



The ARBA Rabbit & Cavy Health Committee

Michigan Rabbit Calicivirus (MRCV)

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Any seasoned rabbit breeder is familiar with the devastating disease known as rabbit hemorrhagic disease virus (RHDV) or commonly referred to as rabbit hemorrhagic disease (RHD). As a quick review, RHD is classified as a calicivirus (single stranded RNA virus) and is associated with illness (morbidity) and death (mortality) in 90-100% of rabbits affected with the disease. Domestic and European rabbits are highly susceptible while cottontail rabbits and hares are generally unaffected. RHD was first seen in China in 1984 and has since been found in Europe, Asia, South America, Australia, Mexico, and the UK. Four outbreaks of RHD have been reported in the United States since 2000.

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In December of 2009 a paper was published describing an event in 2001 where a small, privately owned rabbitry in Michigan experienced a fatality rate of approximately 32.5%. The following clinical signs were noted upon gross examination:

- Conjunctival Congestion:** redness around the eyelids.
- Cyanosis of the lips and ear tips:** A blue-purple discoloration due to lack of oxygen.
- Vulvar hemorrhage:** Blood from the vulva.
- Friable, tan, and accentuated lobar pattern in the liver:** Rounded edges of the liver (normal is angular), easily falling apart.
- Icterus:** Yellow discoloration to the skin; jaundice.
- Gastric petechiae and ecchymoses:** Reddened areas of the stomach due to blood vessel rupture.
- Colonic serosal hemorrhage:** Bruised and bloodied areas of the colon and large intestine.
- Multifocal hemorrhage in lung lobes:** Areas of bruising and bloody regions of the lung tissue.

Samples from these deceased rabbits were sent for diagnostic evaluation and further characterization for the nature of death. From these samples, a virus was isolated and used to inoculate a group of study rabbits that were specific pathogen free (SPF). This implies that these rabbits were born without any known prior diseases and thus naïve to the challenge presented with the virus. Of those rabbits inoculated with the virus, the clinical signs observed were limited to decreased activity and a reduction in appetite. This was only seen in a select few of the rabbits inoculated. All other rabbits remained free of the clinical signs described at the initial outbreak in 2001.

Based on this study, it is clear that a naturally occurring disease that is similar in presentation to RHD had been discovered and designated the Michigan Rabbit Calicivirus (MRCV). Because of the percentage of animals affected during the outbreak and the almost complete failure to reproduce the disease in SPF rabbits, MRCV is tentatively being labeled as being low pathogenicity (a very small chance of actually causing disease). The presence of this new disease is a relevant and necessary condition that all rabbit breeders should be aware of and cognizant of when RHD is suspected in a herd. The following table is to summarize the key differences between RHD and

MRCV:

PARAMETER	RHD	MRCV
Mortality (% that die)	90-100%	32.5% in outbreak
Affected age group	Rabbits > 8 weeks of age	Rabbits ≥8 weeks of age
Pathogenicity (potential to cause disease)	High	Low

This article is not meant to undermine the importance of reporting any and all outbreaks of this nature to the USDA if RHD is suspected in your herd. Instead, it is meant to further educate all rabbit breeders that other viruses are being discovered that may resemble RHD but do not have the devastating effects of the reportable disease. Further research will help to better characterize the condition and help describe a more accurate idea of the true pathogenicity, mortality, and morbidity of this virus.

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