

3.2 Types of infection

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From an epidemiological point of view BVD virus is extremely successful. It occupies a special place among viral pathogens thanks to its world-wide distribution and high rate of infection. Its success is due to a combination of two well-known strategies, the "hit-and-run" strategy and the "infect-and-persist" strategy. Both of these strategies are popular among viruses, however, they are rarely used in combination. Hit & Run (transient infection)

The hit and run strategy means that the viruses make use of a relatively short period of susceptibility to infection in their host population in order to multiply and thus for survival. Following the multiplying of the virus the hosts either develop antibodies (BVD) or else die from the disease (e.g. rabies, Ebola). By this strategy the virus robs itself of its own basis for survival and has to rely on continuously finding new susceptible hosts.

In the case of BVD, the hit and run strategy manifests itself in a transient infection which is frequently without symptoms. The animals then develop antibodies which protect them from a repeat BVD infection for the rest of their relatively short life. The hit & run strategy on its own turned out to be insufficient for the survival of BVDV, i.e. without PI animals, the virus will disappear sooner or later. Infect & Persist (persistent infection)

Viruses with the ability to persist in their host have an advantage: they simply wait until a new opportunity for infection presents itself. Various viruses, such as Lentiviruses or herpes viruses, use this strategy. However, the persistent infection caused by BVDV is unique in the sense that the virus simply evades the immune system of the host altogether by infecting the individual prior to attainment of immunocompetence. The virus refrains from damaging its host in such a way as to prevent development. The host develops an immunotolerance towards the virus, i.e. the immune system considers the virus to be part of the body.