



A new vaccine that gives rabbits
the protection they deserve

Nobivac  **Myxo-RHD**

The joy of owning a rabbit: protect it!

Rabbits are the third most popular pet in Europe. Unfortunately, it appears from available figures that fewer than 15% of these animals are vaccinated; and yet, out of all our domestic pets, rabbits are perhaps the most exposed to fatal disease. A UK based survey of national disease incidence reports an increasing trend of myxomatosis across the country and this is also thought to reflect the situation here in Ireland¹.

Rabbit owners – often children and their parents – are highly motivated to provide proper veterinary care for their pets. But many simply don't understand the disease threat faced by their animals.

Myxomatosis

Myxomatosis is a serious, often fatal disease of rabbits caused by infection with myxoma virus. The most obvious clinical signs are normally the swollen, almost closed eyes and other localised swellings around the head, face, ears, lips, anus and genitalia which can appear within a few days of infection. Severe swellings can lead to blindness and distortion around the face within a day or so of the onset of signs, leading to difficulty feeding and drinking. Bacterial respiratory infection often complicates the disease, resulting in a fatal pneumonia.

Although recovery is sometimes possible with intensive care, myxomatosis can be a very protracted and profoundly unpleasant disease and euthanasia is generally recommended. Recovery in the wild occasionally occurs but for animals with severe signs, death usually occurs about 12 days after initial infection.

Myxomatosis is typically spread by blood sucking insects – in particular fleas and mosquitoes. However it is now known that the virus can also be spread directly from rabbit to rabbit if the animals are housed together. All breeds of domestic rabbit can be affected, and whatever the lifestyle of the rabbit there is potential risk of this disease.

There is no specific treatment for myxomatosis; vaccination is the most effective way of protecting a rabbit.

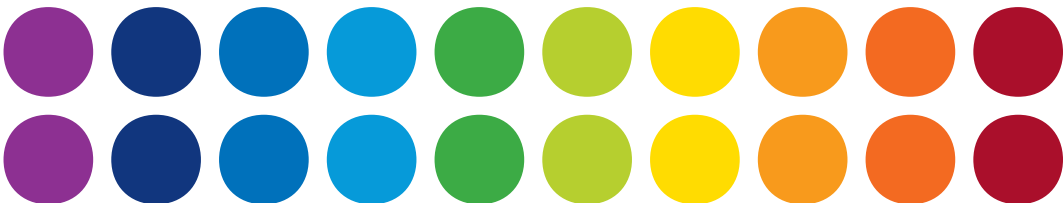
Rabbit Haemorrhagic Disease (RHD)

RHD (also known as Viral Haemorrhagic Disease or VHD) is another serious infectious disease of rabbits. It is caused by a calicivirus and has an incubation period of just one to three days. The virus itself is very stable in the environment and can survive for over 100 days.

Signs of RHD may go almost unnoticed as the disease progression can be very rapid. However, where present, the signs may include depression, collapse, difficulty in breathing, convulsions, high body temperature, lethargy and bleeding from the nose. Death usually occurs within 12-36 hours after the onset of fever and the mortality rate can be as high as 90-100%.

The virus is spread by direct contact between rabbits (both wild and domesticated) and also via indirect contact. Possible sources of indirect contact are people, clothing, contaminated hutches and bedding, as well as insect vectors such as fleas.

As for myxomatosis, there is no specific treatment for RHD. Vaccination is the only effective way of providing protection.



Nobivac Myxo-RHD

Comprehensive protection for rabbits

Comprehensive and convenient, the launch of Nobivac® Myxo-RHD is the perfect opportunity for vets to increase the vaccination rate amongst pet rabbits.

The first vaccine to combine a full 12 months protection against both myxomatosis and Rabbit Haemorrhagic Disease (RHD) in a single inoculation; it means we can finally give rabbits the protection they deserve.

About Nobivac Myxo-RHD

Nobivac Myxo-RHD contains a live myxoma vector virus strain with an RHD virus capsid gene insert.

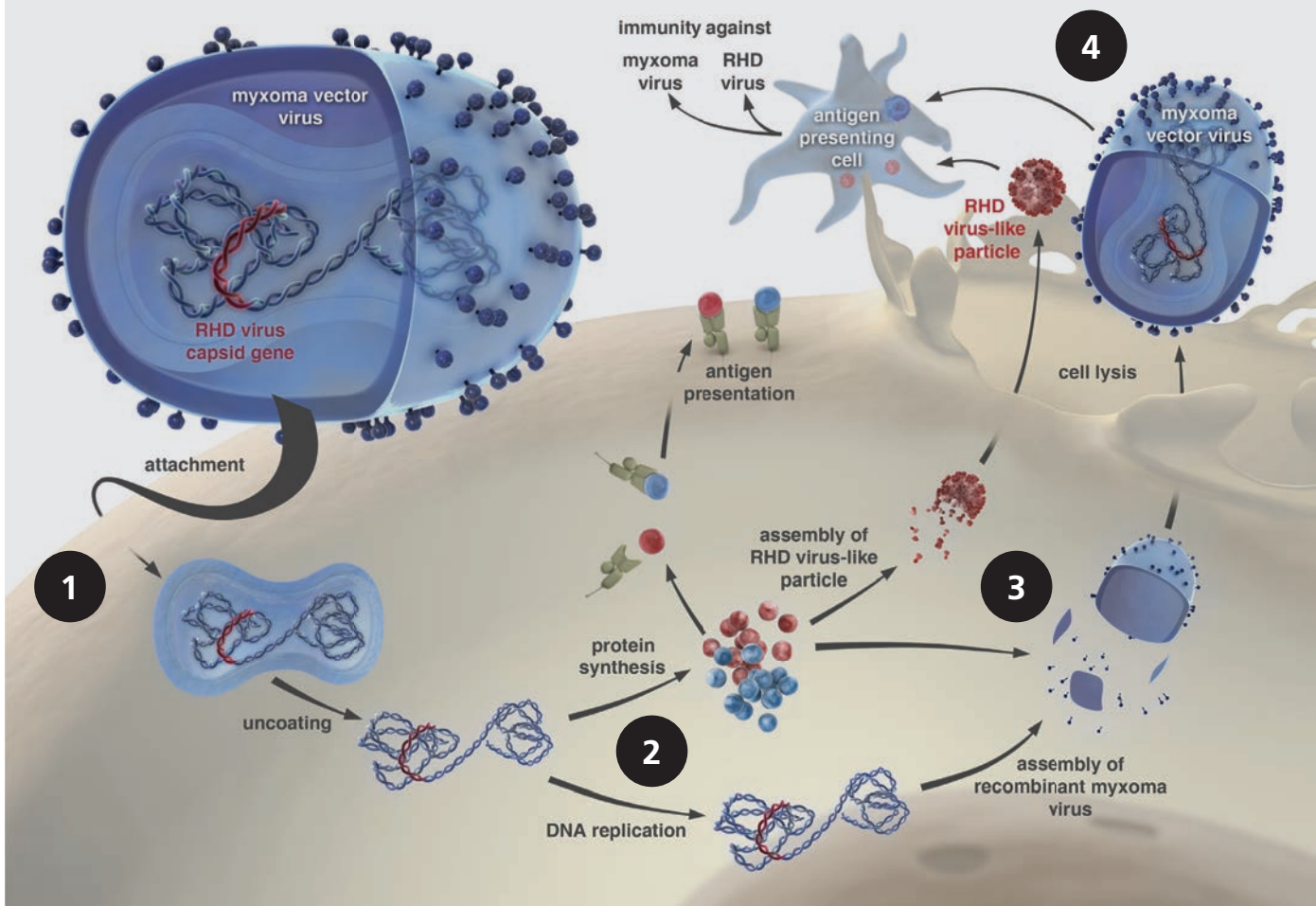
Cells infected with the vaccine virus will produce myxoma virus particles as well as RHD capsid antigen, resulting in an immune response to both.

BENEFITS

- A **single vaccination** provides immunity within 3 weeks
- The vaccine **has a one year duration of immunity** against both myxomatosis and RHD
- Can be given from **5 weeks of age** onwards
- Available in **single dose vials** (with peel-off labels)
- Fully efficacious after **subcutaneous injection**: no need to vaccinate by the intradermal route
- The vaccine does not contain any adjuvant or preservative

1. A Myxo-RHD vaccine virus enters a host cell.
2. After entry the Myxo-RHD vaccine virus DNA is replicated and viral proteins including the RHDV capsid proteins are synthesised.

3. Inside the cell both infectious myxoma virus vaccine particles and non-infectious RHDV capsid "virus like" particles are produced.
4. The infected cell dies and lyses releasing both types of particles to further stimulate the immune system.



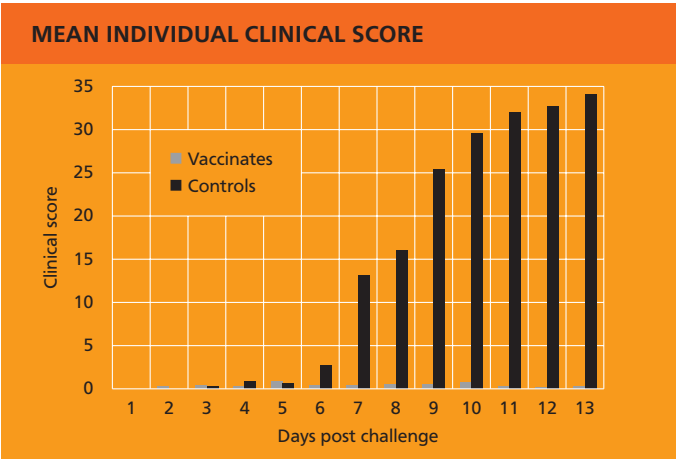
Efficacy of Nobivac Myxo-RHD

Myxomatosis challenge study²

Sixteen, four-to-five week old rabbits were divided into two groups:

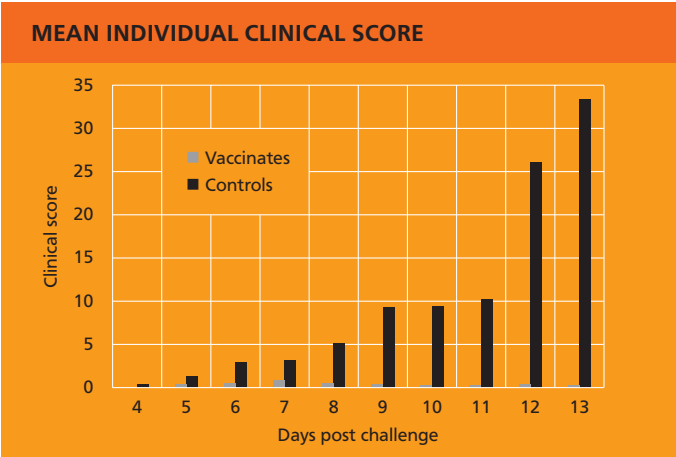
- 11 injected subcutaneously with a single dose of vaccine
- 5 left unvaccinated

Twenty-four days post vaccination all rabbits were challenged with virulent myxoma virus and monitored for any subsequent signs of myxomatosis. The following chart shows the mean daily individual clinical scores for the vaccinate and control groups.



Myxomatosis – 1 year duration of immunity³

Ten rabbits were vaccinated with a minimal vaccine dose. One year post vaccination they were challenged with virulent myxoma virus together with 5 unvaccinated controls and scored for clinical signs of myxomatosis. The following chart shows the mean daily individual clinical scores for the vaccinate and control groups.



One unvaccinated rabbit died 5 days after challenge. All four remaining unvaccinated rabbits developed severe signs of myxomatosis and were euthanased at 14 days post challenge. Some vaccinated rabbits showed very minor, transient signs (swelling of the eyelids and/or genitalia).

RHD challenge study²

Sixteen, 11 week old rabbits were divided into two groups:

- 10 injected subcutaneously with a single dose of vaccine
- 6 left unvaccinated

Three weeks post vaccination all rabbits were challenged with virulent RHDV. They were monitored daily for signs of RHD.

Five of the six unvaccinated rabbits either died suddenly or had to be euthanased within 24-36 hours post challenge.

However, none of the vaccinated animals showed any clinical signs of RHD.

RHD – 1 year duration of immunity³

Ten rabbits were challenged with virulent RHDV, 13 months after vaccination, together with 5 unvaccinated controls.

All unvaccinated rabbits either died or were euthanased for welfare reasons within two days of challenge. All vaccinated rabbits remained healthy with no signs of malaise or other changes in demeanour.



AN OUTSTANDING SAFETY PROFILE

As a result of deleting two virulence factors, the vaccine virus can infect the skin at the site of injection and the draining lymph node but it cannot spread around the tissues of the animal. This results in a vaccine with minimal side effects.

In safety studies carried out with the vaccine, doses of up to 10⁷ffu (10x the maximum dose) have been administered with no adverse reaction. The vaccine virus did not disseminate to the typical sites of replication of wild type myxoma virus such as the skin around the eyes, ears and genitalia.

Supporting your customers and your practice

Nobivac Myxo-RHD comes with the range of support materials you would expect from MSD Animal Health.

1. Vaccination certificates and Booster Reminder Postcards
Users of Nobivac dog and cat vaccines can use the Chameleon online print service to design and print rabbit vaccination certificates and booster reminder cards.

2. The importance of vaccination for your rabbit
Client leaflet explaining the benefits of vaccination against myxomatosis and RHD.

(Available to order in hard copy from your MSD Animal Health Account Manager. Can also be viewed online in the 'Caring for your Rabbits' section of www.msd-animal-health.ie and in the 'I'm an Animal Owner' tab of www.myvetonline.ie)

3. Caring for your rabbits
Comprehensive brochure discussing all aspects of keeping a rabbit, including information on:

- Where to get a rabbit
- Housing and house training of rabbits
- Nutrition
- Preventive health care including vaccination
- Common rabbit diseases

This brochure was written by a well known rabbit expert and contains the latest insights about keeping rabbits healthy and happy.

(Available to view online in the 'Caring for your Rabbits' section of www.msd-animal-health.ie and in the 'I'm an Animal Owner' tab of www.myvetonline.ie)

3.

Caring For Your Rabbits

MSD Animal Health

1.

2.

The importance of vaccination for your rabbit

MSD Animal Health



PRODUCT INFORMATION

Composition

Nobivac Myxo-RHD contains at least 10^{3.0} FFU of live myxoma vectored RHD virus strain 009 per dose. The vaccine strain is a myxoma virus expressing the capsid protein gene of rabbit haemorrhagic disease virus. As a consequence rabbits are immunised against both myxoma virus and rabbit haemorrhagic disease virus.

Indications for use

For active immunisation of rabbits from 5 weeks of age onwards to reduce mortality and clinical signs of myxomatosis and to prevent mortality due to Rabbit Haemorrhagic Disease. Onset of immunity is 3 weeks, duration of immunity is 1 year.

Amounts to be administered and administration route

After reconstitution, administer 1 dose of vaccine by subcutaneous injection to rabbits from 5 weeks of age onwards. After reconstitution use the vaccine within 4 hours. Revaccinate annually.

Special precautions for use

Vaccinate healthy rabbits only. Rabbits with pre-existing immunity against myxomatosis, may not develop a proper immune response against Rabbit Haemorrhagic Disease following vaccination.

Use Medicines Responsibly

Legal Categories: ROI: **POM** NI: **POM-V**

Adverse reactions

A transient temperature increase of 1-2°C can occur. A small, non-painful swelling (maximum 2 cm diameter) at the injection site is commonly observed within the first two weeks after vaccination. The swelling will resolve completely by 3 weeks after vaccination.

Use during pregnancy and lactation

Studies involving the use of the vaccine during early pregnancy were inconclusive, therefore vaccination is not recommended during the first 14 days of pregnancy. No safety study on the reproductive performance has been conducted in male rabbits (bucks). Therefore, the vaccination of breeding bucks is not recommended.

Interaction with other medicinal products

Do not mix with any other veterinary medicinal product, except the solvent supplied for use with the vaccine. No information is available on the safety and efficacy of this vaccine when used with any other veterinary medicinal product. A decision to use this vaccine before or after any other veterinary medicinal product therefore needs to be made on a case by case basis.

Storage

The vaccine should be stored in a refrigerator, the solvent can be stored at room temperature or in a refrigerator.

Additional Information

After infection with virulent myxoma virus some vaccinated animals may develop a few very small swellings, especially on hairless places of the body, which quickly form scabs. The scabs usually disappear within 2 weeks after the small swellings have been observed.

These scabs are only observed in animals with active immunity and have no influence on the general health, appetite or behavior of the rabbit.

References

1. CICADA survey carried out in the UK
2. Spibey, N. et al. (2011), A novel bivalent vectored vaccine is effective in preventing myxomatosis and rabbit haemorrhagic disease, accepted for poster presentation at WSAVA
3. Data on File (study code MXR/0001/03)

