

# 1. ROUTINE LIVESTOCK FARM MANAGEMENT PRACTICES

## Can you recall ?

- The term livestock, breed and animal husbandry
- Routine practices followed by farmers on their livestock farm



Animal husbandry or livestock rearing is as old as human civilization. The animals are dependent on humans for their sustenance and performance under domestication. Their feeding, housing, healthcare and routine management based on scientific recommended practices is essential for obtaining higher profit from dairy farming.

Management is the process of judicious decision making in an enterprise. Management is an art and science of combining ideas for planned proceedings with available resources to produce and market a worthwhile product.

Livestock management involves integrated application of principles of breeding, feeding, housing, organization and disease control in a manner suitable for a particular situation.

## 1.1 Identification of animals

### Do you know ?

- How animals are generally identified on farm?
- Importance of animal identification.



A lot of farmers ignore animal identification which is very important. Giving names to farm animals may serve the purpose to an extent for a small herd, but may not be feasible for a large herd. So it is important to put some sort of identification marks on each farm animal soon after its birth.

## Importance of identification

1. To identify the animal if lost or stolen.
2. To record the details of animal in respect of breeding, feeding, management and health cover.
3. To know pedigree of animal.
4. To record growth, reproduction and production performance of animal.
5. To make easy for treatment or culling of sick or unproductive animals from the herd.

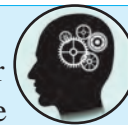
## Methods to identification

- 1) Ear tattooing
- 2) Ear notching
- 3) Tagging
- 4) Branding
- 5) Electronic Identification System

**1) Ear tattooing :** Ear tattooing is the process of puncturing desired number or letter on inside skin of ear with the help of tattoo forcep and then rubbing tattooing ink (black carbon pigment) over the punctures.

### Remember...

Tattooing is most suitable for marking newborn calves and cattle having light coloured skin of the ear.



## Technique

1. The animal is firmly secured to put the number.
2. The surface of the ear is cleaned inside with the help of soap water and then wiped with spirit swab to remove grease before tattooing.
3. The desired number is then fixed in the tattooing forceps and pressed on the inner side of ear in between two veins.
4. The tattoo puncture is then rubbed with tattooing ink with the help of thumb.
5. Tattooing is done on undersurface of tail in case of animals having dark or pigmented ear skin.



**Fig. 1.1 : Tattooing forcep (Tattooer with digit)**



**Fig. 1.2 : Tattoo in ear**

6. Precautions should be taken to avoid injury to ear veins.

**Advantages**

1. It is easy and permanent method of identification.
2. It can be used in animals of any age, whether small or large stock.
3. It is less painful.
4. It is legally acceptable.
5. It is suitable for all livestock.

**Disadvantages**

1. Tattoo mark usually fades out in course of time.
2. It is less useful in animals having dark pigmented skin.
3. Reading of number needs close inspection.

**2) Ear notching**

- It is the method of making 'V' or 'U' shape cuts / notches along borders of ear with the help of scissor or pincers.



**Fig. 1.3 : Ear notching**

3. A single notch at lower side of right ear indicates the number '1' while of left ear indicates the number '3'
4. A single notch at the upper side of right ear indicates the number '10' while on left ear indicates the number '30'.
5. Notches should neither be made too small nor too large.

**Advantage**

- It is a permanent method of marking buffalo and pigs.

**Disadvantage**

- It causes injury to calf.

**3) Tagging**

- Tagging is method of fixing of numbered tag at ear / neck of animals.

**Remember...** Ear notching is commonly used for marking of buffalo calves and pigs.

**Technique**

1. Animal is firmly secured, ear is cleaned and disinfected with the help of spirit.
2. Then 'V' or 'U' shape cuts/notches are made at the border of ear by using sterilized ear punch/scissor/pincers.

**Do you know ?** Tagging is mostly used for marking of sheep, goat and sometimes young calves.

## Types of tagging

a. Ear tagging b. Neck tagging

**a) Ear tagging :** It is the most popular method of identification of farm animals.

### Technique

1. In this method, tags made up of light metal or strong coloured plastic having number engraved on it are used.
2. Tags are of two types i.e. self-piercing and non-piercing.
3. Prior to tagging ear is cleaned with spirit.



**Fig. 1.4 : Ear tag**



**Fig. 1.5 : Ear tag with forceps**



**Fig. 1.6 : Ear tagging in cow and goat**

4. Self-piercing tag is directly pierced and locked with the help of pincers.
5. In case of non-piercing tag, hole is made on the upper edge of ear with the help of ear notcher or ear punch and then tag is placed in the hole and fixed.
6. While tagging, number should be visible outside the upper edge of ear.
7. Tag should not be too tight or too loose.
8. Antiseptics solution like tincture iodine or benzoin should be applied at the site of tagging.

### Advantage

- It facilitates easy supervision, management and accurate record maintenance.

### Disadvantage

- Tags usually fall down or tear off the ear lobe.

### b) Neck tagging

- In this method metallic or plastic tag is tied in the neck chain by the use of thread or wire.
- It is temporary method of marking animals as there is a chance that they may be lost.



**Fig. 1.7 : Neck tagging in Goat**

### 4) Branding

It is the method of imprinting number or any identification mark on the thigh of animal by hot iron, chemical or coolant. Branding is mostly used for marking of cattle, buffaloes, horses and camels.

## Internet my friend

Details of branding



### 5. Electronic identification

The electronic identification system is started in the year 1970s. Radio frequency identification (RFID) is one of the most advanced method used in organized farm to identify and record the day to day data of animal.

#### Radio frequency identification (RFID) technology for cattle

Radio frequency identification (RFID) describes a system that wirelessly transmits the identity of an animal. These devices have an electronic number that is unique for an individual animal and link that animal to the database. Electronic ear tags, injectable transponders and boluses with a transponder, inside in the reticulum are the latest technologies for animal identification.

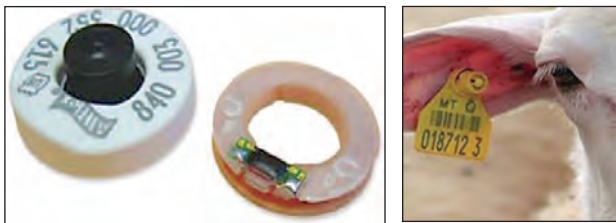


Fig. 1.8 : Parts of RFID ear tag

#### Do you know ?

RFID ear tags for cattle was first used by USDA (United States Department of Agriculture).



### Types of RFID tags

**1. Active RFID tags :** Active RFID tags have a local power source like a battery and can operate hundreds of meters away from the RFID reader. They constantly transmits data.

**2. Passive RFID tags :** Passive tags don't have a local power source. It takes energy from the interrogating radio waves of a nearby RFID reader. A passive RFID tag needs to be "powered up" by a nearby reader before it can transmit data.

## Internet my friend

Search different types of RFID tags used for animal identification.



### Basic components of RFID system

- 1. Transponder :** The transponder is the electronic data source that stays with the animal you want to identify. The transponder contains a microchip, where the identification number is stored. The transponder is embedded in the ear tag.
- 2. Transceiver:** The transceiver (or reader) is used to retrieve the information stored in the transponder. This device is essentially a radio transmitter and an antenna. The transceiver could be part of a hand-held unit that is taken to the location of the animals with the RFID tags or a stationary unit that the animals pass by.
- 3. Data accumulator:** This is a device where information received by the transceiver is accumulated or stored. eg. Computer, Personal Digital Assistant (PDA), Android/iOS Mobile etc.

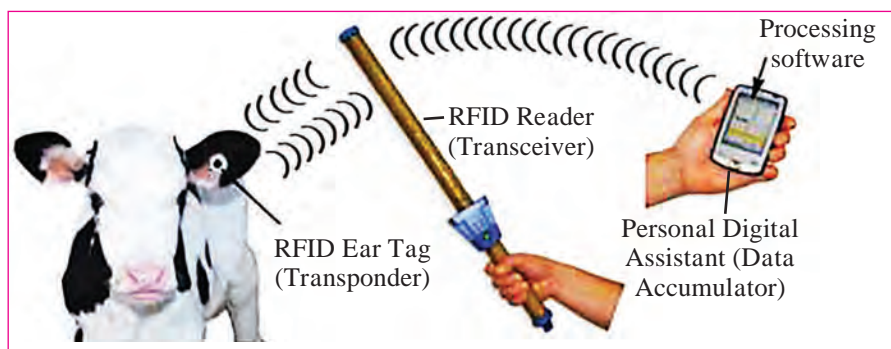


Fig. 1.9 : Basic components of RFID system

4. **Processing software:** This software transforms the accumulated data into recognizable and useful information and can be imported into a variety of data management programs like word, excel, spreadsheet or any other software etc.

### Advantages

1. It does not require direct contact or line-of-sight scanning.
2. It can be used to dispense feed automatically to animals.
3. It provide a higher level of security like giving password to access information
4. Production history can be located quickly.
5. Readers can process multiple RFID tags at once (Thousands of tags per second).
6. RFID tags can be read at a greater distance.
7. RFID tags can store larger amounts of data.
8. RFID tags have high durability and resistance to harsh environments.

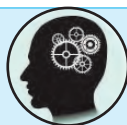
### Disadvantages

1. Initial cost is more.
2. It require software to access data.

#### Remember...

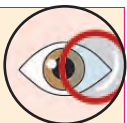
Other methods of identification

1. Use of leather neck strap
2. Keeling i.e. painting of horns
3. Photographing.
4. Muzzle prints.



#### Observe and Record...

The various methods used to identify animals in organized dairy farm near by you.



### 1.2 Weighing of cattle

Cattle should be weighed usually once in months.

#### Importance of weighing animal

1. It helps to record the growth rate.

2. It is essential for balanced feeding of livestock and also for computation of ration.
3. It guides the farmer regarding the general health of animal.

### Methods of weighing

#### 1. Direct Method

- In this method, animal is weighed directly on weighing balance/machine or platform scale.
- The animal should not be given feed for atleast 12 hrs. before weighing
- A few hours before weighing, animals should not be given water.

#### Limitations

1. Weigh bridge or platform scale is costly
2. It may not be commonly available at farm or near to farm.

#### 2. Indirect Method /Alternate Method

- In this method, weigh of animal is indirectly calculated from body measurements.
- The common formulae used for estimating body weight are as below

**a. Shaeffer's formula :** It is widely accepted for estimating body weight of an adult cattle

$$\text{Live body weight (in pounds)} = \frac{\text{Length} \times (\text{Girth})^2}{300}$$

Where,

Length = Distance between point of shoulder to pin bone in inches

Girth = Entire circumference of the body behind the point of elbow in inches

**b. Agarwal's formula:** It is modified Sheffer's formula for Indian cattle.

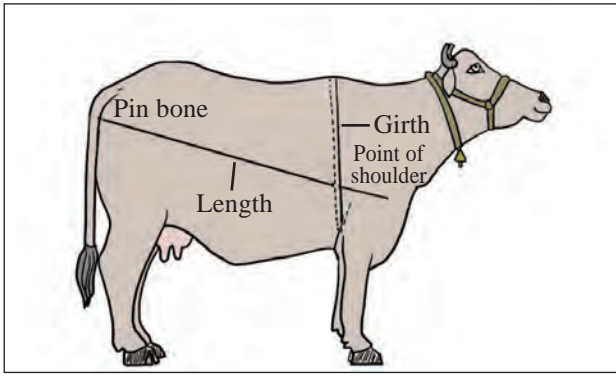
$$\text{Live body weight (in pounds)} = \frac{\text{Length} \times \text{Girth}}{Y}$$

Where,

Y = 9 if girth is less then 1.62 meters

Y = 8.5 if girth is between 1.62 – 2.0 meters

Y = 8 if girth is more than 2 meters



**Fig. 1.10 : Body measurements for weighing of cattle**

### 1.3 Disbudding and Dehorning

- Disbudding is the process of removing horn bud in young calves before its attachment to skull within 3-5 days after birth.
- Dehorning is the removal of horn after it has attached to the skull in older calves.
- However, in most of the dairy farms disbudding is practiced instead of dehorning as former is less painful.
- Moreover, in case of horn injury or horn cancer to check the spread of infection dehorning is practiced.

#### Can you tell ?

The purpose of disbudding in calves



#### Advantages

1. It makes animal safe for handling and management.
2. It protects other animals from injury due to fight.
3. It prevents body and udder injuries.
4. It is most convenient for the animals in loose housing.
5. It prevents occurrence of horn cancer.
6. It gives uniform appearance to all the animals.
7. It reduces floor space requirement in shed.

#### Disadvantages

1. Animals cannot make the defense when attacked by other animals.

2. Age determination from horn rings becomes impossible.
3. An important breed characteristic in the form of horn is lost.
4. Good look of animal in some breed of cattle is lost.

#### Methods of disbudding

1. Chemical method
2. Electrical method

##### 1) Chemical method

- It is usually performed before 10 days of age.
- It is easy and inexpensive method.

#### Technique

1. Calf is properly secured and about 2 cm area around the horn bud is clipped.
2. Then spirit is applied on horn bud and grease or vaseline is applied around horn bud to protect encircling skin from chemical.

#### Do you know ?

Caustic potash (KOH) or caustic soda (NaOH) or silver nitrate ( $\text{AgNO}_3$ ) sticks are used for chemical disbudding



3. A stick of caustic potash held in the caustic holder or with a piece of paper is rubbed on the horn bud in circular motion till little blood appears.
4. The cauterizing action of chemical destroys horn bud.
5. Bleeding is checked by applying tincture benzoin.



**Fig. 1.11 : Disbudding with caustic soda**



**Fig. 1.12 : Chemical method of disbudding**

**2) Electrical method**

- Disbudding may be done mechanically using red hot iron or electrical dehorner pressing on the horn bud.
- It is performed at three weeks of age in calf.
- It is quite safe, quick and most popular method.

**Technique**

1. Animal is secured well.
2. Horn buds are located properly and about 2 cm area around the buds is clipped.
3. Then horn buds are cauterized by applying red hot electric dehorner for 10 to 20 seconds.



**Fig. 1.13 : Electrical dehorner**



**Fig. 1.14: Electrical dehorning**

**Do you know ?**



Electrical dehorning is best as it requires only 10 minutes and less hazardous compared to chemical or hot iron method.

**1.4 Determination of age**

Knowing cattle age is useful for both cattle management and marketing in the absence of birth records.

**Advantages/Importance**

1. It helps in accessing the tentative age of animal when birth record is not available.
2. It helps in fixing the price and purchase of animals.
3. It helps to decide medicinal doses against diseases.

**Limitations**

1. Exact age of animal cannot be determined.
2. Purposeful attempt of hiding age may result in wrong assessment of age.

**Methods of determination of age**

1. General appearance method
2. Horn ring method
3. Dentition method

**1. General appearance method :** Dairymen make certain observations on the animal and its approximate age on the basis of breed, temperament and type of animal, shining and tightness of skin, activeness, vigor etc. are some of the characters suggestive for animal age. Based on general appearance, animals are categorized into age groups, such as very young, yearlings, adults, old etc.

Group of animals	General appearance
<b>Younger animals</b>	Smaller in size, having active disposition, smooth and tight skin, soft hair coat and full mouth.
<b>Older animals</b>	Large in size having normal look, rough hair coat, broken mouth, loose skin, weak joints, roughened stature etc.,

## Limitations

1. Actual age of the animal cannot be determined by this method.
2. Clever preparation of animal adds to difficulty in determining age by appearance method.

**2. Horn ring method :** With the increase in age the horn rings grows in size and rings are formed on it. First appears on the horn at three years of age in cattle. There after one ring appears yearly. Hence following formula for estimation of age may be used.

Age of animal in year =  $N+2$

Where,

$N$  = Number of horn rings

## Advantage

- It is easy to adopt

## Disadvantages/Limitations

1. It cannot be used in dehorned and polled animals.
2. It is less reliable method.
3. In some breeds rings are either not clear or horns are small.

## 3. Dentition method

- In this method, age of animal is determined by examining the available incisor teeth in the mouth.
- In cattle, eight incisor teeth are present in the lower jaw.
- Cattle do not have incisor in upper jaw, instead of they have dental pad.
- Eruption of incisor teeth follows a specific sequence with the advancing age.
- At about 5.5 years of age all the permanent incisor are present in mouth, hence animal is considered to have full mouth.
- The age of cattle can be judged by observing the wear and tear of the permanent incisor from 6 to 12 years of age.

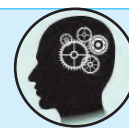
## Dental formulae

**1. Temporary teeth :** incisors (I) 0/8 canines (C) 0/0 premolars (P) 6/6 molars (M) 0/0 = 20

**2. Permanent teeth :** incisors (I) 0/8 canines (C) 0/0 premolars (P) 6/6 molars (M) 6/6 = 32

### Remember...

Ruminants do not have canines.



**Table 1.1 : The age wise temporary and permanent incisor teeth eruption in cattle**

Age	Teeth eruption
At birth	First pair of temporary incisors
One week	Second pair of temporary incisors
Two weeks	Third pair of temporary incisors
Four weeks	Fourth pair of temporary incisors
2 to 2.5 years	First pair of permanent incisors
3 to 3.5 years	Second pair of permanent incisors
4 to 4.5 years	Third pair of permanent incisors
5 to 5.5 years	Fourth pair of permanent incisors

**Table 1.2 : Typical cattle ages when permanent incisors teeth erupt, develop, and wear**

Teeth	Eruption	Full development	Wear
First pair	18 to 24 months	24 months (2 years)	Leveled at 5 to 6 years, noticeable wear at 7 to 8 years
Second pair	24 to 30 months	36 months (3 years)	Leveled at 6 to 7 years, noticeable wear at 8 to 9 years
Third pair	36 to 42 months	48 months (4 years)	Leveled at 7 to 8 years, noticeable wear at 9 to 10 years
Fourth pair	42 to 48 months	60 months (5 years)	Leveled at 9 years, noticeable wear at 10 years

### Advantages

1. It is quite reliable method of age determination though the nutrition and management of animals influence it.
2. It is popularly accepted by most of the farmers.

### Limitation

1. Loss of teeth due to accident or injury may mislead the age of animal.



**Fig. 1.15 : Dentition of a 3 year old cattle with 2 pairs of permanent incisors**



**Fig. 1.16 : Dentition of cattle aged around 5 years with 4 pairs of permanent incisors**

## 1.5 Approach, Restraining and Casting of Animals

### Approach and restraining of animal

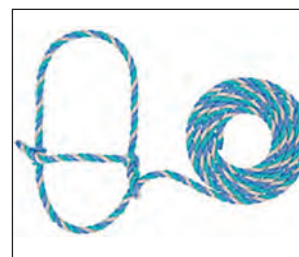
#### Principle

1. Proper method for approach, handling and control is necessary from the point of safety to veterinarian, attendant and also to the animal.
2. Animals should always be approached from behind and on their left side.

Various means of restraining the animals are as below.

#### a. Halter

1. Halter is used for proper controlling of animals.
2. The rope used for halter making should be about 3-3.5 m in length and 1.3 cm in thickness.
3. The rope is fixed around the face with one string around the poll.



**Fig. 1.17 : Rope Halter**

### b. Anti-Cow Kicker

1. It is used to prevent kicking by the cow especially during milking.
2. It is made up of two metal clips connected together by chain.
3. Clips are fitted above the hocks with chain hanging in front of hocks.
4. A smaller clip is provided, to fix the tail at left clip.



**Fig. 1.18 : Anti-Cow Kicker**

### c. Bull nose ring

1. It is used for better control of bull.
2. It consists of two semicircular pieces hinged together.
3. It is made from non-rusting metal like copper or aluminum.
4. Each year, existing bull nose ring is replaced by bigger size.



**Fig. 1.19 : Bull nose ring**

### d. Mouth gag

- It is used for keeping mouth open by making the jaws apart.
- Its use is essential for examination of mouth or passing of the probang safely.
- Mouth gags are mainly of two types

#### 1. Drinking water gag

1. These are made up of aluminum.
2. These are two in number. One for upper jaw and another for lower jaw.

3. These correspond to the shape of jaw.
4. Both are fitted with flanges to accommodate check teeth.



**Fig. 1.20 : Drinking water gag**

#### 2. Probang gag

1. It is made up of wood.
2. It has hole in the center to pass probang.
3. It is also provided with a strap which go over the poll.



**Fig. 1.21 : Probang gag**

### 2. Casting of animals

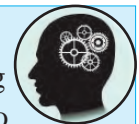
Casting is defined as throwing of animal on the ground slowly and safely.

#### Objectives

1. To perform shoeing, branding and dehorning.
2. To perform various surgical operations.
3. To perform and dressing of wounds.

#### Remember...

- The animal should kept on fasting for 12 hours before casting to prevent injury to distended digestive organs.
- Casting of pregnant animals must be avoided.
- Animals should always be casted on grassed area or where smooth bedding is available



## Methods for casting

**1. Reuff's method :** It is most commonly adopted method for casting of animal.

1. Make a running noose or knot at the end of 9 m. long cotton rope and put around the base of horns. In polled animal noose is placed round the neck.
2. Make first half hitch round the neck and tie with rigid knot that will not slip.
3. Make second half hitch around the chest behind the elbow.
4. Make third half hitch around the abdomen in front of udder or scrotum.
5. Turn the head opposite to the desired casting side.
6. Animal then falls steadily on the ground.
7. Pulls steadily the free end of rope backward and towards the desired side.
8. Then press the head to the ground or turn it over on the shoulder.
9. Pass the tail forward from in between the thighs and pull around the top side of thigh.



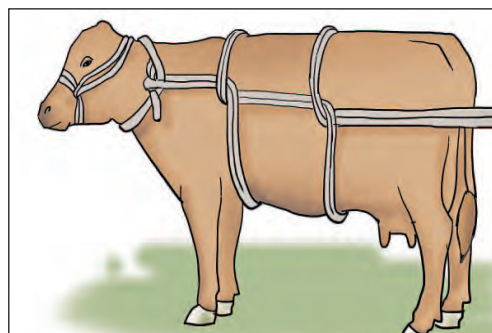
Step 1



Step 2



Step 3



Step 4

Fig. 1.22 : Reuff's method of casting

10. Secure the animal's feet along with the tail by another rope.

### Internet my friend

Search alternate methods of casting the animals



### 1.6 Castration

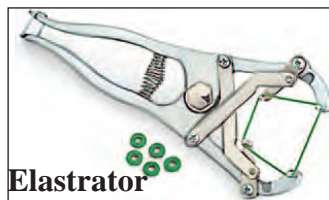
- It is method of removing or dysfunctioning of essential reproductive organs in males.
- The optimum age for castration in male is 4 to 6 months for blood less castration and 8 months for incision method.

#### Advantages

1. Castration prevents indiscriminate and unwanted breeding from undesired males.
2. Male and female can be kept in one place.
3. It makes animal more docile and easy for handling.
4. It improves the growth rate and meat quality of animal.
5. It increases fat deposition in animals.

### Can you tell ?

- Objectives of castration in cattle
- Proper age of bull for castration



**Fig. 1.24 : Rubber band method**

### Disadvantages

1. It produces pain to animals.
2. If proper care is not taken increases susceptibility to infection.
3. In surgical castration chance of tetanus is more.

### Methods of castration

The following are five methods of castration.

1. Burdizzo method
2. Rubber band method
3. Surgical / open / incision method
4. Vasectomisation
5. Mulling

### Can you tell ?

The bloodless method of castration in bull



#### 1) Burdizzo method

- It is close method of castration.
- This is also called as bloodless castration.



**Fig. 1.23 : Burdizzo castrator**

#### 2) Rubber band method

- This is also known as elastrator method.
- This method is mainly used for sheep and goat at about 2-3 weeks of age.

#### 3. Surgical/Open/Incision method

- In this method, testicles are removed by giving incision to scrotum.
- It is commonly used in dogs and horses.

#### 4. Vasectomisation

- Vasectomisation is used for the preparation of teaser bull.

### Remember...

- Vasectomised bulls are sterile but they maintain sex libido.
- The semen of vasectomised bulls does not contain sperms.



#### 5. Mulling

- This is very old and crude method of castration
- In this method, testicles and spermatic cord are crushed between two hard objects like stone or wood till testicle is reduced to pulp.
- It is very painful, cruel and unscientific method

### Internet my friend

Search additional information about technique used in castration



#### 1.7 Grooming

Grooming is the careful brushing and combing of body hair coat and from scalp of animal.

### Advantages

1. It improves appearance of animal.
2. It makes skin coat smooth, clean and glossy.
3. It stimulates the blood and lymph circulation of skin.
4. It removes dandruff, loose hair, dust, dirt and ectoparasites.

- It helps to feel the animal fresh by reducing tiredness and fatigue.
- It helps in clean and hygienic milk production.



**Fig. 1.25 : Hand groomer**



**Fig. 1.26 : Mechanical groomer**

### Technique

- Grooming is done with the help of brush and curry comb.
- It includes brushing followed by combing.
- It is always done in the direction of hair.
- It is started at neck, behind ear and finished towards hind quarter.
- Face is not brushed but wiped with a moist, clean cloth.
- Brush and comb are cleaned after each 4-5 sweeps or strokes of grooming.

- Rotating cow brush is also used in organized farm. It is easy to use, and rotate when cow moves the brush.

### Do you know ?

Grooming generally practiced before milking along with washing to improve the clean milk production.



### 1.8 Body condition scoring

- Body condition scoring is a subjective scoring method based on visual assessment of animal for the amount of fat and muscle covering the bones of a cow, regardless of body size and evaluating the energy reserves of dairy animals according to 5 point scale.
- It provides a better understanding of biological relationship between body fat, milk production, reproduction and health status of animal.
- It helps in adopting the optimum managerial practices to derive maximum production.
- A low score may indicate diseases or improper feeding while a high score may indicate a high probability of breeding and metabolic problems.

### Do you know ?

Traditionally, body condition scoring is done by looking at a cow and feeling it. This can lead to inaccuracies, particularly if the barn is crowded.



### Important body parts of cow for body condition score

**Backbone** - Is it flat or is there a ridge? Can you see or easily feel notches?

**Long ribs** - Can you see or easily feel the ribs? If visible how many can you see?

**Short ribs** - Can you see the short ribs? What do they feel like? Are the rib ends sharp or rounded?

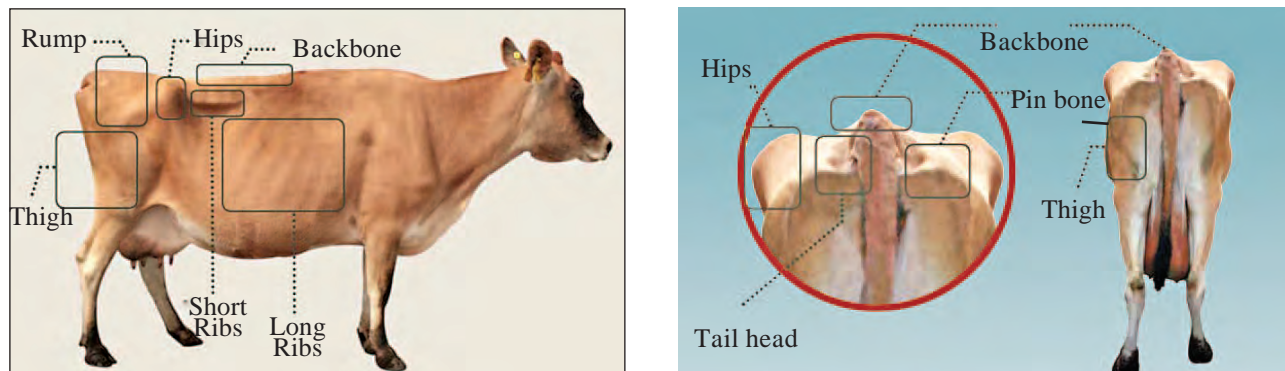
**Hip bones** - Are the hip bones rounded or angular?

**Rump** - Is the area between the pins and hip bones, flat, sunken or hollow?

**Pin bones** - Are they pointed, "tap" like or rounded?



**Tailhead** - Is there a hollow between the tail head and pin bones? Is it a deep V or shallow U shape?




**Thigh** - Is the area indented, flat or rounded? Is the muscle structure defined.



**Fig. 1.27 : Important body parts of cattle for BCS**

**Table 1.3 : Body condition score in cattle**

Score	Description of animal	Interpretation
BCS 1	<ul style="list-style-type: none"> <li>Animal is emaciated</li> <li>Deep cavity around tailhead</li> <li>Bones of pelvis and short ribs are sharp and easily felt</li> <li>No fatty tissue in pelvic or loin area</li> <li>Deep depression in loin</li> </ul> 	<ul style="list-style-type: none"> <li>Not in good health</li> <li>Will not milk well or reproduce</li> <li>May be diseased and survival during stress is doubtful</li> </ul>
BCS 2	<ul style="list-style-type: none"> <li>Animal appears weak</li> <li>Shallow cavity around tailhead with some fatty tissue lining it and covering pin bones</li> <li>Pelvis easily felt</li> <li>Ends of the short ribs can be feel rounded and upper surfaces can be felt with slight pressure</li> <li>Depression is visible in loin area</li> </ul> 	<ul style="list-style-type: none"> <li>Health may be ok, but milk production is low</li> <li>Poor reproduction</li> </ul>

<p>BCS 3</p>	<ul style="list-style-type: none"> <li>• No cavity around tailhead and fatty tissue easily felt over whole area</li> <li>• Pelvis can be felt with slight pressure</li> <li>• Thick layer of tissue covering top of short ribs which can still be felt with pressure</li> <li>• Slight depression in loin area</li> </ul> 	<ul style="list-style-type: none"> <li>• High producing, but fat may not be enough for peak production</li> </ul>
<p>BCS 4</p>	<ul style="list-style-type: none"> <li>• Folds of fatty tissue are seen around tailhead with patches of fat covering pin bones</li> <li>• Pelvis can be felt with firm pressure</li> <li>• Short ribs can no longer be felt</li> <li>• No depression in the loin area</li> </ul> 	<ul style="list-style-type: none"> <li>• May have more metabolic problems at calving</li> </ul>
<p>BCS 5</p>	<ul style="list-style-type: none"> <li>• Tail head is buried in thick layer of fatty tissue</li> <li>• Pelvic bones cannot be felt even with firm pressure</li> <li>• Short ribs covered with thick layer of fatty tissue</li> </ul> 	<ul style="list-style-type: none"> <li>• Extremely fat and will have metabolic and breeding problems</li> </ul>

### Remember...

Dry cows and calving cows should have a body condition score of 3.5



## 1.9 Milking

Milking is a skillful act of drawing milk from udder of lactating animal.

### Principles of milking

1. Milking is a key operation on the dairy farm.
2. Milking is hormone related act. Oxytocin secreted by pituitary gland is responsible for letting down of milk.
3. Milking should be gentle, quick and complete.
4. Letting down of milk can be stimulated by gentle massage.

5. Milking should be completed within 7 minutes.
6. Before milking, hind quarters should be groomed and washed.
7. Tail should be tied with hind legs.
8. Udder should be washed with a weak antiseptic solution prior to milking.
9. Milking should be done by an experienced milker who is free from bad habits like spitting or smoking and communicable disease. He himself realizes cleanliness.
10. Milking is usually done from left side of the animal.
11. Full hand method of milking should be followed particularly for large animals.
12. First drawn milk strips are collected in strip cup to check any abnormality and should not be added in milk.
13. The last stripping of milk is rich in fat.
14. Milking time and interval between milking should be kept constant.
15. A concentrate mixture should be offered to animal during milking for calm and convenient milking.
16. Silage, leaves of onion, cabbage, cauliflower, parthenium etc. should not be fed just before milking.
17. Hind legs should be well secured before milking.
18. Animal should not be disturbed or excited during milking as it may cause inhibition of milk ejection due to action of adrenaline hormone.
19. Avoid excess noise/sound during milking.
20. At the end of milking teats should be dipped in antiseptic solution.

### Methods of milking

There are two methods of milking -

1. Hand milking – done manually
2. Machine milking – done by milking machine

### 1. Hand milking

- It is most common method of milking.
- There are three methods of hand milking.

#### a. Stripping or strip milking

#### b. Full hand milking

#### c. Knuckling

#### a. Stripping or strip milking

1. In this method, teat is firmly held at the base between thumb and index finger.
2. It is then pulled downward along the length of teat with equal pressure thereby milk flows down in a strip.
3. The procedure is repeated in quick successions till that quarter of udder is evacuated.



**Fig. 1.28 : Stripping or strip milking**

#### b. Full hand method

1. In this method, teat is held completely in the fist with thumb raised hence method is also called as fisting.
2. Base of the teat is firmly held in ring formed by thumb and forefinger.
3. It is then pulled downward to tip of teat which causes milk ejection.



**Fig. 1.29 : Full hand method**

- The procedure is repeated in quick successions till that quarter of udder is evacuated.
- Avoid holding of teat with thumb bent in against the teat i.e. knuckling.

### c. Knuckling

- It is the modification of full hand method.
- The thumb is folded inside and teat is pressed in between the bend of thumb and remaining fingers.
- It gives more irritation to teats and if continuously used, teat become smaller at the centre with depression.
- It is more troublesome and uncomfortable to the animal.



**Fig. 1.30 : Knuckling method**

### Can you tell ?



- Hormone responsible for milk let down
- Hormones responsible for inhibition of letting down of milk

## 2. Machine milking

In this method, machine is used for milking instead of hands.

### Method

- Udder and teats are wiped with warm antiseptic solution half a minute prior to milking.
- Two to three strips of foremilk are drawn from each teat.
- Teat cups are then placed on teats.
- Then the machine is operated at 10-15" vacuum with a pulsation rate of 50/minute.
- The negative pressure created by machine evacuates the milk from udder.
- Teat cups are removed as soon as milk ceases to flow

**Table 1.4 : Differences between full hand milking and stripping or strip milking**

Sr. No.	Full hand milking	Stripping or strip milking
1	In this method, teat is held in fist.	In this method teat is held between thumb and index finger.
2	Milking is quick.	Milking is slow.
3	It is similar to natural suckling process of calf.	It is not similar to natural suckling process of calf.
4	It causes less irritation to teats hence animal is at comfort during milking.	It causes more irritation to teat, hence animal is less comfortable at milking.
5	It is suitable for high yielder having long teats.	It is suitable for very low yielder having small teats.



**Fig.1.31 : Machine milking**

**Precautions to be taken**

1. Teat cups should not be kept for long time.
2. Machine should be operated with optimum vacuum.

**Advantages**

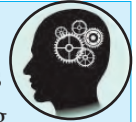
1. Labour requirement is less.
2. Milking is rapid.
3. Milk production is hygienic.

**Disadvantages**

1. It is expensive method due to higher cost of milking machine.
2. There are many technical complexities in operation of milking machine.
3. Low yielders cannot be milked.
4. Requires technical person for milking of animal.
5. If part of machine coming in contact with milk is not properly cleaned regularly then there are chances of increase in micro-organisms in milk.

**Remember**

Full hand milking method is most suitable method of milking while knuckling method is most painful method.



**Internet my friend**

Prices of different types of milking machine are available in the market



**1.10 Drying off**

- It is the process of making a lactating but pregnant cow dry approximately 60 days before next calving.
- It is the best practice for high producing animals.

**Advantages**

1. It provides sufficient rest for organs of milk secretion before calving.
2. It helps to built up body reserve of nutrients.
3. It helps in better development of foetus.
4. It maintains good health of pregnant animal.
5. It reduces the occurrence of milk fever at or after calving.
6. It results into better milk production in future lactation.

**Methods of drying off :** Drying off in pregnant but lactating cow can be achieved by adopting any of the following method

**Table 1.5 : Differences between hand milking and machine milking**

Hand milking	Machine milking
1. Milking is done by hand	1. Milking is done by machine
2. It is economical method	2. It is expensive method
3. Milking is slow	3. Milking is rapid
4. Labour requirement is more	4. Labour requirement is less
5. It is suitable for smaller herds	5. It is suitable for bigger herds
6. Milk production is less hygienic	6. Milk production is more hygienic

### 1. Intermittent milking

### 2. Incomplete milking

### 3. Abrupt or complete cessation of milking

#### 1. Intermittent milking

1. Initially the number of milkings are reduced to once in a day.
2. Milking once in a day is followed for about a weeks period.
3. Thereafter milking is done once in alternate day.
4. At about 60 days before parturition, milking is stopped completely.

#### 2. Incomplete milking

1. In this method, for first few days milk is partially withdrawn from udder.
2. Then cow is milked intermittently but incompletely.
3. The intermittent and incomplete milking causes lowering of milk synthesis in udder.
4. Milking is stopped completely, when production is reduced to less than 1kg.

#### Do you know ?

Incomplete milking method is suitable for drying off high yielding animals.



### 3) Complete or abrupt cessation of milking

1. In this method, quantity of feed and water is reduced, which causes reduction in milk synthesis.
2. Milking is stopped abruptly or completely.
3. Sudden cessation of milking increases pressure in udder which results in decreased milk secretion.
4. The milk accumulated is reabsorbed from the udder till cow becomes completely dry.

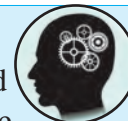
**Advantage :** It is suitable for low yielder.

#### Disadvantages

1. It causes swelling and pain in udder.
2. It is not suitable for high yielding animals.

#### Remember

After last milking, teats should be washed thoroughly and suitable antibiotic is infused in a teat which prevents the entry of infectious organisms into udder.



**1.11 Steaming up :** Dry cows are fed in a nutritionally proper manner to get prepared for calving is called as steaming up.

- Separate dry cows from the milking herd and group them with the pregnant heifers. Allow dry cows to get plenty of exercise.
- Feed judiciously mainly good quality roughages and recommended concentrate. Limit body gain to no more than 45 kg from late lactation to the next calving to reduce the problem of ketosis, milk fever, displaced abomasum and calving problem.
- Watch the cow closely for signs of calving.
- Calving-pen floor should not be slippery and should have proper bed of dry straw to ensure safe calving.
- Watch the cow for signs of milk fever, ketosis, or other health problem.
- Provide fresh water and hay/soft roughages/ wheat bran after calving.
- Care and precautions must be taken for prevention of udder edema. First calvers are more prone to edema.

#### 1.12 Culling

- The word comes from Latin language word “colligere” which means “to collect”.
- Culling is defined as the process of removal of unproductive and undesirable animals from the herd.
- Culling is very important to run livestock farming in profitable manner.

#### Do you know ?

About 10 % of animals from the herd having undesirable characters should be culled each year.

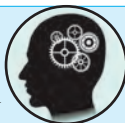


**The animals having following problems should be culled from herd.**

1. Animals having low production.
2. Animals having anatomical defects.
3. Animals having breeding problems like infertility / sterility.
4. Animals having stunted growth.
5. Animals having contagious disease.
6. Animals having frequent abortions.
7. Old /senile animals.
8. Animals not exhibiting true breed characters.
9. Animals having short lactation length and longer dry and intercalving periods.
10. Hard milkers.

**Remember**

Culling helps to maintain purebred herds and prevents economic losses in terms of production and feed consumption.

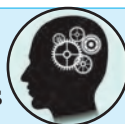


**1.13. Hoof trimming**

- Hoof trimming is the process of cutting and shaping the over grown hooves with the help of hoof knife or hoof trimmer.

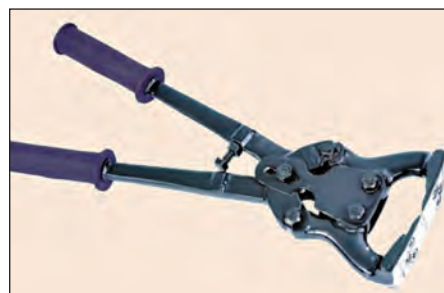
**Remember**

Hooves of stall fed animals should be trimmed once in two months while, animals allowed for grazing be trimmed once in four months.

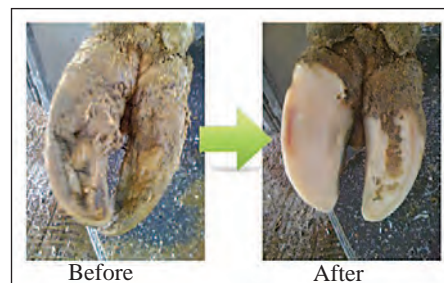


**Technique**

1. Animal is casted and legs are secured tightly.
2. The foot is then rested on solid board.
3. Hoof is then trimmed / cut to its original shape and size by using hoof knife.
4. Rasper is then used to level the bottom of hoof.
5. Lastly turpentine oil is applied for conditioning and disinfection.
6. Over cutting should be avoided as it may lead to injury and lameness.



**Fig. 1.32 : Hoof trimmer**



**Fig. 1.33 : Hoof trimming**

**Do you know ?**

Hoof trimming prevents uneven, overgrowth of hooves, thereby helping in comfortable walk and reduces the possibility of lameness and foot rot.



**1.14 Ringing the bulls**

- Ringing is the process of putting nose-ring to bull.
- Bull nose-ring is usually made from a non-rusting metal like aluminum or copper.
- Nose ring comprises of two semicircular pieces joined together by hinges.

**Technique**

1. Bull is first casted and legs are secured.
2. Nose holder is then used to stretch nose.
3. Then nasal septum is punctured by using nose punch or trocar sterilized with tincture iodine.

4. Nose-ring is introduced through puncture / hole and locked by screw.



**Fig. 1.34 : Ringing of bulls**

#### Advantages

1. It is very useful for control of breeding bull.
2. It keeps the head of bull extended and raised while restraining.
3. Leading rope or pole can be attached to nose ring.

#### 1.15 Vaccination

Vaccine is a suspension of attenuated or partially killed organism such as bacteria, viruses, which is administered to individual for prevention against an infectious disease.

#### Do you know ?



Vaccination is a word derived from Latin language "vacca" which means cow. The cowpox material used for injections was then called vaccine and the process of injecting it into animal is called vaccination.

#### Principle of Vaccination

The principle behind vaccination is the introduction of pathogenic material in part or complete whose pathogenicity has been reduced by some mechanism, into a healthy animal so that body can form enough defense molecules (antibodies, defense cells, cytokines etc.) to counter the attack of the same pathogen. When body is exposed to small amount of foreign materials (pathogens) body's immunity is activated. Activated immunity lasts longer in the body which is capable of killing the pathogen.



**Fig. 1.35 : Vaccination of cattle**

**Table 1.6 : Vaccination schedule for cattle and buffaloes**

Sr. No.	Disease	Primary vaccination	Regular vaccination
1.	Foot and mouth disease	3 months onwards	Twice in a year i.e. September and March
2.	Anthrax	6 months onwards	Every year before monsoon in endemic area
3.	Haemorrhagic septicaemia	6 months onwards	Every year before monsoon
4.	Black quarter	6 months onwards	Every year before monsoon
5.	Brucellosis	Only once at 4-8 months of age in female calves in problem herds	Every year in January.
6.	Theileriosis	3 months and above	Every year in endemic area

## 1.16 Deworming

- Deworming is the process of removal of endoparasites such as roundworms, tapeworms and liver flukes.
- Anthelmintic are used for deworming purpose.



**Fig. 1.36 : Deworming in animal**

### Signs of worm infested animal

1. Diarrhoea
2. Loss of weight
3. Soil licking and eating pieces of cloth
4. Delay in puberty
5. Weakness and slow growth
6. Decrease in milk production
7. Death at an early age
8. Thin and rough skin

### Advantages

1. An increase in milk production of the animal.
2. Regular de-worming of calves, increases their daily growth rate.
3. Regular de-worming keeps the animal healthy.

**Table 1.7 : Deworming schedule for cattle and buffaloes**

Sr. No.	Type of worm	Schedule
1	Round worms	First dose at three days of age and thereafter at monthly interval up to 6 months of age
		Thrice a year in animals above 6 months of age
		From 1 year onwards, once in 4 months i.e. June, October and March
2	Tapeworms	Twice a year i.e. January and June in calves in problematic herds
3	Liver flukes	Twice a year i.e. May and October in disease prone area

## 1.17 Spraying and dipping

### a. Spraying

1. Spraying of insecticide controls all sorts of ectoparasites like ticks, lice, flies and thereby keeps animal healthy.
2. Spraying of insecticide should be done in cattle shed and on animal body at monthly intervals.
3. Insecticides like amitraz and deltamethrin are commonly used for animal spray.
4. All insecticides are toxic to animals hence should be used carefully.



**Fig. 1.37 : Spraying of animal**

### b. Dipping

- Dipping is the process of offering a bath with a mild parasitocidal drug / chemical in a specially prepared tank.

### Do you know ?

Dipping controls the ectoparasitic infestation viz. lice, ticks, flies, mites etc.



## Method

1. It is specially used for sheep however goat, cattle and buffalo may also be dipped.
2. The size and structure of dipping tank depends on type of animal.
3. The usual dimensions of dipping tank are depth 1.5 m, width 1.0 m, length at top 2.5 m and length at bottom 1.5 m.
4. The tank is usually made up of cement concrete, however tank made from wood or galvanized sheet are not common.
5. The various chemicals used for dipping are Lindane (0.03% for young stock and 0.05% for adults) Sumithion (0.05%) and Nicotine (0.1%).
6. The animal is allowed to pass through the dipping tank containing solution of desired concentration.
7. It is expected that animal should be in dip for at least 2 minutes for better results.



**Fig. 1.38 : Dipping of animals**

## Precautions to be taken while dipping

1. Animals should be given sufficient drinking water before dipping.
2. Dipping to pregnant animals should possibly be avoided.
3. Sufficient rest should be given before dipping.
4. Animals with injuries or open wounds should not be given dipping.
5. Dipping should not be done immediately after shearing.
6. Dip should be provided for a specific period of time.

## 1.18 Record keeping

Record keeping is an important daily farm activity helpful for the evaluation of individual performance of cow and economic assessment of dairy farm as a whole. Keeping records is a key operation on dairy farms. Systematic arrangement of information of various events at the farm is known as recording. Application of computer has very crucial role in dairy record management. It is usually done by using prescribed forms and with the help of computer programme.

### Advantages

1. Records provides basis for evaluation of animals for fixing proper prices of animal meant for purchase and sale.
2. It helps in systematic breeding programme for improvement of herd, in progeny testing of bulls
3. It helps in preparing pedigree and history record of animals.
4. It helps in detection of abnormal condition of animals leading to loss in body weight.
5. It helps in determining cost of milk production.
6. It is helpful in comparing the efficiency of labour and herd with other farms.
7. It helps to assess the present status of business.
8. The low producing animals can be identified.
9. It becomes easy to select the animals for culling.
10. Profitability or loss of business can be judged at any time of the year.

### Types of registers

1. Livestock register (History sheet)
2. Daily heard register
3. Calf register
4. Growth record register (young stock)
5. Feed and fodder register
6. Cattle breeding register
7. History and pedigree register
8. Calving register

9. Milk yield register
10. Herd health register
11. Mortality register

### Remember

Records should be accurate, up to date, less expensive, easy to handle and maintain.



### 1. Livestock register

Sr. No.	Tattoo No.	Date of purchase	Date of birth	Value (Rs)	Approximate age when purchased	Pedigree		How disposed off	Page of herd register	Remarks
						Dam	Sire			

### 2. Daily herd register

Date	Cow		Bulls	Calves		Heifers	Bullocks	Total Livestock		Milk yield (kg)	Addition during day from where	Deduction during day	
	Milch	Dry		Male	Female			AM	PM			No.	How

### 3. Calf register

Sr. No.	Date of birth	Tattoo No.	Sex	Breed	Sire No.	Dam No.	Birth weight (kg)	Disposed		Remarks
								How	Date	

### 4. Growth record register (young stock)

Tattoo No.	Date of birth	Birth weight (kg)	Weight at weeks (kg)					Weight at month (kg)				Weight at first service (kg)	Weight at first calving (kg)	Remarks	
			1	2	3	4	5	12	4	5	6				24

### 5. Feed and fodder register (month)

Date	No. of Animals	Green (kg)			Dry (kg)			Concentrate (kg)			
		Received	Issued	Balance	Received	Issued	Balance	Received	Issued	Balance	

### 6. Cattle breeding register

Sr. No.	Cow No.	Date of last calving	Date of service	Time of service	Bull No.	Date of Pregnancy Diagnosis	Expected date of calving	Date of calving	Weight of the calf (kg)	Sex of the calf	Tattoo No. of calf	Remarks

## 7. History and pedigree sheet

Identification of animal	Date of birth / date of purchase	Sire No.	Dam No.	Dam's Milk yield (kg)	Dam's Lactation length (days)	Dam's Dry days	Paternal Grand Dam No. FLY & LL	Maternal Grand Sire No. FLY & LL	Maternal Grand Dam No. FLY & LL

## 8. Calving register

Cow No.	Due date of calving	Date of calving	Sire No.	Calf No.	Calf sex	Birth weight (kg)	Breed	Remarks

## 9. Milk yield register

Sr. No.	Cow No.	Milk yield (kg), Date of month										Total		
		1		2		3		.....		31		Milk (kg)		
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	

## 10. Herd health register

Animal No.	Admission Date	Symptoms	Diagnosis	Treatment details	Date of discharge	Treat. Cost	Remarks

## 11. Mortality register

Animal No.	Breed	Sex	Date of illness	Diagnosis	Date of death	Cause of death	Post mortem report no.	Book value	Remarks

### Important applications of farm record analysis

1. In making decision about culling of animals.
2. In reducing feed cost.
3. In proper utilization of land and labour.
4. Comparing performance with standard values.
5. Proper breeding of herd.
6. Proper claiming from insurance companies.
7. Adjusting profitability and productivity

### Livestock (Herd) management software

The livestock management software is a framework that helps the farmers to maintain and track the records of their livestock from born to till the time they are disposed.

The various herd management software's are now available in the market that includes milk recording, breeding, lactation reports, vaccination, breeding notifications, calf rearing program, income and expense reports, weight changes, etc.

eg. Herdman, Dairy Live!, Milk Manager, Farm 365, Herd intelligence,



**Fig. 1.39: Herd management software**

## Advantages of herd management software

1. It is easy to enter day to day data in an organized livestock farm.
2. It is easy to handle data with the help of the software.
3. It help to store data securely.
4. It automatically generates information.
5. It generate production efficiency as an when required.
6. It allows to compare two individual or group of animal etc.
7. It remind about the scheduled activities.
8. It help to generate quick and easy need based daily, monthly and annual reports of the herd.
9. It is easy to transmit data and report for expert evaluation

### Internet my friend

Search different open source livestock management softwares available in the market



## 1.19 Carcass disposal

The died animals or carcasses and parts that unfit for use as food should be disposed off within 48-72 hours and the premises should be cleaned promptly. Improper disposal of carcass increases the spread of zoonotic disease also contaminate surface and ground water. Therefore, it is necessary to dispose carcass of dead and slaughtered animals as soon as possible.

### Methods of carcass disposal

- |                |               |
|----------------|---------------|
| 1. Burial      | 2. Composting |
| 3 Incineration | 4. Rendering  |

#### 1. Burial

- Burial is a common method of carcass disposal to manage mortalities, but it poses a groundwater contamination risk if the burial site is not selected and managed properly. Therefore, selection and maintenance of a burial site is very important.
- For example, areas with sandy or gravelly soil and a shallow groundwater table must not be used as burial sites.

- The bottom of the disposal trench must be 4 feet above any permanent water table, and the trench must be a minimum horizontal distance of 200 feet from the nearest surface water.



Fig. 1.40 : Burial method of carcass disposal

## 2. Composting

- Composting is a carcass disposal method that involves the placement of carcasses beneath organic materials in compost pits that are long, narrow windrows or trapezoidal shaped and above ground which promotes decomposition at elevated temperatures and destroys pathogens present in the carcasses.
- In this process, bacteria break down the carcass, leaving only feathers and bones.
- Composting has gained popularity in areas where burial and incineration are not practical or have become restricted.
- Proper composting techniques destroys most disease-causing bacteria and viruses.
- Composting is safe and produces fairly odorless, spongy, and valuable soil supplement as an end product.

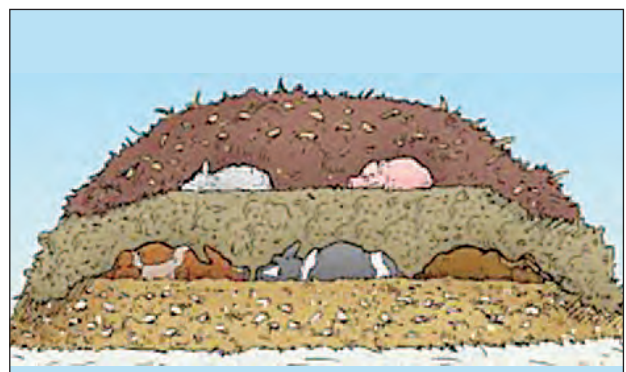
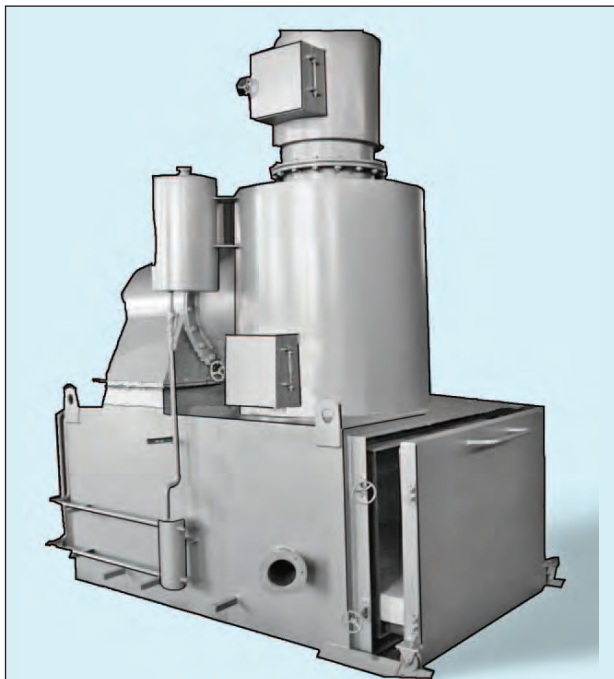


Fig. 1.41 : Livestock composting

### 3. Incineration

- Incineration is the thermal destruction of carcasses by auxiliary fuel such as propane, diesel or natural gas.
- Modern incinerators reduce carcasses to ash and are biosecure. However, incineration requires more energy as compared to other disposal methods hence, it is not considered as a viable economic disposal option due to cost and labor.
- Incineration is a preferred method for managing small carcasses e.g. poultry



**Fig. 1.42 : Incinerator for livestock**

### 4. Rendering

- Rendering is the process of converting animal carcasses to pathogen-free, useful byproducts such as meat, feather, bone, and blood meal that can be used in animal feeds as a protein.
- In this process, the carcasses are exposed to high temperatures (about 130 °C or 265 °F) using pressurized steam to ensure destruction of most pathogens.

- It is an environmentally safe method for disposal of dead livestock. However, rendering poses biosecurity concerns due to the transportation of dead animals to multiple locations by road to the rendering plant.



**Fig. 1.43 : Rendering plant**

#### Internet my friend

Search the other options for disposal of dead animals on farm and carcasses from slaughter house.



**Q.1 Fill in the blanks**

1. Ear notching is permanent method of marking in .....species.
2. The temporary method of marking the animals is .....
3. .... is the most advanced method for identification and record the data of animals.
4. The mechanical dehorning is performed at.....years of age.
5. The old and crude method of castration is .....
6. ....chemical is used for chemical dehorning.
7. Milking machine is operated at 10-15 vaccum with pulsation rate of .....per minute for successful milking.
8. ....method of drying off is suitable for high yielding cow in pregnant condition.
9. ....stimulates the blood, lymph circulation of skin and improves appearance of animal.
10. ....reduces the possibility of lameness and foot rot.

**Q.2 Make the pairs**

**Group A**

**Group B**

- |                  |                                       |
|------------------|---------------------------------------|
| 1. Ear notching  | a. Puncturing desire letter or number |
| 2. Tagging       | b. U or V shape cut/notches           |
| 3. Branding      | c. Self-piercing and non-piercing     |
| 4. Disbudding    | d. Removing horn bud                  |
| 5. Ear tattooing | e. Hot Iron, Chemical or coolant      |
|                  | f. Dehorning                          |

**Q.3 State true or false**

1. Dehorning is the removal of horn after it has attached to skull
2. Incisors are commonly used for estimation age
3. Casting of an animal means removing or dysfunctioning of essential reproductive organs in males.
4. Burdizzo castrator is used for bloodless castration.
5. Vasectomized bulls are fertile.
6. Knuckling is the best method of milking in dairy animals.
7. Ringing is the process of putting nose ring to the bull.

**Q.4 Answer in brief**

1. Define tattooing.
2. State types of tagging.
3. What is mean by disbudding?
4. What is mean by vasectomization?
5. Name the close and bloodless method of castration.
6. What is grooming?
7. Which method of milking is modification of full hand milking?
8. What is ringing of bulls?
9. Give the appropriate age of calf for first dose of dewormer?
10. Define dipping.
11. What precautions should be taken while dipping the small animals?
12. Hoof trimming increases productive life of cow, Justify?

**Q.5 Answer the following questions**

1. Write the importance of record keeping in livestock farm.
2. Differentiate between hand milking and machine milking.

3. Give the advantages and disadvantages of machine milking.
4. Enlist different methods of identification of animals and explain any one of them.
5. Enlist the criteria for culling of animals.
6. What do you mean by the term vaccination?
7. What is drying off? Write in details about drying off methods.
8. Explain the chemical methods of dehorning with advantages and disadvantages.
9. Give deworming schedule for cattle and buffalo.
10. Write the advantages of herd management software.

11. What are the common types of hand milking in dairy cows?

#### **Q.6 Answer in detail**

1. What are the methods of determining the age of animals? Give merits and demerits of each.
2. What are the methods of dead animal disposal? Explain any one.
3. Enlist the different name of the records maintained at a dairy farm with its objectives.
4. What do you mean by castration and write the different methods of castration?
5. What are the principles of milking in dairy animals?
6. Explain in detail the RFID technology used for cattle identification.

