SEROPREVALENCE OF *TOXOPLASMA GONDII* INFECTION IN PIGS REARED IN INTENSIVE SYSTEM FROM TIMIS COUNTY

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Summary

To determine the seroprevalence of *Toxoplasma gondii* infection in the study were taken 17 intensive farms with pigs belonging to multinational companies and 4 pig farms, with intensive programme, belonging to company type SC from Timis County.

Serological samples were processed by ELISA technique (immunoenzymatic assay). The blood samples were collected from 100 individuals of each multinational farm, and from each farm type SC.

In pig multinational farms *Toxoplasma* infection prevalence was 0.88%, with variations between 0 and 7%, and in pigs type SC farms, the *Toxoplasma gondii* infection prevalence was 1.5%, with variations between 0 and 5%.

**Key words:** *Toxoplasma gondii*, pigs, intensive breeding

Toxoplasmosis is one of the most common parasitosis in humans and animals, it being placed on the top three global spread (2). The cat is the key element in the epidemiology of toxoplasmosis. For toxoplasmosis transmission, a very important role it have raw meat consumption. In pigs, infection occurs by eating kitchen scraps unsterilized or rodents (6).

Necropsy diagnosis in the slaughterhouse, it is very difficult to done, because very small necrotic lesions are difficult to observe. Serological diagnosis is possible to made in the slaughterhouse, but is not warranted in our economic Country's conditions (1).

Reporting an increased incidence of toxoplasmosis in humans and animals worldwide and the small number of bibliographic data in our Country about *Toxoplasma* infection, motivates our study.

**Materials and methods**

Serological samples were collected from pigs, in Timis County, between 02.05.2008 - 15.11.2009. From multinational farms were collected 100 samples from each farm. Farms were categorized by age as follows: 4 farms included individuals from the youth category, that mean animals aged between 1 to 3 months, 3 pig farms included fat category, that mean pigs aged between 3 to 6 months and 10 farms...
consisting of individuals selected for breeding (boars and sows), that mean animals aged between 6 months to 3 years. Intensive farms have very large flocks, as follows: youth and fat pig farms comprise between 8 000 to 25 000 heads, sow farms hold 10 000 heads, and those of boars contain between 30 to 80 heads/shelter.

From SC type farms were studied pigs aged between 1 to 5 months, boars and sows. SC type farms held between 4 800 to 18 000 heads/shelter.

Collected blood was left to express serum and it was kept in a freezer until the month of November 2009 when samples were processed in the laboratory of Parasitology and Parasitic Diseases of Faculty of Veterinary Medicine of Timisoara.

Serum samples were examined by indirect ELISA method using ID Screen Multi-species kit (ID.VET., France) for anti-Toxoplasma specific Ig G antibodies, resulting from infection with Toxoplasma gondii. Kit can be used for determination of anti-Toxoplasma specific Ig G antibodies from sera of ruminants, pigs and cats. We respect technology manufacturing indicates by producer company.

The S/P values above 200% were considered strongly positive, between 50 and 200% samples were considered positive, between 40% and 50% were doubtful, while values below 40% were considered negative.

Results and discussions

Out of 1 700 samples taken from multinational farms only 15 sera had anti-Toxoplasma Ig G antibodies (Table 1). Average prevalence was 0.88%, varying between 0 and 7%.

Out of 400 samples taken from type SC farms only 6 of the serum samples examined had anti-Toxoplasma Ig G antibodies (Table 2). Average prevalence was 1.5%, with variations between 0 and 5%.

Thus, we conclude that from multinational farms, only 3 farms (17.64%) met seropositive pigs to Toxoplasma infection.

In SC type farms in 2 (50%) from 4 farms examined met cases of pigs seropositive for Toxoplasma (Fig. 1).

Table 1

<table>
<thead>
<tr>
<th>No.</th>
<th>Farm</th>
<th>Category</th>
<th>No. positive samples (%)</th>
<th>No. doubtful samples (%)</th>
<th>The minimum and maximum titres values</th>
<th>Positive titres values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Padureni F1</td>
<td>youth</td>
<td>0</td>
<td>-</td>
<td>5.48-12.77</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Padureni F2</td>
<td>fat pigs</td>
<td>0</td>
<td>-</td>
<td>9.45-17.02</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Parta F3</td>
<td>youth</td>
<td>0</td>
<td>-</td>
<td>6.07-9.01</td>
<td>-</td>
</tr>
<tr>
<td>4.</td>
<td>Parta F4</td>
<td>fat pigs</td>
<td>0</td>
<td>-</td>
<td>8.29-14.16</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>Peciu Nou F5</td>
<td>youth</td>
<td>0</td>
<td>-</td>
<td>9.13-15.06</td>
<td>-</td>
</tr>
<tr>
<td>6.</td>
<td>Peciu Nou F6</td>
<td>fat pigs</td>
<td>0</td>
<td>-</td>
<td>12.69-24.82</td>
<td>-</td>
</tr>
<tr>
<td>7.</td>
<td>Birda F7</td>
<td>boars</td>
<td>0</td>
<td>-</td>
<td>6.52-31.66</td>
<td>-</td>
</tr>
<tr>
<td>8.</td>
<td>Birda F8</td>
<td>sows</td>
<td>0</td>
<td>-</td>
<td>8.16-19.58</td>
<td>-</td>
</tr>
</tbody>
</table>
Table 2

Prevalence of *Toxoplasma gondii* infection in type SC pig farms from Timis County

<table>
<thead>
<tr>
<th>No.</th>
<th>Farm</th>
<th>Category</th>
<th>No. positive samples(%)</th>
<th>No. doubtful samples(%)</th>
<th>The minimum and maximum titres values</th>
<th>Positive titres values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Farm SC 1</td>
<td>youth + fat pigs</td>
<td>0</td>
<td>-</td>
<td>10.19-17.62</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Farm SC 2</td>
<td>youth</td>
<td>0</td>
<td>2 (2%)</td>
<td>7.90-45.06</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Farm SC 3</td>
<td>youth + fat pigs</td>
<td>5 (5%)</td>
<td>2 (2%)</td>
<td>12.48-61.74</td>
<td>57.83-61.74</td>
</tr>
<tr>
<td>4.</td>
<td>Farm SC 4</td>
<td>fat pigs</td>
<td>1 (1%)</td>
<td>-</td>
<td>9.27-63.01</td>
<td>63.01</td>
</tr>
</tbody>
</table>

Legend: F.intensiv – multinational intensive breeding pig farms
F. SC – SC type intensive breeding pig farms

Fig. 1. Prevalence of *Toxoplasma gondii* infection in the studied units
For studied Counties, information obtained are particularly important as they are the first reported data on *Toxoplasma* infection in the area. The intensive breeding farms, maintenance and feeding conditions reach high standards. An exception make Periam farm where reform sows are maintained outdoor in an open shelter, barn type, and thus make possible the animal contact with various sources of infestation. That may explain, perhaps, the number of positive animals from that farm. In parallel with the high standards that these farms are built was observed an administrative oversight, namely poor control of rodents in these units. In many of these farms we could see free access of rodents in/and around shelters. They may be considered as infection sources for pigs.

However, the prevalence of 1.5% in SC type farms and only 0.88% in multinationals farms, highlights the possibility of reducing the risk of human contamination by eating meat. The study found the absolute need to best practice animal husbandry and food to reduce the risk of transmission of infection with *T. gondii* in humans and other animals.

In the world the results are different. Thus, the Netherlands, has acquired a *Toxoplasma* prevalence of 2.6% in 2007 (4).

In Italy, the prevalence of infection was 16.3%, with the lowest values (7%) at 5-7 months age group and the high values (19%) in pigs older than 24 months (7). In Germany, 5.6% of pigs tested were positive for infection with *Toxoplasma gondii* (5).

In Romania, Iovu et al. in 2009 found a prevalence of *Toxoplasma* infection in Central and Northwestern Romania, of 0.4% in fat pigs and 0.5% in sows (3).

*Toxoplasma* infection of pigs in Timis County matters both because of neonatal death can occur in pigs, and the possibilities of disease transmission to humans through inadequately cooked meat.

**Conclusions**

The prevalence of *Toxoplasma gondii* infection in pigs from intensive multinational company farms in Timis County was 0.88%, varying between 0 and 7%.

In pigs from intensive type SC farms the prevalence of seropositivity was 1.5%, with variations between 0 and 5%.

In multinational pig farms, out of 15 seropositive pigs, 3 (20%) were boars and 12 (80%) were sows.

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References


