

Results of five years monitoring for *Toxoplasma gondii* infection in animals by the official Italian Zoonoses Informative System (SINZOO)



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In order to drive effective public health preventive measures for human toxoplasmosis a scrupulous epidemiological monitoring of animal toxoplasmosis is essential

Background

- *T. gondii* is the fourth most important parasite in the world and second out of 14 foodborne pathogens in the USA and in Europe.
- Meat-borne transmission of *T. gondii* causes most of food-borne infections in Europe (EFSA-European Food Safety Authority).
- SINZOO is part of the Veterinary Informative System of the Italian Ministry of Health. It collects and transmit data to EFSA, published in the annual EFSA/ECDC summary reports on zoonoses in Europe.

The aim of this study was to evaluate the effectiveness of SINZOO for epidemiological surveillance of toxoplasmosis in Italy.

Materials and Methods

The reported data were summarized and processed by the Area of Catania of Experimental Zooprophyllactic Institute of Sicily, as National Reference Center for Toxoplasmosis.

Species selected among those tested in Italy between 2015 and 2019:

- sheep,
 - cattle,
 - pig,
 - goats,
 - wild boars,
 - wild ruminants,
 - cats.
- Species most commonly reared for human consumption

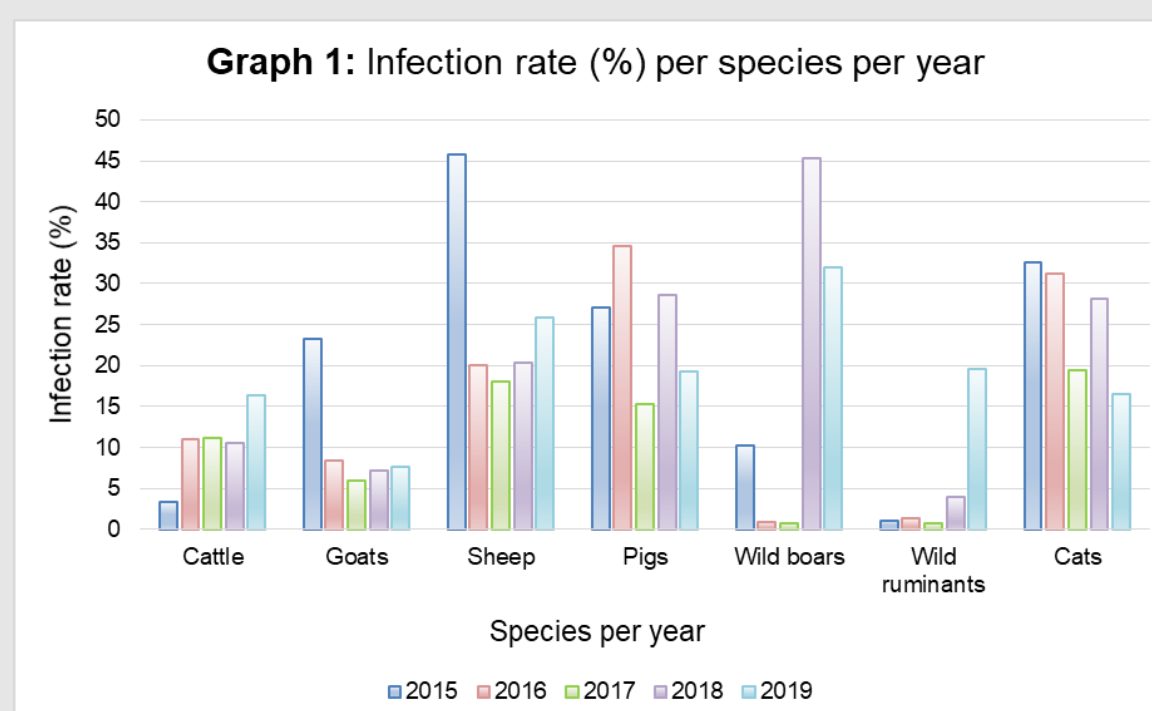
Results

Infection rates ranged from 0.73% in wild boars to 45.72% in sheep. Total number of tested animals ranged from 37 pigs in 2015 to 3449 sheep in 2018 (Table 1).

Table 1: Positive vs Total number of tested animals per species per year

| | 2015 | | 2016 | | 2017 | | 2018 | | 2019 | |
|----------------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|
| | Positive | Total | Positive | Total | Positive | Total | Positive | Total | Positive | Total |
| Cattle | 44 | 1292 | 23 | 209 | 235 | 2118 | 36 | 344 | 38 | 233 |
| Goats | 83 | 357 | 36 | 432 | 14 | 234 | 83 | 1166 | 71 | 925 |
| Sheep | 417 | 912 | 494 | 2465 | 483 | 2682 | 704 | 3449 | 880 | 3403 |
| Pigs | 10 | 37 | 57 | 165 | 104 | 682 | 58 | 203 | 117 | 606 |
| Wild boars | 43 | 420 | 8 | 901 | 4 | 551 | 227 | 501 | 64 | 200 |
| Wild ruminants | 4 | 375 | 4 | 295 | 3 | 394 | 21 | 523 | 62 | 317 |
| Cats | 238 | 729 | 209 | 668 | 15 | 77 | 24 | 85 | 19 | 115 |

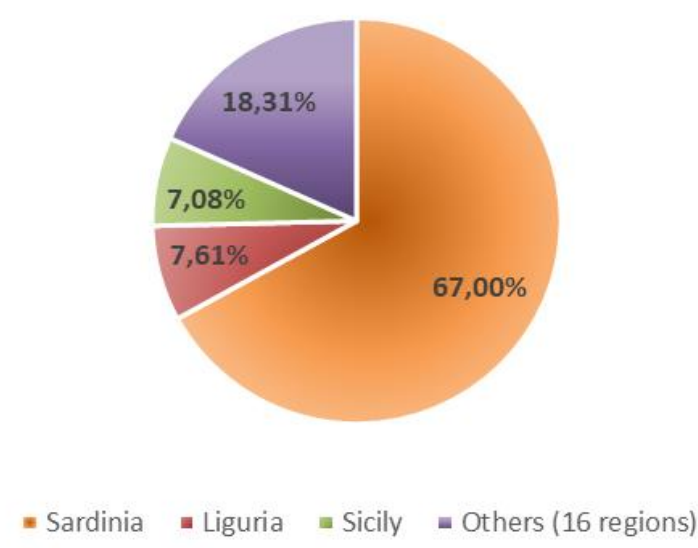
Besides a relevant incidence among wild boars in 2018 (45%) and 2019 (32%), higher infection rates were more often reported among sheep and pigs (Graph 1).



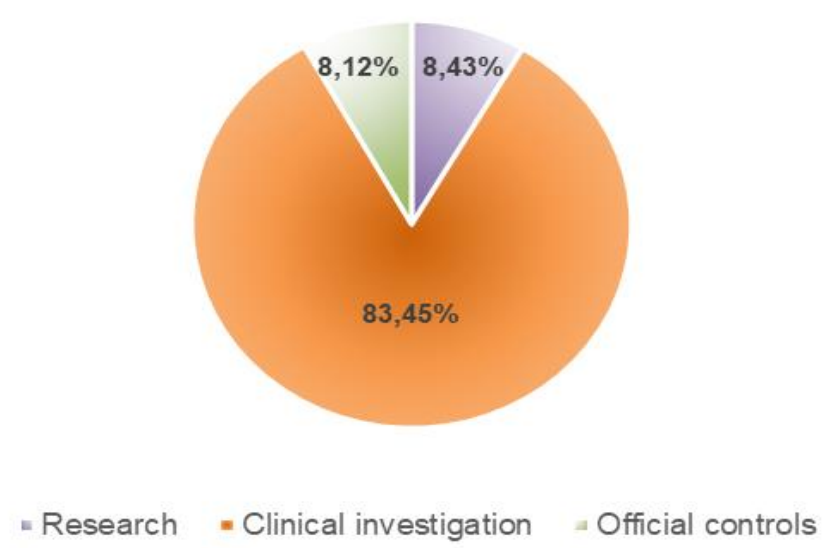
Additional Results

Between 2018 and 2019 67% of the overall analyses were carried out in one region (Sardinia) (Graph 2), mostly on one species (sheep) and emerged mostly from targeted research. In fact in 2019 83.45% of analyses were performed following clinical suspicions while only 8.43% came from official controls, highlighting toxoplasmosis underestimation by the national veterinary health system (Graph 3).

Graph 2: 2018-2019 region monitoring



Graph 3: Sampling contest



Conclusions

Despite EFSA recognizes the relevance of toxoplasmosis, this is not included among zoonoses under mandatory notification, making animal epidemiological surveillance rather scarce and uneven. Data reported to SINZOO suggest that *T. gondii* is still a relevant hazard to monitor mainly by meat inspection and in-farm survey, for effective epidemiological evaluations and appropriate public health interventions. This issue characterizes Italy and most of Europe, highlighting that toxoplasmosis monitoring should be made mandatory and with uniform rules among European states.

References:

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3. FAO/WHO [Food and Agriculture Organization of the United Nations/World Health Organization], 2014. Multicriteria-based ranking for risk management of food-borne parasites. In: *Microbiological Risk Assessment Series No. 23*. Rome.