International
Dairy Topics'
Dairyhealth
BYTES
YOUR OWN REFERENCE SOURCE ON DAIRY HEALTH

2 – Causes of disease II

Infectious diseases

Infectious diseases are caused by living pathogenic agents, such as viruses, mycoplasma, fungi, bacteria and protozoa. They share various features in common, which were covered in the first Dairyhealth BYTES. We will now consider the specific categories of agents that cause infectious diseases, starting with bacteria.

Bacteria: an introduction

In a very simplistic way, bacteria can be considered microscopic animals – they are so small that a row of them 'head to tail' would contain >10,000 per cm.

All of the attributes used to define an animal also apply to a bacterium. For example, to survive and grow, bacteria require food, but bacterial food is simple nutritional (organic) molecules rather than grass or meat. Bacteria can take these nutrients into their 'bodies' and use them as energy sources or to construct the proteins and other substances which are used to build the structures inside and surrounding the bacteria.

Bacteria also need to drink and any area of dampness will provide them with all their water requirements.

Most bacteria need air (oxygen) and are known as aerobes or aerobic bacteria. Others can live without oxygen and these are known as anaerobes. A third group can survive in reduced oxygen levels and these are known as microaerophilic bacteria. Examples of aerobes include E. coli and Salmonella Spp, while Clostridium perfringens is anaerobic and many Campylobacter Spp. are microaerophilic.

Bacteria produce waste substances which they excrete into their environment. All bacteria are capable of growing and multiplying. Multiplication (reproduction) is typically asexual and can be best described as binary division in which 1> 2 > 4 > 8 > 16 > 32 and so on. This will be covered in more detail in the next Dairyhealth BYTES.

They also survive more easily if they can be protected from adversities, such as desiccation, heat, extremes of pH, UV light (sunlight) and chemicals (disinfectants and antibiotics). Thus, the smallest crack or hole in a surface and that blood or faecal smear could be providing a haven, as well as protection, for thousands of bacteria.

Many bacteria have whip-like flagella that can propel them through a water film. Thus, under favourable conditions, they are able to move.

Control of bacteria

If we can deprive bacteria of their basic needs, we are well on the way to controlling them. Cleanliness deprives bacteria of food, dryness deprives them of water, smooth surfaces deprive them of places to hide from disinfectants, and so on. If you think about it, this is basically what cleanliness and hygiene is based on!