



# SERO-EPIDEMIOLOGICAL SURVEY OF TOXOPLASMOSIS IN CATTLE, SHEEP AND GOATS IN ALGERIA

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## Abstract

Described for the first time in Tunisia, toxoplasmosis is a cosmopolitan parasitic zoonosis caused by a protozoan. It occurs in most warm-blooded animals and causes abortions in pregnant females, a high rate of mortality among infants and young. By its medical importance, health and economic toxoplasmosis is not only a hindrance to the intensification of our meat production but also a real danger to man and his environment.

Prevalence of toxoplasmosis in *Toxoplasma gondii* in 283 cattles, 875 sheeps and 311 goats was carried out using serological methods (MAT and ELISA) in Algeria. In the sample studied, the overall serological prevalence was 24.3 % for sheep, 14.4% in cattle and 7.3% in goats.

Seroprevalence found in females was 29.4 % for sheep, cattle 15.3% and 7.1 % in goats. Among males, the prevalence found was 17.6 % for sheep, 12.8% in cattle and 5.8% in goats.

In conclusion, animal toxoplasmosis is strongly present in Algeria, area known for its large herds of sheep, cattle and goats for human consumption; highlighting the importance of the implementation of preventive measures in order to reduce zoonotic infection by *T. gondii*.

## Introduction

Toxoplasmosis is a cosmopolitan zoonotic disease caused by the obligatory protozoan *Toxoplasma gondii* being responsible for major economic losses in most classes of livestock through abortions, still birth and neonatal losses.

The distribution of this parasite depends on regions and weather condition where the oocysts survive in environment. The ingestion of undercooked infected meat is considered as an important source of the infection for humans.

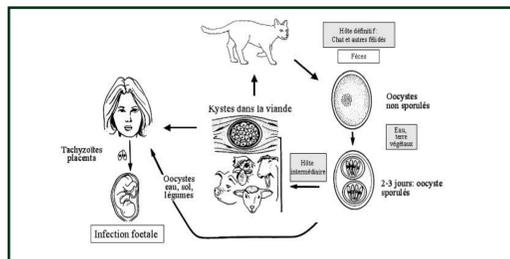


Figure 1 : Life cycle of *Toxoplasma gondii* (Dubey et Beatty, 1988).

Despite its worldwide presence, the prevalence of toxoplasmosis is not well known especially in Algeria.

The prevalence of *Toxoplasma gondii* infection in humans in Algeria, continuously monitored over the past 50 years, has always been among the higher in Europe. Recent studies of risk factors for *T. gondii* infection in women of generative age in Algeria have established consumption of undercooked meat or meat products as the single risk factor.

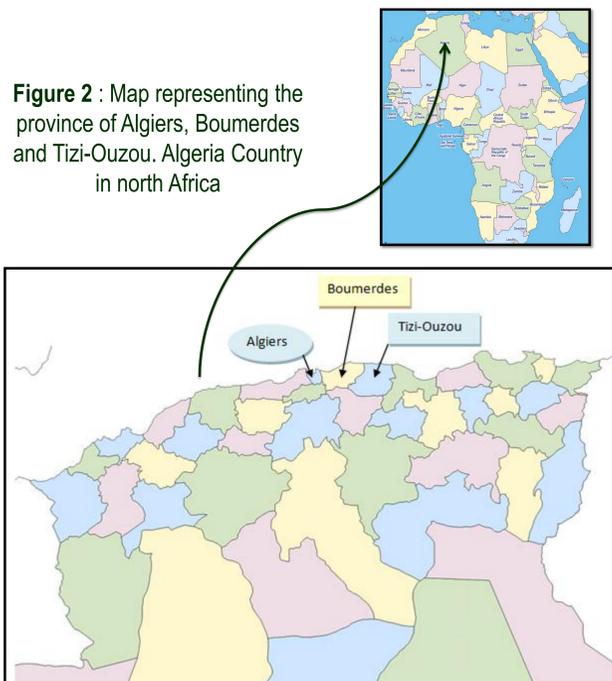
This prompted us to conduct an epidemiological survey in cattle, sheep and goat from all regions of M'sila to determine the seroprevalence of *T. gondii* infection in animal species mostly used for human consumption in the Algerian culture, and to determine the main risk factors associated with the infection.

## Material & Methods

### Area description

Algeria is a country in North Africa on the Mediterranean coast. Its capital and most populous city is Algiers. With an area of 2,381,741 square kilometers (919,595 sq mi), 90% of which is desert. The climate is typically continental due in part to Saharan influences, the summer is dry and hot (29-35 C°), while winter are very cold (2 to 10 C°).

Figure 2 : Map representing the province of Algiers, Boumerdes and Tizi-Ouzou. Algeria Country in north Africa



### Animals:

The study involved a total of 1469 randomly selected animals, including 283 heads of cattle, 875 sheep and 311 goat, from farms selected at random from various regions of Annaba (East of Algeria). 283 Bovins, 875 Ovins et 311 équin

### Serology:

Serum samples were tested for immunoglobulin G antibodies to *T. gondii* by the modified agglutination test (MAT), using a commercial kit (Toxo-Screen DA®, bioMerieux, Lyon, France). Sheep, goat sera were diluted at 1:20, 1:400, 1:1600 and 1:6400, and cattle sera at 1:100, 1:400, 1:1600 and 1:6400. Positive and negative controls supplied with the kit were included in each testing plate.

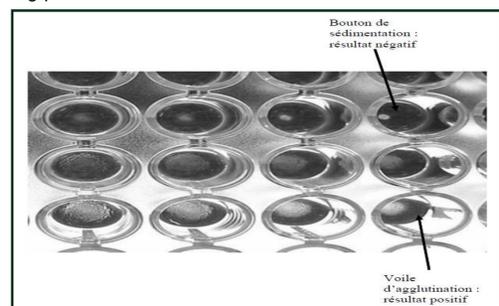


Figure 3 : Modified agglutination test (MAT)

## Results

### CATTLE

Overall seroprevalence in the three wilayas in the center of Algeria is different from one region to another. It is higher in females and in young cattle under 02 years. This result is quite consistent considering different seroprevalence studies in the world and particularly studies conducted based on a modified direct agglutination test where values range from 17% to 65%.

CATTLES		
Global Prevalence	14.4% (41/283)	
Region	Alger	4.7% (3/63)
	Boumerdes	13.5% (13/96)
	Tizi-Ouzou	20.1% (25/124)
Gender	Femele	15.3% (28/182)
	Male	12.8% (13/101)
Age	<2	26% (26/100)
	[2-5]	11% (11/100)
	>5	4.8% (4/83)

### SHEEP

The distribution of prevalence by wilaya is relatively homogeneous. Indeed, the 213 positive samples, 147 (29.4%) belong to female and 66 (17%) in males. Young people are most affected by *toxoplasma* infection.

SHEEP		
Global Prevalence	24.3% (213/875)	
Region	Alger	22.8% (48/210)
	Boumerdes	23.5% (67/285)
	Tizi-Ouzou	25.5% (98/380)
Gender	Femele	29.4% (147/500)
	Male	17.6% (66/375)
Age	<2	27.1% (174/640)
	>2	16.5% (39/235)
//	//	

### GOAT

Of the 23 positive samples, young under 05 years are most affected. There is no difference between male and female, against the infection is much more present in the capital.

GOATS		
Global Prevalence	7.3% (23/311)	
Region	Alger	8% (21/260)
	Boumerdes	3.9% (2/51)
	Tizi-Ouzou	//
Gender	Femele	7.8% (19/243)
	Male	5.8% (4/68)
Age	]1-5]	10.8% (20/185)
	[6-11]	2.4% (3/124)
	>11	// (0/2)

## Conclusion and Recommendation

In conclusion, in addition to providing data on *T. gondii* infection in meat animals in Algeria, determination of risk factors associated with infection for each species investigated may serve to indicate the type of preventive measures to be undertaken to reduce the reservoirs of human *T. gondii* infection thereby reducing human infection.

the high seroprevalence of antibodies to *T. gondii* found has important implications for public health, suggesting a wide dispersion of oocysts and parasite reservoir hosts in the environment. Considering the presence of *T. gondii* in animals from the study area in Algeria, meat should be considered as an important source of infection in the human population when consumed raw or undercooked.

This seroepidemiological survey to better understand the dynamics of the transmission of *Toxoplasma* to humans. Toxoplasmosis may represent a public health problem by Algeria, it would be particularly useful to obtain information on the genetic diversity of *T. gondii* and isolate strains of this parasite affecting humans and animals of this country.

## References

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