International Dairy Topics

Dairy**health**

BYTES

Your own reference source on dairy health

Number: 64

Causes of disease VI

Ceva

Alltech®

Boehringer Ingelheim

CID Lines

Henke-Sass Wolf

Kemin

Livisto

Novus

Wisium/Neovia

Viruses

At the end of the 19th Century, in 1898, Loeffler and Frosch found evidence that the cause of foot and mouth disease in livestock was an infectious agent smaller than a bacterium. This was the first clue to the nature of viruses as genetic entities smaller than bacteria.

Viruses rely on the host cells that they infect in order to reproduce. Outside of host cells, viruses exist as a protein coat or capsid, which is sometimes enclosed within a membrane. This capsid contains either DNA or RNA, which codes for the virus elements. While in this form outside the cell, the virus is metabolically inert and some viruses can survive for long periods of time in this form.

When it comes into contact with a host cell, a virus can insert its genetic material into the host cell and take over its functions. An infected cell produces more viral protein and genetic material instead of its usual products. Some viruses may remain dormant inside host cells for long periods, causing no obvious change in their host cells (the lysogenic phase).

However, when a dormant virus is stimulated, it enters the lytic phase: new viruses are formed, self-assemble, and burst out of the host cell, killing the cell and going on to infect other cells in the same animal or another one.

Viruses cause a number of diseases. Examples in man include smallpox, the common cold, chickenpox, influenza, shingles, herpes, polio, rabies, Ebola, hanta fever, and AIDS. Viral infections do not respond to antibiotic treatment. Even some types of cancer have been linked to viral causes. In animals, foot and mouth disease, swine fever and Newcastle disease all have viral causes.

Classification of viruses

Viruses are classified according to whether they contain DNA or RNA and whether this is single or double stranded. Examples include:

- sDNA – parvovirus, circovirus.

- dDNA – pox, herpes, adenoviruses.

- sRNA – picornaviruses, astroviruses, coronaviruses.

- dRNA - reoviruses.