UNIT 5 ANIMAL HUSBANDRY PRACTICES AND HEALTH CARE

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5.0 OBJECTIVES

After reading this unit, we shall be able to:

- describe the management and feeding practices of dairy calves, heifers, milking and dry cows and buffaloes.
- explain the estrus cycle, symptoms of heat, methods of heat detection and artificial insemination in dairy animals.
- outline the common diseases of dairy animals and measures for their prevention and control.

5.1 INTRODUCTION

The animal husbandry or the rearing of animals for their economic utilization is as old as human civilization. The Neolithic (New Stone Age) man first domesticated the various present-day animal species and started practicing animal husbandry. Under domestication, the animals are dependent on humans for their sustenance and performance. They need to be provided with appropriate levels of feeding, suitable housing, breeding, timely healthcare and management so as to obtain desired productivity.

The cattle and buffaloes are the two major milk producing species in India. The cattle initially domesticated primarily as draft animal and later on some of the cattle breeds were developed as milch animals through selection. The buffalo, though domesticated much later, is the most important milk producing species in India.

Together they contribute more than 95 per cent of 91.1 million tonnes of milk currently produced in India. Therefore, their feeding, housing, healthcare and routine management based on scientific recommended practices is essential for obtaining higher profit from dairy farming. The care and management of a dairy farm starts with the birth of a healthy calf. The healthy female calves born have to be fed and cared well to grow at a faster rate and become a producing cow or buffalo at an early age. Once in production, the dairy animals are managed for breeding regularly and to produce milk at higher level so that their rearing becomes profitable to the dairy farmer.

5.2 MANAGEMENT OF DOWN CALVERS AND CALF RAISING

The dairy farming starts with the birth of a healthy and vigorous calf. The care of calf starts in the womb of cow itself. The cows during last 6-8 weeks of pregnancy, called "down calvers" become slow and gentle separating themselves from the general herd and avoid fights so as to guard against any injury to the fetus inside the womb. Therefore, the advanced pregnant cows especially during the last 15 days of pregnancy need special care and attention of the dairyman.

i. Care and Management of Down Calver Cows and Buffaloes

a) **Shifting the cows and buffaloes to the calving pens:** The advance pregnant cows should be separated from the general herd and should be shifted to individual calving pens (maternity pens) about 1 to 2 weeks before the expected date of calving. The keeping of down calver cows and buffaloes individually in calving pens provide the pregnant cows with better climatic protection and the disturbance from other cows is avoided. The cows in these pens are given individual attention and kept under the watch round the clock. These pens can be disinfected which prevent chances of infection gaining entry at the time of calving. Chances of contamination of the general herd by infected cows and healthy cows contacting diseases of genital tract are minimized.

   Small farmers who have only one or two animals must tie the cow in advanced pregnancy separately in a clean area where it will not be disturbed. Good straw bedding should be provided. In farms where abortions and calf diseases are common, the calving pen should be sterilized regularly. The floor and walls should be scraped and scrubbed with 4 per cent washing soda in hot water and disinfected before the cows are brought in. Once in the calving pen, the cows should be provided a good quality laxative feed and ample amount of clean drinking water.

b) **Care at calving:** The cow should be kept under constant watch for the signs of parturition like swelling of the udder, swelling of the vulva and drooping away ligaments around the tail head. At the first sign of calving, the first two fore feet followed by the muzzle will appear after the water bag has burst. Birth usually takes place 2 to 4 hours. If the labour prolongs for more than four hours, abnormal presentation may be suspected and veterinary aid may be called for immediately.

   After parturition wash the udder and hindquarters with lukewarm water containing an antiseptic and dry with a clean cloth. Watch for the expulsion of afterbirth (placenta). It will be expelled within 2 to 4 hours after the calving. If it is not expelled within 8 to 12 hours, help of a veterinarian may be sought.

ii. Care and Management of Calf at Birth

a) **Attending to the newly born calf:** Immediately after the birth of the calf, all phlegm (mucus) sticking in the nostrils, mouth and on the body should be removed and the calf should be wiped dry with a clean cloth. Normally the calf starts respiration immediately after birth on its own. However, sometimes the

respiratory tract of the calf may be blocked by mucus and the calf may not start breathing. Under this situation, hold the calf head down by lifting it holding the back. The mucus may flow off and the calf may start breathing. The new born calf should be protected from inclement weather conditions especially during winter months and be provided with plenty of dry bedding like straw.

b) **Disinfecting the navel cord:** The navel of the calf should be painted with antiseptics like tincture of iodine soon after birth to prevent infection gaining entry through the navel. If the umbilical cord is not broken, a ligature may be put 2-3 cm away from the body with a sterile thread and cut 1 cm distal to the ligature with a clean sterile scissors. A small amount of antiseptic lotion may be painted at the cut end and protected from flies.

c) **Colostrum feeding:** The calf should be fed with colostrum (first milk of cow after calving) for the first 3 to 4 days of its birth. The feeding of colostrum is very essential as the antibodies present in colostrum provide passive immunity to the calf against many diseases. It should be fed within half to one hour after birth of the calf at the rate of 1/10 of its body weight per day. In conditions where there are no facilities to weigh the calf, a quantity of 2.5-3.0 kg colostrum per day per calf may be offered. So as to reduce the feeding and labour costs, the calves of crossbred cows may be weaned at birth and maintained in an individual pen for the first few weeks. In case weaning is not practiced, the calves should be allowed to suckle for 5 minutes 4-5 times a day.

iii. Management and Feeding Practices for Growing Calves

The husbandry practices and feeding of the calves born at the farm are aimed at attaining a higher rate of growth with a lower morbidity and mortality.

a) **Management practices:** The new-born calves should be provided with individual housing for 4-6 weeks after birth for better protection and care. These houses should have the provision for warming in winter season and cooling in summer season along with the provision of a good bedding on the floors. Later on they may be kept in small groups. The new born calves are given an identification number during the first 3-4 days generally by tattooing the number in the left ear or by tagging. At large farms, dehorning of crossbred calves may be done by removing the horn buds with an electric dehorner within 1 to 2 weeks of birth. Any extra teats present on the udder of female calves called “supernumerary teats” are removed within first 1 to 2 months after birth.

b) **Feeding of growing calves:** The feeding of weaned calves after initial colostrum period shall be as per the following feeding schedule: (Table 5.1)

Table 5.1: Feeding schedule for calves

Age	Whole milk	Skim milk	Concentrate mixture (kg)	Green fodder
5-30 days	1/10th b.wt*.	—	—	—
1-2 month	1/15th b.wt.	1/25th b.wt.	0.120	*ad libitum*
2-3 months	1/25th b.wt.	1/15th b.wt.	0.250	-do-
3-4 month	—	6.5 kg	0.650	-do-
4-5 month	—	6.5 kg	1.000	-do-
5-6 month	—	5.0 kg	1.500	-do-

* body weight

From 6 months onwards, the calves may be offered a good quality green fodder free choice along with the supplementation of 1.0 to 1.5 kg of concentrate mixture per calf daily. The deworming of the growing calves is to be done regularly. The following calf deworming schedule may be followed at the dairy farm (Table 5.2).

Table 5.2: Deworming Schedule for Calves

Age of calf (day)	Name of medicine	Dosage
3rd	Piperazine adipate	1 gm/4 kg Body weight
7th	-do-	-do-
8th	Sulmet course for 3 days	1st day — 30 ml
		2nd day — 15 ml
		3rd day — 15 ml

Later on whenever infection of endoparasites is suspected broad spectrum anthehelmintic drugs like albendazole, fenbendazole or thiobendazole should be used at the rate of 5-10 mg/ kg body weight depending on the severity of infection. The growing calves may also need to be protected from ectoparasites click, tick by periodically spraying of animals and calf houses.

Check Your Progress 1

1) Why the down calvers should be housed separately?

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2) What care and management should be provided to the down calvers in the calving pen?

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3) List the practices for care and feeding of a new born calf.

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4) Give the feeding schedule of weaned calves.

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5.3 HEIFER MANAGEMENT AND FEEDING PRACTICES

Heifer is a female animal of cattle and buffaloes from one year of age up to first calving. Thus, heifers are future cows of the herd. On most dairy farms, 20-25

per cent of the cows are replaced every year with freshly calved heifers. Therefore, proper nutrition and management of heifers are necessary to provide adequate number of healthy and genetically superior herd replacements. Under Indian conditions the goal of dairy farmer should be raise well grown heifers that calve at an average age of about 30 months in case of crossbred cows, 36 months in indigenous cows and about 40 months in case of buffaloes.

The nutrition during this period shall mainly comprise *ad libidum*. feeding of good quality green fodders supplemented with some amount of concentrate mixture so as to obtain a daily growth rate of 500-550 gm in crossbred heifers and 450-500 gm in heifers of indigenous cattle breeds and buffaloes. The heifers may be fed mostly on roughages and allowed to remain lean until pregnancy. During the last half of pregnancy, they can be fed at a higher plane of nutrition to achieve rapid growth which could cause maximum development of ducts and alveoli in the heifer's udder.

The loose system of housing for heifers is generally followed through out the country except in heavy rainfall and coastal areas. For better growth, the heifers need to be protected from summer stress especially under North Indian conditions. Water sprinkling or splashing during hotter parts of the day twice or thrice daily, provision of ceiling fans in the sheds, provision of mist cooling devices and wallowing especially in buffalo heifers are some of the practices to be followed for the protection of heifers from heat stress. For protection from cold stress in winters, the heifers are offered a well balanced nutritious diet. In severe cold weather conditions, the allowance of concentrate mixture may be increased by 0.5 to 1.0 kg per heifer daily so that their growth is not adversely affected. Provision of adequate bedding is essential during winter.

Heifers having stunted growth, late maturing, anatomical defects or bad disposition should be regularly culled from the herd. They need to be protected against ectoparasites such as ticks, lice, etc. by spraying with insecticides like 1 % malathion at monthly intervals. The floors, walls and roofs of the heifer sheds should also be sprayed to make them free from these ectoparasites. The heifers at the age of puberty should be observed for signs of heat every day and should be inseminated with the semen of superior bulls. Attainment of 60 per cent of mature body weight (about 300 kg) is the stage at which the heifers should be bred. The advance pregnant heifers should be trained for milking by taking them to the milking parlour along with the milking cows and allowed to go through the milking routine. This will give them an opportunity to get adapted to the milking routine. Such heifers will not get excited and thus will not give any difficulty in milking after calving.

5.4 BREEDING MANAGEMENT OF DAIRY ANIMALS

After milk production, reproduction is the most economically important trait in dairy animals. Therefore, the maintenance of high fertility rate is basic to the success of any dairy farming enterprise. The practices adopted for the breeding management of dairy cows and buffaloes should aim at bringing about higher breeding efficiency. The breeding efficiency is the measure of the capacity of an adult cow or buffalo to reproduce. It can be measured in terms of number of services taken by a cow or buffalo per conception, length of calving interval, percentage of non-returns and percentage of pregnancies in a breedable period.

i. Sexual Maturity and onset of Estrus Cycle

a) **Puberty and sexual maturity:** The stage of life in which animals become sexually mature and the secondary sexual characteristics first become clearly visible is known as "puberty." In cow and buffalo heifers, this is the stage of first estrus (heat), and in the bull calf it is the stage when it starts giving semen with viable sperms. The term "sexual maturity" means that the heifers are

capable of reproduction. At this stage, reproductive organs undergo a marked increase in size.

Puberty occurs before mature body size is attained. Under good feeding, a calf attains puberty approximately at 66 per cent of adult body size. Breed, genotype, climate and level of feeding influence the age at puberty. The time of onset of puberty appears to be a function more of body size than of age. The sudden increase in size and weight of reproductive tract associated with puberty involves hormonal action.

b) **Estrus cycle:** Every 21±3days from the time of puberty, the cow prepares for a pregnancy. A mature ovum is liberated from the ovary, the cervix becomes receptive to the spermatozoa, the female exhibits behavioural adjustment and attraction to receive the male in copulation, the uterus and fallopian tubes produce the secretions which are conducive to the transport of ovum and sperms and the endometrial lining of the uterus prepares to receive and nourish a fertilized ovum. The events listed above in sum total are known as "estrus cycle."

The estrus cycle has two major phases *viz.* estrogenic phase and progestational phase. The estrogenic phase or the period of follicle includes the proestrus and estrus and lasts for about 4 days of the cycle. The progestational phase or the luteal phase includes the metestrus and the diestrus and lasts for about 17 days.

ii. Symptoms of Heat and Heat Detection

The estrus or the heat is the period in which the animal exhibits sexual desire. The length of estrus period is between 8 to 24 hours in cows with an average of 18 hours. In buffaloes, the estrus period varies between 5 to 27 hours with an average of 20 hours. During summer the buffaloes have very short estrus period.

a) **Symptoms of Heat:** The cows in early stages of heat will show activities like smelling other cows, attempting to mount other cows and bellowing. They will be restless and their vulva will be moist, red and slightly swollen. After a time lapse of 6 to 8 hours, the heat will become more pronounced. The cow will stand to be mounted by other cows or bulls. Due to this, this period is termed as 'standing heat'. This extends for 14 to 16 hours and shows other symptoms like bellowing, nervousness, anorexia, reduction in milk yield, clear mucus discharge and dilated pupil of eye.

b) **Detection of Cows in Heat:** The heat detection work may be carried out twice daily, once early in the morning and once in the evening. Disturbances like noise, visitors or other activities on the farm may be avoided at the time of detecting heat. Use of heat detection chart and breeding history of the cow should always be made while detecting heat. Parading of a teaser (vasectomized) bull amongst the cows in early morning and evening hours by a skilled person will greatly enhance the heat detection rate. Also keenly observing the expected cows and buffaloes while milking and while leaving the milking barn can improve heat detection rate. The other aids suggested to improve heat detection include the use of chin ball markers, heat mount detectors and pedometers.

iii. Artificial Insemination (AI) and Time of Breeding

a) **Artifical Insemination:** AI is the technique in which semen with living sperms is collected from the male animals and introduced into the female genital tract at proper time by mechanical means. The semen is collected from the bulls commonly by the artificial vagina technique. Then it is examined to judge its suitability for insemination by physical, microscopic, chemical and bacteriological tests. The good quality semen is extended further with an appropriate diluent to increase its utility in fertilizing more females. The freshly diluted liquid semen is then used for inseminating the cows and buffaloes in heat or preserved in frozen state for future use.

Advantages of AI: The AI technique offers many advantages over natural mating. It enables an individual bull to sire a large number of progeny. This reduces the number of bulls required for breeding purpose. The services of superior bulls are greatly extended allowing for the genetic evaluation of bulls through progeny testing. It is a major aid in crossbreeding work and in preventing the spread of genital diseases. Due to economic reasons, small farmers may not be in a position to maintain a bull. They can avail AI services at nominal cost.

b) **Time of breeding:** The time of breeding cows naturally or by AI is very important as it greatly influences the conception rate. The best time to breed cattle is from the middle of standing heat and six hours following that. Three or four hours perceeding or succeeding this excellent period also gives good results. As a routine practice, if a cow is seen showing early heat in the morning, it may be inseminated in the evening. If heat signs are first manifested in the evening, the cow may be bred next day morning. A cow is expected to show heat in 30-40 days after calving. Cows that fail to show heat even after 50 days have generally some problems and need examination.

Check Your Progress 2

1) What do you understand by estrus cycle?

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2) What are the symptoms of heat in cows and buffaloes?

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3) Describe artificial insemination (AI). Also give its advantages.

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5.5 MANAGEMENT AND FEEDING PRACTICES FOR MILKING COWS & BUFFALOES

The freshly calved cows should be shifted to the milking herd after 4-5 days of colostrum period. The management and feeding during the lactation is of paramount importance as the level of production and profitability from dairy farming depends largely on the amount of care and judicious feeding provided during this period.

a) **Housing:** The milking cows should preferably be housed in loose houses having a covered area of 3.5-4.0 sq. m. and an open area of 7-8 sq. m. per cow. The floors of these loose houses should be non-slippery and a good dry bedding material should be provided especially in rainy and winter seasons. All the milking cows should be divided into 2-3 groups depending on their level of production as high, medium and low producers. When housed in groups, the number of cows in each paddock should not be more than 50. Frequent shifting of the animals between different groups should be avoided.

The loose housed milking cows and buffaloes need to be protected against the

summer heat stress especially in Northern Indian conditions by suitable means. Water splashing / sprinkling on the animals body for 5-10 minutes twice or thrice daily during the hotter parts of the day, provision of ceiling fans in cow sheds or installation of mist cooling devices specially for crossbred cows and wallowing of buffaloes twice daily for a period of about 1 hour are some of such means. During winter the cows need to be protected against direct cold drafts especially during nights.

b) **Feeding:** The feed and fodder requirements of dairy cows and buffaloes are calculated based on their dry matter (DM) content. The dry matter requirement of milking dairy animals varies between 2.5 to 3.5 per cent of their body weights depending on the level of milk production. Two-thirds of the total requirement of DM of the milking animal should be met through a mixture of cereal and leguminous green fodders and dry roughages. The remaining one-third of DM should be fed through concentrate mixture. As a thumb rule the producing cows should be fed concentrate mixture at the rate of 1 kg for every 2.5 kg of milk produced and buffaloes at the rate of 1 kg for every 2 kg of milk produced over and above the maintenance requirement of the animal.

c) **Milking:** The milking of the dairy animals should be done at the same time daily as per the routine. The buffaloes and low producing cows are milked twice daily and high producing crossbred cows thrice daily maintaining a constant interval between each milking. For better milk production, the milking should be done gently, quietly, quickly and completely. For clean milk production, the milking should be done at a clean place or in a separate milking parlour. Before milking, the cow or buffalo should be washed with water and the udder and teats should be wiped dry with a clean cloth. The milker should also wash his hands and milk the cow after proper let down of milk in clean dry narrow mouthed milking bucket. Milking should be completed within 5.7 minutes.

   All milking animals should be observed for signs of heat from 45 days after calving and should be bred by 60 days of calving. Cows not coming into heat after 60 days of calving should be examined for any reproductive problems.

5.6 MANAGEMENT AND FEEDING PRACTICES FOR DRY COWS AND BUFFALOES

The day from which the cow stops giving milk to the day it calves is called as dry period. A normal dry cow does not give milk but it should be in advance pregnancy. The importance of dry period is to give rest to the cow's udder. It also gives an opportunity to the cow to recuperate its body condition lost during the lactation. Allowing dairy cows a dry period thus results in higher milk production in the succeeding lactation.

An ideal length of dry period is about 60 days. However, in Zebu cattle and buffaloes it is much higher. These animals do not normally need to be dried as they are low milk producers and have shorter lactations which end on their own accord. The high producing crossbred cows and purebred exotic cows need to be dried by using a suitable method.

a) **Methods of drying-off cows:** There are three methods of drying cows viz. abrupt cessation of milking, intermittent milking and incomplete milking. In abrupt cessation method, the milking of cows is stopped all of a sudden. The build up pressure of milk in the udder causes regression of milk secretary cells. This method is suitable for low to medium milk producing cows. In intermittent milking method, the cows are milked once every second or third day till milk production completely ceases. In incomplete milking, the cows are milked gradually, smaller and smaller quantities of milk spread over a week or so. This method is preferred for high yielding cows.

b) **Feeding and management of dry cows:** The feeding of the dry-pregnant cow should be aimed at making up the condition of the cow lost during the lactation. Cows that have been properly fed during the dry period produce up to 25 per cent more milk than the cows which have not been conditioned. Cows which gain about 500 gm of body weight per day during dry period have high milk production in the ensuing lactation. The feeding of cows during dry period should mainly comprise of good quality *ad libitum* green and dry fodders which may be supplemented with 1-2 kg of concentrate mixture per cow per day depending on the condition of the cow.

The dry-pregnant cow should be housed in a separate comfortable paddock at a lesser stocking rate than for the milch or growing stock. About 15 days before the expected date of calving, the pregnant cows should be transferred to maternity pens for better care and feeding.

Check Your Progress 3

1) Briefly describe the housing, feeding and milking management practices of lactating cows and buffaloes.

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2) What is dry period? Describe its importance and list methods of drying off.

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5.7 HEALTHCARE PRACTICES OF DAIRY ANIMALS

Maintaining dairy animals in proper health is essential for obtaining desired productivity and higher profitability from dairy farming enterprise. Animals can be kept healthy if they are purchased from the healthy herd and are quarantined for 45 days before entry into the herd. Further, they are to be kept under proper sanitation, management and feeding and use of appropriate vaccines for the prevention of diseases should be made so that losses from diseases could be minimized.

i. Signs of ill health

The animals that are not in good health, will show several behavioural changes and other symptoms which can be observed by any experienced person. Every farmer should be aware of the common signs of illness of dairy animals so that he/she is able to identify the unhealthy animals at an early stage. Some of such symptoms are described below:

a) The general posture of the animal, its movement and behaviour will change in case of illness. The animals separating from the herd, showing weariness, lack of alertness and keeping head down are likely to be sick.

b) Stoppage of rumination and off-feed are the earliest signs of ill-health. The muzzle and nostrils will be moist and devoid of any discharges in healthy animals. Sunken eyes with fixed staring look, redness in the eyes, paleness or yellow colouration of eye membrane are indicative of disease.

c) The dung in healthy animals is semi-solid in consistency with a dark green colour. Urine of healthy animals is clear and straw coloured. If variation to deep yellow, bloody or coffee colour is noticed it can be a sign of disease.

d) The skin of healthy animals should be soft, elastic and pliable and the hair coat should be glossy and lustrous.

e) Change in quality and quantity of milk produced is an early indicator of disease. Milk yield in dairy cows fall when they are sick. The purulent and creamy discharges from the reproductive tract are indicative of diseased reproductive tract.

f) Change in the normal rectal temperature indicates illness. The average normal rectal temperature of cattle is 101.5 ºF and in buffaloes it ranges from 98.3 ºF in winter to 103 ºF in summer.

g) Variation in the nature and rate of pulse can be indicative of disease. The normal pulse rate varies from 50-60 counts per minute in cattle and 40-50 counts per minute in buffaloes.

h) The rate of respiration and the manner of breathing deviate in disease conditions and ailments of respiratory system. The normal respiration rate varies from 20-25 counts per minute in cattle and 15-20 counts per minute in buffaloes. Incidence of coughing, whistling, crackling and grunting with pain are the signs of diseases of the respiratory system.

ii. Common Diseases and Control Measures Against them

The disease conditions commonly affecting cattle and buffaloes, their causes, modes of transmission, symptoms and the measures for their prevention and control are given in table 5.3.

Table 5.3 Common Diseases and their Control

Name of disease	Cause	Mode of transmission	Principal symptoms	Prevention and control
Foot-and-mouth disease (Muh-khur)	Small filterable virus of 7 types	Contact with infected animals or material contaminated with discharge from lesions	Principal symptoms Salivation, sores on feet, tongue and inside of mouth, stamping of feet, lameness, off-feed, drop in milk production	Seggregation and other sanitary measures, pre-seasonal vaccination with polyvalent vaccine.
Haemorrhagic septicaemia (galghotu)	A bacteria - Pasteurella boviseptica in Cattle and Pasteurella bubalisepta in Buffaloes	Ingestion through contaminated feed, water and pastures, contact with infected animals, organism usually present in the respiratory tract of apparently healthy animals and cause disease when the animal's resistance is lowered.	Sudden attack, high fever, painful, hot swellings on throat, neck and dewlap, swollen tongue and laboured breathing.	Segregation,avoidance of infected pasture, feed and water sources, pre-monsoon vaccination, adequate sanitation.
Black Quarter or Black Leg (sujua)	Bacteria-Clostridium chauvoei	Water and food contaminated with blood and excretions.	Lameness, swellings over shoulders and thighs, high temperature, death in three days.	Annual vaccination before rainy season
Brucellosis	Bacteria - Brucella abortus	Feed, water etc. contaminated by discharge and aborted foetus.	Incidence of abortions during 7th to 9th month of pregnancy, full-time still-births, retained placenta etc. in the herd.	Elimination from herd of carriers, calfhood vaccination at 6 months of age
Anthrax (Gorhi)	Bacteria - Bacillus anthracis	Water and food contaminated with blood and excretions or by wound infection	History of sudden death, high fever, rapid breathing, swelling over body especially around neck.	Annual vaccination before rainy season

Mastitis (Than pakka)	Infectious mastitis is due to the entrance of bacteria into the gland. Non-infectious mastitis is due to improper milking, injury, burns, chilling etc.	Bacteria from dirty floor, milker's hands, cow's body etc. enter into udder through injuries on udder and teats.	Uneasiness in cow when milked, udder swollen, hot and painful in acute cases, milk whey-like with milk clots or even blood clots, temperature of animal rises.	Follow proper dry hand milking, washing or wiping of udder and teats with mild antiseptic before and after milking. Clean barns and sheds, prevent overcrowding in cow sheds
Milk fever (Zichighi-ka bukhar)	A metabolic disorder - due to acute fall in calcium (and magnesium) level possibly due to draining of the same at the onset of lactation through milk.	Occurs generally during the early stages of lactation	Loss of appetite, constipation, general depression, animal lies with its head resting on the chest wall and the nose pointing towards the flank, temperature sub-normal, animal may develop nervousness and die in 6-24 hours if unattended.	Feed mineral supplements to high yielders during late pregnancy and early lactation. To prevent further secretion of milk - stop milking.
Tuberculosis (Kashaya rog)	A bacteria - Mycobacterium tuberculosis	Infection occurs either directly or indirectly from infected animals, their secretions or excretions -bacteria enter system by ingestion or inhalation.	Usually lungs and lymph glands are affected. In cows, the udder becomes infected sometimes There may be loss of weight, swelling of joints, a chronic cough and laboured breathing	Seggregation and other sanitary measures.
Calf scour	Mostly Escherichia coli	Overfeeding, underfeeding, feedeing from dirty pails, feeding milk at temperature below body temperature, housing in unclean pens are predisposing factors.	Severe diarrhoea with light coloured, foul smelling, watery or foamy faeces. Many calves are affected at a time and may die quickly.	Hygienic calf feeding practices, clean calf pens, segregation of infected calves and disinfection of premises
Pneumonia	Many micro-organisms, inhalation of water or medicine drenched by untrained person, exposure to cold drafts	Generally pneumonia occurs when animals are exposed to unfavourable weather conditiond and when their resistance is lowered.	Initially chill followed by high temperature, breathing becomes faster and laboured, dry and painful coughing, watery or mucus like discharge from nostrils.	Avoid sudden exposure to cold or rain. Avoid overcrowding of animals. Keep animals in neat, clean and dry houses.
Bloat (Aphara)	Accumulation of gas / foam in rumen	Greedy feeding on lush green fodders, obstruction in oesoghagus.	Greatly distended abdomen especially on the left side.	Care in feeding green fodders, feeding after wilting, feeding dry fodders with green fodders.
Retention of placenta	As a consequence of abortion, difficult parturition etc.	----	A portion of membrane hangs out from the vulva, chocolate coloured discharge with foul smell, milk yield goes down.	Clean the hind quarters of cow with warm water and take care that the hanging part of the membrane does not get pulled out. Seek veterinary aid.

iii. Vaccination for the Prevention of Diseases.

Vaccination is a procedure for artificially inducing active immunity in animals against specific infectious diseases by introducing biological agents called vaccines into their systems. The vaccine is an antigenic substance from a particular microorganism. A vaccine when introduced into the animal system produces antibodies in the animal against the disease and thus protects the animal from the attack of that disease. A chart showing the programme for vaccination at a dairy farm is presented in Table 5.4. Vaccination is carried out routinely on animal farms so as to prevent the outbreak of diseases in the herd. The vaccination is not done at a locality where the disease has already broken out.

Table 5.4 Vaccination schedule

Name of the disease	Type of vaccine	Time of vaccination	Duration of immunity imparted
Foot and mouth disease	Polyvalent tissue culture vaccine	At about 6 months of age with a booster dose 4 months later. Thereafter, yearly once in the month of September-October	One season
Haemorrhagic Septicaemia	Oil adjuvant vaccine	Once in a year (pre-monsoon)	One season
Black Quarter	Polyvalent vaccine	Once in a year (pre-monsoon)	One season
Tuberculosis	B.C.G. vaccine	At about 6 months of age to be repeated every 2-3 years	One to two years
Brucellosis	Strain - 19	Calfhood vaccination, in case herd is suspected of infection	Life long

Check Your Progress 4

1) Enumerate major signs of ill health in dairy animals.

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2) List the common diseases of dairy animals. Also describe their symptoms and control measures.

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3) What is vaccination? Give a schedule of vaccination to be followed at a dairy farm.

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5.8 LET US SUM UP

The dairy business comprises of performing several practices in a synchronized fashion. These include feeding, breeding, housing, healthcare and day-to-day management of all categories of dairy animals such as calves, heifers, lactating as well as dry cows and buffaloes. The feeding of a balanced ration comprising both fodders and concentrates in required quantities and at proper time shall result in better health and growth performance. Likewise, proper heat detection and insemination of estrus cows at the right time shall result in higher breeding efficiency and better reproductive performance. For better productive performance, the dairy animals are to be kept in sound health by practicing regular deworming and vaccination and attending to the sick animals promptly. Proper care and management of lactating cows and buffaloes and following of a good milking routine shall result in higher milk production which ultimately determines the profitability of dairy farming.

5.9 KEY WORDS

Herd	:	A group of cows or buffaloes.
Umbilical cord	:	A band of tissue connecting the foetus with its placenta.
Placenta	:	An organ that attaches the foetus to the wall of uterus.
Colostrum	:	The first secretion (milk) produced by mammary gland in each lactation.
Alveoli	:	The cells responsible for the secretion of milk in the mammary gland
Weaning	:	Separating the calves from their mothers at their birth or later and rearing them artificially.
Mortality	:	The incidence of death in a population in a given period.
Morbidity	:	The state of being diseased.
Tattooing	:	A method of identifying individual animals by the use of numbered pins and indelible ink.
Breeding	:	The mating (artificial insemination) of animals to produce young ones under controlled circumstances.
Anorexia	:	Complete loss of appetite.
Conception rate	:	The number of animals pregnant as a proportion of the total number mated or inseminated.
Ad libitum	:	Free choice
Zebu cattle	:	The humped cattle breeds of Indian origin.
Skim milk	:	The milk from which fat has been separated.
Genotype	:	The genetic constitution of an individual or group as determined by the particular set of genes it possesses.
Teaser bull	:	A vasectomized bull used for estrus detection.
Purulent	:	Containing pus.

5.10 SOME USEFUL BOOKS

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5.11 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Yours answers should include following point

Check Your Progress 1

1) i. For better climatic protection and avoidance of disturbance from other cows
   ii. For giving them individual attention and keeping under constant watch.
   iii. For preventing the chances of infections to cows and calves at the time of birth.
   iv. For preventing the injury to the new born calves and cows
2) i. Provision of bedding and laxative feed.
   ii. Watching for the signs of approaching parturition
   iii. Assisting the cow in delivery if needed
   iv. Washing the udder and hindquarters and their drying
   v. Watching for the expulsion of placenta
3) i. Care of new born calf: Removal of mucus and drying of calf, ensuring normal respiration, protection against extreme weather conditions, disinfection of the navel
   ii. Feeding of new born calf: Time and amount of colostrum to be fed D duration of colostrums feeding
4) i. The feeding schedule for growing calves including the feeding of whole milk, skim milk, concentrate mixture and fodders.

Check Your Progress 2

1) i. Attainment of puberty D onset of estrus D showing of physiological and behavioural symptoms of heat D shedding of ovum from the ovary D repeating of estrus after about 21 days if case the cow has not conceived D called estrus cycle.
2) i. Cows will be restless, their vulva swollen, red and moist, eyes dilated.
   ii. Bellowing and mounting by cows with mucus discharge from vulva.
   iii. Nervousness with reduced feed intake and milk yield.

3) i. Semen collection from bulls D its quality evaluation D semen dilution insemination with liquid semen '! freezing for future use.

ii. a. Reduces the requirement of bulls

b. Aid to crossbreeding programme of cattle

c. Reduces the spread of diseases

d. Small farmers can avail breeding services at low cost

Check Your Progress 3

1) i. Type of housing D space requirements D grouping of animals D summer and winter protection measures. ii) Dry matter (DM) requirement D DM to be fed through concentrate mixture, green & dry roughages D thumb rule of concentrate feeding. Ii) Regularity of milking D cleanliness of cows, milkers and milking utensils.

2) i. Definition of dry period ii) Giving rest to cow's udder D improving the body condition of cow D higher milk yield in next lactation iii) Abrupt cessation of milking intermittent milking and incomplete milking D suitability of each method.

Check Your Progress 4

1) i. The posture of the animal D condition of the muzzle, nostrils and eyes D consistency and colour of dung and urine D Change in milk production and quality of milk D change in body temperature, pulse rate and respiration rate D loss of appetite.

2) i. Name various diseases of cattle and buffaloes D give their major symptoms and the steps to be taken for their control.

3) i. Introduction of vaccines into the animal body D production of antibodies against the disease D protection of the animal against that disease.

ii. Give the chart showing the vaccination programme to be followed at a dairy farm.