

Cross reactivity antibody response after vaccination with modified live and killed bovine viral diarrhea virus (BVD) vaccines

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INTRODUCTION

- ✓ Bovine viral diarrhea virus (BVDV) is a member of the genus *Pestivirus* and it is associated with various morbid forms.
- ✓ 3 distinct species, namely BVDV-1, BVDV-2 and HoBi-like virus (BVDV-3), have been described [1-2].
- ✓ In Italy, the presence of at least 14 different genotypes of BVDV-1 has been recorded, BVDV-2 is a sporadic event and BVDV-3 represents the new emerging species.
- ✓ In our country, the high level of genetic heterogeneity of BVDV, associated with high viral circulation despite the frequent use of vaccination, raises a question concerning the real ability of vaccines to totally protect against different circulating BVDV genotypes.



- ✓ The aim of the present work was to verify whether animals immunized with different licensed vaccines would have developed a protective humoral immunity also against viral genotypes other than those contained in each vaccine.

MATERIALS AND METHODS



- ✓ 100 adult cattle free from BVDV were divided into 4 groups, each immunized with a different vaccine: (i) Bovilis® BVD (C86, BVDV-1a), (ii) Rispoval BVD® (RIT4350, BVDV-1b), (iii) Mucosiffa® (Oregon C24V, BVDV-1a), and (iv) Bovela® (KE-9, BVDV-1b).
- ✓ Cross neutralization tests by using sera collected 28 days after vaccination, were set up on MDBK cell line and using four different BVDV-1 genotypes as test virus, including the homologous one, to assess the degree of cross reactivity.
- ✓ The protocol adopted for serum neutralization test was that described in the OIE Manual for diagnostic tests and vaccines for terrestrial animals [3].
- ✓ The results were evaluated and compared using Wilcoxon tests to assess the presence of statistically significant differences between test results. Data analysis was performed using Stata 11.2 software.

RESULTS

VACCINE	TEST VIRUSES / p-VALUES (*)				
		1a 365/05	1b RIT 4350	1b 3240	1e 7219
BOVILIS	1a NADL	0,0000	0,0011	0,0000	0,0000
	1b RIT 4350	0,0000	0,0000	0,0000	0,0000
RISPOVAL	1a NADL	0,0000	0,3545	0,0000	0,0000
	1b RIT 4350	0,0000	0,0000	0,0004	0,0000
MUCOSIFFA	1a NADL	0,0000	0,0000	0,0000	0,0000
	1b RIT 4350	0,0000	0,0000	0,0004	0,0000
BOVELA	1a NADL	0,0000	0,0000	0,0004	0,0000
	1b RIT 4350	0,0000	0,0000	0,0004	0,0000

Table 1 - Wilcoxon test (p-value), through Napierian logarithm, to evaluate the difference between post-vaccination antibody titers against the homologous virus (or the proxy variable) and other selected test viruses; (*) Statistical significance $p < 0.05$.

CONCLUSIONS

Based on assumption that calves with viral neutralizing titers lower than 1:16 develop severe clinical disease when challenged with a virulent BVDV, our results lead to the conclusion that the four licensed vaccines employed are not able to confer a solid protective immunity against all the BVDV-1 genotypes that can be potentially involved during infection with field strains [3]. In Italy, the insufficient vaccination efficiency, the circulation of at least 14 different genotypes, the absence of national control or eradication plans and the dense network of commercial exchanges, increase the risk of introduction of BVDV in breeding farms and the entry of new viral variants, thus explaining why this disease is so widespread despite the common use of vaccination.

REFERENCES

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