Seroprevalence of Neosporosis in Cattle Raised in Extensive System in a Village from Cluj County

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Abstract. The purposes of this study were to demonstrate the presence of IgG type antibodies against Neospora caninum and to establish the prevalence of the disease in bovines raised in extensive system from a village in Cluj county. 119 samples have been collected in the direction of detecting antibodies anti-N. caninum using an ELISA method with a commercial kit (HerdChek Neospora, Idexx Laboratories, Switzerland). The bovines were divided into two age groups: group one: under 5 years old (31 animals) and group two: equal and over 5 years old (88 animals). From all 119 tested sera a number of 23 were positive, reaching a prevalence of 19.3%. The prevalence of infected animals belonging to the first group was 16.1% (5/31) and from the other group 20.9% (18/88). ELISA technique has a very high specificity and the prevalence obtained in this study (19.3%) shows that the infection with N. caninum is present in our county even in extensive systems and it’s a very important cause of abortion in cattle.

Keywords: neosporosis, bovine, seroprevalence, extensive system

INTRODUCTION

Neospora caninum is considered to be a major cause of abortion worldwide (Dubey and Lindsay, 1996). It is a relatively new parasitic disease (1984) that affects cattle and dogs. In bovines, transplacental transmission from infected animals to their offspring represents the major route of infection. Infected but healthy calves remain persistently infected and can transmit on their own the infection to their descendants (Anderson et al., 1997). This leads to the endogenous transplacental transmission of the infection throughout many generations (Davison et al., 1999).

Dog and coyotes are the only known definitive hosts (Gondim et al., 2002) for this parasite. They can eliminate oocysts at one time with the feces after they have eaten infected meat, abortions or secretions after birth. Postnatal bovine infections are possible (horizontal transmission) through oocysts ingestion, oocysts that are eliminated by dogs (Gondim et al., 2002) or another definitive hosts (McAllister et al., 2000).

The role of other routes of horizontal transmission, like infected placenta ingestion or secretions are still not very sure. In cattle heards with epidemic abortions the most probable way of infection is by consumption of fodder and water contaminated with oocysts (McAllister et al., 2000).
MATERIALS AND METHODS

Sera samples. There were taken under study a number of 119 sera samples from cattle reared in extensive system in Chiuiești village from Cluj county. 118 of the bovines were females and only one male and were raised for private consumption of milk and meat. Depending on the animals’ age we divided them in two categories: group one: under five years old (31 of 119 animals) and group two: equal and over five years old (88 of 119 animals). From all these animals blood was collected by puncture of the jugulare vein and was incubated and left under 37°C for the sera to express. After that the sera was moved in eppendorf tubes and stored in freezer under -20°C until use.

Methods. All the samples were processed through ELISA techniques in the direction of detecting anti-Neospora caninum antibodies IgG type using a commercial kit (HerdChek Neospora, Idexx Laboratories, Switzerland, Lot: BGVV-B 319). The sera was diluted at final dilution of 1:100. The sera was considered negative if the S/P ratio is less than 0.50, and positive if the S/P ratio is greater than or equal to 0.50.

Statistical analysis. The data were statistically analysed to calculate the statistical significance of the prevalence of N. caninum infection in cattle between the age groups considered for the study, using Epi Info 3.5.1 it were considered significantly statisticaly values of p \( \leq 0.05 \).

RESULTS AND DISCUSSIONS

Antibodies against Neospora caninum were detected in 23 cows (19.3%). The seroprevalence according to the age group was 16.1% (5/31) for the first group (under 5 years old) and 20.9% (18/88) for the second group. For the negative samples the average optical density was 0.029 ± 0.039 (with a value between 0.000 and 0.399) and for the positive samples the average optical density was 0.791 ± 0.308 (values between 0.568 and 3.422) (Tab. 1).

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<thead>
<tr>
<th>No</th>
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<tr>
<td>5</td>
<td>16.1</td>
<td>18</td>
<td>20.9</td>
<td>23</td>
<td>19.3</td>
<td>0.791 ± 0.308</td>
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<tr>
<td>26</td>
<td>83.9</td>
<td>70</td>
<td>80.89</td>
<td>96</td>
<td>80.7</td>
<td>0.029 ± 0.039</td>
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In this study performed on cattle breeded in extensive systems a percentage of 19.3 of the animals were found positive (23 out of 119). There were no statistically significant differences between the age groups (p \( \leq 1.000 \)).

For cattle the main symptom is abortion and because of it the economical losses are very significant. Beside abortion other symptoms are represented by stillbirth, resorbition of the fetuses and consequently the rebreeding of the female, secondary, loss of the lactation and not the least, the costs for medical guidance. The abortions may reach in cases of epidemy up to 57% (Scharers et al., 2002). The prevalence of infection with Neospora caninum worlwide varies a lot from 12.1% in Argentina (Moore et al., 2002) to 77% in Mexic (Morales et al., 2001).

Similar seroprevalence as we obtained in our study was obtained in Australia (Boulton et al., 1995) and Switzerland (Sager et al., 2001), 21% and in United States (Thurmond et al.,
1995) a value of 24.2%. Some of the risk factors are represented by age of the animals (as older they get the higher chance of getting infected), presence of dogs near cattle shelters, presence of other possible intermediate hosts near the farms (mice, rats), grazing, source of water, birth management and density on the animals correlated to the surface of the farm (Dubey and Lindsay, 1996).

In Romania the seroprevalence is mentioned as having values of 56.2% (Gavrea et al., 2008), 33.71% (Ionescu et al., 2003), 20% (Ionescu et al., 2002) and 5.4% (Şuteu et al., 2008).

The cycle of this disease is completed by ingestion of the infected meat with cysts from positive animals by the dogs that live in the same households or by others. These cysts are localized especially in heart muscle, lungs, liver, and skeletal muscles. The international prevalence of neosporosis in rural dogs varies between 0% in Kenia (Barber et al., 1997) and 30% in Brasil (Andreotti et al., 2004). In Romania the prevalence is mentioned to be 12.5% in 2005 (Şuteu et al.) and 12.3% in 2008 (Şuteu et al.).

**CONCLUSIONS**

The researches regarding the seroprevalence by ELISA method of *N. caninum* infection in cattle from extensive system in a village from Cluj county pointed out:

- A prevalence of anti-*N. caninum* antibodies of 19.3%
- The prevalence among the two age groups was 16.1% for the first group and 20.9% for the second group
- The results are similar to the ones obtained in other parts of the country and of the world.
- The prevalence shows that extensive system can also be a point source of infection with *Neospora caninum* for both dogs and cattle.

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**REFERENCES**


