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Short communication

A survey of anti-*Ostertagia ostertagii* antibody levels in bulk tank milk samples (BTM) in dairy herds in Lower Silesia Region (Poland)

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Abstract

This work presents serological evidence of cattle ostertagiosis in the Lower Silesia Region (Poland), based on the measurement of antibodies in bulk tank milk (BTM) samples. It represents the first evidence of this parasite examined with the use of the ELISA test and milk samples in Poland. The prevalence of *Ostertagia ostertagii* antibodies was determined in BTM from 32 dairy cattle herds. Antibodies to *O. ostertagii* were demonstrated in all herds. The optical density ratio (ODR) varied from -0.088 to 1.024. The mean ODR value in the examined region was 0.53.

Key words: *Ostertagia ostertagii*, ELISA, BTM, ODR, Lower Silesia Region, Poland

Introduction

Ostertagia ostertagii infection is probably the most serious parasite in grazing cattle and is widespread in temperate climate regions all over the world. Measurement of antibodies to *Ostertagia ostertagii* in bulk tank milk (BTM) has value as a diagnostic indicator of potential production losses (Forbes at al. 2008). The aim of our study, involving the Lower Silesia Region, was to determine the range of antibody levels specific to *O. ostertagii* and estimate the potential production losses resulting from ostertagiosis.

Materials and Methods

This study was conducted in May of 2009 in the Lower Silesia Region (Poland). BTM samples were taken from 32 randomly selected cattle herds (Table 1). Raw milk samples were taken from the milk tank after morning milking according to Polish standard PN-A-86002:1999. The BTM skim milk samples were tested for the presence of antibodies to *O. ostertagii* using the ELISA test [Svanova®, Sweden] according to the manufacturer's instructions. The test results were expressed as an optical density ratio (ODR). Statistical analysis was performed using the U-Mann-Whitney test.

Results and Discussion

Our results demonstrate for the first time in Poland the seroprevalence of *O. ostertagii*, based on BTM examination. Antibodies specific to *O. ostertagii* were detected in all examined herds. Distribution of the total ODR values is shown in Table 2. The mean BTM

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Table 1. Description of examined herds.

Parameter	Description	
Total examined herds	32	
Herds location	Lower Silesia Region, Poland	
Total count of examined animals	953	
Average herd size (adult lactating cows)	30	
Average age of cows	5.5 years	
Type of enterprise	dairy 32/32	
Average herd milk production	9000 l/ cow/ year	
Minimal and maximal herd milk production	8000-10000 l/ cow/ year	
Antiparasitic prophylaxis (in the last year)	0/32	
Access to pasture*	Yes 19/32	No 12/32
Administration of green fodder/ if no access to pasture (n=12)	Yes 10/12	No 2/12

* one herd was excluded from the analysis because of dual system of maintaining within the herd.

Table 2. Distribution of the total ODR values.

Number of herd	ODR value	Access to pasture	
		Yes	No
1.	1.024	+	
2.	0.593	+	
3.	0.67	+	
4.	0.865	+	
5.	0.721	+	
6.	0.372		+
7.	0.387	+	
8.	0.739	+	
9.	0.902		+
10.	0.702	+	
11.	0.643	+	
12.	0.82	+	
13.	0.132		+
14.	0.764	+	
15.	0.601	+	
16.	-0.088	+	
17.	0.587	+	
18.	0.79		
19.	0.341		+
20.	0.403		+
21.	0.615	+	
22.	0.363		+
23.*	0.256	not analyzed	not analyzed
24.	0.107		+
25.	0.246		+
26.	0.686	+	
27.	0.791	+	
28.	0.383		+
29.	0.417		+
30.	0.806	+	
31.	0.206		+
32.	0.218		+

* Herd No 23 – dual feeding system

ODR in the Lower Silesia Region of Poland was 0.53 and ranged between 0.43 to 0.63 ($p<0.05$). The mean ODR in the BTM collected in the European study in 2005/2006 were in the range 0.48 – 0.60 (Forbes at al. 2008). In the light of these studies, there is no remarkable difference between our results and the ODR values reported from other countries. However, during our studies 75% of results were in the range from 0.31 to 1.024. Also, the median, which reflects the actual state more accurately than the mean value, is relatively high and is 0.59. Based on the mean (0.53) or median (0.59) value of ODR, the examined area of Poland would be classified as a region with a high optical density rate, expressing a probably high exposure to the parasite. Mean ODR value in herds with access to pasture was 0.67 and was higher than in confined herds (ODR = 0.34) ($p \leq 0.001$) (Herd No 23 was excluded from the analysis because of the dual system of maintaining within the herd). The mean BTM ODR value in herds without access to pasture, where green fodder was or was not given was 0.37 and 0.11 respectively. The measurement of seroprevalence of *O. ostertagii* in BTM samples allows an estimate of the potential production losses to be made. The unified cut-off established for all investigations in order to compare results from different studies is set at 0.5 ODR (Forbes at al. 2008). Of the 32 BTM samples investigated, 18 were confirmed as containing specific antibodies at this or a higher level. Interpreting the results of our research, production losses could potentially reach from 0.5-1 kg (ODR 0.6-0.8) to 2 kg (ODR>1.0) milk/ cow/ day.

References

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