Overview of Rabbit Hemorrhagic Disease

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Previous isolated U.S. cases in owned domestic rabbits
✓ 2000 (IA)
✓ 2001 (UT, IL, NY)
✓ 2005 (IN)
Rabbits at Risk

Tame/owned & feral domestic rabbits
(European rabbits, Oryctolagus cuniculus)
WILD RABBITS

- Snowshoe hare (*Lepus americanus*)
- European brown hare (*Lepus europaeus*)
- Black-tailed jackrabbit (*Lepus californicus*)
- White-tailed jackrabbit (*Lepus townsendi*)
- Volcano rabbit (*Romerolagus diazzi*)
- Pygmy rabbit (*Brachylagus idahoensis*)
- Eastern cottontail (*Sylvilagus floridanus*)
- Nuttall's or mountain cottontail (*Sylvilagus nuttallii*)
World Animal Health Information Database
OIE World Organisation for Animal Health
www.oie.int/wahis_2/public/wahid.php/Diseaseinformation/WI

We’re famous! 😊
### Timeline of RHD Cases in WA, 2019

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
<th>Risk Factors</th>
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</thead>
<tbody>
<tr>
<td>July 9</td>
<td>Index case: Single owned domestic rabbit, Orcas Island</td>
<td>Rodents, farm hygiene</td>
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<tr>
<td>July 11</td>
<td>Case 2: Feral domestic rabbits die off, Orcas Island</td>
<td></td>
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<tr>
<td>July 18-24</td>
<td>Suspect cases: Feral domestic rabbit die-off, Lopez Island</td>
<td></td>
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<tr>
<td>July 24</td>
<td>Case 3: 14/25 domestic owned meat rabbits die, Orcas Island</td>
<td>Vegetation cut for bedding and forage</td>
</tr>
<tr>
<td>Aug 2</td>
<td>Case 4: 2/5 domestic owned rabbits die, feral die-off San Juan</td>
<td>Direct contact with feral through cages</td>
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<tr>
<td>Aug 16</td>
<td>Case 5: 11/33 domestic owned breeding rabbits die, Orcas Island</td>
<td>Rodent contact with lower cages</td>
</tr>
<tr>
<td>Nov 7</td>
<td>Case 6: Feral domestic rabbits die-off, Whidbey Island</td>
<td></td>
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<tr>
<td>Dec 23</td>
<td>Case 7: 108/145 domestic sanctuary rabbits die, Clallam County</td>
<td>Outdoor housing, bird contact, multiple caretakers</td>
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</tbody>
</table>

**July-Dec., 2019:** Owned and feral domestic rabbits tested negative King, Skagit, Pierce, and Clallam Co.
RHD Quarantine and Control Zones
Quarantine Summary

• Quarantines issued on individual premises with positive case(s)
  o 30 to 120 days, depending on risk
  o Restrict movement of rabbits on or off positive premises
• Emergency Rule enacted
  o WSDA authorized (RCW 34.05.350) to issue emergency rules
    ▪ State Veterinarian will use this authority during an FAD outbreak to preserve animal welfare, protect industry
  o Purpose of Emergency Rule
    • Stop movement of rabbits, rabbit products and equipment from Orcas, San Juan, Lopez (09/19/19-1/18/20), Whidbey (11/8/19- 3/7/20), Clallam premise (120 days)
    ▪ No human travel restrictions
  o Used in conjunction with individual premise quarantine if feral domestics confirmed in a geographic location
The Virus

- First noted in China 1983-84
- Three main forms
  - RHDV and RHDVα: share vaccine; more fatal; less effect on kits
  - RHDV2: separate vaccine; less fatal; affects all ages
- Family Caliciviridae, genus Lagovirus, species RHDV
- “Icosahedral, non-enveloped, single-stranded positive-sense RNA virus of ~7437 nucleotides”

The Virus continued

• Survives
  ➢ Environmental temp of 122°F for one hour
  ➢ Dried at room temp for 3+ months
  ➢ Freeze/thaw cycles
  ➢ Wide pH range (3.0 to 11.9)
  ➢ Persists in frozen meat and carcasses
  ➢ Persists up to 2 months in infected rabbits
  ➢ Detectable in blood and feces for 15 weeks post-infection

• Killed by
  ➢ 1% sodium hydroxide (lye), 1-2% formalin, 2% One-stroke Environ®, 0.5% sodium hypochlorite (bleach)

• Diagnosis
  ➢ Necropsy findings (hepatitis, hemorrhages, congestion)
  ➢ Liver, spleen, blood testing for antibodies and/or virus
## RHV1/RHVa vs. RHV2

<table>
<thead>
<tr>
<th></th>
<th>RHV1/RHVa</th>
<th>RHV2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>80 to 90%</td>
<td>*5 to 20 to 70%</td>
</tr>
<tr>
<td>Time to death</td>
<td>12 to 36 hours</td>
<td>**3 to 5 days</td>
</tr>
<tr>
<td>Ages</td>
<td>2+ months</td>
<td>2+ weeks</td>
</tr>
<tr>
<td>SubA/Chronic</td>
<td>5 to 10%</td>
<td>More</td>
</tr>
<tr>
<td>Incubation</td>
<td>1 to 3 days</td>
<td>3 to 9 days</td>
</tr>
</tbody>
</table>

*33, 40, 56, and 74% on owned domestic WA rabbit premises

**Peracute to acute on WA premises (<1 day)
How Is the RHD Virus Spread?

Oral, nasal, conjunctival contact with virus from:

- Fomites
- Contaminated food/water
- Equipment
- Flies, vermin, predators
- Infected rabbits’ excretions
How Does the RHD Virus Spread?

Remember, it’s a non-enveloped virus (like parvo, not like rabies or influenza), so persists easily in environment.
Signs of Illness

- Previously healthy-looking animals found dead
- +/- hemorrhage from mouth, nose
- Fever (N = 100 to 104°F)
- Less curious
- Inactive
- Anorexia
- “Limp”
- Depressed
Biosecurity Recommendations:
Ways to Reduce Disease Risk

• Establish relationship with knowledgeable veterinarian
• House rabbits indoors if possible
• Keep a closed rabbitry (no shows, visitors, new animals)
• Quarantine new/returning rabbits for 30 days
• Purchase from low-risk sources; test/examine new rabbits
• Separate footwear for barn, house, off farm
• Control flies, biting insects, and vermin
• Do not put rabbits on ground outside
• Clean and disinfect properly
• Do not use forage, branches, etc. for bedding
• Do not feed grass or other forage that could be contaminated
• Wash hands before and after handling rabbit groups
• Consider vaccinating for diseases of concern
The Vaccine

• A tool for disease control in outbreak areas only
• 1 cc SQ or IM; protective immunity in 7 to 10 days; lasts ~12 months; booster every 6 to 12 months
• Only approved for use in quarantine and contingent areas or where wild rabbits infected and maintain virus
• Limited production capacity and supply
• Separate vaccines for RHDV/RHDVa and RHDV2
• Killed vaccine; will not cause disease
• Vaccine not licensed for use in U.S.; special permit needed to import and use it
• One western WA veterinarian was successful importing
• Vaccine clinics were held in quarantine areas
Considerations for a Farm Biosecurity Plan:

Traffic Flow (Feet, Vehicles)

VISITORS

PLEASE RESPECT

FARM BIOSECURITY

Vehicles, machinery, people and animals can carry weed seeds, pests and diseases.

Please call at the house or phone: 360-848-6151

**Cleaning and Disinfection Protocol**

- **Remove** all grossly visible debris.
The presence of gross contamination or organic material, especially feces, will inactivate most disinfectants.

- **Wash** the area or item with water and detergent.

- **Thoroughly rinse** the cleaned area to remove any detergent residue.
Some disinfectants may be inactivated by detergents; therefore, it is very important to rinse well after washing the area or item.

- **Allow the area to dry** completely.

- **Select and apply** an appropriate, effective disinfectant.

- **Allow the proper contact time**!
This is one of the most overlooked steps!! Contact time may vary depending on the disinfectant selected, but is usually at least 10 minutes. Consult the product label.

- **Thoroughly rinse away** any residual disinfectant and allow the area or item to dry.
Biosecurity Supplies

• Clean, disinfectable boots
• Bucket
• Long-handed boot brush and pick
• Soap
• Disinfectant*
• Plastic garbage bags
• Coveralls
• Disposable gloves
• Garden sprayer
• Water
• Hand sanitizer

*For brand names and effectiveness, see www.cfsph.iastate.edu/Disinfection/Assets/CharacteristicsSelectedDisinfectants.pdf
“A quick splash of a dirty boot in a foot bath is not likely to accomplish anything except to give a false sense of security.” (Bowman and Shulaw, 2001).
Always a Good Idea!
Your Job

- Be observant
- Call veterinarian ASAP with concerns
- Follow biosecurity practices
- Minimize stress to rabbits
- Provide clean food, water, shelter
- Only share facts, not rumors or guesses
- Stay up-to-date on disease situations
- Model best practices to others
- Learn more
Educating Others

- Share facts and reliable sources of information.
- Consider RHD for educational posters and public presentations.
- Discuss biosecurity requirements before visiting other rabbit premises.

Be careful!

From an article on ARBA web site:

There is no vaccine in the U.S. because there is no outbreak or positive cases in the U.S. If there was, all vaccinated rabbits would test positive for RHDV and will then be eliminated.
Examples of Public Education

The Typical Incubation Period for Viral Rabbit Hemorrhagic Disease is 1-3 Days. Often the Only Sign of Infection is Sudden Death.
NOTICE

Rabbit hemorrhagic disease (RHD) is present on the San Juan Islands. It is a highly contagious and deadly viral disease of domestic rabbits. The virus is easily spread by wild rabbits, feral domestic rabbits, predators, birds, flies, and contaminated footwear, clothing and equipment.

PLEASE HELP PREVENT SPREAD OF RHD

• Do not contact dead or living wild or feral rabbits on the islands
• Do not bring pet or other rabbits onto the islands
• Do not move wild, feral or domestic rabbits off islands
• Do not transport flies in vehicles
• Launder clothing and clean and disinfect footwear before and after leaving the islands
• Educate others about this situation
• Wash your hands after being outside

RHD IS NOT A HUMAN HEALTH CONCERN

Call the WSDA sick rabbit hotline to report cases: 360-902-1878

For more info: 360-902-1878 | ahealth@agr.wa.gov
wastatedeptag.blogspot.com/2019/08/deadly-rabbit-disease-persists-and.html
www.cfsph.istate.edu/Factsheets/pdfs/rabbit_hemorrhagic_disease.pdf

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Resources

- www.cfsph.iastate.edu/Factsheets/pdfs/rabbit_hemorrhagic_disease.pdf
- https://cms.agr.wa.gov/getmedia/36442c2c-caac-4c13-a99e-774e0cea6744/809-RHDVaccineFactSheet
- https://cms.agr.wa.gov/getmedia/07915d2d-bfd5-4cbb-b443-ab3b42b72722/RHDFactsheet
- https://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Disease_cards/RHD.pdf
- https://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/3.06.02_RHD.pdf
ANY QUESTIONS?

YEAH! WHY ARE WE YELLING?!
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