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Rabbit Hemorrhagic Disease: Protecting your Rabbitry

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Until recently, there have been few serious diseases affecting domestic or pet rabbits in the United States. For the first time ever cases of Rabbit Hemorrhagic Disease (sometimes abbreviated RHD or RHDV) have surfaced in wild rabbit populations in North America. This disease is caused by a highly contagious calicivirus that affects rabbits and hares (lagomorphs) and causes serious disease and death. This virus and the disease it causes has been around for many years; it was first identified in China in 1984. It soon spread into Europe where it caused significant fatalities in the European wild and domestic rabbit populations. Humans inadvertently introduced the disease to Australia and New Zealand in the early 1990s, when they were trying to develop a tool to control RHDV in wild (and invasive) rabbit populations in those countries.

There are several different strains of RHDV: RHDV1 and RHDVa (which are closely related) and RHDV2. Since the year 2000, there have been small outbreaks of RHDVa in the United States, but since this strain does not affect North American wild rabbits (only domestic rabbits and European wild rabbits), these outbreaks remained limited to domestic herds and did not spread. However, as of May 2020, the RHDV2 strain has been detected in both wild and domestic rabbit populations in Arizona, New Mexico, Nevada, Colorado, and Texas (see Table 1). The RHDV2 strain can affect a wider variety of rabbit species, including North American wild jackrabbit and cottontail populations. This makes eradication of the disease very difficult and it's likely to remain endemic (always present) in wild rabbit populations in the United States.

Transmission of Infection

This disease is highly contagious, has a high fatality rate, and there are no real treatments. While there are caliciviruses in other species, RHDV is not known to affect other animals outside of rabbits and hares. If RHDV is detected in your rabbitry, your entire herd may need to be depopulated (euthanized) to try to control the spread. The virus is shed in urine, feces, and respiratory discharges of infected rabbits and can be transmitted in a variety of ways: passed directly through rabbit to rabbit contact (live or dead), through ingesting contaminated feed or water, by vectors such as birds, rodents, insects, or humans, and by contact with contaminated equipment, tools, or bedding (fomites). It's important to note that the virus can survive on inanimate objects for as long as 105 days, decomposing carcasses as long as 90 days, and in the environment for up

Table 1: RHDV Virus Strains and Affected Rabbit Populations

Virus Strain	North American and European Domestic Rabbits	European Wild Rabbits and Hares	North American Wild Rabbits and Hares
RHDV1/a	Affected	Affected	Not Affected
RHDV2	Affected	Affected	Affected

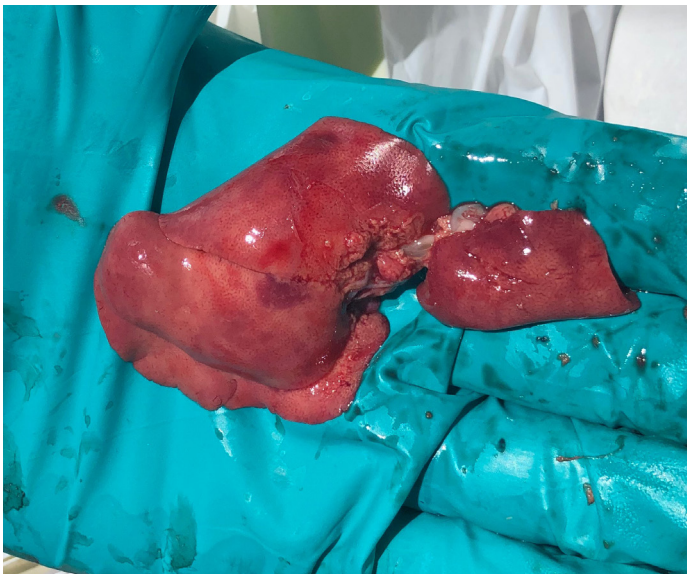

Figure 1: This is an image of a liver from an infected rabbit. The increase in red surface area on the liver is an indication of RHD. Photo courtesy of Jennifer Davey.

to 35 days at 72 degrees Fahrenheit. It's very resistant to disinfection, changes in temperature, and multiple freeze/thaw cycles. There is currently no vaccine available in the United States and preventing the virus from entering your rabbitry is the only way to protect your herd. RHDV is not zoonotic, meaning it does not affect humans.

Signs

The disease has an incubation period of three to nine days. Rabbits acutely affected with RHDV may show signs including shortness of breath, loss of coordination (ataxia), depression, loss of appetite, and general lethargy. You may also see hemorrhages of the eye and blood in the feces. These animals generally succumb to the disease in one to three days. In many cases, the only sign of infection will be sudden death of one or more animals over a very short period of time with few signs of sickness. A few animals may only be mildly affected and recover. Rabbits that recover may have some immunity to reinfection, although it is not known for how long, and they could shed the virus for as long as 105 days. If your herd is infected with RHDV, 40 to 100% of affected animals could die from the disease.

Protecting your herd from infection

Implementing strict biosecurity measures are the best way to protect your herd from infection. Here are some examples of how you can decrease the risk of your rabbits contracting the disease:

- **Limit Access to your Rabbitry -** Do not introduce new rabbits without following quarantine protocols, do not allow pets, other people or other animals to enter your rabbitry or have contact with your herd. Do not visit other rabbit herds or share equipment with other rabbit owners.
- **Rabbit Housing -** keep rabbits in hutches off the ground, preferably indoors if possible. Do not let rabbits play or roam in the yard or floor of the rabbitry. Quarantine any rabbit that has left the premises for a minimum of one month before re-integrating them into the herd.
- **Control Food Storage -** Store food in rodent and pest proof containers. Do not store food, hay, or bedding where it could be contaminated by wild animals of any kind. Do not feed or use for bedding any foraged items (grass, branches, etc.).
- **Rabbitry Pest Control -** Exclude wild rabbits and other animals (including pets and wild birds) from the rabbitry. Deter rodents by preventing access to food, keep a clean, well-organized rabbitry free from debris that could invite rodents to nest, and use nighttime lighting where appropriate to further discourage rodents. Use fly control methods, including installing a small mesh screen in all ventilation openings to prevent flies and mosquitoes from entering, and clean the rabbitry regularly.
- **Sanitation -** Wash your hands before entering your rabbitry. Clean and disinfect tools and equipment often. Install a footbath with disinfectant at the entrance to your rabbitry (follow product label directions for proper dilution) and ensure anyone entering the facility uses it. Don't wear footwear or clothing that has been in contact with other rabbits (wild or domestic) into your rabbitry.
- **Rabbits Exhibiting Signs -** Contact your veterinarian if you have any rabbits showing RHDV signs or a sudden death in your rabbitry. Separate sick animals, remove dead rabbits promptly, and only dispose of them at the direction of your vet (they may be needed for testing). If your area is put under RHDV quarantine, do not attempt to transport rabbits in or out of the area. Do not approach, handle, or otherwise touch any wild rabbit - alive or dead. If dead wild rabbits are observed in your area, contact Arizona Game and Fish to report them.

Quarantine Protocols

Quarantine is a period of strict isolation to prevent a disease from entering a healthy population of animals, such as your rabbit herd. The standard recommended

DISINFECTION RECOMMENDATIONS

Recommended disinfectants include any phenol class disinfectant or a 10% bleach solution. Clean the items with detergent or soap first, apply the disinfectant, and allow it to remain on the item for the recommended contact time. Always follow label directions. Disinfectants with quaternary ammonium compounds as the active ingredients (i.e. Lysol and Clorox brand wipes) are not effective against this virus.

length of quarantine is 21 to 30 days, unless exposure to a disease with a longer incubation time is suspected. Quarantine should follow these procedures:

- Quarantined animals should be housed where they have no contact with non-quarantined animals
- Monitor quarantined animals closely for signs of disease
- Equipment, food, and other supplies should not be shared between quarantined and non-quarantined animals
- Care for quarantined animals last to prevent spreading potential disease back to your herd.
- Do not return to the non-quarantined animals without changing clothes and fully washing up
- Plan ahead and have a quarantine area ready should it be needed

Important Contacts and Sources for Updated Information

Your Veterinarian

Arizona Game and Fish
www.azgfd.com or (623) 236-7201

Arizona Department of Agriculture/Arizona State Veterinarian's Office
www.agriculture.az.gov

New Mexico Livestock Board
www.nmlbonline.com/animalhealth

Sources

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