Unit 3

Establishing Livestock within Accommodation

171109CH03

Introduction

Management of dairy animals involves various activities like feeding, milking, cleaning, etc., as per the set routine. It is obvious that some animals would suffer from illness or injury at some or the other point, which could be identified from abnormal behaviour or specific symptoms shown by them. This Unit discusses the various aspects of management of livestock within their accommodation.

As a dairy entrepreneur, one has to regularly inspect the animals to check for abnormalities and identify the problem at the earliest. Sometimes, new animals are brought to the farm from different places. It is important to ensure that the animals do not feel stress during transportation. At the same time, efficient management also includes protecting the farm workers involved in the day-to-day operations, from injuries or risks. Also, large quantity of manure is produced in a dairy farm on a daily basis, which requires proper disposal, otherwise it could lead to infections as well as environmental pollution.

Session 1: Standard Practices for Maintaining Health of Cattle

The farm supervisor is required to inspect and observe the animals carefully for any illness or injury, every day. The daily routine of feeding, milking and caring is followed, and any major change in the routine could affect the health and production of animals. This could lead to abnormal behaviour or specific symptoms of illnesses in animals, some of which are mentioned in Fig. 3.1.

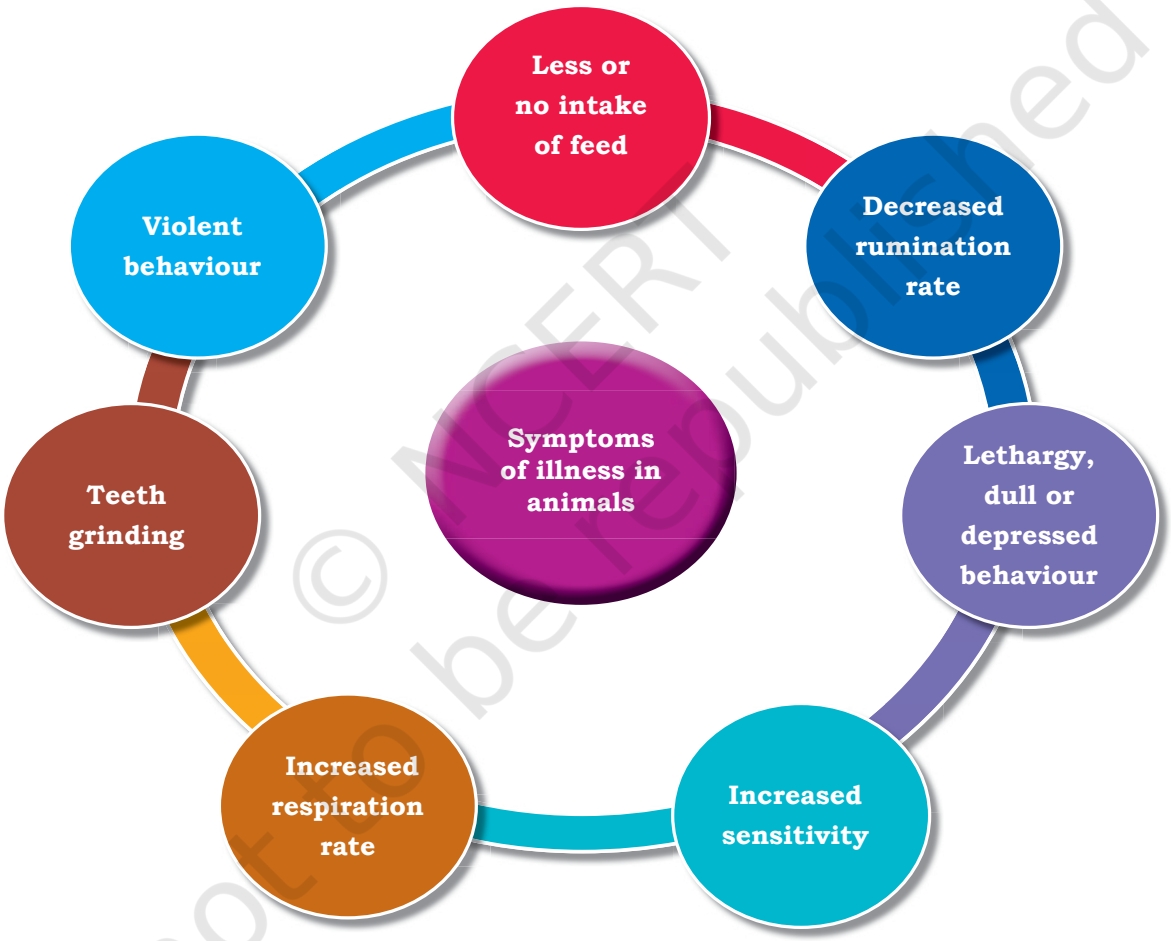

Fig. 3.1: Symptoms of illness in animals

Some measures that could be undertaken to supervise and maintain the health of the dairy animals are presented in Fig. 3.2.

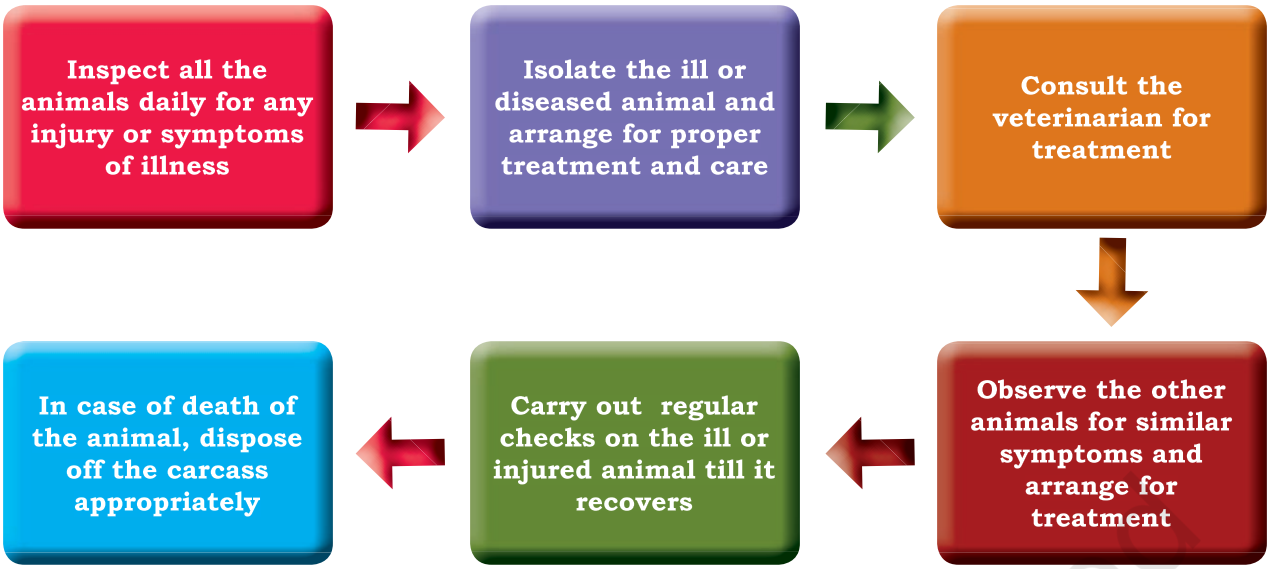

Fig. 3.2: Measures for effective supervision of health of cattle

Vaccination

Dairy animals, just like human beings, are susceptible to various fatal diseases caused by bacteria, viruses, fungi, parasites, etc. Diseased animals can cause substantial economic losses to a dairy farm, which is why it is necessary to prevent them from diseases as much as possible.

Vaccination means the administration of a particular vaccine into the animal's body for producing immunity in the body of the animal against a specific disease. It is an efficient and powerful method to promote the health of animals by preventing outbreak of major diseases, which have an impact on animal health and production as well as human health. The major diseases in cattle requiring vaccination are given in Fig. 3.3.

A vaccine is a fluid containing attenuated or killed micro-organisms that makes an animal immune to a disease caused by certain germs or micro-organisms. The vaccine contains some part of the germ or the poison that the germ produces. The vaccine does not make the animal sick, in fact it protects the animal's body from getting diseased in future. The vaccine is administered generally subcutaneously or intramuscularly, based on the standard instructions prescribed for that vaccine. It must always be remembered that vaccines are administered only to healthy animals.

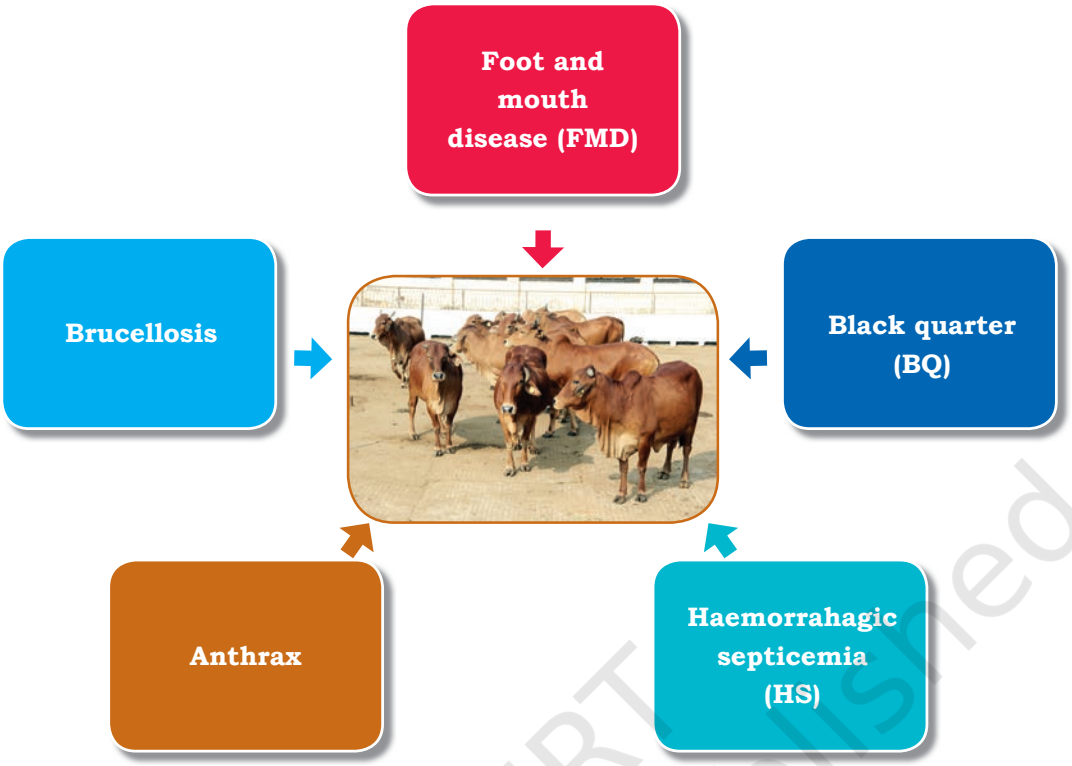

Fig. 3.3: Major diseases in cattle requiring vaccination

Vaccination schedule for cattle

The recommended vaccination schedule for some diseases in cattle are given in Table 3.1.

Table 3.1: Vaccination schedule for some diseases in cattle

Vaccine	Age of primary vaccination	Booster	Revaccination
FMD vaccine	4–6 months	9 months after primary vaccination	Annually
HS vaccine	6 months	_	Annually
BQ vaccine	6 months	_	Annually
Anthrax vaccine	6 months	_	Annually in endemic areas
Brucella vaccine	4–8 months in female calf only	_	_

Source: Farmers Manual, Department of Animal Husbandry, Dairying & Fisheries, Government of India, Ministry of Agriculture and Farmers Welfare

Most of the vaccines used in farm animals are developed from live infectious organisms. Vaccines are very sensitive to temperature variations, which is why they must be handled and administered properly.

Documentation of vaccination

Proper documentation of vaccination is quite important as it becomes a legal proof of vaccination in animals in the event of outbreak of a disease and therefore, helps the farmers claim compensation from insurance companies. Documentation is also required for monitoring adverse reactions in the animals in which vaccination has been carried out.

The following information is recorded in the vaccination record of each animal.

(i) Name of the vaccine administered, manufacturer's detail, lot or serial number, date of expiry
(ii) Date of administration of vaccine
(iii) Route of administration of vaccine

The manufacturer's label can be removed (Fig. 3.4) from the vaccine bottle and pasted on the register or record book. It is easier to maintain such records on a computer.

There are some other aspects of vaccination like pre- and post-vaccination care, handling and administration of vaccines and disposal of unused vaccines, for which you can refer to Session 2 of Unit 2 of *Animal Health Worker* (Class IX).

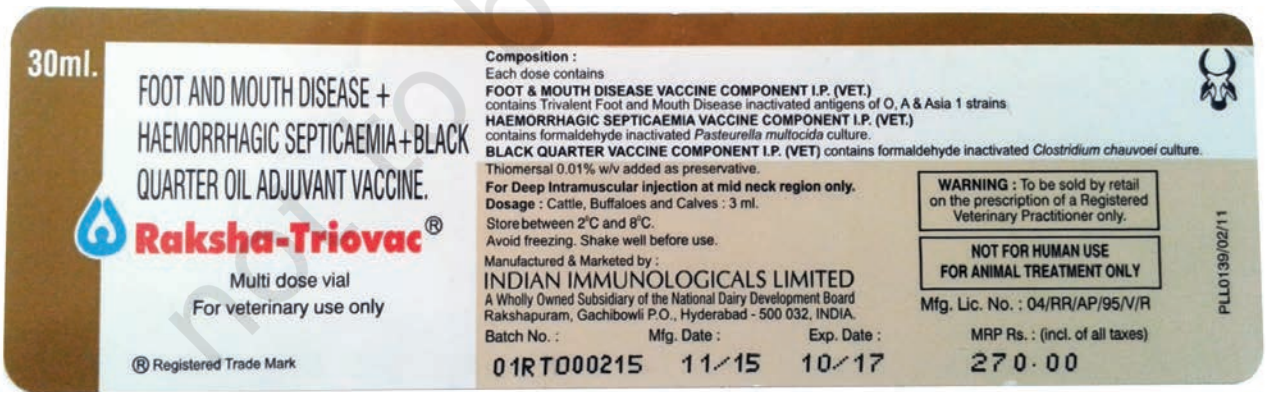

Fig. 3.4: A specimen of vaccine label showing (1) name of vaccine, (2) route of vaccination, (3) vaccination dosage, (4) optimum temperature for storage of vaccine, (5) batch number, (6) manufacturer's details, etc.

Establishing suitable environmental conditions in a dairy farm

Farm animals are homoeothermic which means there are little changes in their body temperature. However, metabolic heat is produced in them and subsequently released to the atmosphere by means of convection, conduction and radiation. When the heat and moisture produced by the animals within an animal house gets accumulated, it causes stress to the animals and ultimately leads to distress and diseases. Thus, intensive livestock housing is equipped with an environmental control system to maintain animal health and welfare. Modifications in environment are achieved by ventilation, heaters for extreme cold conditions and cooling equipment for hot climatic conditions. The following environmental conditions are maintained for optimum milk production.

Temperature

The favourable temperature within the animal shed is between 15°C to 27°C. Deviation in the temperature may cause significant loss in productivity and health of the cattle.

Relative Humidity

Optimum relative humidity of dairy animal house is about 40 per cent to 60 per cent. Significant variation in the relative humidity can cause stress in animals.

Ventilation

The animals feel comfortable when they are kept in a well-ventilated animal house. When the animal shed is properly ventilated, obnoxious gases produced within the animal house come out easily. It is important to ensure that animal sheds are not overcrowded.

Wind Velocity

Animals feel comfortable when wind speed is about 5–8 km/hr. Planting of green belt (with trees) in areas with high wind velocity breaks the wind speed and minimises the disturbance in the environment.

Optimum and natural light

Artificial or bright lights can disturb the routine of animals and affect their health and productivity, and therefore, arrangements for optimum and natural light are necessary. Extra care is provided to weak, ill or injured, pregnant and young animals.

Minimising stress in dairy animals

The common factors responsible for creating stress in dairy animals are given in Fig. 3.5.

Cattle are social animals that prefer to stay in a herd (Fig. 3.6). They do not like to be isolated, and move quickly and become aggressive if mishandled and provoked. Cattle in stress could be dangerous to livestock handlers, and in case of rough handling, the animals could become averse to people.

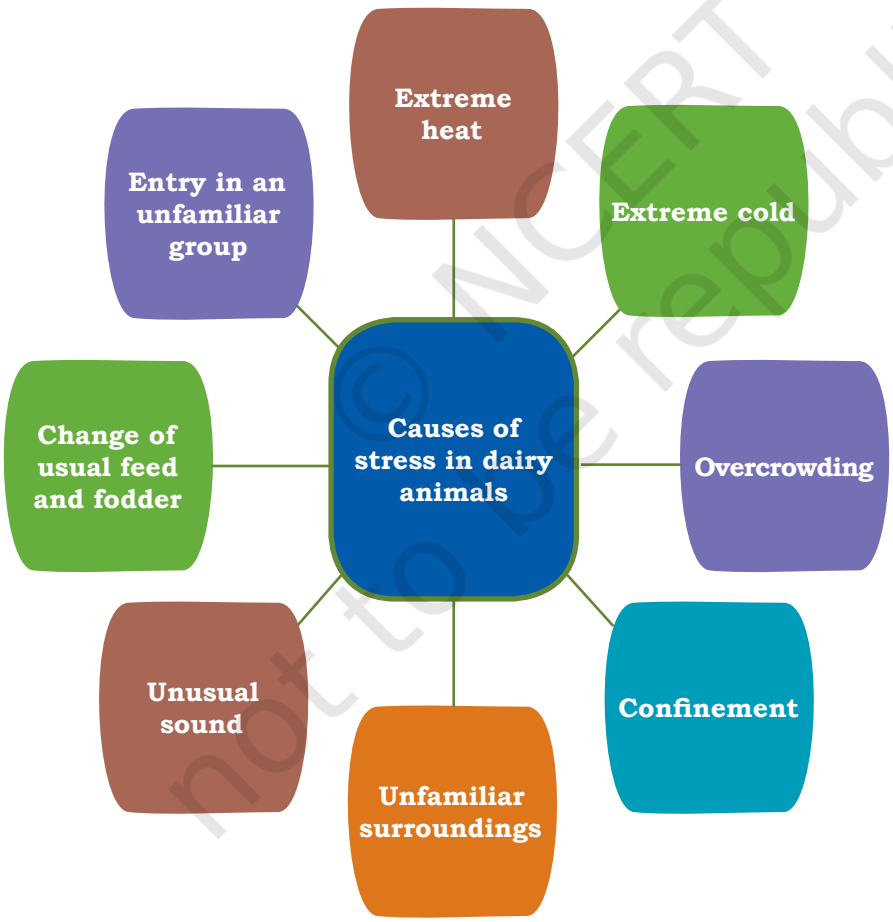

Fig. 3.5: Causes of stress in dairy cattle

Fig. 3.6: Cattle exhibiting herd behaviour

Transportation of dairy animals

Transportation of livestock involves a number of operations like handling, loading and unloading. Important parameters to consider while transporting animals are environments unfamiliar to animals, isolation, social disruption, confinement, fluctuations in environmental temperature, humidity, feed and water deprivation, etc.

The main objective of transportation is to ensure the safety, security and comfort of the animals, while moving them efficiently to their destination. Transportation can result in significant stress for the animals, which can be categorised as — physical (changes in temperature, humidity or noise), physiological (limited access to feed and water) and psychological (exposure to new individuals or environments).

Purpose of transportation

Animals are transported for various reasons such as change of ownership, marketing, movement from drought areas to better grazing areas, treatment, exhibitions (*krishi mela*) and animal fairs.

Modes of transportation

The usual modes of transportation for animals are:

- On foot (walking/trekking)
- Road
- Rail
- Sea
- Air

Loading and unloading ramps (elevators) for livestock

Ramp is a sloping surface used to allow access from a lower level to a higher level. It is used to load and unload the animals in a vehicle or train. Loading and unloading ramps provide non-slippery footing to prevent animals from falling. On concrete ramps, stairs provide good footing. The recommended angle of the loading ramp is 20° or less.

Transport of livestock on foot

Cattle can be successfully moved on foot. The journey of animals is planned by paying attention to the total distance to be travelled, opportunities for grazing and watering and overnight rest. Animals walk during the cooler period of the day. If they are to be loaded in a rail wagon after moving some distance, they are given sufficient time for rest and water before loading. The maximum distance that animals can walk on foot depends on the weather, body condition, age, etc. The maximum distance that can be covered for transporting different animals on foot, are given in Table 3.2.

Table 3.2: Maximum distances for trekking

Species	One day journey	More than one day	
		First day	Subsequent days
Cattle	30 km	24 km	22 km
Sheep/goats	24 km	24 km	16 km

The specifications for transportation of animals on foot are presented in Table 3.3. No animal is made to walk under conditions of heavy rain, thunderstorm and extremely dry conditions. Also, they are not transported on foot before sunrise or after sunset. While transportation on foot is beneficial and economical for short distances, some disadvantages of this method are longer travel time, exposure to extreme environmental conditions and loss of body weight of animals.

Table 3.3: Specifications for transportation of animals on foot

Species	Maximum distance travel (km/day)	Speed (km/hr)	Maximum hours travelling in a day	Period of rest, drinking and feeding	Temperature range (°C)	
					Max.	Min.
Cows and buffaloes	30	3–4	8	At every 2 hours for drinking and at every 4 hrs for feeding	12	30
Calves	16	2.5	6	At every 1½ hours for drinking and at every 3 hrs for feeding	15	25

Transport of livestock by road

When it is not feasible for transporting animals on foot, they are transported by road with the help of trucks. The body of the truck is cleaned with a broom to maintain cleanliness and suitable bedding material is provided on the floor of the truck to make the journey comfortable to the animals. Sand (10–12 cm depth) or straw bedding (15 cm depth) are good bedding material. The trucks are also connected to the loading ramp. Partitions are made with bamboo in the truck for individual animals. An attendant is present all the time during the journey.

It is important to note that the vehicles transporting animals are not loaded with any other merchandise. To prevent cows and buffaloes from being frightened or injured, they must face the engine side. The animals can be placed either head-to-head or tail-to-tail on the truck. Feed and water must be supplied at an interval of 8 to 10 hours. The attendant accompanying the animals looks after them during the journey. The animals must be given rest and a little exercise on the ground at an interval of 10–12 hours. They are then again loaded in the truck for the remaining journey.

The number of cattle per truck for safe loading is given in Table 3.4.

Table 3.4: Space requirement for cattle during transportation

Vehicle size (length × width) (square metre)	Floor area of the vehicle (square metre)	Number of cattle			
		Cattle weighing upto 200 kg (@1 square metre space per cattle)	Cattle weighing 200–300 kg (@1.20 square metre space per cattle)	Cattle weighing 300–400 kg (@1.40 square metre space per cattle)	Cattle weighing 400 kg (@2.0 square metre space per cattle)
6.9 × 2.4	16.56	16	14	12	8
5.6 × 2.3	12.88	12	10	8	6
4.16 × 1.9	7.904	8	6	6	4
2.9 × 1.89	5.481	5	4	4	2

Source: Transport of the Animals Amendment Rules, 2008 under Section 38 of the Prevention of Cruelty to Animals Act, 1960, Ministry of Environment and Forests, Government of India

Road transport is quite suitable when long distances are to be covered, and it also provides freedom to choose the time of movement of the animals. Also, it allows direct transportation of the animals from the source to the destination. However, there are a few disadvantages of this method like higher chances of injury and body weight loss in animals due to extreme stress.

Transport of livestock by rail

Transportation of animals by rail is done when very long distances are to be covered. The size of the wagon and the size of the cattle determine the number which can be loaded on a single wagon. For comfort in transportation, the wagon is loaded heavily enough so that animals stand fairly close to each other; however overcrowding is avoided. An ordinary railway goods wagon carries ten adult cattle. The following points are kept into consideration while transporting cattle by train.

- At least one attendant is present in each wagon.
- Cattle are loaded parallel to the rails, facing each other.
- Cattle wagon is always positioned in the middle of the train.

- Two breast bars are provided on each side of the wagon, one at a height of 60–80 cm and the other at 100–110 cm.
- Cattle in milk are milked at least twice a day and the calves are given the required quantity of milk.
- It is always preferable to move cattle during the night.

The advantages of railway transport are less stress to the animals as compared to road transport, ease in covering long distances in a short span of time and reduced chances of bruising and other injuries during handling. Some disadvantages of this method are adhering to the railway timetable and difficulty in transporting lesser number of animals.

Transport of livestock by sea

Animals have been transported by sea, lakes and rivers since time immemorial. Sea route is preferred when animals have to cover a long journey. The animals considered to be of high value and used for breeding purposes are transported by sea route. About 40 square feet area is required for each cattle. Crates of dimensions 5 feet long, 3 feet wide and 3 feet high are sometimes used for transporting animals. The examination of animals is done at an interval of 2 to 3 hours.

Transport of livestock by air

Usually highly valued animals are transported by air, like race horses, poultry parent stock, etc. However, in certain circumstances other livestock could also be transported through air.

Animals not suitable for transport

The conditions in which animals are not suitable for transport as follows.

1. Weak newborns, emaciated animals and animals with injuries.
2. Animals nearing the time of parturition.
3. Animals in advanced pregnancy.
4. When the pregnant cattle has approached the maximum pregnancy period allowed for transportation, as given in Table 3.5. In general,

it is not advisable to transport cattle during the last trimester of pregnancy.

5. Animals that have given birth during the preceding 48 hours.
6. Aged animals.
7. Unfavourable climatic conditions like very hot or cold weather or heavy rains.

Table 3.5: Maximum pregnancy period in farm animals beyond which transportation is forbidden

Animals	Maximum period of pregnancy
Cow	190–200 days
Buffalo	210–220 days

Practical Exercises

Activity 1: Identify sick animals and note down the symptoms of diseases in them.

Material required
Thermometre, Mask, Apron

Procedure

1. Visit a dairy farm.
2. Identify the sick animals.
3. Note down the symptoms of the diseases.
4. Examine the body temperature of the sick animals.

Activity 2: Examine the vaccination procedure of dairy animals at a dairy farm.

Material required
Notebook, Farm records

Procedure

1. Visit a dairy farm.
2. Find out the vaccination records.
3. Note down the vaccination schedule followed at the farm.

Check Your Progress

A. Multiple choice questions

1. During transportation of animals by foot, the maximum distance travelled in a single day journey for cattle is _____.
   (a) 10 km (b) 20 km
   (c) 30 km (d) None of these
2. Animals need to be transported for _____.
   (a) Change of ownership (b) Treatment
   (c) Breeding (d) All of these

3. Primary symptoms of illness in cattle are _____.
   (a) lethargy, dull or depressed
   (b) teeth grinding
   (c) decreased rumination rate
   (d) All of the above
4. Preferable relative humidity in the animal house is _____.
   (a) less than 20% (b) 20–40%
   (c) 40–60% (d) Above 60%

B. Fill in the blanks

1. _____ is the sloping surface used to allow access from one level to a higher level.
2. For very short distance transport, the easiest and most economical method of transport is _____.
3. The recommended angle of the loading ramp is _____.
4. Cattle are _____ animals used to living in herds.
5. The frequency of vaccination against Black quarter is _____.

C. Mark true or false

1. Transportation of aged animals is avoided.
2. During transportation of cattle by rail, the cattle wagon is attached at the end of the train.
3. Animals that are nearing the time of parturition are not transported.
4. Vaccination is done to prevent the animals from diseases.
5. Rough handling of cattle makes them frightened of people.

D. Match the following

A	B
1. Angle of the loading ramp	(a) 40% to 60%
2. Optimum relative humidity of dairy animal house	(b) 20°
3. The favourable temperature within the animal shed is between	(c) 25°C

E. Crossword

		[1]	[4]R			K
	[2]	O		D		
			P			
[3]R			L			

Across

1. Vehicle used for road transport
2. Usual mode of transportation of animals
3. One of the modes of transportation by which comparatively large number of animals can be transported at a time

Down

4. Structure required for loading and unloading of animals.

Session 2: Safety Measures for Farm Workers and Disposal of Manure

In well-managed dairy farms, dairy workers are protected from injury or impairment of any bodily function that might occur due to absorption or inhalation of harmful elements, or even by physical contact with diseased animals. In this session, we will discuss the personal protective equipment and measures for safety of farm workers and the preferable methods for disposal of manure.

Personal protective equipment (PPE) for dairy workers

The dairy workers wear protective clothing and adequate protective equipment while carrying out day-to-day operations.

Risks during animal handling, feeding or milking or other routine operations can be minimised by using personal protective equipment (PPE) by the farm workers.

Common PPE used by the dairy workers

The most often used PPE include the following.

Gloves

It helps to protect the hands from contact with hazardous substances, hot or cold surfaces, stings, rough textures or sharp tools (Fig. 3.7).

Fig. 3.7: Gloves

Safety shoes or gumboots

These are used in dairy farms for various routine farm activities (Fig. 3.8). Gumboots protect the toes and legs

Fig. 3.8: Gumboots

of the farm workers from injuries by being stampeded by animals. Gumboots also provide protection from snake bites, slippery surfaces, sharp item penetration, water penetration, etc.

Goggles

They protect the eyes from dust and straw particles and fumes. They are used during weeding, welding, cutting and while working in the workshop.

Earplugs and earmuffs

They protect the farm workers from high noise levels emitted from machines, such as chainsaws, or animals, such as pigs, when housed.

Face protection

It is used while welding, to protect the eyes, nose and mouth from fumes, heat and stray metal. Face protection must also be worn while mixing, spraying or applying chemicals or using solvents, and also while grinding metal or cutting timber.

Hard hats

These help prevent injuries from falling objects.

Breathing apparatus

This is particularly needed when working in confined spaces such as in silos.

Both the dairy owner and the workers must wear all necessary and prescribed protective clothing and equipment while operating machines as per manufacturer specifications. Loose clothing must be avoided while operating machines, tractor, etc., to prevent the clothes of the farm workers getting caught into moving parts.

Safety measures during farm activites

(i) Always read instructions on labels of chemicals, pesticides, fumigants or disinfectants before use.
(ii) Use chemicals as prescribed by the manufacturer.
(iii) Use protective clothing as specified by the manufacturer while handling chemicals.

(iv) Dispose off chemical containers and medical waste appropriately to minimise environmental damage.
(v) Take immediate medical help or assistance in case of accidents due to chemicals.
(vi) Keep necessary emergency equipment and first aid accessible as per manufacturer's specifications while handling chemicals.
(vii) Chemicals are always kept away from children and animals.

The risks associated with the dairy workers and farmers are as follows.

(i) Transmission of diseases
(ii) Problems related to the handling of animals
(iii) Problems of the working environment

The common problems encountered in the farm and their remedial measures are given in Table 3.6.

Table 3.6: Common problems and their remedial measures

Common problems	Remedial measures
Damage to clothing	Wear comfortable overalls without lengthy projections. Always use waterproof footwear.
Burns and scalds	Wear covering for hair. Always wear gloves while handling hot items, insecticides, chemicals, etc.
Dust inhalations	Wear face masks to filter out dust
Cuts on fingers and wrists	Wear gloves

Collection of manure and washing

Manure is the breeding place for pathogens and insects. Solid manure is usually collected and removed from the animal shed twice daily and the floor of the animal house is flushed. Semi-solid and liquid manure (slurry) is removed with the help of a water hose pipe.

Solid waste from livestock farm is dumped in the manure pit. These wastes are gradually changed into manure by the bacterial activity after few months. The manure pit is about 100 metres away from the animal shed and other structures. It helps in avoiding foul smell originating from the manure pit and safeguards against

flies and insects. Manure pits are easily accessible from different parts of the farm. They are placed far from the water source. A roof may be provided over the pit to protect it from rain.

The liquid manure can also be flushed through a shallow drain located longitudinally to the longer axis of the animal house. Each shallow drain of the shed is connected to the sub-drain and subsequently to the main drain. The main drain is finally connected to the liquid manure storage tank, or the same can be treated by effluent treatment plant. The treated water is reused for agricultural crops.

Effective disposal and utilisation of manure

There are various methods for handling and treating animal waste (Fig. 3.9). Methods that are available for applying animal excreta into the soil include:

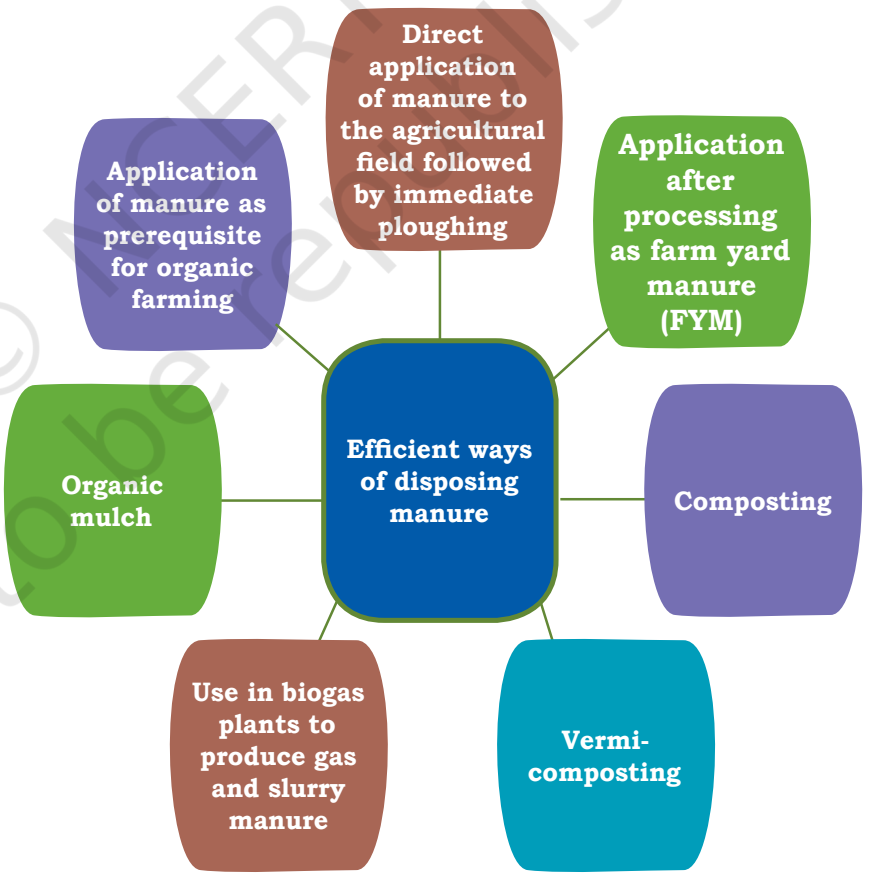

Fig. 3.9: Various methods of disposal of manure

1. Farm yard manure (FYM)
2. Conversion into compost
3. Vermicomposting
4. As a feedstock in biogas plants to produce gas and slurry manure.
5. Organic mulch: It is a layer of organic material which protects the soil from erosion by reducing direct impact of rains thereby slowing overland flows.

Farm Yard Manure (FYM)

When a mixture of dung and urine of farm animals and leftover feed and fodder is allowed to decompose slowly, the resulting product is called FYM. The composition of FYM depends on the type of animals, their ration, age, species, etc.

Composting

Composting is the process whereby organic matter is decomposed by micro-organisms. This process is in practice for centuries by farmers who stock dung into piles or in pits (Fig. 3.10). Composting can be either aerobic or anaerobic. The advantages of aerobic decomposing are shorter stabilisation time, no foul smell and destruction of weed seeds and pathogens. During composting, temperatures can reach as high as 150°F, whereas most of the pathogens harmful to humans are destroyed at 131°F.

Fig. 3.10: Compost pit

Composts must be handled carefully. An unripe compost has a high temperature which can damage the plants in which it is put. Mature manure compost is safe to use and is the best type of organic fertiliser. Older composts can be identified by their colour and moisture, a black and dry compost is considered as mature and a yellowish and wet compost is not suitable for use in plants.

Vermicomposting

The term vermicomposting means the use of earthworms for composting organic residues. By the process of vermicomposting, the earthworms convert the organic material into humus-like material, and process the farm waste quickly and efficiently.

Earthworms (Fig. 3.11) consume all kinds of organic matter and eat equivalent to their own body weight per day; for example, 1 kg of worms can consume 1 kg of organic matter daily. The end-product, i.e., the vermicompost is the excreta of earthworms rich in humus and nutrients (Fig. 3.12). The excreta (castings) are rich in various soil nutrients like nitrogen, potassium, phosphorus, calcium and magnesium. The earthworm castings contain 5 times the nitrogen, 7 times the potassium and 1½ times the calcium as found in good top soil. *Eisenia foetida* and *Lumbricus rubellus* (red worm) species of earthworms are commonly used for vermicomposting. Besides converting the organic waste into valuable manure, earthworms keep the environment healthy.

Fig. 3.11: Earthworms used in vermicompost preparation

Fig. 3.12: Vermicompost

Benefits of vermicomposting

The benefits of vermicomposting are given in Fig. 3.13.

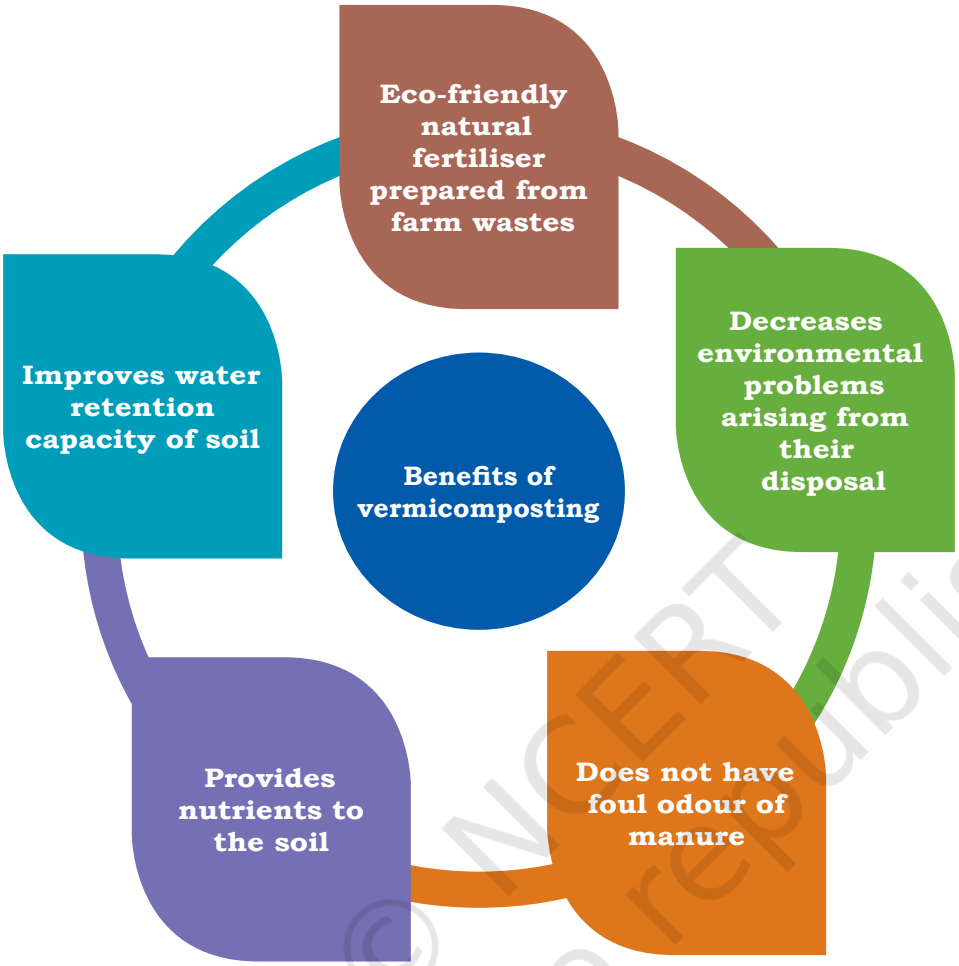

Fig. 3.13: Benefits of vermicomposting

As a feedstock in biogas plants to produce gas and slurry manure

Biogas is non-poisonous, with a characteristic odour, which disappears on burning. When mixed with air, it burns with a non-luminous blue flame without producing any smoke. It has a very low level of inflammability. Biogas is used for household cooking, lighting and power. Special lamps are available for lighting where biogas can been used. Combustion engines, commonly available, can be run on biogas. To do this, a special attachment is fitted to the combustion engine. Such

attachments are readily available. The biogas-spent slurry is better than Farm Yard Manure (FYM) since it is well digested and has high nutrient contents.

Organic mulch

Mulch is a layer of material applied to the soil surface. It reduces water loss by reducing evaporation from the soil. Mulch also keeps the soil cooler, reduces weed growth, run-off and erosion. Manure can be used as mulch but are best mixed with other mulches, especially if the manure is fresh.

Practical Exercise

Activity 1: Prepare vermicompost in your school.

Material required
Manure, Earthworm, Waste fodder, Leaves, Water, Covered area

Procedure

1. Bear in mind that the vermicomposting unit must be in a shady area.
2. Prepare a layer of chopped dried leaves/fodder of about 15–20 cm as bedding material.
3. Mix cow dung and waste fodder in the proportion of 3:1 and keep it for 7–10 days.
4. After partial decomposition of material, make a bed of size 6 x 2 x 2 ft.
5. Release about 1500 to 2000 earthworms on the upper layer of the vermicompost bed.
6. Sprinkle water immediately after releasing the worms.
7. Maintain sufficient moisture in the beds by sprinkling water daily and covering with gunny bags.
8. Turn the bed once after 30 days to maintain proper aeration within the bed.
9. Check if the compost gets ready in 45–50 days.

Check Your Progress

A. Multiple choice questions

1. The dairy farm worker wears protective equipment to protect _____.
   (a) eyes (b) face
   (c) head (d) All of these
2. Composting can be done _____.
   (a) aerobically (b) anaerobically
   (c) Both (a) and (b) (d) None of these

3. For which purpose is biogas used?
   (a) Household cooking (b) Lighting
   (c) Power (d) All of these
4. Which of the following conditions is associated with the risk of a dairy farm worker?
   (a) Problems of transmission of diseases
   (b) Problems related to the handling of the animals
   (c) Problems of the working environment
   (d) All of the above
5. Which of the following is an advantage of mulching?
   (a) acts as a soil cooler (b) reduces weed growth
   (c) reduces erosion (d) All of these

B. Fill in the blanks

1. PPE stands for _____.
2. The manure pit is generally dug out on a dry and fairly elevated land about _____ metres away from the animal houses.
3. Manure is removed from the animal shed _____ times daily.
4. Vermicompost is the excreta of _____ rich in humus and nutrients.
5. Biogas burns with a non-luminous _____ coloured flame without producing any smoke.

C. Mark true or false

1. Liquid waste from livestock farm is dumped in the manure pit.
2. PPE only protects the individual and does not prevent the accident from happening.
3. Slurry is obtained from FYM.
4. Black colour and dryness is the indication of immature compost.
5. Mulch is a layer of material applied to the soil surface.

D. Match the following

A	B
1. Natural process in which organic matter is decomposed by micro-organisms	(a) Manure pit
2. Use of earthworms for composting organic residues	(b) Mulch
3. Solid waste from livestock farm is dumped	(c) Slurry
4. A layer of material applied to the soil surface	(d) Composting
5. Manure in liquid form	(e) Vermicomposting

GLOSSARY

Earthworm castings: *It is also known as vermicast which is nothing but worm's manure in its natural form. It contains an abundance of bacteria, remnants of decaying plant matter, enzymes, earthworm cocoons and other by-products.*

Homoeothermic: *The ability of cattle to maintain a constant and persistent body temperature which is almost independent of the surrounding environmental temperature.*

Rumination: *The activity of cattle to bring back the consumed feed to the mouth and chewing it for a second time.*

Transportation: *The act or process of moving animals or things from one place to another.*

Waste: *Unwanted or unusable items generated from a unit.*