. The house should be well ventilated. It should be reasonably cool in summer and warm during winter. The optimum temperature for the chicks is between 12° and 32°C depending upon the age. Mulberry or other shade trees that should be planted around the poultry-house.



5.4 LIVESTOCK HYGIENE

Good hygienic conditions are the most important aspect of organic livestock farming. Proper hygienic conditions also prevent many diseases and disorders in the animals. Livestock hygiene identifies the causes of all preventive animal diseases and devises means of removing those causes or rendering them ineffective. It aims at increasing the efficiency of animals by providing them the most comfortable conditions of life.

Cleanliness helps to preserve the health of animals. It is necessary that the animals should be frequently and systematically cleaned. Animal sheds must be kept clean and perfectly dry, especially the floors, mangers and drains. Solid and semi-solid excreta should be removed periodically from the sheds and put in proper manure pits. The best time to wash and clean animal houses is when the animals are on grazing.

Sunlight and heat act as powerful disinfectants. Direct sun-rays kill many germs and mitigate the action by their oxidizing and desiccating properties. Heat, as a disinfectant, may be applied either in the form of a direct flame or burning or steam of the boiling water.

Cattle should be regularly washed and groomed once or twice a week. The cattle should be washed once daily in hot weather, once a week during the rains, and once or twice a month during the cold weather.

Suckling calves need not be bathed, but should be brushed. Feet should receive special attention in all animals, and any large dirt particles, pieces of stone or thorn found lodged between the hoofs should be removed and sores properly dressed.

5.5 LIVESTOCK NUTRITION

The composition of animal feed reflect in their health and milk. Livestock feeds are classified as concentrates and roughages. The concentrates have low fibre content (less than 18 per cent) and possess a high total digestible nutrient value. They include cereals, oilseeds, oilcakes, and cereal and animal by-products. The feeds having fibre content above 18 per cent and a low total digestible nutrient value are called as roughages, for example, cultivated fodders, silages; hays and straws. Here, we shall describe the various components of the animal nutrition.

5.5.1 Cereals, Pulses, Oilseeds and their By-Products

The cereals rich in starch with low percentage of crude fiber are greatly relished by livestock. Their protein content is low and also lack certain essential amino acids. Oat and barley can be fed safely to all classes of farm animals. Maize, although suitable for all classes of farm animals, causes flatulence if fed in large amounts, unless it is given in conjunction with other concentrates such as oat.

Guar is fed to almost all classes of farm animals in India. It is a moderately rich in calcium and phosphorus. Pigeonpea (*arhar*) and cluster-bean (*guar*) are largely used as cheap substitutes for gram and can be fed to all kinds of livestock. The cluster-bean is rich in protein, but not relished by the animals.

Garden pea, Indian bean and moth bean (*Phaseolus aconitifolius*) are the common *kharif* beans which are fed as crushed coarse grained stuff. Rice bran is fairly palatable to stock.

Oilseeds and oilcakes are protein rich feeds. They are highly palatable, easily digestible and are generally used to balance the ration in respect of protein. They are rich in phosphorus but poor in calcium content.

Groundnut cake has high protein content (up to 50 per cent). Linseed cake is very digestible and has a slight laxative effect, which makes it valuable for young stock. Palm kernel and coconut cakes possess properties similar to those of groundnut-cake. Gingelly-cake (til) is rich in high grade protein, calcium and phosphorus.

5.5.2 Pasture Herbage

Mixed pasture herbage constitutes the best and cheapest feed suited for growth and milk production. Some of the important common grasses which constitute

the pastures are: *doob* (*Cynodon dactylon*), *anjan* (*Cenchrus ciliaris*), *palwan* (*Andropogon pertusus*) *musel* (*Iseilema laxum*), *star* (*Cynodon plectostachya*), *sarwala* (*Heteropogon contortus*), *geria* (*Chrysopogon montanus*) and *spear grass* (*Andropogon contortus*). Perennial rye grass (*Lolium perenne*) may also be used for the same purpose. It is a very good fodder grass and is especially suitable for the hills.

5.5.3 Cultivated Fodders and Legumes

Sorghum, maize, pearl millet (*bajra*), finger-millet (*ragi*) and oat are the commonly grown fodder crops. Napier, Para, Guinea, Sudan and Rhodes grasses are also commonly grown.

Among the green forage crops, legumes occupy a place of particular importance. The two usually grown legumes are berseem and lucerne, which thrive well only under irrigated conditions. Cowpea, soyabean, cluster-bean and peas are also grown in certain areas.

5.5.4 Straw, Hay and Silages

Straw has the highest percentage of crude fibre and rich in silica. In India, they constitute about 50 per cent of the total feed roughage and the livestock subsist largely on cereal straws. Straws have the advantage of being bulky and on account of their high percentage of fiber and silica, they act as mechanical stimulants in digestive processes. Oat, barley, wheat and rice straws are put in the descending order with respect to the nutritive efficiency.

The early flowering stage of grasses is the best stage to obtain hay. While preparing hay, the moisture content is reduced to 10 to 15 per cent. Excessive exposure of the hay to the sun, dew and rain causes considerable depreciation in its food value.

Grasses and legumes are directly conserved as hay or silage for use as feeds when necessary. In the case of fodder crops, the plants may be chopped to pieces of convenient size to make them proper silage. Tree leaves, particularly the fresh ones, are generally poor in carbohydrates and for the production of good quality silage it is advisable to add molasses to the extent of 2 per cent of the ensiled material.

A silo pit, about 2.4 m × 1.5 m × 1.2 m in dimensions and capable of holding 37 quintals of green material, can be dug. A pit of this size can be filled by two men in about four to five days and the silage thus obtained is sufficient for feeding two bullocks for two months. There should be a lining with *bhurra* or paddy straw on all the four sides and the bottom of the pit. The material to be ensiled is then stacked in layers, each layer being firmly trampled to compress it and exclude air as completely as possible. The silage pit is filled to about 0.6 to 0.9 m above the ground level, thoroughly trampled, and after a layer of *bhurra* or paddy straw has been placed on it the material is covered with earth, stones, or other similar materials. When it has settled down well, another plaster of mud is given.

5.5.5 Tree Leaves

Tree leaves are frequently lopped for feeding to sheep and goats and are sometimes fed to cattle during lean period. The following species of trees and shrubs are suitable for use as maintenance ration for livestock:

Sandan (*Ougeinia dalbergioides*), Tut (*Morus indica*), Jharberi (*Ziziphus nummularia*), Bans (*Dendrocalamus strictus*), Gauj (*Millettia auriculata*), Marorphali (*Helicteres isora*), Katchnar (*Bauhinia variegata*), Pipal (*Ficus religiosa*), Gular (*Ficus glomerata*), Bard (*Quercus incana*), Phaliant (*Quercus glauca*), Khair (*Acacia catechu*), Pula (*Kydia calycina*), Ber (*Ziziphus mauritiana*), Babul (*Acacia arabica*) and Bel (*Aegle marmelos*).

Leaves of certain tree species may also be used as maintenance ration for livestock if they are supplementing to a small extent with concentrate or roughage, as the case may be. The names of the more important trees of this category are Siras (*Albizia lebbek*), Sainjana (*Moringa oleifera*), Khoda (*Ehretia laevia*), Rohini (*Mallotus philippinensis*), Karlju (*Holoptelea integrifolia*), Kusum (*Schleichera oleosa*), Haidu (*Adina cordifolia*), Bargad (*Ficus benghalensis*), Phaldu (*Mitragyna parvifolia*) and Sal (*Shorea robusta*).

5.5.6 Other Sources of Feed

There are substances that are very rich in protein and are used to replace grains from the concentrate. Such stuffs include seed kernel of Mango (*Mangifera indica*), Panewar (*Cassia tora*) seed, Tamarind (*Tamarindus indica*) seed, Babul (*Acacia arabica*) pods, entrails and fish. Similarly, coarse grasses, such as Kans (*Saccharum spontaneum*) and Munj (*Erianthus munja*) and certain plants, such as Kantiara (*Carthamus oxyacanthus*), sugarcane tops and panewar straw also serve as roughages. Groundnut (*Arachis hypogaea*) husk can particularly serve as food during famine conditions. Rago molasses can replace the grain husk in cattle ration used in rural areas. Mahua (*Madhuca Indica*) cake and Mahua flower, sunnhemp (*Crotalaria juncea*) seed, rain tree (*Samanea saman*) pods and autumn-shed leaves of trees can also be used as animal feeds.

5.5.7 Preparation of Ration

An adult cattle generally eat 2 to 2.5 kg of dry matter per 100 kg body weight per day. Milch stock eat a little more. A part of this feed should always be supplied in the form of roughage. The roughage should include some green fodder. The recommendation about Feed-Mix (per day) for different live stock is furnished below.

Livestock	Green Fodder (kg)	Dry Fodder (kg)	Concentrate (kg)
Milking Cows with			
a) Milk yield of < 4 lit	30-35	3-4	0.5
b) Milk yield of > 4 lit	35-60	1-2	0.5

Milking Buffaloes with			
a) Milk yield of < 4 lit	40-45	3-4	0.5
b) Milk yield of > 4 lit	50-80	1-2	0.5
Dry Cows & Buffaloes	15-20	4-8	0.5
Pregnant Cows & Buffaloes	45-50	1-2	0.5-1.0
Growing Calves	15-50	1-3	0.5
Buffaloes			
a) Idle	15-20	4-8	0.5
b) Working	30-40	3-4	0.5

5.5.8 Care of Pregnant Cows and Calves

All pregnant animals should be liberally fed. They should not be put under any kind of stress. They must be well fed particularly during the last 2 months of gestation, when nutrient demand of the growing foetus is high. The feed should consist of succulent fodder, about half of which should be a legume. If succulent fodder is inadequate, crop residues such as straw and *kadbi* (dry maize stalk) supplemented with 1 to 2 kg of concentrate per day should be fed. The concentrate may be prepared from the locally available feeds and should consist of pulse, oil-cake and bran or husk mixed in equal proportions. The concentrate mixture should also be reinforced with a mineral mixture.

Pregnant animals should not be made to walk long distance, or to run fast or chased by dogs or frightened or fight with other animals. Turning the pregnant animal out for grazing is the best form of exercise for her.

One or two hours after delivery, cow should be given a stimulant mash prepared by boiling crushed wheat, barley or pearl-millet to which a little crude sugar, powdered ginger and common salt have been added. Soon after calving, the cow should be cleaned with a piece of cloth moistened with lukewarm water and a clean bed should be provided. If the calf has sucked, its feeding does not require to be specially attended to; otherwise, the cow should be milked dry and some of colostrums given to the calf.

Later, cow may be fed on bran mash and green fodder two or three times daily. Drinking water should be lukewarm. Linseed-meal, oat-meal or pearl-millet meal also serves well at this time. Such a diet is continued for about 10 to 12 days, and afterwards concentrate ration should be increased gradually.

Generally, the cow will lick her calf dry and thereby cleanse it completely. In case the cow does not lick, it can be induced by sprinkling a little amount of common salt on the body of the calf.

Weaning 3 to 4 days after birth is a standard practice. The cows may be milked without and with the calf on alternate days.

The colostrums, the milk from a cow immediately after calving, is rich in vitamin A and antibodies. In addition to protective properties, it also has a

laxative action. A calf must be fed on the colostrums. The colostrums, when it is fresh and warm should be fed to the weaned calf. The quantity of milk fed to a calf depends upon its body weight, rate of growth and age. When the calf sucks directly from the udder, the quantity sucked depends upon the milk yield of mother.

5.5.9 Feeding Goats

Goats are the sensitive animals. They don't eat dirty or foul smelling feed. They dislike wet, stale or trampled fodder. Hence, their feed must be clean and fresh; It is advisable to feed them in hay-racks or by hanging the feed in bundles from any support. It is also advisable to serve them only small quantities at a time.

Goats are fond of leguminous fodders and relish hay prepared from leguminous crops. Some of the common green roughages liked by the goats are: lucerne, berseem, napier grass, green arhar, cowpea, soybean, cabbage and cauliflower leaves, shaftal, senji, methi, shrubs and weeds of different kinds; and leaves of trees such as babul, neem, tamarind (*Tamarindus indica* L.) and pipal (*Ficus religiosa* L.). The common dry fodders liked by goats are straws of arhar, urd, mung, bengal gram (*Gicer arietinum* L.), dry leaves of trees and lucerne or berseem hays.

Goats have higher basal metabolic rate than cattle and hence, their maintenance requirements are higher than those of cattle. The following concentrate mixture may be used to feed the goats:

- One part of wheat bran, 2 parts of maize grain and 1 part of linseed-cake;
- Two parts of maize grain, 1 part of barley, 2 parts of mustard-cake, and 2 parts of gram husk;
- One part of wheat bran, 2 parts of barley grain, and 1 part of groundnut-cake;
- Two parts of barley gram grain and 1 part of wheat bran; and
- These above mixtures should also contain 2 per cent each of mineral mixture and salt.

Lumps of rock salt of fairly good size should be hung up in some suitable place so that goats can easily get at them. The provision of salt licks is important for goats as they secrete a good amount of sodium and chloride ions in their milk. The salt often helps to tone up the system and may even have some effect in removing worms from the body.

5.5.10 Feeding Pigs

In contrast to the ruminants like cattle, sheep and goats, pigs have a simple stomach. They cannot fully utilize coarse fodder. Hence, pigs must be fed maximum of concentrates and minimum of roughages.

5.6 NATIONAL AND INTERNATIONAL NORMS FOR ORGANIC LIVESTOCK

As you have read in the previous course that an organic product should be certified by an accredited certification agency before it's selling as 'organic'. The certification agencies verify the compliance of standards. In case of livestock also, there are norms (national and international) which have to be complied by an operator to get his/her products be certified as organic. Now, we shall elaborate these norms separately.

5.6.1 National Norms

The *Section 3 (Sub Section 3.3)* of the National Programme for Organic Production (NPOP) contains the norms for organic Animal Husbandry. As per the NPOP, norms for organic animal husbandry are as follows:

- Livestock management approaches should be based on physiological and ethological needs of the animals. The animal herd or flock size should not adversely affect the animal health and growth.
- The animals should be given sufficient free movement, fresh air and natural daylight.
- Provisions for protecting the animals against excessive sunlight, rain and wind.
- Bedding material should provide sufficient comfort to the animals.
- The construction material used should not adversely affect the health of the livestock.
- Poultry and rabbits should not be kept in cages.
- Animal products should be certified as organic after 12 months of conversion period. With regards to egg and dairy production, this period is less than 30 days.
- All animals should be brought in the organic holding.
- Breeds should be adaptable to local climatic conditions.
- Reproduction techniques should be natural.
- Artificial insemination is allowed.
- Embryo transfer is not allowed.
- Hormonal heat treatment and induced birth are not allowed.
- The livestock should be fed by 100 per cent organically grown feed stuffs.
- The animals should be fed with balanced diet and artificial colouring agents should be avoided.
- The following products are prohibited in the feed of animal:
 - Synthetic growth promoters or stimulants.
 - Synthetic appetisers.
 - Food preservatives.

- Urea.
- Farm animal by-products (e.g. abattoir waste) to ruminants.
- Feed extracted by solvents (e.g. hexane), extraction (soya and rape seed meal) or the addition of other chemical agents.
- Pure amino acids.
- Genetically engineered organisms.
- The following fodder preservatives may be used:
 - Bacteria, fungi and enzymes.
 - By-products of food industry (e.g. molasses).
 - Plant based products.

5.6.2 International Norms

IFOAM (International Federation of Organic Agriculture Movements), European Council (EC) and NOP (National Organic Program) of USA are some of the internationally accepted norms for organic livestock. European Union's Council Regulation No.1804/1999 amended to cover livestock production. We are summarising some of the internationally accepted livestock norms as below (Lockeretz, W. and Lund, V., 2002):

- EU and IFOAM allow up to 10% non-organic feed for herbivorous and respectively 20 % and 15 % for other species.
- IFOAM desires that about 50 % of the feed to be grown on the farm or in cooperation with farms but EU says that feed should come from the farm.
- EU and IFOAM prohibit use of antibiotics for therapeutic purposes.

Now we shall summarize some of the organic livestock norms prescribed under NOP(USA), as below (Source: *David Zodrow and Harold Rachuonyo* : Organic Livestock Production and Marketing, NC State University, USA) :

- Poultry or edible poultry products must be from the poultry that has been under continuous organic management beginning not later than the second day of life.
- Dairy animals: Milk or milk products must be from animals that have been under continuous organic management beginning no later than 1 year prior to the production of the milk or milk products that are to be sold, labeled or represented as organic.
- The following are prohibited :
 - Livestock or edible livestock products that are removed from an organic operation and subsequently managed on a non-organic operation may be not sold, labeled, or represented as organically produced.
 - Breeder or dairy stock that has not been under continuous organic management since the last third of gestation may not be sold, labeled, or re-presented as organic slaughter stock.

- Animal drugs including hormones.
- Feeds containing urea.
- Provision of conditions which allow for exercise, freedom of movement, and reduction of stress appropriate to the species.
- Administration of vaccines and other veterinary biologics at appropriate time.

5.7 RECORD KEEPING

The record keeping is an important activity of an organic farmer. In the next course, you will study more about this aspect. Complete and accurate records are a valuable asset to the management of cattle, buffalo and other livestock. An organic farmer must maintain information on date of birth, sex, colour and other individual identification marks of the animals. In addition to these, records of breeding and performance including productivity of all animals in the herd should be maintained. The fodder details such as package of practices of their raising should also be kept in the records.

Check Your Progress Exercise 2

Note: a) Space is given below for the answer.

b) Compare your answer with that given at the end of the Unit.

1) Describe the significance of record keeping in organic livestock?

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2) What are the feed ingredients prohibited in organic livestock?

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3) What are the differences between Hay and silage?

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5.8 LET US SUM UP

In this Unit, we studied about breed of cattle and buffalo with their distribution in different parts of the country. The nature of livestock largely depends upon the climatic condition of their place of origin.

Many breeds of cattle and buffaloes of India and their distribution were presented in order to encourage the role of indigenous livestock in organic farming. Livestock maintenance is an important activity in organic farming as they provide additional income besides providing vital inputs such as dung. Designing and maintaining sheds for animals with emphasis on hygiene and nutrition are the important dimensions of livestock maintenance. Care of pregnant animals and calves is also important. Maintenance of livestock records strengthens the base of organic farming. The national and international norms prescribe the different aspects of organic livestock management. The maintenance of organic livestock has also been dealt in detail in this Unit.

5.9 KEY WORDS

- Cattle** : Domestic cows.
- Roughages** : High fiber (>18%) containing feeding material.
- Concentrates** : High nutrient containing grain mixture.
- Flatulence** : It is also called bloating. It is a state when animal stomach (rumen) is filled with excessive gas.
- Hay** : Dried grasses and other foliage used as animal feed. Usually the material is cut from the field while still green and then either dried in the field or mechanically dried by forced heat.
- Silage** : It is a fermented preserved products of green succulent legume fodder. Molasses is added to enhance fermentation process. Silage is made by packing cut green plants in a storage container to exclude the air and allow fermentation to develop acetic and other acids, which preserve the moist feed.

5.10 FURTHER REFERENCES

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5.11 MODEL ANSWERS

Check Your Progress Exercise 1

- 1) Name the breeds of cattle and buffaloes of your area. Please section section 5.2 for describing their characteristics.
- 2) The cattle shed should be built in an open place. There should be proper provision of fresh air and sun light during the winter. The space should not stress to the animals. The floor of the shed should have sufficient slope to drain the animal feed and dung.
- 3) Roughages are feeds having fibre content of above 18 per cent and a low total digestible nutrient value. They form an important component of the animal ration. Their incorporation also help in economizing the total ration of the animal.

Check Your Progress Exercise 2

- 1) Record keeping is an important aspect of organic farming and also for organic livestock. The certification agencies verify the compliance of norms by checking the records available at the farm.
- 2) There are norms which prohibit the use of different chemical such as urea or any form of feed preservative in the animal ration.
- 3) Hay is the dried form of grasses kept for feeding the animals. Similarly the silage is fermented form of green fodder (legume). These are the form of preserved fodder feed to the animals during lean periods. Their nutrient values are maintained.