INFECTIOUS DISEASES

Real time PCR (RT-PCR) in pooled blood samples as an economical monitoring technique in cattle populations with low Bovine Viral Diarrhoea Virus (BVDV) prevalence.

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INTRODUCTION

Bovine Viral Diarrhoea represents an important issue for health, productivity and welfare in cattle herds. However, many cattle owners perceive the cost of testing individual animal samples as a barrier to monitoring of the presence of BVDV in their herds.

OBJECTIVE

The aim of this study was to determine whether the use of pooled blood samples and a commercially available real time PCR (RT-PCR) test are suitable for monitoring of BVD virus presence in cattle populations with a low prevalence of animals positive for the presence of BVDV[1,2].

MATERIALS AND METHODS

2701 blood samples collected from 62 different dairy farms located in seven geographical regions of Turkey.

Sample pooled in groups of eight, creating a total of 342 pools.

Nucleic acid extraction from each pool and subsequent RT-PCR were performed using commercially available test kits with appropriate negative and positive controls.

Statistical differences between pools, farms and regions were assessed through Pearson's Chi-square test with p-value >0.05 regarded as statistically significant.

BVDV monitoring by sample pooling and real time RT-PCR can be done very economically when the disease prevalence is low (<10%).

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RESULTS

The presence of BVDV nucleic acid was detected in 18 pooled samples out of 342 pooled samples tested **(Fig. 2)**.

BVDV-positive separate pools represented 11 individual farms, 17.74% of all farms tested.

It was not possible to test individual blood samples within each pooled sample. Therefore, the predictive positive value of the test could not be defined.

The standard approach would be to follow each positive result of a farm-specific pooled sample, with more in-depth antigen-testing down to the level of individual animals.

No statistically significant differences between the regions where BVDV were detected in pools (P = 0.297) **(Table 1)**.

FIGURE 1. Collection of blood sample from a dairy cow on a typical dairy farm in Turkey.

FIGURE 2. Methodology of sampling and testing of pooled samples for BVDV and results.

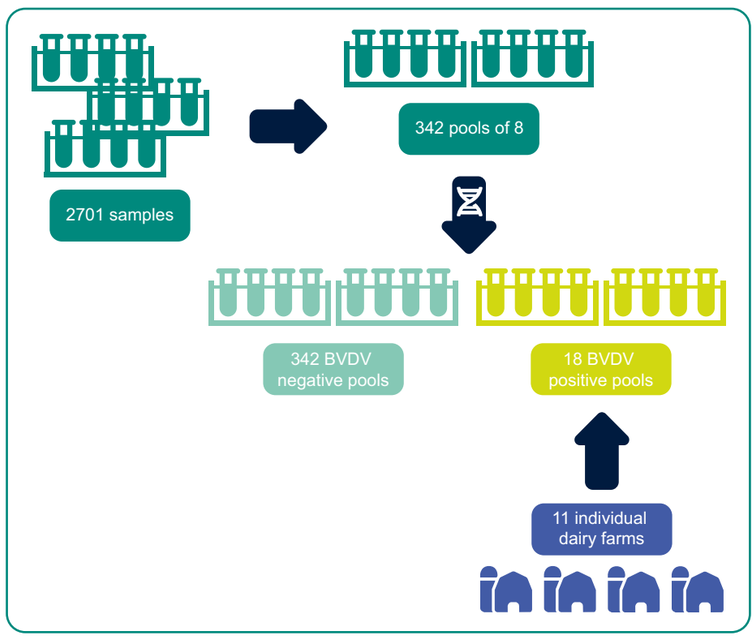

TABLE 1. The distribution and test results for the samples used in the study.

Geographical region of Turkey	Number of blood samples	Number of sample pools	Number of farms	BVDV negative			BVDV negative		
				Blood samples	Sample pools	Farms	Blood samples	Sample pools	Farms
Mediterranean	237	30	9	221	28	7	16	2	2
East Anatolia	106	14	3	90	12	1	16	2	2
Aegean	381	48	7	365	46	5	16	2	2
South-East Anatolia	80	10	1	80	10	1	0	0	0
Central Anatolia	922	116	24	904	113	22	18	3	2
Black Sea	98	13	2	98	13	2	0	0	0
Marmara	877	111	16	811	102	13	66	9	3
Total number (%)	2701 (100)	342 (100)	62 (100)	2569 (95.11)	324 (94.74)*	51 (82.26)*	132 (4.89)	18 (5.26)*	11 (17.74)

* There was no significant difference between the regions where BVDV was detected in pools (p=0.297).

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