

Introduction to Animal Health

Lesson Aim

Describe common diseases affecting farm animals and the circumstances under which animals contract these diseases.

Anyone working with animals needs to be familiar with the normal, vital signs of his animals, so that health and ill-health can be easily recognisable.

The vital signs include:

- Pulse rate
- Respiration rate
- Body temperature

These signs should be measured at rest.

In addition to vital signs, the farmer should continually observe the natural habits and behaviour of stock. Any changes in behaviour should be investigated immediately as it could be due to illness.

The earlier a farmer can treat sick animals, the better. Illness causes individual cells in the animal to break down and die. If treatment is started quickly, the cells can be stopped from degenerating. If treatment is delayed, the damage done by illness can be considerable; especially if the affected cells make up an organ.

THE HEALTHY ANIMAL

A good sign of a healthy animal is when it is interested in food. It will graze as normal, or in the case of penned animals, look forward to the next feed. The healthy animal will drink its normal amount of water (this is easily checked with penned animals), but more difficult with animals out grazing.

The healthy animal appears bright and alert. It will show its normal response to humans (ie. probably moving away as you approach if it is a grazing animal or approaching if it is very used to human company). Brightness is most apparent in the eyes. The animal will show interest in unusual noises and sights.

The healthy animal's coat and skin will be supple and in good condition. Hair is one of the first parts of the body to register ill health, and it will also look dull if the animal is lacking some essential vitamins or minerals.

The colour of the mucous membrane is a good indicator of health, as it shows the condition of the blood. Mucous membrane is found around the eye, on the gums, inside the mouth, and at the entrance to the anus. In healthy animals, it should show a salmon pink colouring (but not vivid red).

The healthy animal will pass the normal number of droppings per day; and the droppings will be neither too loose nor too dry for the type of livestock, and will be passed easily. If you press your ear to the side of the animal, you should be able to hear rumbling noises - signs that the digestive system is working. The healthy animal will also pass normal coloured urine.

Ruminants which are in good health will spend the normal number of hours chewing the cud. Healthy animals will also spend a normal number of hours resting each day.

Normal vital signs are as outlined below:

Type of Animal	Temperature		Respiration Rate	Pulse Rate (beats/ minute)
	° Centigrade	° Fahrenheit		
Horse	37.7-38.68	99.86-101.62	8-15/min	36-42
Cattle	38.3-38.8	100.94-101.84	12-16/min	45-60
Sheep	38.8-40	101.84-104	12-30/min	70-80
Goat	38.8-40	101.84-104	20-30/min	70-90
Pig	38.8-39.4	101.8-102.9	20-30/min	60-80
Poultry	40-43	104-109.4	12-28/min	250-300

Physiological Values for Other Animals

Average Rectal Temperatures (°C ± 0.5°C)	
Cat	38.6
Dog	38.9
Rabbit	39.5

Average Resting Respiratory Rates (breaths/min)			
Cat	26	Dog	22
Monkey	40	Guinea pig	90
Hampster	74	Rat	97
Pigeon	26	Rabbit	39

Range of Heart Rates (beats/min)			
Bat	100-970	Cat	110-140
Dog	100-130	Elephant	22-53
Goat	70-135	Guinea pig	260-400
Hampster	300-600	Monkey	165-240
Mouse	324-858	Rabbit	123-304
Rat	261-600	Squirrel	96-378

CAUSES OF ILL HEALTH

Injury

An injury can cause disease in two different ways:

1. The animal may be injured in a way that it cannot function properly. The injury might be localised (eg. a bruise or lameness, which can be treated and put right fairly easily); or it may be severe (eg. a broken leg, which could require the animal to be destroyed). In general, treating serious injuries is a matter of

economics on the farm. If the cost of treatment is greater than the value of the animal, then the animal may be best destroyed.

2. The injury may cause tissues to be exposed through wounds, which subsequently become infected by bacteria and other organisms. Examples of such diseases include blood poisoning, septic wounds, gangrene and tetanus (lockjaw).

Hereditary Conditions

Inherited characteristics can cause certain cells in the body to degenerate. An example of this is "dwarfing" in calves.

Poisons

Poisons cause chemical processes to occur inside the animal, which lead to degeneration and death of body cells. There are two types of poisons:

1. Those present in plants eaten by animals. Some weeds which grow in pasture can be a problem and other weeds can change the flavour of milk, affecting its market value.
2. Those which are chemicals (eg. pesticides) which contaminate the animal by accident. In some cases, an ingesting excess of a useful mineral (eg. iron, fluorine, sulphur or selenium) can cause poisoning.

Nutritional Problems

Feeding is a factor which has a great effect on the health of farm animals, in any of the following ways:

- a. Feeding too little or too much food to the animal. Too little food will cause a loss of production from the animal, and in severe cases may lead to malnutrition and death from starvation. Over feeding can lead to animals becoming over fat and unhealthy.
- b. Feeding a ration which is not balanced for the particular animal's needs. Deficiencies of protein, major minerals, trace elements, vitamins, and even water; can lead to many different deficiency diseases.
- c. Feeding a ration that contains a substance that is toxic to the animal.
- d. Allowing the animal to eat food or to drink water that has been contaminated by bacteria or by parasites such as worms.
- e. The health of the animal can be affected positively by feeding a diet that increases its resistance to bacterial disease.

Living Organisms

This is the commonest cause of ill health in animals, and the organisms involved are:

- Micro-organisms - such as bacteria, fungi, viruses and protozoa.
- Parasites - as worms, ticks, lice and insects.

Micro Organisms

- a. Bacteria are small organisms belonging to the plant kingdom. They consist of single cells, but when they multiply, cells often remain joined together, so that they appear to be multicellular. Bacteria reproduce in a very simple way. The bacteria enlarge, and a cell wall develops across the middle. The two new halves then separate to become two new bacteria.

This process can be completed in twenty minutes, so that if conditions are good and plenty of food is available, thousands of millions of bacteria can be produced from a single cell in 24 hours. This very rapid multiplication accounts for the rapid course of a disease, and the way in which a disease can spread throughout a herd in a short time.

Examples of diseases caused by bacteria include: Anthrax, Brucellosis, Lumpy Jaw, Mastitis and Tetanus. It must be emphasised however, that not all bacteria cause disease. Many live inside or on the skin of an animal and cause no ill effects.

- b. Fungi are plants. Some are large (eg. mushrooms), and others are so small that they can only be seen under a microscope. They start from a single cell, and spread by simple division to form long threads. Fungi also produce spores which are released and spread the disease over a wide area. Ringworm is an example of a disease caused by a fungus.
- c. Viruses are the smallest living organisms at present know. Viruses are a most highly infectious form of disease. They live within the cells of other living organisms, and as such are difficult to treat without also affecting the cells which they inhabit. Viruses are highly infectious.

Examples of virus diseases include: swine fever, foot and mouth disease, fowl pest, cattle plague and the common cold.

- d. Protozoa are single cells, but unlike bacteria, they are animals. There are many different kinds of protozoa, some of which cause diseases in humans or in animals. In many cases, the disease is transmitted by flies or other insects.

Examples of diseases caused by protozoa include: Redwater (transmitted by ticks), East Coast Fever and Sleeping Sickness (transmitted by the tsetse fly in Africa) and malaria in humans (transmitted by insects).

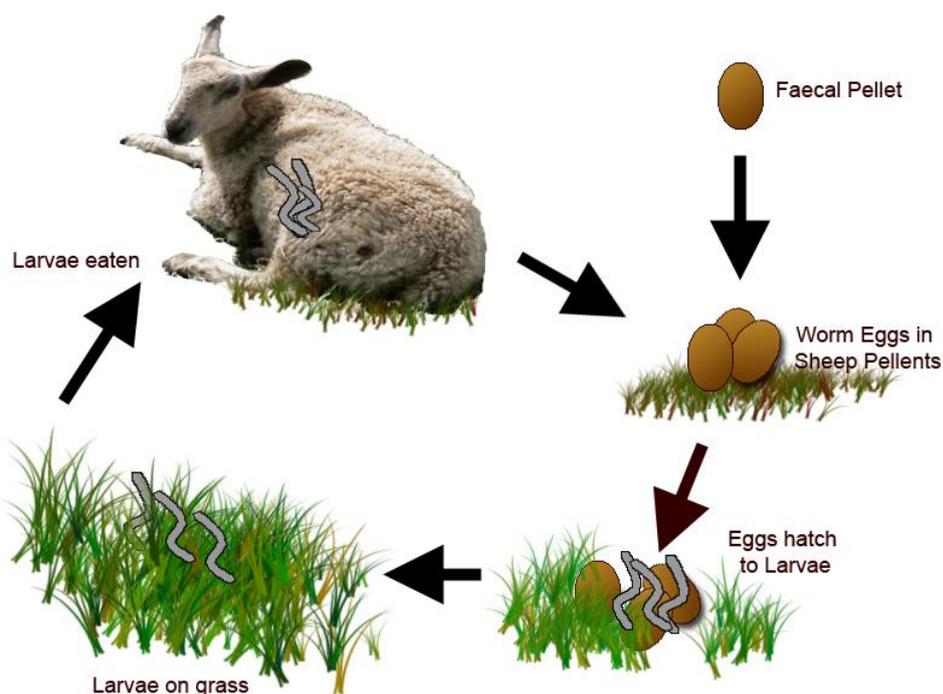
Parasites

a. Worms (Helminths) are invertebrate multi cellular animals. There are two types of parasitic worms:

- Roundworms
- Flatworms (ie. Flukes or Tapeworms)

Worms often have complex life cycles, spent partly in the infested animal, and partly outside (either in a different animal, or not inside any organism). When inside an animal, they may remain in the one part of the body, or they may travel, passing through different organs.

The example below is of a simple lifecycle:



Wherever worms are in a body, they are a foreign system, competing with the body for nourishment.

They don't reproduce as fast as bacteria or fungi, but a single organism is much larger and can cause a lot of damage. They can still reproduce relatively fast, and may develop into large numbers over a relatively short period. When worms are present in an animal, they usually cause ill health either by using the food the animal would have otherwise used; or by directly damaging an organ, or tissue.

All worms are classified as endoparasites because they live inside their animal host.

b. External parasites: Ticks, Lice and other Insects are collectively called ectoparasites, because they live outside the host animal; either biting or sucking blood from the animal. This group can be divided into two:

- Arachnids - ticks and mites (adult ticks and mites have eight legs)
- Insects (adult insects have six legs)

PREVENTING ILL HEALTH

It is better to prevent ill health ever occurring. To minimise the chances of ill health the farmer should do the following:

A. Feed Animals an Adequate and Well-Balanced Diet

The importance of nutrition to well-being cannot be over stressed. A well-nourished animal will have an effective natural immune system. A badly fed animal is much more susceptible to disease.

It is not enough that livestock are given sufficient bulk to satisfy their appetites. The food given must supply all needs for fibre, protein, vitamins and minerals. The food fed must also be of good quality. Poor quality food can in itself, cause disease (eg. fungal spores in mouldy maize cobs).

There is increasing evidence that some foods can protect animals against disease. Garlic, for example has well researched medicinal properties, and is used in some countries as a feed supplement (in powdered form). Another supplement that has proved beneficial is powdered seaweed (supplies many essential minerals and vitamins).

B. Control Insects

Many diseases are spread by insects such as flies and midges. These insects are attracted to the farm by warmth of the animals, and smell of the manure. Where animals are penned, regular removal of the manure can reduce the insect population. Manure should be stored well away from animal pens and removed regularly in order to minimise the threat from insects. Some insects lay their eggs in manure.

Still water can also attract insects. Avoid leaving buckets or other containers around which can collect rainwater. A slow burning, smoking fire will deter many insects (as a short term measure only!)

C. Dip Animals

Dipping prevents parasites from biting their hosts. Dipping should be done regularly and with the correct mixture to be effective.

D. Vaccinate

Vaccination involves injecting a small amount of the disease organism into the animal, which in turn, will produce anti bodies to overcome the disease. The animal is then protected from future infections by these anti bodies.

E. Avoid Stressing Livestock

Stress is any stimulation which puts strain on the animal's body. A stressed animal is much more susceptible to disease. Pigs, for example, are highly stressed if exposed to very hot or cold conditions. Animals grown in an artificial environment may produce more, but may also be more susceptible to disease. Routine tasks like dipping might also cause stress, but this needs to be balanced against the benefits.

The farmer should generally try to keep animals in the most natural environment as is possible. This is not always easy as some types of livestock just don't produce their full potential under "free range" conditions. The farmer needs to balance stresses caused by nature with stresses caused by an artificial environment, then develop an appropriate environment for the livestock.

SET TASK

Investigate three different situations where farm animals have suffered ill health (eg. from a disease or injury). You may pursue this task by any of the following methods:

- Visit a library, and look at references to agriculture in magazines, journals, books etc.
- Conduct online research
- Look in farming or rural magazines or newspapers.
- Look at general articles on diseases, or on specific animals or farms where a problem has arisen and been dealt with, etc.
- Contact Department of Primary Industries/Agriculture in your locality or state, and obtain brochures or booklets which may be relevant.
- Contact a professional person or service, or supplies products to farmers. This might be a supplier of veterinary products, stock feed etc; or a veterinary surgeon; or a farm consultant; or a stock agent, etc.
- Visit an agricultural show; look at animals on display, ask questions, etc.

Take notes whenever you talk to anyone.

Assignment 1

Question 1

List the criteria used to assess animal health and ill-health (present in point form).

Question 2

Describe three situations or causes of ill-health in farm animals, which you came across in your set task (write no more than 250 words on each).

Question 3

List methods commonly used to prevent ill-health of animals on farms in your locality (use point form to list your answers)

Question 4

If you have any specific questions about animal health, write them down and send them to the tutor with this assignment.

VISIT THE COURSE PAGE AT

<https://www.acs.edu.au/courses/animal-health-care-165.aspx>