BRC Update on

New Variant Rabbit Haemorrhagic Disease (RHDV2)

Date: 03 August 2017

INTRODUCTION

Following the first BRC reported cases of RHDV2 in late 2015 and subsequent information provided *via* various media, we provide below an update of the situation with respect to vaccination options, current epidemiology and recommended actions that BRC members should consider. The BRC's position remains that vaccination of stock against RHDV2 and RHDV1 is "**STRONGLY RECOMMENDED**".

VACCINES

Two vaccines are now approved in the UK and available from most vets; **Filavac** and **Eravac** (previously marketed and known as Cunipravac). Filavac is available in single and dual formulations: (i) "VHD Variant" that only protects against RHDV2, or (ii) as "Filavac VHD K C + V" which is a dual RHDV-1 and RHDV-2 vaccine and is the most commonly prescribed in the UK and Europe. Key information is provided in Table 1 which is complemented by further information and references herein.

Eravac is an oil-based vaccine effective against RHDV2 and is available in 10 and 40 dose vials.

COST, THE SUPPLY CHAIN & SAFETY

Many fanciers are able to now obtain vaccine at reasonable prices for bulk dose vials and some vets have been very responsive to our needs.

The vaccines (Table 1) are produced from live viral particles and deactivated so cannot actually cause disease following administration via subcutaneous rabbit injection, however only healthy rabbits should be given the vaccine.

The vaccine supply chain involves refrigeration transportation from production to its eventual administration. The vaccine is an inactivated protein and will be ruined and **not viable** if not kept refrigerated and suitably transported. In addition, sub-sampling (part use) of large-dose vials is not recommended since bacterial contamination of the vial can also result in ruining the vaccine and rendering its activity and viability. As such, the BRC also recommends that fanciers should only purchase vaccine from registered vets and ensure appropriate refrigerated transportation is used following collection for the self vaccination of stock.

VACCINATION OF PREGNANT & NURSING DOES AND KITS

Filavie have supplied extracts from their registration documents that confirm that Filavac is well tolerated in pregnant and nursing does with no adverse effects. Their MA Dossier confirms that, "*no statistically significant differences were observed between control and vaccinated groups*". Hipra, the manufacturer of Eravac have not yet published their latest findings on length of effectiveness of safety of use on pregnant or lactating does.

As shown in Table 1, the vaccination of kits varies with respect to vaccine and age of vaccination. The data and information has been extracted from the respective product information sheets and reputable sources. The data is supported by regulated clinical testing such that is it validated. However, there is new ("off-label") information that supports the vaccination of kits less than 10 weeks old is viable with **Filavac VHD K C + V** but will require a subsequent booster to ensure continued protection.

Although the availability of large dose vials has been of enormous benefit, the vaccination of small numbers of kits provides a challenge. We are in contact with the manufacturers to explore how smaller dose vials can be made available and at a comparable cost. Fanciers should continue to explore forming consortia such that they can share vaccine and help each other protect stock and keep vaccination costs reasonable.

Table 1: Key Information on Filavac and Eravac Vaccines

Information/Vaccine		**Filavac VHD Variant (Single RHDV2)**	**Filavac VHD K C + V (Dual RHDV1 & 2)**	**Eravac* (Dual RHDV1 & 2)**
Pack Sizes		40 doses 100 doses	1 dose 50 doses 200 doses	10 doses 40 doses
Type of vaccine		Inactivated, Freeze-dried vaccine	Inactivated, Freeze-dried Vaccine	Inactivated, Oil emulsion
Virus Strain	**RHDV-1 (Classic)**	X	RHDV, Strain IM.507.SC.2011	X
	RHDV-2 (Variant)	RHDV-2 Strain LP.SV.2012	RHDV-2 Strain LP.SV.2012	RHDV-2 Strain V-1037
Adjuvant		Aluminium hydroxide	Aluminium Hydroxide	Mineral Oil
Route of Administration		Subcutaneous (0.2 ml)	Subcutaneous (0.5 ml for 1 dose; 0,2 ml for 50/200 doses)	Subcutaneous (0.5 ml)
Protection after		7 days	7 days	7 days
Booster needed		Yes, after 6 weeks	6 Months – High risk 12 Months – Low risk	Yes, after 6 weeks
Vaccination interval		6 months (high risk) 12 months (low risk)	6 months (high risk) 12 months (low risk)	6 months
Minimum age for vaccination		4 Weeks	10 Weeks	30 days + 6 weeks OR 10 weeks + booster
Storage life following opening		2 Hours	2 Hours	8 hours
Reported side effects		Possible local vaccination reaction (nodules up to 3 mm in diameter) that are palpable after 52 days following vaccination	Possible local vaccination reaction (nodules up to 3 mm in diameter) that are palpable after 52 days following vaccination	Minimal transient temperature rise (<1 deg.C) 2-3 days following vaccination, resolves within 24 h
Other Safety Remarks				Accidental human injection can result in severe pain and swelling. Seek medical assistance immediately.

***Previously marketed as "Cunipravac"**

EPIDEMIOLOGY

The BRC continues to liaise with The Rabbit Welfare Association & Fund (RWAF) and share information on suspected and reported cased of RHD. During recent weeks and driven by the hot weather, there has been a substantial increase in cases compared to the same period last year (Table 2).

Table 2: Confirmed and Suspected cases of RHD in the UK (May – July 2017).

Month	Confirmed cases	Suspected cases
May 2017	Burnley, Crediton, Ewell, Forest of Dean, Great Notley, Hereford, Longlevens, Gloucester, Lydney, Manchester M24, Newbury, Newport, Northampton NN5, Plymouth, Sandwich, Stoke-on-Trent, Sunbury, Thatcham.	Barnsley, Braintree, Burgess Hill, Burnley, Gloucester, Hailsham, Halstead, another Halstead, Hastings, Horsham, Oswestry, Romford, St Albans, Tiptree, Tunbridge Wells, Worthing, Yate.
June 2017	Bristol, Burgess Hill, Chorley, Dublin, Gloucestershire, Guernsey, Hampshire, Hereford, Sale, Sible Hedingham, Sussex, Wellington, Wigan	Bewdley, Brandon, Cardiff, Chelmsford, Cork, East Molesley, Gwent, Hastings, Hatfield Peverel, Hereford, Mildenhall, Oldham, St Helens, Stanford-le-Hope, Windsor, Yateley
July 2017	Abingdon, Altrincham, Andover Bedford, Bishops Stortford, Brecon, Bridgend, Canterbury, nr Canterbury, Chippenham, Crediton, Darlington, DE13, Felixstowe, Galashiels, Hednesford, Hockley, Lancaster, Lymm, Northampton, Peldon, Probus, Shalford, SO40, Sompting, St Austell, St Columb Major, Sunderland, Walsall, Warrington, Weston-super-Mare, Whitstable	Arbroath, Bangor, Barnsley, Barnsley area, Blackpool, Blackwood, Bournemouth, Brentwood, Bristol, Bristol, Bristol/Bath area, Caerphilly, Cheshire, Chester, Chorley, Colchester, Eastleigh, Grampound Road, Helston, Hinkley, Lancaster, Llanwrst, Lydbrook, Milton Keynes, Neath, Newhall, Newport, Pembury, PL17, Powys, Preston, Redhill, Redruth, Roker, Rugeley, Rugeley, Saltash, Sheffield, Sherborne, Strood, Sunderland, Swindon, Telford, Telford, Vale of Glamorgan, West Sussex, Wolverhampton, Yeovil, Yorkshire Dales

DIFFERENCES BETWEEN RHDV1 & RHDV2

Although there appears to be only subtle differences between the two classes of RHD virus (Table 3) they actually translate into substantial differences in behaviour and effect. We have been grateful for data and advice from the Virology Teams at the University of Utrecht (Netherlands) Anses (France). Their data show that RHDV2 has almost completely replaced RHDV1 in France in both wild and domestic populations. The moderate virulence of RHDV2 is probably a selective advantage and may explain its ability to replace highly pathogenic RHDV in wild populations. Also, given the longer time it takes for the RHDV2 virus to cause disease and subsequent death, as well as the lower rates of morbidity and mortality compared to classic RHDV, it is easier for RHDV2 to spread.

Table 3: Clinical Manifestation of RHDV1 (Classical) & RHDV2 (New Variant)

	RHDV1 (Classical)	RHDV2 (New Variant)
Incubation Period	16 hours – 3 days	3 – 5 days
Clinical manifestations	Subclinical Peracute Acute Subacute Chronic (5-10%)	Subclinical Peracute Acute Subacute Chronic (>>10%)
Morbidity	100%	Variable
Mortality	80-90%	5 -70%
Susceptibility	Rabbits >8 weeks	Rabbits >2-3 weeks

FUTURE VARIANTS OF RHD & AWARENESS

The spread of both RHDV1 and RHDV2 were characteristic in that they were first identified in mainland Europe before being identified in the UK and the Netherlands which is consistent with the epidemiological spread of other animal and human diseases. Hence we should see a similar profile for future variants when and if they appear. Our increased vigilance will also maximise our ability to identify any future diseases that may eventually affect the UK rabbit population.
