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Rabbit Hemorrhagic Disease

Although historically uncommon in the United States (U.S.), there have been cases of Rabbit Hemorrhagic Disease Virus Serotype 1 (RHDV1) in Iowa (2000), Utah (2001), Illinois (2001), New York (2001), Indiana (2005), Minnesota (2010), and Canada (2011). It is considered endemic to Australia, New Zealand, Cuba, parts of Asia and Africa, as well as most of Europe. Rabbit Hemorrhagic Disease Virus Serotype 2 (RHDV2) emerged in France in 2010 and has since spread across Europe and is endemic in Australia. It came to southwestern Canada in 2018, and subsequently caused cases in Ohio, Washington, and New York City. In early 2020 a widespread outbreak of RHDV2 emerged in wild and domestic rabbits in the southwestern U.S. (New Mexico, Texas, Colorado, Arizona, Nevada) and northern Mexico.
Wild rabbits have been important in the continuing spread of this outbreak.

What is Rabbit Hemorrhagic Disease (RHD)? RHD, also known as viral hemorrhagic disease, can be caused by two related Caliciviruses.

- RHDV1 only affects rabbits in the genus *Oryctolagus*, which includes most domestic rabbits and wild European rabbits.
- RHDV2 affects *Oryctolagus* and several other species of rabbits including wild jackrabbits and hares (*Lepus*), wild American cottontails (*Sylvilagus*), and other genera of rabbits and as well as Pikas (family Ochonotidae) may be susceptible.

The incubation period for RHD is 1 to 5 days, and it can cause liver inflammation (hepatitis) and prevent the blood from clotting. Rabbits often die suddenly without showing any outward signs of illness, or may show:

- Fever,
- Inappetence,
- Lethargy,
- Spasms,
- Breathing difficulties,
- Blue colored lips or mucous membranes, and/or
- Bleeding from body cavities.

Death is due to massive internal hemorrhaging and liver impairment. Of susceptible rabbits, 80-100% that develop the disease may die. Rabbits of all ages are affected.

Can people or other animals get RHD?

No; RHD viruses are only known to affect lagomorphs of the family Leporidae (rabbits and hares). Other types of Caliciviruses have been found in people, cattle, sea lions, and cats.

Controlling the Spread of RHD

This virus may be inhaled, ingested, or absorbed through scrapes and wounds. It persists in the environment for several months and can be transmitted through direct contact with infected domestic or wild rabbits or by indirect contact with objects (cages, feeders, grooming equipment, etc.) or people and their clothing that have been contaminated by rabbit secretions or excretions. Transmission may occur following consumption of contaminated water and food, or exposure to rabbit products (meat, fur skins, offal). Vermin, such as insects or rodents, or

Follow appropriate biosecurity guidelines to prevent the spread of diseases to your facility including: domestic animals and birds may also become contaminated with the virus and transfer it to rabbits. Dogs can spread the virus by moving infected rabbit carcasses between premises.

- Minimize exposure to wild rabbits and hares by keeping your rabbits in hutches or cages that are elevated off the ground.
- Do not allow your rabbits to graze or roam in a yard if suspect disease in wild rabbits in your area.
- Avoid unnecessary contact with other people's rabbits. If you must have contact with other people's animals, wash your hands or shower and change your clothes prior to handling your rabbits.
- Restrict visitors to your rabbitry and limit the handling of the animals by visitors.
- After visiting a show, fair, or meeting where rabbits were comingled, shower and change clothes before handing your rabbits.
- Know the health status of the rabbitry from which you purchase rabbits.
- Control dogs, coyotes, insects, birds, rodents, and other animals, which may carry disease to your facility.
- Be aware of visitors from other states or countries with rabbit disease and take appropriate precautions.
- If you are planning to travel, be aware of the rabbit disease status of the state or country you are visiting and take steps to avoid introducing RHD to your rabbits.
- Be aware of the rabbit disease status of the state or country of origin of any equipment or supplies that you are purchasing.

Disinfectants

RHDV is inactivated by 10% bleach (sodium hypochlorite), potassium peroxymonosulfate (such as 1% Virkon-S), and some others. Quaternary ammonium compounds are not effective (including Lysol spray, Clorox wipes, and Odoban) against RHDV.

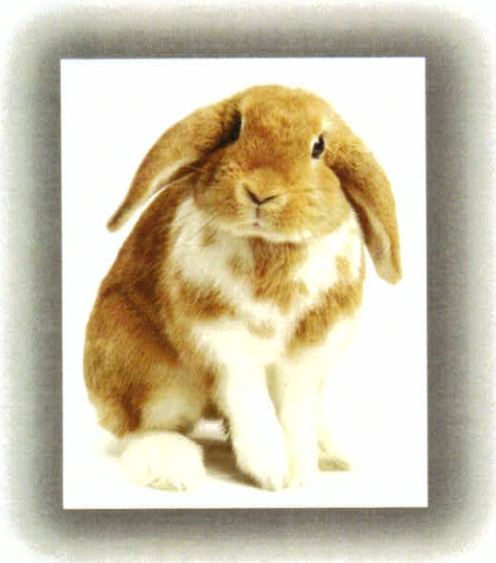
To report dead wild rabbits or hares contact:
CDFW Wildlife Investigations Lab - (916) 358-2790
or report online at:
https://wildlife.ca.gov/Conservation/Laboratories/Wildlife-Investigations/Monitoring/Mortality-Report

To report dead domestic rabbits contact the CDFA Animal Health Branch.

Consult your private veterinarian if your rabbit is sick.

Can I vaccinate my rabbit against RHD?

RHD vaccines have not been approved for use in the U.S., but due to the recent outbreak, vaccination has been allowed on a limited emergency basis in affected states. To be effective, vaccines must include antigens for the appropriate serotype, RHDV1 and RHDV2.



Animal Health and Food Safety Services
Animal Health Branch
Headquarters - (916) 900-5002
Redding District - (530) 225-2140
Modesto District - (209) 491-9350
Tulare District - (559) 685-3500
Ontario District - (909) 947-4462
USDA-APHIS-VS - (916) 854-3950 or (877) 741-3690

For more information, please click the following:

Animal Health Branch

Hand Washing Why, When, How, and with What?

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Keep Your Rabbits Safe from Rabbit Hemorrhagic Disease

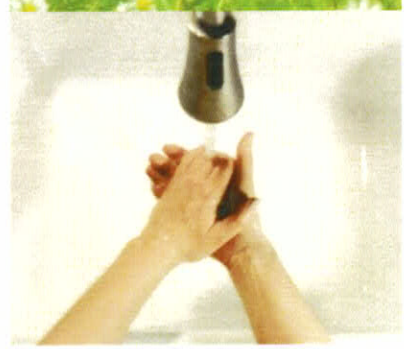
May 2020

Biosecurity Recommendations

Rabbit Hemorrhagic Disease (RHD) is caused by a calicivirus and is extremely contagious between rabbits. Follow these biosecurity guidelines to help reduce risk of exposure and transmission of RHD.

Visitors

- Ensure wild rabbits do not come near your rabbit(s)
- Maintain proper fencing so wild rabbits cannot enter your yard, rabbit housing, or feed storage area
- Do not allow other people who own rabbits to handle your rabbit(s)
- Watch that dogs, cats, birds and scavengers do not bring rabbit carcasses onto your property; promptly dispose of and disinfect



Care and Equipment

- House rabbits off the ground when possible
- Do not feed plants or forage gathered from outside to your rabbit
- Do not use materials gathered from outside for bedding or cage base
- Keep new or returning rabbits separated from your existing rabbits for 2 weeks
- Properly and frequently dispose of soiled and used bedding
- Clean and disinfect caging, enclosures, harnesses, and other equipment between different rabbits with 10% bleach water, 1% Virkon-S, or other product recommended by your veterinarian
- Do not allow rabbits to share toys and enrichment objects

You

- Always wash your hands before and after handling your rabbit
- Use separate footwear for outside and inside the rabbitry, or use a disinfectant footbath, to avoid tracking contamination on your shoes
- Do not handle any rabbits that are not your own. If you do, then wash your hands and change clothes and shoes before handling your rabbits

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www.cdfa.ca.gov

General Guidance for Cleaning and Disinfection of Rabbit Hemorrhagic Disease Virus (RHDV) Contaminated Premises

April 2020

(These instructions are general guidance and are not to supersede cleaning and disinfection requirements from the State Animal Health Official (SAHO))

Environmental Persistence of Rabbit Hemorrhagic Disease Calicivirus

- Rabbit Hemorrhagic Disease (RHD) calicivirus is spread by oral, nasal and parenteral transmission
- The virus is present in urine and feces from infected rabbits, thus contaminated bedding can be a source of infection
- Contaminated foods can be a source of infection
- The virus survives at pH 3.0, is stable at pH 4.5-10.5, but is inactivated at pH>12
- The virus can survive for long periods outside the host. For example:
  - Viable virus has been detected for as long as 105 days in its dried state on a fomite (cloth) at room temperature.
- Environmental temperature and protection by organic material are important factors in the survival of the virus
  - Virus may persist in chilled or frozen rabbit meat and the lengthy persistence of infective virus in carcasses may provide a reservoir of disease after outbreaks in the wild, as viable virus has been found in decaying tissue after 90 days outdoors
  - At 50C (122F) the virus survives for 1 hour

Photo by Canva.com

  - It can remain viable for 22-35 days at 22C (72F) but only for 3-7 days at 37C (99F). It also survives freezethaw cycles.

Disinfectants

- The RHD calicivirus is inactivated by sodium hypochlorite (dilution of ½ cup of 6% or 8.25% household bleach concentrate in 1 gallon of water to create a approximately 2300 ppm solution of sodium hypochlorite) and 1% potassium peroxymonosulfate (e.g. Virkon S).

Practical Cleaning and Disinfection Recommendations

Preparation: Disinfectants Household Bleach

- A diluted solution of sodium hypochlorite, household bleach, is the most accessible disinfectant available to rabbit owners. To prepare the correct dilution add ½ cup of 6% or 8.25% sodium hypochlorite bleach concentrate to one gallon of potable water. Contact time needed is 5 minutes. Wear nitrile, silicon or rubber gloves and eye protection and work in a well ventilated area when mixing and handling the bleach or bleach solution. Wear protective clothing to avoid contact with the skin.

- Bleach concentrates lose potency over time. Be sure to store bleach concentrates in a cool, dark, place and use recently purchased bleach concentrates to mix solution to be used for disinfecting purposes. New dilute bleach solutions should be mixed every 24 hours to maintain effectiveness.

- Follow the link for information on what to do if you have accidental exposure https://www.thecloroxcompany.com/wpcontent/uploads/2020/04/Clorox%C2%A E-Germicidal-Bleach3.pdf.

Virkon S

- Virkon S is a disinfectant often used by Animal Health Officials. A 1% solution is effective for disinfection for RHDV-2. To achieve a 1% use dilution, add Virkon S (depending on formulation type, either 1 sachet, 8 tablets, or 1.3 ounces of powder (or 1 Virkon S scoop)) to 1 gallon of water. Stir thoroughly until fully dissolved, then use per label. Contact time needed is 10 minutes.

- Wear protective gloves and eye/face protection. Use only in a well-ventilated area. Avoid breathing dust. Wash hands thoroughly after handling. Wear protective clothing to avoid contact with skin. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials and food and drink. Dispose of contents and container in accordance with all local, regional, national and international regulations

- Follow the link for information on what to do if you have accidental exposure http://virkon.us/wpcontent/uploads/sites/15/2017/11/Virkon TM-S-USA.pdf

Pre-Cleaning (Dry Cleaning) Because of the hardy nature of the virus, removal of all organic material (bedding, feces, fur, material on hutches or cages etc) via scraping, brushing, sweeping or digging before cleaning and disinfection is critical for cleaning and disinfection to be effective.

- Remove all visible debris from items to be disinfected (cages, hutches, feeding equipment, waterers, etc.).

- Remove all bedding from cages, hutches, or ground and safely discard by deep burial or double bagging in plastic bags, disinfecting the outer bag by spraying with disinfectant solution, and disposing of in a licensed landfill or as otherwise directed by your SAHO. Items made of wood are best burned, safely

discarded either by deep burial, or by double bagging in plastic bags, disinfecting the outer bag by spraying with disinfectant solution, and disposing of in a licensed landfill or as otherwise directed by your SAHO.

- For wood that cannot be discarded, remove organic material and then clean and disinfect as instructed below.

- Rabbit feces should be removed and safely discarded by deep burial or double bagging in plastic bags, disinfecting the outer bag by spraying with the disinfectant solution and disposing of in a licensed landfill or as otherwise directed by your SAHO.

- Soil beneath rabbit hutches that has been contaminated with rabbit urine, feces, or bedding should be removed to a depth beyond visible contamination and buried.

- Any feed that has the possibility of being contaminated should be safely discarded by deep burial or double bagging in plastic bags, disinfecting the outer bag by spraying with disinfectant solution, and disposing of in a licensed landfill or as otherwise directed by your SAHO.

Cleaning and Disinfection (C&D):

- Once organic material has been removed by dry cleaning, wash items or structures thoroughly with soap and potable water; rinse well with potable water and let dry.

- Then, submerge or saturate items or structures with spray with the proper dilution of one of the two disinfectants provided above. Allow the appropriate contact time for the disinfectant used (5 minutes for diluted bleach and 10 minutes for 1% Virkon S). Contact time means leaving the item saturated with disinfectant for the specified time. If the item dries before the specified time the disinfectant solution should be reapplied. After the contact time has been achieved, rinse with potable water and let dry before further contact.

Further Virus Elimination

- After cleaning, disinfection and drying of all hutches, water, feed containers, other rabbit equipment or materials is completed, a fallow period during which no rabbits are introduced is recommended. The fallow period timeframe will be specified by the SAHO. In situations where C&D is complicated by the conditions (such as large amounts of organic material, wooden structures, a large number of infected animals, etc), a 90 day fallow period is recommended.

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