FRIEDRICH-LOEFFLER-INSTITUT
FLI
Bundesforschungsinstitut für Tiergesundheit
Federal Research Institute for Animal Health

FAQ

Rabbit Haemorrhagic Disease

(RHDV, RHDV-2)

FAQ Rabbit Haemorrhagic Disease (RHDV, RHDV-2)

What is Rabbit Haemorrhagic Disease?

Rabbit Haemorrhagic Disease (RHD) has been known since the 1980s and is caused by a calicivirus, RHD virus (RHDV). Since 2010, a novel variant, RHDV-2, has been known.

Which symptoms occur?

Both variants can lead to sudden death within 12 to 36 hours after onset of fever and unspecific symptoms of disease such as apathy and anorexia. Sometimes these symptoms can be accompanied by respiratory and neurological disorders and increased bleeding tendency. Chronic courses of disease are rare.

Based on the symptoms it is not possible to differentiate RHDV-2 from classic RHD. Mortality rates vary considerably (20 to 100 %) and strongly depend on the animals' immune status, age and general health condition.

What is the difference between the two virus variants?

A significant difference is the occurrence of RHDV-2 in very young animals (younger than 2 weeks). Symptoms can be severe; in contrast to infections with classic strains there is no nestling immunity in animals younger than 4 to 6 weeks.

In contrast to classic RHD hares are also susceptible to RHDV-2.

How is RHD transmitted?

The viruses are mainly transmitted by direct contact; infection is also possible by indirect contact and contaminated objects (persons, food, equipment, transport cages, indirect contacts at animal shows, passive transmission by insects etc.). One important factor is direct contact with wild rabbits and herbage contaminated with excretions of infected wild rabbits.

How stable is the virus in the environment?

RHDV and RHDV-2 are very stable in the environment. At higher temperatures (up to 50° C) and dry conditions the viruses remain stable for a longer period of time, e.g. under dry conditions at room temperature for at least 15 weeks. In carcasses, stability of the virus at low temperatures has been confirmed for 7 months.

Where can animals be investigated and what are the costs?

For routine RHDV diagnostics samples should be sent to the responsible diagnostic agencies of the federal states or to private diagnostic laboratories.

The FLI only will carry out investigations for RHDV/ RHDV-2 for scientific reasons or in justified exceptional cases.

Fees for detection and differentiation of RHDV range between 25 and 35 € plus VAT. Fees for more extensive investigations should be discussed directly with the diagnostic institution.

To ensure short-distance transport, please ask the responsible veterinarian where to send the samples.

Is it possible to investigate rabbits which previously survived RHDV infection for RHDV 2?

Commercially available antibody tests cannot differentiate between antibodies against classic RHDV and RHDV-2 (cross reactions).

Blood from unvaccinated animals can be investigated for antibodies against RHDV. If the animal already had vaccine-induced antibodies, interpretation of test results obtained with the currently available diagnostics is difficult, if no comparison with an earlier sample and a later sample collected after the suspected exposure is possible. This so-called serum

pair proves the strong increase of antibody levels following infection.

Investigation of live animals for the virus itself is not reliable; excretion is intermittent, i.e. it ceases temporarily and reoccurs at irregular intervals.

The FLI does not conduct differentiating antibody detection.

Can a rabbit which has survived RHDV-2 infection still transmit the virus?

In our experience, genetic material of the virus can be detected in surviving animals for several weeks. However, no experiments have been carried out to confirm that animals can excrete infectious virus permanently. This would require laborious animal studies, as RHDV/RHDV-2 cannot be replicated in cell cultures. Case reports on virus dynamics/re-infection in rabbit holdings (epidemiology) support the assumption that infection of newly acquired animals by animals which permanently excrete the virus is possible. It has been confirmed that this positive status of surviving animals fluctuates, i.e. test results can temporarily be negative. Therefore, neither permanent virus excretion nor freedom from virus can be confirmed reliably.

Is vaccination possible?

Currently, vaccines against both, classic RHDV and RHDV-2 are licensed in Germany. Although RHDV-2 has spread throughout Germany, protection against RHDV should not be neglected, as classic RHD is far from being eradicated. To achieve maximum vaccine protection, it is crucial to follow the vaccination recommendations of the Standing Committee for Vaccination in Veterinary Medicine (StIKo vet). These are available on the internet (https://stiko-vet.fli.de/).

Why do some animals survive and others die, although they have been immunized with the same vaccine? Which factors may protect rabbits and which ones have a negative effect?

This phenomenon is not RHD-specific, but is also observed in other aggressive infectious diseases. There is no general and exact explanation; the immunological factors are too complex. General factors influencing the outcome of infections are e.g. age (e.g. juvenile resistance of young animals in classic RHD), race or sex.

On the side of the infectious agent the different levels of “aggressiveness” (pathogenicity) of different strains/isolates influence the course of disease; pathogen load also has an effect on the clinical picture. Furthermore, individual parameters such as general health and nutritional status, stress, pre-existing conditions and secondary diseases play a role. Reaction to immunization may differ between animals.

What must be observed after an outbreak of the disease in a rabbit holding?

After an outbreak all objects which were in contact with diseased animals (e.g. clothing items, shoe soles, enclosures, cages) must be cleaned thoroughly and decontaminated using an appropriate disinfectant. Instructions for use must be followed exactly. The disinfectant must be effective against non-enveloped viruses. A list of suitable disinfectants has been published by the Deutsche Veterinärmedizinische Gesellschaft (DVG; http://www.desinfektion-dvg.de).

Outdoor enclosures should remain unused for several weeks, the grass should be held short. The virus remains stable in the environment for up to 3½ months; however stability is reduced by thorough cleaning measures. Introduction of the virus by persons, objects, herbage, but also by flies and carrion eaters is possible.

Restocking with new animals should not take place until 8 – 12 weeks after final disinfection at the earliest. Initially, it is strongly recommended to keep the animals separately, if possible, to immunize them and to co-house them with animals which survived RHDV/RHDV-2 infection one week after the maximum vaccine protection has been reached (as indicated by the manufacturer). Please observe the recommendations for vaccination of the Standing Committee for Vaccination in Veterinary Medicine (StIKo vet), see https://stiko-vet.fli.de/.

Should animal shows with rabbits be cancelled?

In general, animals approved for participation in an animal show should be vaccinated against RHDV and RHDV-2 following the recommendations for vaccination of the Standing Committee for Vaccination in Veterinary Medicine (StIKo vet; https://stiko-vet.fli.de/).

Furthermore, we appeal to the animal holders' sense of responsibility to consider the regional disease situation and, if appropriate, refrain from participation.

Friedrich-Loeffler-Institut, Bundesforschungsinstitut für Tiergesundheit
Headquarters: Insel Riems, Südufer 10, D-17493 Greifswald – Insel Riems, www.fli.de
Photos/Source: Friedrich-Loeffler-Institut