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Short communication

Seroprevalence of BHV-1 (bovine herpesvirus type 1) among non-vaccinated dairy cattle herds with respiratory disorders

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Abstract

The objective of this study was to estimate a herd-level seroprevalence of bovine herpesvirus type 1 (BHV-1) in herds with clinical symptoms of the respiratory tract. Eighty-three herds with suspected BHV-1 infection were selected and divided into two categories with respect to their size: small (n=27) and large herds (n=56). Samples were collected from calves, heifers and cows older than 24 months. Seroprevalence was determined using the gB ELISA test. The herd level seroprevalence was estimated as 53% (44/83) in the tested herds, 11.1% (3/27) in the small herds and 73.2% (41/56) in the large herds. Our study suggests that the current biosecurity measures still warrant improvement.

Key words: BHV-1, herd-level seroprevalence, seroconversion, ELISA, dairy cattle

Introduction

In the light of the earlier studies, conducted in Poland by Rola et al. (2011) seroprevalence of BHV-1 was 20.6% in 1996-1998 and 37.7% in 2004-2005. The aim of our study was to determine a herd-level seroprevalence of BHV-1 in dairy cattle herds with respiratory disorders, suspected of BHV-1 infection.

Materials and Methods

The study was conducted in 83 dairy cattle herds (Holstein-Friesian) under a veterinary supervision of the Faculty of Veterinary Medicine in Wrocław (Poland). In all farms the owners observed clinical problems with the respiratory tract (suspicion of BHV-1 infection). The study was conducted in two types of

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Table 1. Description of herds tested.

No. of herds ≤100 cows (n=27)			No. of herds > 100 cows (n = 56)		
Animals	Age	Total count	Animals	Age	Total count
Calves	< 6 months	199	Calves	< 6 months	464
Heifers	6-12 months	215	Heifers	6-12 months	548
Cows	> 24 months	270	Cows	> 24 months	560
Totals		684	Totals		1572
		Totals	2256		

Table 2. Results obtained in small and large herds (n=83), in three age categories.

Herds	Positive calves < 6 months	Heifers 6-12 months	Cows > 24 months	Status of the herd	
				Seropositive	Seronegative
≤100 cows (n=27)	199 tested 20 positive	215 tested 5 positive	270 tested 28 positive	3	24
>100 cows (n=56)	464 tested 311 positive	548 tested 167 positive	560 tested 370 positive	41	15

herds: small (≤100 cows) and large (>100 cows) in three age categories (Table 1). No vaccinations against BHV-1 was performed. Number of serum samples to be collected to confirm the presence of the disease in each animal category was calculated with the Episcope 2.0 software at the assumption of prevalence at the level of 50% and confidence at the level of 95%. Antibodies against BHV-1 were detected using an ELISA test (HerdCheck BHV-1 gB, IDEXX, Scandinavia AB, Sweden) according to the manufactures instruction. A herd was declared positive when at least one animal turned out positive irrespectively of the age category to which it belonged.

Results

Antibodies against BHV-1 were detected in 44 (53%) of the herds tested. Seroprevalence in the small and the large herds was 11.1% and 73.2%, respectively. The overall percentage of seroconversion was 39.93% among the animals examined (n=2256). The prevalence ratio was 6.59 (95% Confidence interval: 2.24 – 19.38). The detailed results are shown in Table 2.

Discussion

Bovine Herpesvirus type 1 (BHV-1) is one of the major pathogens involved in respiratory and reproductive problems of cattle. It is a type of latent infection, where the latency follows primary infection (Lemaire et al. 2000). Herd-level seroprevalence s determined according to specific criteria for the classification of such herds as positive. In Ireland the BHV-1 herd-level seroprevalence was 74.9% and in England 42.3% – 40.0% (Woodbine et al. 2009, Cowley et al. 2011). Our results were similar (53%), however the herd-level seroprevalence was significantly lower in smaller herds (11.1%) compared to large ones (73.2%). The association between the size of herd and seroprevalence was comparable to that reported in other countries e.g. England (Cowley et al. 2011) or Estonia (Rapeeri et al. 2010). It is possible that this tendency results from different herd management. Also, our results confirmed the differences in seroprevalence in different age groups, comparable to those reported in cattle in Germany, Italy and Hungary by Makoschey et al. (2007). From the standpoint of the current legislation, compulsory monitoring of BHV-1 infection in Poland was commenced last year (Regulation of the Minister of Agriculture of 24 June 2010, Journal of Laws 2010, No. 123). The national compulsory IBR eradication programme still needs supplementing. Moreover specific immunoprophylaxis has been allowed in Poland since 2005 (Makoschey et al. 2010). Despite the fact that herd-level seroprevalence has slightly decreased after implementation of a marker vaccine, the current biosecurity measures like introduction of only seronegative new animals or restrictions in animal movement, still warrant improvement of the status of animals.

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