ONE VACCINE
TRIPLE PROTECTION

INTRODUCING

Nobivac® Myxo-RHD PLUS

MSD Animal Health

SERIOUS **VIRAL DISEASES**

Until now, current practice required two annual vaccines to protect rabbits against myxomatosis and both strains of rabbit haemorrhagic disease (RHD): RHDV-1 and RHDV-2*.

Rabbit disease timeline

1953

Myxomatosis was introduced to the UK in 1953.

1992

By 1992 RHD became prevalent in the UK.

In 2011 Nobivac Myxo-RHD was launched making protecting pet rabbits against both serious diseases simpler than before.

80–90%

Both diseases cause significant mortality amongst both domestic and wild rabbit populations[1].

THE EMERGENCE **OF RHDV-2**

In 2010 a variant strain of RHD emerged in France: RHDV-2[2].

This strain spread rapidly, becoming prevalent in the UK by 2013 and causing mortality amongst wild and domestic rabbits.

Antigenic differences between RHDV-1 and RHDV-2 necessitated additional vaccination to fully protect rabbits against RHD.

Vaccination against RHDV-2 first available in the UK in 2016.

This meant that rabbits were required to make two separate visits to the practice to vaccinate comprehensively against both myxomatosis and RHD.

A SIGNIFICANT **THREAT**

Since emergence in 2013, RHDV-2 has been the dominant virus causing RHD in the majority of European countries.

- RHDV-2 has a distinct antigenic profile with a capsid protein sequence of around 80% identity when compared with the classic RHDV-1 virus[3]
- RHDV-2 spread throughout Europe within 1 year, causing a crash in both domestic and wild populations[4]
- During this time the virus was rapidly evolving and isolates have been identified with an increasing mortality rate[3]
- RHDV-2 has been shown to have a broader host range, with proven fatalities in hares[3]
- RHDV-2 inflicts mortality in younger rabbits less than 8 weeks of age, that would be typically resistant to the classic RHDV-1 virus[5]

RABBIT VACCINATION **IN THE UK**

Vaccination rates amongst UK pet rabbits are worryingly low, particularly for RHDV-2, putting many rabbits at risk of these fatal diseases.

- Rabbits are rarely seen in practice, only making up 2% of the vet-visiting pet population[6]
- Primary vaccination rates for rabbits are significantly lower than for dogs and cats with surveys suggesting that less than 50% of rabbits receive initial vaccination[7]
- 40% of vaccinated rabbits are estimated not to be protected against RHDV-2
- The inconvenience of returning to practice for a second vaccine exacerbates poor compliance
- Stress is an important consideration when rabbits visit practices. Steps to reduce stress in vet-visiting rabbits are important (see tips below) so reducing the number of visits needed is helpful

Top tips for keeping rabbits comfortable in practice:

- Familiarise the rabbit with the carrier before travelling
- Ensure the carrier is comfortable, e.g. provide a towel or other suitable soft surface
- Keep the rabbit occupied with treats
- If the rabbit has a companion, bring both rabbits at the same time

For more client support visit www.nobivacmyxorhdplus.co.uk

NEW COMBINATION.
UNIQUE VECTOR APPROACH

INTRODUCING

Nobivac® Myxo-RHD PLUS

The FIRST and ONLY rabbit vaccine indicated for protection against myxomatosis as well as both classic (RHDV-1) and variant (RHDV-2) strains responsible for rabbit haemorrhagic disease*.

The unique vector construction of Nobivac Myxo-RHD PLUS enables protection against all three viral threats, delivering unprecedented triple protection from a single annual vaccine.

Unique live myxoma vector vaccine:

Low volume vaccine providing 12-month coverage:

- 0.5 ml vaccine
- Broad protection
- Single dose

With a single dose enhancing convenience, there is a greater chance of improving compliance while reducing stress for both the rabbit and owner.

Dual-vector technology:

- Non-adjuvated vaccine
- Stimulation of both humoral and cell-mediated immunity
- No requirement for live rabbits during manufacture
- The attenuated myxoma strain is disabled by the inactivation of two virulence genes: MGF and M11L

Myxoma virus and classic RHDV-1

Nucleic acid derived from the RHDV-1 capsid gene is inserted into the myxoma virus vaccine strain to create a myxoma virus vector vaccine strain (strain 009). This is the identical strain used for the original Myxo-RHD vaccine.

Myxoma virus and variant RHDV-2

Using the same vector approach the capsid gene of RHDV-2 is inserted into the myxoma virus vaccine strain to create a second myxoma virus vector vaccine strain (strain MK1899).

The two vector strains are physically combined to produce the final vaccine

The result: a new vector vaccine that will stimulate immunity against myxomatosis, classic RHDV-1 and variant RHDV-2.

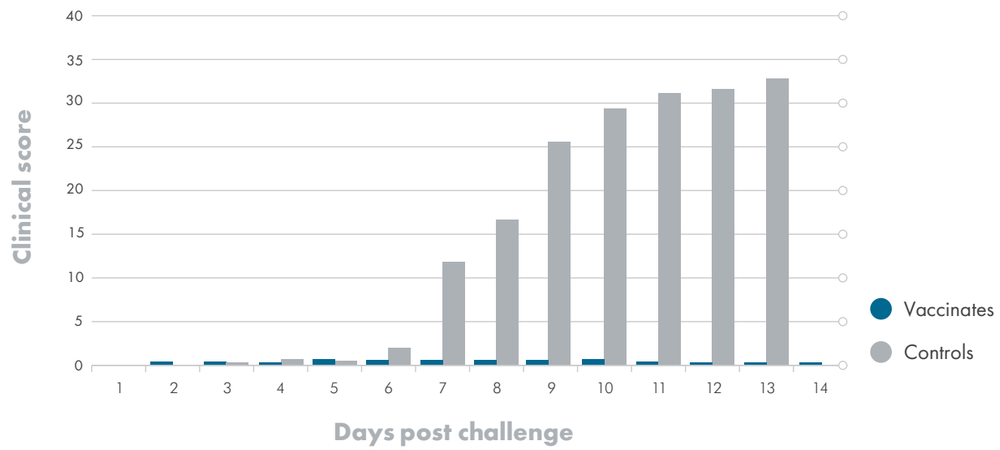
CLINICALLY STUDIED.
PROVEN EFFICACY

Challenge study against myxomatosis[8]

METHODS

- 11 vaccinates, 5 unvaccinated controls (4-5 weeks old)
- Vaccinated with a minimum titre dose of Nobivac Myxo-RHD (10^5 ffu)
- All rabbits were challenged at 24 days post-vaccination with a virulent myxoma virus strain

Mean individual clinical scores



RESULTS

- All controls developed signs of myxomatosis
- 1 vaccinate developed acute enteritis (mucoid enteropathy) unrelated to the myxoma virus challenge
- All other vaccinates were free of clinical signs except for minor rectal temperature fluctuations

Challenge study against RHDV-1 and RHDV-2[9]

METHODS

- 45 rabbits divided into six groups
- Vaccinated with a minimum titre dose of Nobivac Myxo-RHD PLUS or solvent, at either 5 weeks or 9 weeks of age
- Challenged 3 weeks or 7 weeks after vaccination with either RHDV-1 or RHDV-2

Vaccination challenge against RHDV-1 and RHDV-2

GROUP	NUMBER OF RABBITS	AGE AT VACCINATION	VACCINATED WITH	AGE AT CHALLENGE	CHALLENGE STRAIN	MORTALITY DUE TO RHD
1	10	5 weeks	Nobivac Myxo-RHD PLUS	12 weeks	RHDV-1	0% (0/10)
2	5	5 weeks	Solvent	12 weeks	RHDV-1	100% (5/5)
3	10	9 weeks	Nobivac Myxo-RHD PLUS	12 weeks	RHDV-1	0% (0/10)
4	5	9 weeks	Solvent	12 weeks	RHDV-1	100% (5/5)
5	10	5 weeks	Nobivac Myxo-RHD PLUS	8 weeks	RHDV-2	0% (0/10)
6	5	5 weeks	Solvent	8 weeks	RHDV-2	100% (5/5)

RESULTS

- All controls showed severe signs of RHD within three days of challenge
- No vaccinates showed any clinical signs of RHD

SWITCHING RABBITS THAT HAVE BEEN PREVIOUSLY VACCINATED ONLY WITH NOBIVAC MYXO-RHD

Nobivac Myxo-RHD PLUS has proven efficacy in naïve rabbits and effectively boosts rabbits previously vaccinated against myxomatosis, RHDV-1 and RHDV-2. However, please note that Nobivac Myxo-RHD PLUS vaccine product labelling also includes the following statement:

Rabbits that have been vaccinated previously with another myxomatosis vaccine, or that have experienced natural myxomatosis infection in the field, may not develop an adequate immune response against rabbit haemorrhagic disease following vaccination.

This statement relates to the phenomenon of *vector interference* which is very relevant to a very specific subset of rabbits being switched over to the new vaccine. Based on the results of efficacy and switching studies, an optimum approach to avoid this potential risk in all relevant groups is laid out opposite.

How to switch:

GROUP 1

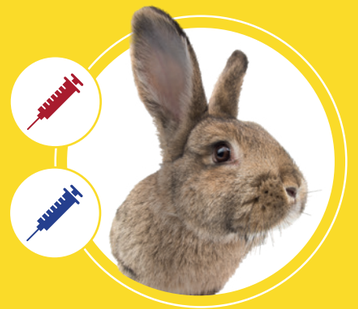
Naïve rabbits

Vaccinate with Nobivac Myxo-RHD PLUS from 5 weeks of age (7 weeks for a full 12-month duration of immunity).

GROUP 2

All rabbits previously vaccinated with Filavac or Eravac*

*in addition to or without previous vaccination with Nobivac Myxo-RHD



Boost with Nobivac Myxo-RHD PLUS when next vaccine booster falls due, then boost annually.

GROUP 3

Rabbits previously vaccinated only with Nobivac Myxo-RHD

Vaccinate with an inactivated RHDV-2 vaccine (i.e. Eravac (Hipra) or Filavac (CEVA)) as soon as possible.

Consider the optional use of Nobivac Myxo-RHD this year (while stocks are available) if the myxomatosis booster is also due at around the same time as the RHDV-2 vaccination.

For boosters due later this year and all subsequent boosters, use Nobivac Myxo-RHD PLUS.

Annual boosters for all groups of rabbits in all subsequent years can be managed successfully with Nobivac Myxo-RHD PLUS.

INTRODUCING

Nobivac® Myxo-RHD PLUS

TRIPLE PROTECTION.
ONE CONVENIENT VACCINE.

- Efficacious against myxomatosis and two different forms of RHD: classic (RHDV-1) and variant (RHDV-2)
- Protection against all three viral threats is made possible by the vaccine's unique dual vector-vaccine formulation
- Full protection from just one visit to practice

To learn more about Nobivac Myxo-RHD PLUS, access to client support and disease information, **visit www.nobivacmyxorhdplus.co.uk.**

Nobivac®
Protection unites us.

1. Rabbit Haemorrhagic Disease. OIE Technical Disease Card (updated January 28, 2019)

2. Le Gall-Reculé G, Lavazza A, Marchandeau S, et al. Emergence of a new lagovirus related to rabbit haemorrhagic disease virus. *Vet Res.* 2013;44:81

3. Capucci L, Cavadini P, Schiavitto M, Lombardi G, Lavazza A (2017). Increased pathogenicity in rabbit haemorrhagic disease virus type 2 (RHDV-2). *Vet Rec,* 180 (17) 426

4. Rouco C, Aguayo-Adán JA, Santoro S, Abrantes J, Delibes-Mateos M (2019). Worldwide rapid spread of the novel rabbit haemorrhagic disease virus (GI.2/RHDV2/b). *Transboundary Emerging Diseases,* Vol 66, July 2019, pp.1762-1764

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6. Sánchez-Vizcaíno F, Noble P-JM, Jones PH, Menacere T, Buchan I, Reynolds S, Dawson S, Gaskell RM, Everitt S and Radford AD (2017). Demographics of dogs, cats, and rabbits attending veterinary practices in Great Britain as recorded in their electronic health records. *BMC Veterinary Research,* Vol 13, p218

7. PDSA PAW Report 2019: https://www.pdsa.org.uk/getinvolved/our-campaigns/pdsa-animal-wellbeing-report (1/4/2020)

8. Spibey N, McCabe VJ, Greenwood NM, Jack SC, Sutton D, van der Waart L (2012). Novel bivalent vectored vaccine for control of myxomatosis and rabbit haemorrhagic disease. *Vet Rec,* 170:309

9. Study Report 18R/0118, MSD Animal Health

* Nobivac® Myxo-RHD PLUS contains live myxoma vectored RHD virus strains 009 and MK1899 for active immunisation of rabbits from 5 weeks of age onwards to reduce mortality and clinical signs of myxomatosis and rabbit haemorrhagic disease (RHD) caused by classic RHD virus (RHDV-1) and RHD type 2 virus (RHDV-2). **POM-V.**

Further information is available from the SPC, Datasheet or package leaflet.
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Advice should be sought from the medicine prescriber.
Use medicines responsibly.

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