What is rabbit calicivirus and how do I protect my rabbit from rabbit haemorrhagic disease?

Rabbit haemorrhagic disease (RHD) is caused by the rabbit haemorrhagic disease virus (RHDV), a type of calicivirus which is fatal in non-immune rabbits. There are currently two strains of this virus in wild rabbit populations in Australia, with a third planned for release in early March 2017. Rabbit owners should ensure their rabbits are vaccinated with Cylap® vaccine to protect against the original strain of the virus, RHDV1. However, Cylap® does not protect against all strains, so additional measures must be taken to reduce the risk of rabbits being exposed to RHDV. Veterinarians should follow current Australian Veterinary Association guidelines to maximise vaccine protection.

Release of RHDV in Australia

The first strain of RHDV, known as the Czech strain (belonging to the RHDV1 family), was released by the government in 1996 to help control wild rabbits in an effort to minimise environmental damage being caused. This followed an accidental release of the virus in 1995 from CSIRO field trials on Wardang Island in South Australia. An effective vaccine, Cylap® has been available for many years to protect domestic rabbits against this strain of the virus.

In recent years, the Czech strain has had less impact on wild rabbit populations due to the development of immunity, so Australian scientists have evaluated a number of different RHDV variants for release. From this evaluation, a new strain was selected known as the Korean strain or K5 (belonging to the RHDV1a family), which is due to be released in early March 2017 at 600 sites across Australia (contact your state department of agriculture for information on locations). This new strain, which was found to be more infectious than the Czech strain, also causes RHD and death in non-immune rabbits. A pilot study to evaluate the effectiveness of the Cylap® vaccine against K5 has indicated that this vaccine will provide protection but further trials need to be undertaken to obtain conclusive results. All rabbit owners are advised to ensure their rabbits are vaccinated before K5 is released.

RHDV2 outbreaks

A third RHDV, known as RHDV2, was first confirmed in a wild rabbit in Canberra in 2015, with authorities unable to state the source of the infection. Over the past eighteen months, it has caused the same type of disease and deaths in wild and domesticated rabbits in NSW, ACT, Victoria, South Australia, Tasmania, Northern Territory and Western Australia. No validated trials have been conducted to test the Cylap® vaccine against RHDV2 and there are many reports of vaccinated rabbits dying from infection with RHDV2. Thus, all domesticated rabbits, including those who are vaccinated, are at a high risk of becoming ill and dying from RHDV2, if they are exposed to the virus. Young rabbits (3-4 weeks of age) are particularly vulnerable.

RHDV2 vaccines being used overseas are not currently available in Australia and they may not be effective against the specific RHDV2 found here.

Full protection against RHDV1 (Czech), RHDV1a (K5) and RHDV2 requires the development of a 'trivalent' (against three different infectious agents) vaccine using these particular viruses. Research is urgently needed to develop such a vaccine.

Overview of RHDV strains

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Presence in Australia</th>
<th>Disease &amp; death of rabbits</th>
<th>Vaccination protection Cylap®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech (original,</td>
<td>RHDV1</td>
<td>Accidental release in 1995</td>
<td>Mainly adults as young are more resistant to disease</td>
<td>Yes - vaccine provides good</td>
</tr>
<tr>
<td>classic or v351)</td>
<td></td>
<td>Controlled release in 1996</td>
<td></td>
<td>protection</td>
</tr>
<tr>
<td>K5 (Korean)</td>
<td>RHDV1a</td>
<td>Release due in early March 2017</td>
<td>Mainly adults as young are more resistant to disease</td>
<td>Pilot study indicates prelim</td>
</tr>
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<td></td>
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<td>inary vaccination is recomme</td>
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RHDV2

Source unknown. First appeared in ACT in 2015; now reported in NSW, Vic, SA, NT, Tas & WA

Very young rabbits most susceptible with death likely

Low# - modified vaccination protocol may provide some protection

*Note: A small pilot study done in New South Wales showed that all vaccinated rabbits survived infection whereas all unvaccinated rabbits died; however, further research is needed.

* Based on many reports of deaths in vaccinated rabbits from outbreaks in several states

What are the symptoms of RHDV?

RHDV damages internal organs such as the liver and intestines and may cause bleeding. Signs include fever, restlessness, lethargy and poor appetite with bleeding from the nose and/or blood on the floor where rabbits are housed. Often infected rabbits will show no signs and die suddenly. If a pet rabbit is showing signs, a veterinarian should be contacted immediately. There is no remedy for RHD but affected rabbits can be given supportive treatment.

How does RHDV spread?

All RHDV strains can spread easily from infected rabbits in droppings, urine, secretions from the eyes and nose, and at mating. Spread can also occur from contaminated objects such as food, clothing, cages, equipment, insects (especially flies), birds and rodents. The virus can survive in the environment for three and a half months over hotter periods but up to seven and a half months in moderate temperatures.

How can I protect my pet rabbit against RHDV?

Rabbit owners should ensure their rabbits are vaccinated with Cylap® vaccine to protect against RHDV. Veterinarians should follow current Australian Veterinary Association guidelines to maximise vaccine protection. However, as Cylap® does not fully protect against all strains of RHDV, additional measures must be taken to reduce the risk of infection.

RHDV1 - an effective vaccine, Cylap® has been available for many years to protect rabbits against this strain of the virus. Rabbits must be vaccinated annually to maintain protection against RHDV1.

RHDVK5 - the current evidence indicates that vaccination with Cylap® will provide protection against RHDVK5, but further research is needed. It is still essential that all rabbits are vaccinated and that precautions are taken to help to prevent infection (see below).

RHDV2 - no vaccine is available in Australia that specifically protects against RHDV2. However, a modified vaccination protocol may provide some protection and thus it is still essential that all rabbits are vaccinated and precautions are taken to help to prevent infection (see below).

Reducing the risk of RHDV infection

RHDV can remain in the environment for an extended period and can be transmitted on objects and via some insects. The following precautions can reduce the risk of infection:

- Keep your pet rabbit indoors
- Rabbit-proof your backyard to prevent access by wild rabbits
- Regularly decontaminate equipment and materials including cages, hutches, bowls etc, with either 10% bleach or 10% sodium hydroxide
- Limit contact between and handling of unfamiliar pet rabbits
- Decontaminate hands, shoes and clothing after handling other than your own rabbits
• Control fleas
• Control insects (especially flies) as much as possible both indoors and outdoors
• Remove uneaten food on a daily basis.

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