Lecture 1

WHAT ARE DISEASES?

Diseases are processes, or conditions that may disrupt normal life functions of an animal. Such animals are said to be of 'ill-health', and in severe cases may die as a result of the disease. In practice, the term 'disease' is commonly used to describe such conditions that may arise when a lower organism causes the disease condition in a higher organism. But strictly speaking, any malfunction of the body process could be described as a disease condition, for example, an animal with a broken leg caused by an accident, or various nutrient deficiency disorders.

Diseases are of different types, and can be classified in several ways based on the

a.) Cause

b.) Nature of spread

c.) Time course or duration of the condition

d.) Age of animal affected.

e.) Physiological status, or stage in life of the animal.

Disease Concepts

Diseases and related animal (Host) responses are described by certain concepts for better understanding of their nature. These concepts are based on the general principles mentioned above.

1. Infectious and Contagious diseases – These are commonly used interchangeable but mean different things. An infectious disease is one in which an animal is invaded by a foreign organism that originates from another infected animal. Such foreign organisms are termed 'Pathogens', and may include micro-organisms such as viruses, bacteria, protozoa, fungi, some parasites etc. Some infectious diseases require intermediary agents to aid their spread from one animal to the other. Such agents are termed 'Carriers' or 'disease vectors', e.g. the tsetse fly is an insect vector for the protozoan disease called 'Trypanosomosis'. Other infectious diseases are described as being 'Contagious' because they do not require a Carrier or Vector for their spread e.g. Contagious Bovine

Pleuropneumonia (CBPP) is spread when healthy animals inhale droplets discharged by a nearby clinical case.

2. Susceptibility, Resistance, and Resilience – These are terms used to describe the response of an animal (Host) to pathogens. An animal is said to be susceptible to a disease if all conditions about the animal favour the establishment of infection by the pathogen. Resistance is the ability of a host to prevent or limit the establishment or development of infection. Resilience is the ability of the host to maintain a reasonable level of production under a disease condition.
3. Venereal and Congenital infectious diseases – Venereal diseases are spread or transmitted during coitus (mating), and therefore are restricted to breeding adults. Transmission can be either way i.e. from an infected male to a susceptible female or vice versa e.g. Epivag i.e. epididymitis in Bulls or cervico-vaginitis in cows. Congenital infections are those transmitted from parents to offspring, commonly from the dam to the foetus during pregnancy (gestation) e.g. Hog Cholera virus in pregnant sows infect foetuses through the placenta. Foetuses may be aborted or born alive but deformed.
4. Acute or Chronic disease – Diseases are characterised by a sequence of events. Where the sequence develops rapidly, a disease is said to be acute. Whereas, a chronic disease develops over a prolonged period. Examples of acute diseases are Anthrax and Rinderpest. Trypanosomosis is usually a chronic disease with animals suffering for months.
5. Sub-clinical infections – These are situations when animals harbour potentially harmful organisms without showing any overt signs of disease. Such animals only become sick when the population of organisms reach significant levels. For example the presence of helminth parasites in the gut of grazing livestock in many part of the world manifests a sub-clinical infection, but may become a disease condition when animals are subjected to conditions that allow the number of helminth to reach significant levels. Other examples of sub-clinical infections are certain tick-borne blood infections such as Anaplasmosis, Babesiosis, and theileriosis.

FUNGI DISEASES

Fungi are non-green plants that are widespread in nature. They include common forms of mould that grow on stale food, different types of toadstools and mushrooms. Unlike most plants they do not have the chlorophyll in their tissues and therefore cannot derive their nutrition via photosynthesis. Hence they are found growing on materials from which they can derive nutrients such as organic matter, vegetation, and sometimes animals.

Fungi can be classified as Moulds or Yeast. Moulds grow as colonies made of many celled filaments, whereas yeasts grow as individual oval shaped cells. Some grow as either yeast or mould depending on conditions. As disease causing agents, fungi can be classified as being:

1. **Pathogenic**: These cause infections in animals directly. Example, skin infections of domestic animals such as ringworm and epizootic lymphangitis.
2. **Opportunistic**: These are otherwise harmless fungi that could become pathogenic when natural bacteria populations are destroyed by prolonged use of antibiotics. This may result in conditions favourable for colonisation by normally harmless fungi.
3. **Mycotoxicoses**: Some fungi produce toxins, called mycotoxins, which can be poisonous to livestock that consume stale or wet food that has become mouldy.