Use of quantitative serology as a new practical tool for veterinarians to follow up BVD status on vaccinated farms.

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INTRODUCTION

Different EU BVD eradication plan schemes are based on 3 elements: biosecurity, detection and elimination of persistently infected animals (PI) and herd monitoring. In many cases additionally systematic vaccination is included[1,2]. Quantitative assay of antibodies against p80 could be a useful tool to determine the BVD status of a vaccinated herd[3,4].

OBJECTIVE

The main objective of this study was to analyze in a larger farm base the practical use of quantitative BVD p80 antibody ELISA to differentiate between the response to field virus circulation and BVD vaccination.

MATERIALS AND METHODS

Serum samples from 50 farms were analyzed by ELISA (IDEXX, BVDV p80 Ab Test). Farms included in the Voluntary ADSG Control Program of Galicia (Spain) were classified by their BVD status: RC (Recent BVD circulation, n=5), BOV (vaccination with inactivated BVD vaccine, Bovilis® BVD, n=40), and LV (vaccinated with live BVD vaccine, n=5). In the vaccinated farms (BOV and LV) no PI animals were detected in the previous two years.

For quantitative study, Inhibition Percentage of the optical density (IP-OD) was used and categorized according to manufacturer's instructions as: negative (>50), doubtful (40-50) or positive (<40). Positive samples were further divided over 4 groups (<10; 10-20; 20-30 ; 30-40).

Quantitative assay of antibodies directed against protein 80 of BVDV are a useful tool helping assess and interpret the BVD status in herds vaccinated with inactivated BVD vaccines.

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RESULTS

A total of 976 serum samples were included in the analysis (101 RC, 780 BOV and 95 LV).

Results of quantitative BVD p80 antibody assay for the samples in the different study groups are shown in **Fig. 1**. Analysis of the distribution of positive results based on the IP-OD result of ELISA in a boxplot, showed patterns that easily allowed to differentiate the positives due to vaccination with the inactivated vaccine (BOV) vs. virus circulation (RC) **(Fig. 2)**.

Moreover, a distribution of the results into four age categories reveled how youngstock pattern (6-18 months old) is even more clear as shown in **Fig. 3** and **Table 1**.

For veterinarians who want to monitor the reduction of BVDV circulation while vaccinating the herd against BVD, the use of an inactivated vaccine may be preferred over a live one.

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FIGURE 1. Results of quantitative BVD p80 antibody assay for the samples in the different study groups (green/blue: different degree of positive results and yellow: negative results).
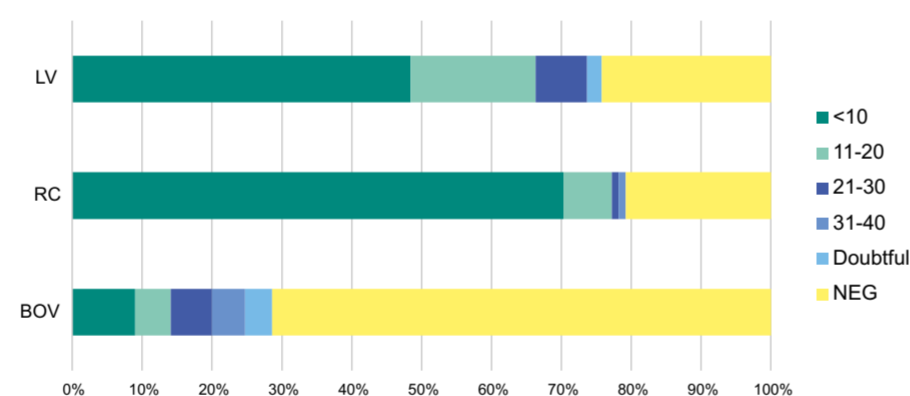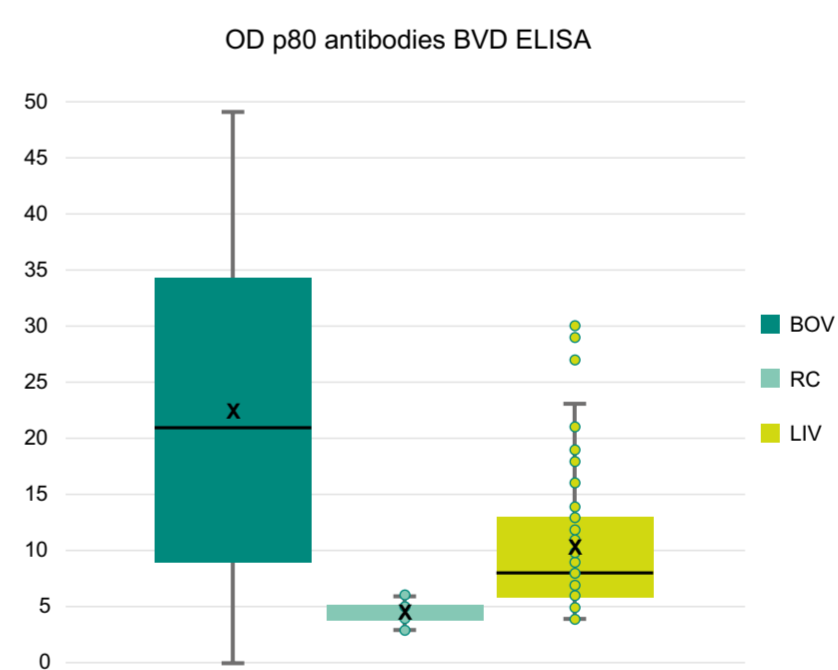

Study groups: RC - recent circulation of BVD; BOV - vaccinated with an inactivated BVD vaccine (Bovilis® BVD) and LV, - vaccinated with a live BVD vaccine.

TABLE 2. Results of quantitative BVD p80 antibody test stratified by age at sampling (2-12, 13-18, 19-24 and >25 months old) in the different study groups.
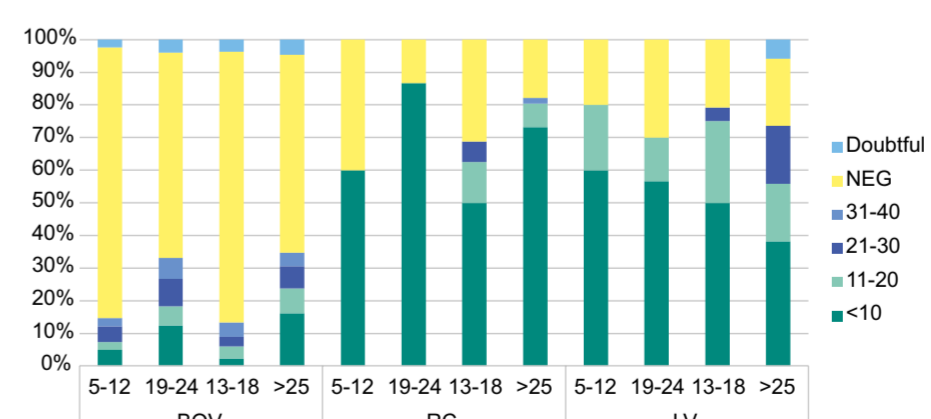
Study Group	Age (months)	P80 Antibodies					
		<10	11-20	21-30	31-40	NEG	Doubtful
BOV	5-12	4.88%	2.44%	4.88%	2.44%	82.93%	2.44%
	13-18	2.23%	3.72%	2.97%	4.46%	82.90%	3.72%
	19-24	12.35%	5.98%	8.37%	6.37%	62.95%	3.98%
	>25	16.18%	7.51%	6.94%	4.05%	60.69%	4.62%
RC	5-12	60.00%	0.00%	0.00%	0.00%	40.00%	0.00%
	13-18	50.00%	12.50%	6.25%	0.00%	31.25%	0.00%
	19-24	86.67%	0.00%	0.00%	0.00%	13.33%	0.00%
	>25	73.21%	7.14%	0.00%	1.79%	17.86%	0.00%
LV	5-12	60.00%	20.00%	0.00%	0.00%	20.00%	0.00%
	13-18	50.00%	25.00%	4.17%	0.00%	20.83%	0.00%
	19-24	56.67%	13.33%	0.00%	0.00%	30.00%	0.00%
	>25	38.24%	17.65%	17.65%	0.00%	20.59%	5.88%

FIGURE 2. Descriptive quantitative data analysis (Box Plot) of IP-OD BVD p80 antibodies in the different study groups.

OD p80 antibodies BVD ELISA

Study groups: RC - recent circulation of BVD; BOV- vaccinated with an inactivated BVD vaccine (Bovilis® BVD) and LV - vaccinated with a live BVD vaccine.

FIGURE 3. Percentage Inhibition of the optical density (IP-OD) for BVD p80 antibodies stratified by age at sampling (2-12, 13-18, 19-24 and >25 months old) in the different study groups.

Study groups: RC - recent circulation of BVD; BOV - vaccinated with an inactivated BVD vaccine (Bovilis® BVD) and LV - vaccinated with a live BVD vaccine.

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