Seroprevalence of *Toxoplasma gondii* in swine slaughtered in Sicily

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Introduction

Several studies showed that the consumption of raw or undercooked meat containing *Toxoplasma gondii* tissue cysts from infected animals is one of the most important sources of human toxoplasmosis. Foods of animal origin most frequently contaminated are pork and small ruminants' meat.

In order to investigate the seroprevalence of Toxoplasmosis in Sicilian pig farms, 1063 swine sera were collected during the slaughtering from locally born and bred animals and 1312 from imported ones (from France and Spain). The local animals came from 154 farms distributed along Sicily, representing pigs of all ages; the others came from lairages.

Materials and methods

The samples were collected by jugular puncture immediately before the slaughtering, and sent to the laboratory under cold conditions. Sera were separated after centrifugation and stored at -20°C until tested.

A commercial kit (ELISA *Toxoplasma gondii* serum screening – Institute Pourquier) has been used. Briefly, according to the manufacturer instructions, 200 μl of the sera (positive and negative controls and samples) at the dilution of 1/20 were dispensed in a microtitre plates coated with Toxoplasma antigen. The microplate was incubated for 1 hour (±5 min.) at 37°C (±3°C); after 3 times washing with the solution included in the kit, 100 μl of Protein G labelled with HRPO were added and incubated for 30 min. (±3 min.) at 37°C (±3°C). The conjugate will bind, if present, to the immune-complex. Finally each well has received 100 μl peroxidase substrate. After incubation at room temperature (21 ± 5°C) for 20 min. away from the light, the reaction was stopped with 100 μl stop solution. The optical density (OD) of each well was measured using a photometer at a wavelength of 450 nm. The S/P% was calculated. 

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\text{S/P%} = \frac{\text{OD}_{450} \text{ value of the sample} - \text{OD}_{450} \text{ value of the negative control}}{(\text{mean OD}_{450} \text{ value of the positive control} - \text{OD}_{450} \text{ value of the negative control}) \times 100}
\]

Any sample with a S/P% ≤ 40% was considered negative.

Any sample with a 40% < S/P% < 50% was considered borderline.

Any sample with a 50% ≤ S/P% ≤ 200% was considered coming from an infected animal.

Any sample with a S/P% ≥ 200% was considered coming from an affected animal.

Results

The overall seroprevalence of *Toxoplasma*-specific IgG-antibodies was 20.04% (213/1063) in sicilian pigs and 0.99% (13/1312) in imported ones. The 46.75% (72/154) of the farms had at least one *Toxoplasma*-positive animal. The increasing age of the animals and a small farm size (considered as pigs' number) were significantly associated with presence of *T. gondii* infection in the farm (p≤0.001; X²=45.63 and 36.54, respectively). Cats' presence in farm and farming method were not found as significant risk factors.

Conclusions and Discussion

The high seroprevalence found for local animals in our research (higher than in other European studies) is partially due to the Sicilian habit to eat imported pigs as fresh meat and slaughter the local ones at the end of their reproductive career for transformed products; thus, considering the increased risk of developing toxoplasmosis with the age, can explain our results, together with the worse developed and less hygienically controlled management conditions. *T. gondii* is usually killed through freezing, heating and salting; nevertheless, in some Sicilian areas still exists the habit to eat raw sausages, and this could represent a risk for human infection. In fact,
Toxoplasmosis can’t be controlled without a good health education, to increase the knowledge on infection risk factors, sanitary strategies and food habits to reduce them.

References


