

## Viruses which affect ruminants

Welcome. In this video we will see viruses that affect domestic ruminants.

Cows, sheep and goats have had a very close relationship with people for ages, when they were domesticated, and are the main source of meat and milk in most of the world. In addition, they provide skin and wool, and other materials that is used in industries or in research. To carry out these functions, it is important that these animals are healthy and so, their diseases, and especially the viral diseases, have always worried much since they can decrease their production and be a source of contagion for people.

Cows, sheep and goats are ruminants due to their physiological and anatomical characteristics. Sheep and goats are also often grouped as "small ruminants", because they share many features of management and production. But in reality, they are different species of animals, so, do the same viruses infect them?

A number of viruses that affect ruminants have been identified, some have been known for long, others are more recent or emerging. Currently, more than 40 species included in 17 different families in cows are known; and more than 25 species from 14 families in small ruminants. Only a few of these viruses are capable of infecting both cows and small ruminants, in some cases producing severe diseases, such as foot and mouth disease or Bluetongue. Small ruminants share many viruses and diseases, although sometimes with different consequences, and most of these viruses do not affect cattle. To see which species of virus are included in each family remember to consult the additional material.

Some of these viruses can also infect wild ruminants, as deer, fallow deer, reindeer, Mouflon, etc., and in some cases produce disease. This makes it difficult to control and fight against these viruses.

Two of the families of **DNA viruses**, with or without envelope, are the Herpesvirus and the Poxvirus. Herpesviruses cause important diseases for animal production, such as malignant catarrhal fever (which affects all ruminants) and infectious bovine rhinotracheitis; Poxvirus cause sheep and goat pox.

As in other animal species, **RNA viruses** are the most numerous group of pathogens in ruminants. They are classified into 11 families in cattle and 8 in sheep and goats. Only three families include **naked RNA viruses**; however, they are very important in Animal Health.

This is the case of Reovirus, especially those of the genus Orbivirus, which causes bluetongue, one of the emerging diseases in ruminants, which we will see in another video. And the picornaviruses, which are very small viruses, but very pathogenic and contagious. They include one of the most important pathogens for livestock: the foot-and-mouth disease virus, which we will also see in detail in another video.

The **enveloped RNA viruses** belong to important families for ruminants, such as *Bunyaviridae*, and *Flaviviridae*, associated with reproductive disorders; and *Paramyxoviridae*, associated with respiratory infections. This last family includes two closely linked viruses:

Rinderpest virus, one of the greatest threats to cattle from past times, has been the first animal disease to be eradicated from the world thanks to vaccination and control campaigns.

And the peste des petits ruminants, that has been proposed as the next animal disease to be eradicated.

*To learn more about the strategy followed to eradicate a viral disease from the world remember to consult the additional material and the OIE website.*

Finally, we would like to mention the infection by **prions** in ruminants. As you know, prions are not actually viruses, since they do not have nucleic acids, and are very specific for the species they affect. These agents produce very severe degenerative diseases, some of which can affect people, and that we will discuss in the following videos.

We have seen the great complexity of viruses that affect domestic ruminants. We will see the viral diseases separately: First, those of cattle, and then, those of small ruminants.

See you in the next video!