Lack of interference after simultaneous administration of a live vaccine against myxomatosis and a new recombinant vaccine against rabbit haemorrhagic disease

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Introduction

Myxomatosis and rabbit haemorrhagic disease are the most important viral diseases in rabbits. Current control measures include the administration of mono- or polyvalent vaccines against these diseases. Previous studies have demonstrated that the simultaneous administration of a live attenuated vaccine against myxomatosis and a conventional inactivated vaccine does not interfere with their efficacy or antibody production.

This study aims to compare the efficacy against myxomatosis, and the serological response produced by the simultaneous administration of two monovalent vaccines for rabbits.

Material and Methods

For this study, two different vaccines were employed: MIXOHIPRA®-H, an attenuated homologous live vaccine for active immunization to prevent infection by the Myxomatosis virus in rabbits; and YURVAC® RHD, a new recombinant vaccine for active immunisation of rabbits from 30 days of age onwards to reduce mortality of rabbit haemorrhagic disease (RHD) caused by classical RHD virus (RHDV) and variant strains (RHDV2), including highly virulent strains.

Group	Vaccine	Route	Challenge
A	MIXOHIPRA®-H	Subcutaneous	Myxomatosis Lausanne strain [10 $CCID_{50}$]
B	MIXOHIPRA®-H + YURVAC®		
C	YURVAC®		

Table 1: Groups distribution.

Thirty, 8-week-old, female, specific pathogen-free New Zealand white rabbits (GSB, Spain), were selected and distributed into 3 groups of 10 animals each (*Table 1*). Group A was vaccinated with 0.5 ml of MIXOHIPRA®-H; Group B was vaccinated with MIXOHIPRA®-H and YURVAC® RHD, administered 0.5 mL of each vaccine at two different administration points; and Group C was vaccinated with 0.5 mL of YURVAC® RHD. All products were administered subcutaneously. During the initial period, one animal from Group A died due to causes unrelated to the study.

At 21 days post-vaccination (dpv), Groups A, B, and C were infected with 10 $CCID_{50}$ of the Lausanne strain of myxomatosis, administered intradermally on the side of the animals. The health status of the rabbits was monitored for 21 days after the challenge. The antibody response against RHDV2 was monitored up to 18 dpv in the blood of all animals using hemagglutination inhibition (HI). The serological results of each group were compared using the Kruskal-Wallis test, with a significance level of 5%.

Results

The challenge with myxomatosis induced clinical symptoms at the administration site and/or general symptoms (e.g., nodules, edema, dyspnea) in 100% of the animals in Group C, which was not vaccinated against myxomatosis. Groups A and B exhibited comparable levels of protection, with a survival rate of 88.89% in Group A and 90% in Group B (*Figure 1*). Additionally, two rabbits from Groups A and B developed mild local reactions (e.g., inflammation, nodule, ulcer, scab or alopecia) at the infection site.

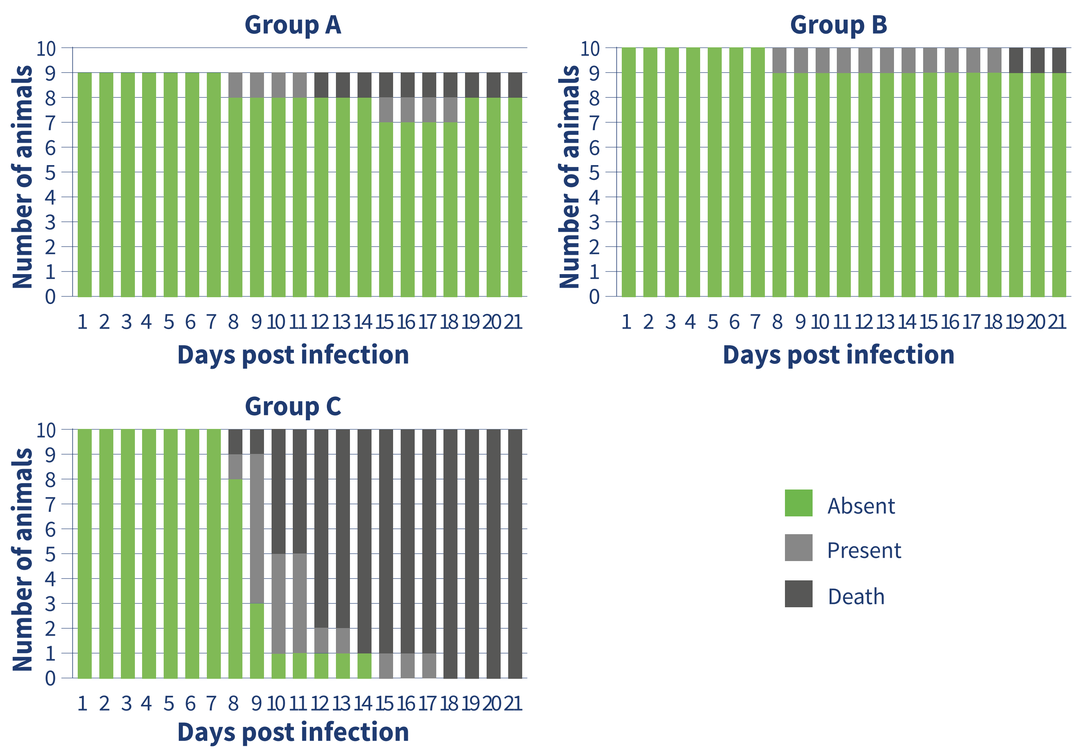

Figure 1: General clinical signs after infection.

Regarding RHDV2 serology, the groups vaccinated with YURVAC® RHD (Groups B and C) showed positive average serological titers at 7 days post-vaccination (dpv), which were sustained until the end of the study. No significant differences ($p>0.05$) were observed between the two groups. Group A remained seronegative throughout the entire study (*Figure 2*).

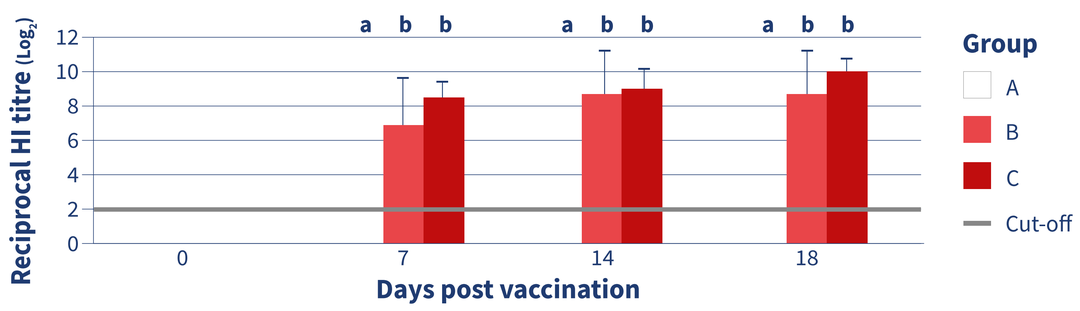

Figure 2: Antibody response against RHDV2 in sera of vaccinated rabbits before the challenge infection with MYXV. Average and standard deviation of the Log2 of the reciprocal HI titres. Different letters indicate a statistically significant difference (Kruskal-Wallis test; n=14-15, $p<0.05$).

Conclusions

Results suggest that the simultaneous administration of MIXOHIPRA®-H and YURVAC® RHD at two different administration points does not interfere with its efficacy against myxomatosis and the ability to produce antibodies against RHDV2. The simultaneous administration of these vaccines makes it possible to offer alternatives to current vaccination plans for rabbits.

These same results were observed in a previous study where MIXOHIPRA®-H and ERAVAC® were administered simultaneously at two different administration points and did not show any interference. On the other hand, it was observed that one trivalent commercial vaccine showed reduced effectiveness in comparison with the aforementioned combination[1].

References

1. Ramirez-Oliveras, Silvia; Baratelli, Massimiliano; Pedrola-Garrido, Patricia; Fontseca-Presta, Mireia; Gascon Torrens, Sandra. (gta 2022). Eficacia de diferentes planes de vacunación frente a mixomatosis. AVEPA. XXI Congreso de Especialidades Veterinarias.