Seroprevalence of paratuberculosis in cattle in Slovenia

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ABSTRACT
Paratuberculosis is a common disease of ruminants in Slovenia. Because of the lack of data about the prevalence since 2001, the purpose of this work was to estimate the seroprevalence of paratuberculosis in cattle herds in Slovenia.

Animals older than two years in 20% of herds originating from different regions of Slovenia were tested for the presence of antibodies to \textit{M. avium} subsp. \textit{paratuberculosis} in 2008. A total of 38,374 sera from 6,780 cattle herds were examined in ELISA test. A total of 228 (0.59%) animals from 188 (2.77%) herds were positive.

Currently, the seroprevalence of paratuberculosis in cattle herds in Slovenia is almost the same as it was in 1997 (2.77% vs. 2.84%). Compared to the majority of European countries, the herd prevalence is rather low. This could be partly attributed to a small number of animals per herd.

INTRODUCTION
Paratuberculosis is a chronic infectious disease of ruminants caused by \textit{Mycobacterium avium} subsp. \textit{paratuberculosis} (Map). The significance of the disease in cattle breeding lies in great economic losses caused by the infected herds. In the USA, losses due to paratuberculosis are estimated at over 1.5 billion dollars per year (Cocito et al., 1994). The first case of paratuberculosis in Slovenia was detected in 1961 in imported Jersey cows. No other cases were reported until 1993, when paratuberculosis was found in a sheep flock. Since then, several outbreaks of the disease in cattle, goats and sheep have been documented.

The estimation of prevalence is necessary for taking the appropriate measures to control the disease. Therefore, a systematic screening of paratuberculosis in Slovenia began in 1995. In order to estimate the prevalence and geographic distribution of paratuberculosis in Slovenia, 5-20% of cattle in all herds were tested in 1996 and 1995, respectively. In the following two years, 3% and 5% of cattle in all herds were tested by ELISA (Ocepek et al., 1999). In 1999, 10-15% of cows and pregnant heifers were tested, while in 2000 and 2001, the monitoring was limited only to breeding cattle herds because of their significant involvement in the selection for reproduction and animal trade (Ocepek et al., 2002).

Since 2001, no data on paratuberculosis prevalence in Slovenia were available. Therefore, the purpose of this study was to estimate the current seroprevalence of paratuberculosis in cattle herds in Slovenia.

MATERIALS AND METHODS
Animals older than two years were tested in 2008 for the presence of antibodies against Map in 20% of cattle herds originating from all regions of Slovenia. A total of 38,374 sera from 6,780 herds were examined with an in-house ELISA test using a protoplasmic antigen (Allied Monitor). All positive samples were retested and confirmed by a commercial screening and confirmation ELISA kit (ID.VET).

Along with the estimation of the current seroprevalence, the comparison of the current and past prevalence data on paratuberculosis in Slovenian cattle was made.

RESULTS
A total of 228 (0.59%) animals from 188 (2.77%) herds tested positive for paratuberculosis. The majority of the positive herds originated from the central and the eastern part of Slovenia as shown on Figure 1. In the herds with more than one seropositive animal, almost a half
(47%) of the positive animals were of Black and white (Holstein-Friesian) breed which represents 19% of cattle in Slovenia.

**Fig. 1**: Geographic distribution of paratuberculosis-positive herds in Slovenia.

Comparison of the data obtained on Map-positive sera from the current and previous studies on paratuberculosis prevalence in cattle in Slovenia is shown on Figure 2. In the last decade, the prevalence remained approximately at the same level.

**Fig. 2**: Comparison of the prevalence data from the current study with the data collected in the previous studies.

**DISCUSSION**

The herd prevalence in Slovenia is similar to the prevalence estimated ten years ago and is rather low compared to the majority of European countries (Nielsen and Toft, 2009). This
could be partly attributed to a small number of animals per herd, i.e. the family-farm breeding strategy. In 2008, the tested herds comprised on average 5.67 animals (aged >2 years) in contrast to the period 2000-2001 when the average was 31 animals (aged >2 years) per herd. The relatively good present situation could change markedly in the near future due to unlimited trade of animals in the European Union. Moreover, in-country animal trade originating from big dairy-cattle herds with Black and white (Holstein-Friesian) breed, which is most commonly affected, can also contribute to the spread of paratuberculosis.

Differences in the prevalence on both the animal and the herd level, observed over the years, reflect also the different tested populations, the number of animals and herds included in the test and the use of ELISA kits with different sensitivities.

In general, our findings contribute to the current knowledge on paratuberculosis prevalence in the European countries. Because of the increasing trade and changes in animal breeding strategy (decreasing numbers of herds and increasing number of animals per herd), the decision and policy makers should prepare efficient measures for surveillance and control of the infection.

REFERENCES