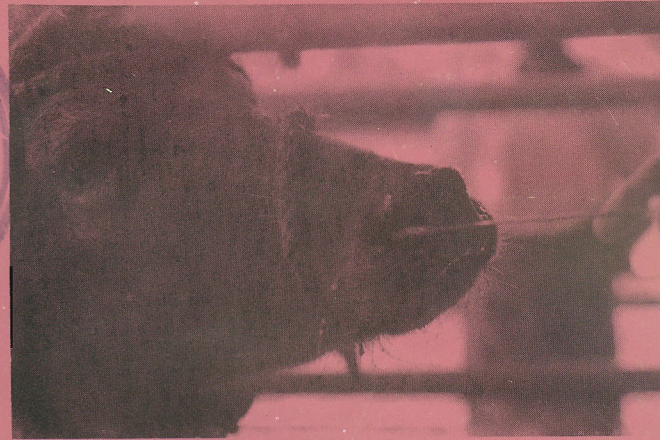
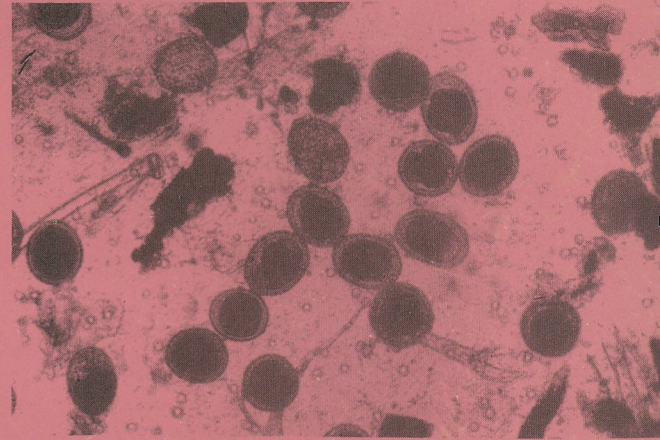


NA-203E



Health and Diseases of Buffaloes and Cattle

A Farmers' Guide for Improving Herd Health and Disease Prevention



NA-203



**SAREC/NARESA Buffalo Research and Development Programme
Peradeniya, Sri Lanka**

Information Leaflet No. 6 (1998)



Why is it important to maintain good health in animals ?

Productivity in buffaloes and cattle depends on a variety of factors such as their genetic potential, management, nutritional status, reproductive efficiency and the health status. Disease conditions adversely effect productivity (and therefore profits) in several ways including the following:

1. Death of the animal
2. Retarded growth
3. Lowered production
4. Lowered reproductive efficiency

Animals generally have an efficient defence mechanism, evolved primarily around the immunal system of the body. This is pictorially depicted in Figure 1. The efficiency of the system, however, depends on the number of factors. When these factors are not operative or present at an optimum level, the animal could no longer defend itself against the disease causing agents. As a result it will succumb to the disease.

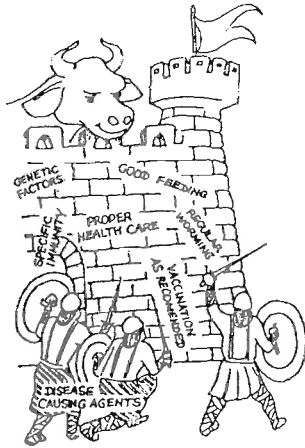


Fig: 01 - Cartoonist's impression of animals defence mechanism.

What are the causes of diseases ?

Diseases are caused by specific agents which may be infectious (e.g. micro-organisms) or non-infectious (e.g. toxic substances), metabolic disorders, or the deficiency or excess of essential nutrients. This leaflet deals with those diseases caused by infectious agents such as parasites, bacteria and viruses.

Common parasitic diseases.

The parasites which cause disease can be broadly categorized as worms (helminths), blood parasites and external parasites (ectoparasites). A list of common parasitic diseases is given below.

- * Round worm infestation
- * Paraphistome infestation
- * Coccidiosis
- * Parasitic diseases of blood (Babesiosis and anaplasmosis)
- * Infestation by ticks, lice etc.

The helminth parasites are found mainly in the gastro-intestinal tract and include the round worms, flat worms and tape worms. Blood parasites invade the red or white cells. The ectoparasites in addition to their direct pathogenic effects, also serve as agents which may transmit other diseases. Though parasites do not cause acute disease conditions (except blood parasites such as Babesia and Anaplasma) the chronic infestations caused by them result in debility and loss of productivity. Most of these conditions could be prevented by simple prophylactic treatment with drugs.

Common bacterial diseases

A variety of bacterial species produce disease in cattle and buffaloes. A list of common bacterial diseases is given in the box below.

- * Haemorrhagic septicaemia
- * Leptospirosis
- * Brucellosis
- * Black quarter
- * Udder infections

Some are specific pathogens such as *Pasteurella multocida* (causing Haemorrhagic septicaemia in buffaloes and cattle) while others such as *Escherichia coli* constitute normal flora which play an opportunistic role and produce disease only when the animal's resistance is low. Some of the diseases caused by bacteria, following an

acute phase of illness could develop into a chronic phase. In certain instances animals suffering from chronic infections may act as a source of infection to other animals. The aim should be to prevent the occurrence of these diseases by vaccination or through improved hygienic practices. Some of the bacterial diseases can be treated effectively. (e.g. with antibiotics)

Common viral diseases

A number of specific viral diseases have also been described in cattle and buffaloes. A list of common viral diseases is given in the box below.

- * Foot and mouth disease
- * Rinderpest
- * Ephemeral fever
- * Infectious keratoconjunctivitis

Compared to most parasitic and bacterial diseases, the common diseases caused by viruses occur as epidemics, resulting in high morbidity and mortality rates. As there are no specific treatment procedures, the best approach is to prevent the occurrence of disease by producing acquired immunity through strategic vaccinations.

How can you help improve the resistance of your animals to disease?

When an animal (host) is exposed to a disease causing agent, the factors that determine whether the animal will get infected or not will depend on the virulence of the agent on the one hand and the ability of the animal to resist infection on the other. Several factors influence the host's resistance, including the following:

1. **Genetic factors:** some animals are genetically more resistant to disease than others. Genetic resistance varies with species, breed and individual animals.
2. **Nutrition:** a well nourished animal has a greater degree of resistance to disease than an ill-nourished animal.

3. **Concurrent disease:** animals weakened by parasites, internal or external, are always more prone to other diseases.
4. **Specific immunity:** this is acquired naturally by exposure to disease, or is induced by vaccination.

Thus the chances of an animal acquiring disease can be minimized by good feeding and proper health care such as regular worming and timely vaccination as recommended.

Short descriptions of a few common diseases which you may encounter are given below

1. Navel ill and Joint ill in young calves

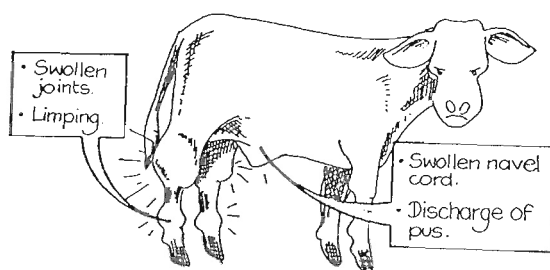


Fig: 02 · Navel and joint ill in young calves.

This is an infection of the navel cord, which could occur immediately following birth, caused by bacteria found in unhygienic calving sheds. This can be prevented by maintaining a good level of hygiene in the calving sheds and by prompt disinfection of the navel cord soon after birth, using an antiseptic solution such as tincture of iodine. You can buy a suitable antiseptic from the nearest pharmacy.

Navel ill has to be treated with antibiotics as soon as it is diagnosed. If the condition is not treated, it will lead to invasion of the blood stream by bacteria (bacteraemia) and localization of the infection in the joints. This causes swollen joints and limping, a condition called "joint ill" (Figure 2). Joint ill has also to be treated with appropriate antibiotics. If not treated in time, the limp will persist and the animal's growth will be retarded.

2. *Gastro-intestinal infections in young calves*

Gastro-enteritis is caused by a variety of agents, including helminth worms, bacteria and viruses. Fig. 3.



Fig: 03 - Emaciated and stunted calf, most likely be suffering from gastro-enteric infections.

A common sign is diarrhoea. Gastro-enteritis caused by bacteria or viruses takes a more acute form and may be associated with more generalized signs of illness including fever. Blood or mucus may be present in the excreta. Uncontrolled bacterial or viral diarrhoea could lead to dehydration and death. Another parasitic gastro-enteric infection is coccidiosis. It is caused by a protozoan parasite causing a similar acute diarrhoea syndrome.

Treatment of gastro-enteritis is based on identification of the cause. The signs of the disease will give some indication of the cause. For confirmation, laboratory examination of faecal samples is necessary. Acute bacterial gastro-enteritis has to be treated with appropriate antibiotics and with fluid therapy when necessary. Coccidiosis must be treated with anticoccidial drugs. Helminth worm infestation could easily be treated with appropriate anthelmintic drug. It is always important to consult a veterinarian for proper diagnosis and treatment.

Gastro-enteritis is preventable. Routine worm treatment will eliminate helminth-gastro-enteritis. The type of routine de-worming programme has to be formulated for the particular farming situation, climatic condition, management system, stocking rate and the type of worms involved. Indiscriminate use of deworming drugs can result in the worm

developing resistance to the drug which then becomes ineffective. General recommendations in this regard is given in Table 1.

3. *Respiratory infections (Pneumonia) in young calves*

This is another common condition among young calves. Its incidence is enhanced by congested housing, moist bedding, humid atmosphere, poor ventilation, etc. Calf pneumonia is primarily caused by one of many viruses. Viral pneumonia is characterized by coughing, clear nasal discharge and fever (Figure 4). If neglected, secondary infection by normal bacterial flora of the upper respiratory tract will set in. Animals will show respiratory distress, purulent nasal discharge and if untreated death will result. Bacterial pneumonia has to be treated with appropriate antibiotics. Antibiotic treatment during the early stages of viral pneumonia will prevent the development of fatal bacterial pneumonia.

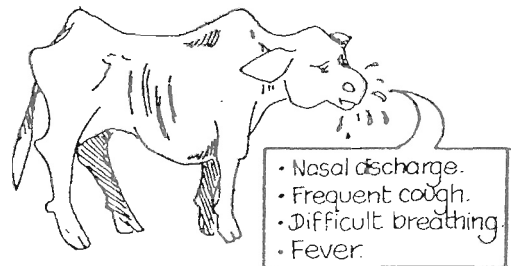


Fig: 04 - A weak calf, with cough and nasal discharge, most likely be suffering from pneumonia.

4. *Mastitis*

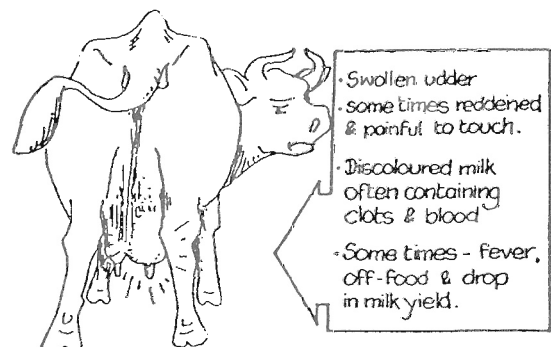


Fig: 05 - A cow suffering from mastitis

In a milking cow, the udder is an organ of utmost importance. Mastitis is an infection of the udder

caused by one or more types of bacteria commonly present in the environment such as streptococcus, staphylococcus and E. coli species. The disease may occur as clinical mastitis, when visible symptoms are present or as sub-clinical mastitis when no obvious signs are visible.

In either case, the glandular tissues of the mammary gland becomes affected and results in a considerable decline in milk production and therefore heavy economic losses. If mastitis is not treated in time permanent damage will occur to the glandular part of the udder and milk production may never return to normal.

The symptoms of clinical mastitis include changes in the udder, the milk and the animal is general. The udder will be swollen, hard, reddened and painful to touch, particularly noticeable at milking time. The milk will be discoloured and contain clots, sometimes blood. One or more quarters of the udder may be affected. In mastitis caused by some bacterial species, the cow will show signs of general illness such as fever, depression and loss of appetite. Treatment of mastitis consists of infusion of a suitable antibiotic preparation into the udder through the teat canal. The correct choice of antibiotic is important. Infusion must be done after milking out the contents of the affected quarter, and must be repeated for several days. The veterinarian will decide on the choice of antibiotic infusion. If commonly used antibiotics are ineffective, a sample of milk collected into a sterile bottle may be despatched to a laboratory for bacterial culture and antibiotic sensitivity testing. The laboratory report will indicate the choice of antibiotic.

Subclinical mastitis can be detected by a simple test called the California Mastitis Test (CMT), a cow-side test and which can be carried out at milking time or any other time. If mastitis occur frequently in your herd it is advisable to get your herd tested by CMT periodically. This service could be obtained from the veterinary office of your area.

How do you control mastitis ?

Mastitis is better controlled than cured. A control programme costs less and will save

money spent on treatment and prevent losses of milk production.

Mastitis control program

1. Hygienic housing - Cow sheds should be clean and maintained as dry as is practically possible. It should have floors without pot-holes where pools of dirty water can stagnate.
2. Hygienic milking - The udder must be washed with clean, preferably running water before milking. Avoid the use of the same cloth in cleaning the udders of several animals.
3. Teat Dipping - Immediately after milking, each teat should be dipped in a solution of an appropriate disinfectant in the correct concentration. Many commercial teat dipping solutions are available. Manufacturer's instructions should be strictly followed. A cheap, effective, locally available solution is 1.6% formic acid.
4. Clinical mastitis should be promptly treated.
5. The entire milking herd should be CMT tested periodically (e.g. once in 3 months). Any cases of subclinical mastitis should be isolated. Such animals should be treated during their dry period with special antibiotic infusions.
6. The herd must be milked in the following order.
 - (i) Healthy CMT negative animals
 - (ii) Clinically normal but CMT positive animals
 - (iii) Clinically mastitic animals.

The animal in the last group must be promptly treated and milk should be discarded during and up to 48 hours after the last antibiotic infusion.

5. *Brucellosis*

Brucellosis is a disease of the reproductive tract of cattle and buffaloes caused by a bacterium. Infection will occur at any age, but the disease will manifest itself only during pregnancy. In the first instance, it will cause abortion in late pregnancy. (Figure 6)

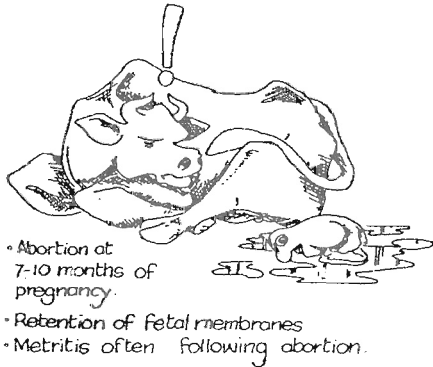


Fig. 06 - Cow affected with Brucellosis

When first introduced into a herd, it causes a "storm" of abortions. Subsequently it will cause infertility, still births, retained placenta and other related disorders and the birth of weak calves.

Brucellosis is communicable to man and causes an undulant fever. Normally the infection occurs through drinking of raw milk from infected animals and handling infected material. Abattoir workers and farmers may acquire infection by contact with infective material.

How do you control Brucellosis ?

Animal brucellosis is not generally treated. It is controlled by one of two methods. If an abortion occurs in late pregnancy of a cow in your herd, immediately contact the nearest veterinary office. Keep the aborted fetus and placental material for examination by the veterinarian. Prevent other animals coming in contact with the aborted animal and material. Handle the material carefully to protect yourself from getting infected. If the veterinary surgeon establishes a positive diagnosis on the basis of symptoms and laboratory tests, he will recommend, one of the following procedures.

1. Testing and culling of animals - Several tests are available for this purpose. If the percentage of positive animals is low

it is best to slaughter them and keep the herd free of brucellosis.

2. Regular vaccination - when the percentage of positive animals is high and culling is not feasible, the entire herd may be vaccinated. It is a single dose vaccine given once in a life time. All new animals growing up should be vaccinated at around 5-6 months of age. Strictly, adhere to the veterinarian's instructions and assist in the prevention and control measures most appropriate to contain the disease in your herd, your area and in the country as a whole.

6. *Leptospirosis*

Leptospirosis is another disease caused by a bacterium which causes abortions in late pregnancy (Figure 7).

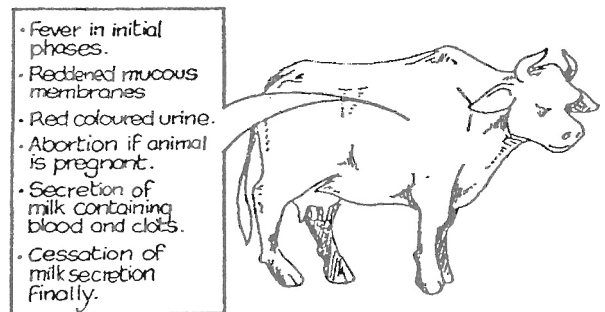


Fig: 07 - Cow suffering from Leptospirosis.

This disease may have an initial phase of fever, loss of appetite reddening of mucous membranes, haemoglobinuria (red urine) etc. which may pass unnoticed. Pregnant females will abort. In lactating animal infection results in the cessation of lactation, and milk becomes red in colour or contain blood clots.

Leptospirosis is also communicable to man. Affected animals and also recovered animals will excrete the organisms in urine. Animals working in paddy fields will thus contaminate the environment and be a source of danger to paddy field workers. Human infection can also occur due to inhalation of the urine spray caused by wind and the switching of the tail.

Unlike brucellosis, animals affected with leptospirosis can be cured by antibiotic treatment. Animals so treated will not become carriers, but animals that recover may spontaneously become persistent carriers and act as a potential source of infection.

Laboratory serological tests using blood collected from the jugular vein can differentiate between brucellosis and leptospirosis. Thus in the event of an abortion you should contact the veterinary surgeon who will establish a tentative diagnosis and collect the blood for confirmatory tests in the laboratory.

7. Haemorrhagic septicaemia (HS)

This is a highly fatal disease of cattle and buffaloes caused by a bacterium. It affects buffaloes more than cattle. In endemic areas it affects mainly young adult animals generally between 6 months and 2 years of age. The disease is endemic in the dry zone. It may also occur sporadically in other areas except in the hill country.

The disease is characterized by high fever, loss of appetite and swelling under the jaw which spreads into the breast region and even to the fore-legs (Figure 8).

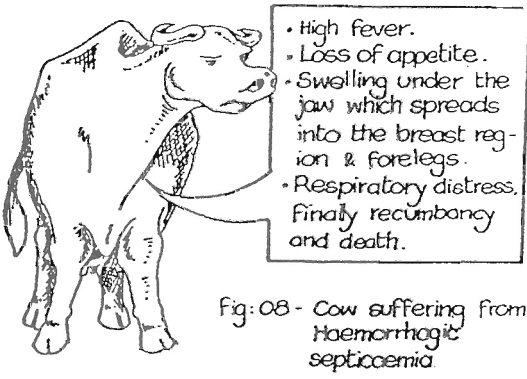


Fig: 08 - Cow suffering from Haemorrhagic septicaemia.

Later, there will be respiratory distress leading to recumbency and death. In the acute form, animals will die suddenly without showing any symptoms. Once the disease is established, death invariably results. The course of disease is so rapid that the early signs may escape notice and treatment is not practicable. Treatment is possible in a herd where a few animals have died of HS after regularly checking of the rectal

temperature of all in-contact animals. Those showing a rise of temperature should be kept separate and treated with antibiotics.

The disease is preventable by vaccination. Outbreaks of HS can cause very heavy losses in unvaccinated herds of cattle and buffaloes. Calves should be first vaccinated at 4-6 months of age. A booster should be given within 3-6 months. Thereafter, annual vaccination should be done. The HS vaccine is made locally and vaccination is done free of charge by the Government Veterinary Office. General recommendations on vaccination schedules for several disease including HS are given in Table 2.

8. Black quarter disease (BQ)

BQ is an acute disease caused by a bacterium. It is characterized by inflammation of muscles leading to severe lameness with pronounced swelling of the upper part of the affected leg, high fever, complete anorexia. (Figure 9)

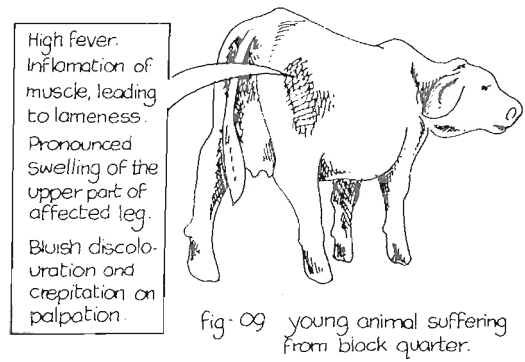


Fig: 09 young animal suffering from black quarter.

The skin of the affected area takes on a dark discoloration and there is gas accumulation under the skin. A crackling noise can be heard when the skin of the affected area is pressed. Once clinical disease is established death occurs invariably. Treatment with antibiotics may be effective only in the early stages.

This disease affects zebu cattle and buffaloes, mainly in the age group of 6 months to 2 years. In the case of temperate breeds however, older animals are also affected. BQ occurs only in certain localized areas in the Northern, Eastern, North-western, North-central and Uva Provinces.

The disease is preventable by vaccination. The vaccine is made locally and vaccination is carried out by the Government Veterinary Office free of charge where the disease occurs. (See Table 2).

9. Foot and mouth disease (FMD)

Foot and mouth disease is an extremely contagious disease of all cloven footed animals including cattle and buffaloes. It is caused by a virus which spreads rapidly through wind, water, contaminated feed and pastures.

Affected animals develop vesicular lesions in the mouth and feet. These vesicles rupture, and if infection sets in, healing will be delayed. Adult indigenous animals will recover but death may result among young animals and in temperate breeds. Affected animals show excessive salivation and a characteristic smacking of lips. Eating will be impaired with the consequent loss of body condition and a drop in milk yield. Foot lesions will cause lameness. The animal's heat regulatory mechanisms may be impaired and there will be visible 'panting'. (Fig. 10)

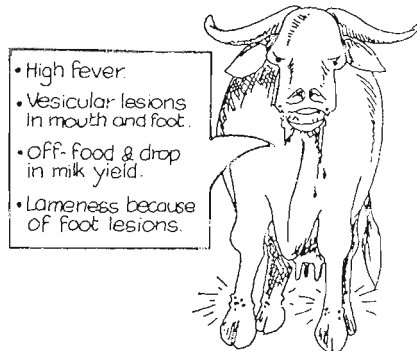


Fig: 10 - Cow suffering from foot & mouth disease.

There are other rare diseases that resemble FMD. Your veterinarian will collect appropriate materials from the effected animals for despatch to the laboratory for confirmation of the diagnosis of FMD. FMD is preventable by vaccination, which is done free of charge by the Government Veterinary Office.

10. Rinderpest

Rinderpest is an acute, highly contagious disease effecting cattle and buffaloes. The disease was eradicated from Sri Lanka in the early 1940's but

was re-introduced in 1988

It is now confined to the Northern and Eastern provinces, but cattle and buffalo owners elsewhere should always have a watchful eye for this disease. It is caused by a virus which is fragile and therefore does not persist outside the body of the animal for more than a few hours. Thus, close contact between animals is necessary for transmission. Distinctive signs of the disease are conjunctivitis and inflammation of the mucosa of the mouth and nostrils, with consequent lacrimation and salivation. Discrete necrotic lesions appear on the mouth and tongue. There will be severe diarrhoea with blood (Fig. 11).



Fig: 11 - Cow suffering from rinderpest.

Absence of foot lesions help to differentiate rinderpest from FMD. If you observe any of the above signs, immediately contact the nearest Veterinary office.

For controlling rinderpest, the present policy of the Animal Production and Health Department is to destroy all effected and immediate in-contact animals. Vaccination of animals in the area around the location of the outbreak will be carried out by the Government Veterinary Surgeon, to prevent the spread of disease to other areas.

11. Infectious Keratoconjunctivitis

Infectious keratoconjunctivitis in cattle and buffaloes (also known as 'pink eye') is a bacterial infection which occurs in epidemic form. Red eyes, with copious lacrimation are characteristic features. (Fig. 12). In this disease only the eyes are affected and no lesions appear elsewhere.

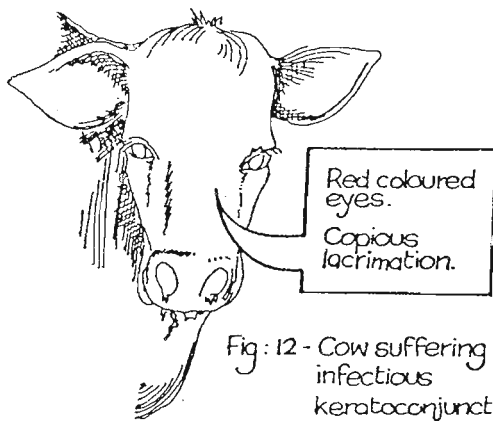


Fig: 12 - Cow suffering from infectious keratoconjunctivitis

Most animals recover spontaneously. A few animals may become blind. Early treatment with antibiotic eye ointment can effect complete recovery.

12. Tick borne diseases

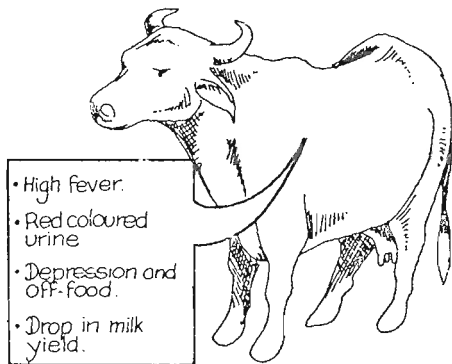


Fig: 13 - Cow suffering from babesiosis.

There are several diseases caused by blood parasites that infect blood cells. These are transmitted by ticks. The most important of these is Babesiosis caused by a protozoan parasite that infects the red blood cells.

The disease is prevalent mainly in the mid and hill country and effects mostly the temperate breeds of animals. It is characterized by fever and the passage of red urine. It is accompanied by other general signs of illness such as depression, lack of appetite and in the case of milking cows, a fall in the milk production.

If untreated, death will result. The diagnosis of the disease is confirmed by the examination of a blood smear from the animal. Once diagnosed, treatment with specific drugs will have to be carried out by your veterinarian.

In endemic areas vaccination is advised. Young calves should be vaccinated at 4-6 months of age. The vaccine is produced at the Veterinary Research Institute. Advance notice must be given by your veterinarian to obtain the vaccine.

Table 1. : Schedule for worm treatment in buffaloes and cattle

Species and age group	Time period	Recommended drug and procedure for worming
Buffalo calves	Day 10-16 of age	Pyrantel Palmoate, 2 tablets of 125 mg per calf. Worming once is satisfactory
	adults	In general, adults do not require worm treatment. However, if animals show signs of worm infestation, contact your veterinarian for advice. Follow the recommendations of your veterinarian
Cattle calves	1 to 12 months of age 1st worming at one month 2nd worming at 3 months Other recommendations: Calves managed intensively in the wet zone may be de-wormed once in 2-3 months up to 12-18 months of age. In areas where worm infestation is endemic; worm the young animal at the commencement of Maha rains (September/October) and again after 3 weeks and with the commencement of Yala rains (April/May)	Albandazole one half of oblet or 750 mg per calf or Febantel at the rate of 75 mg/kg body weight (in general about 3 gram per calf) There are few more drugs suitable for worming and you can obtain more details from your veterinarian
	Adults	For young as well as adults de-worming is only required, if the animal show signs of worm infestation. Your veterinarian will examine dung samples and tell you whether worm treatment is required or not. Follow the recommendations of your veterinarian

Table 2 : Vaccination schedule

Disease	Primary vaccination (Age)	Secondary vaccination (Age)	Booster vaccination (Age)
Haemorrhagic septicaemia	4 months	7 months	12 months + annually thereafter
FMD	4 months	5 months and 7 months	12 months and bi-annually thereafter
BQ	6 months	9 months	12 months and bi-annually (up to 2 yrs)

This information leaflet was prepared by Drs. M.C.L. de Alwis, H. Abeygunawardena, J.A. de S. Giriwardene, D.H.A. Subasinghe and N.U. Horadagoda for the SAREC/NARESA Buffalo Research and Development Programme in collaboration with Department of Animal Production and Health and University of Peradeniya.