EVALUATION OF THE SEROLOGICAL RESPONSE OF TWO COMMERCIAL VACCINES FOR PREVENTING ENTEROTOXAEMIA IN EWES

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INTRODUCTION

Haemorrhagic enterotoxaemia caused by *Cl. perfringens* type C is a common disease in raising lambs and is a major cause of economic losses in the first few weeks of life. Newborn lambs are orally infected after birth and many of the affected animals die without prior symptoms. The β-toxin is the most important factor in its pathogenesis and it is considered necessary to immunize animals against the toxin. The transfer of antibodies (Ab) via colostrum seems to be protective and detectable. The aim of this study was to compare the response to vaccination, in terms of seroconversion, of two commercial vaccines for preventing enterotoxaemia, when administered in ewes. A vaccination and revaccination protocol was applied ante partum, the purpose of which was to achieve a maximum peak of antibodies on the date of lambing to enable transfer of immunity via colostrum.

MATERIAL AND METHODS

We used a total of 33 primiparous ewes, free of antibodies against the β-toxin. They were randomly distributed into 3 experimental groups: Group A (n = 8), vaccinated with product M, Group B (n = 15) vaccinated with the product Toxipra® Plus; Group C (n = 10) was the control group. The study was conducted under double-blind conditions. The animals were vaccinated 6 weeks before the expected date of parturition (D0) and revaccinated 3 weeks later (D21). The control group received 2 ml of placebo on the same dates. Blood extractions were taken from the animals on days D0, D21, D42, D56, D70 and D98 to determine the degree of seroconversion against the β-toxoid of *Cl. pergringens* (IgG) by an in-house ELISA for evaluating specific antibodies against the β-toxoid of *Cl. perfringens* in sheep serum.

Table 1. Tasks carried out in the animals.

Task	Day of study					
	0*	21*	42**	56	70	98
Vaccination	X	X				
Blood extraction (IgG serology)	X	X	X	X	X	X

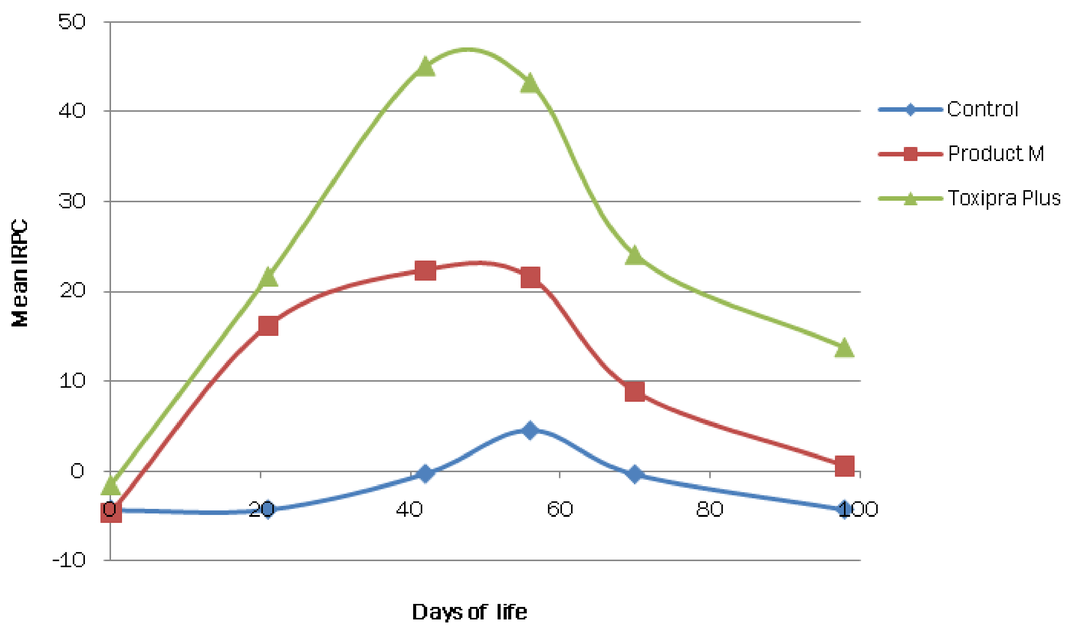
* Day of vaccination and revaccination. * * Expected date of parturition

A statistical analysis was performed using a non-parametric Mann-Whitney test to compare the evolution of the titres of antibodies of the various experimental groups.

RESULTS

The results of serum antibodies against the β-toxin, in ewes, are shown in Figure 1, where it can be seen that after the first vaccination, from D21 onwards, the animals in groups A and B had a higher concentration of antibodies than animals from the control group ($p < 0.05$). The differences were significant in comparison with the control group throughout the study. After the second vaccination, the increase of antibodies was more marked in group B (Toxipra® Plus) than in group A (vaccine M). Statistically significant differences between these two groups were observed by day D42 ($p = 0.013$), D56 ($p = 0.013$), D70 ($p = 0.015$) and D98 days ($p = 0.044$). The highest levels of antibodies in both vaccinated groups were detected at the time of lambing (D42).

Figure 1. Levels of Ab against the β-toxin of *Cl. perfringens*.



The results are expressed as average values per group and date.

DISCUSSION

Both vaccines induced a significant immune response, compared with the control group, under the proposed vaccination programme. However, the response induced by the two vaccines was different. The vaccinated group, Toxipra® Plus, showed a significantly higher immune response than the group treated with vaccine M, from day D42 to the end of the study (D98).

CONCLUSIONS

The vaccination schedule of 6 and 3 weeks prepartum with the tested vaccines is optimal for achieving maximum titres of β-toxoid anibodies at the time of birth in sheep previously free of Ab. The study of the levels of Ab in their progeny should corroborate the hypothesis that these higher titres of antibodies would produce better immunization of lambs and greater protection against challenge. The study also shows that not all commercial vaccines were able to induce the same immune response.

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Oral communication presented at the XXV SEOC Conference. Valladolid, September 2010

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