

PROGETTI DI “RICERCA CORRENTE 2016”
RELAZIONE FINALE

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Progetto presentato da:

ISTITUTO ZOOPROFILATTICO SPERIMENTALE

LAZIO E TOSCANA “M. ALEANDRI”

Area tematica: Sicurezza Alimentare

Titolo del progetto: Studio di prevalenza e dei fattori di rischio dei principali patogeni alimentari associati ai prodotti della filiera ovina in Italia centrale

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Responsabile Scientifico: Roberto Condoleo

Tel. 06.79099360

roberto.condoleo@izslt.it

SUMMARY

Sheep's sector is one of the major livestock farming in Central Italy, both for the number of animals raised and for the derived productions. Indeed, production, marketing and consumption of sheep's milk products and sheep meat are very well eradicated in those territories where they are economically and socially relevant. However, recently, the presence of food pathogens in sheep's products has been repeatedly reported by national surveillance authorities and in literature. The most relevant pathogens in the sheep sector are *Listeria monocytogenes* and *Toxoplasma gondii* in the dairy sector and sheep meat production sector, respectively. They are both widely distributed and represent important zoonotic pathogens with severe effects on public health. However, data are scarce data both at national and European level on the presence of these pathogens in sheep and derived products. In Italy, there is lack of data on the occurrence of *L. monocytogenes* in raw bulk tank milk and on the presence of *T. gondii* in edible tissues of sheep carcasses. Therefore, the present study aimed to acquire further information regarding the occurrence and prevalence of such pathogens as well as related risk factors to fill such knowledge gaps and provide useful data for future risk assessments.

To estimate the occurrence of *L. monocytogenes* in raw bulk milk we collected 372 milk samples from 87 sheep farms over a period of 1 year and administered a questionnaire to acquire information regarding relevant farm management variables. *L. monocytogenes* was not found in any of the samples, which indicates a low occurrence of this pathogen in sheep's bulk tank milk (maximum possible prevalence 0.8%, CL 95%). In contrast, *E. coli* was found in almost two-thirds of milk samples (61%) but at levels below 102 CFU/mL in most of them (approximately 75%). Statistical analysis indicated that, during the warmest seasons, *E. coli* presence is more probable and counts are significantly higher. Unexpectedly, milk collected by hand milking had a lower level of contamination. Although further studies are necessary to clarify some aspects, the reported data add to the knowledge about the occurrence of *L. monocytogenes* and *E. coli* in raw sheep's milk and will be useful for future risk assessments.

The occurrence of *T. gondii* in ovine carcasses was investigated testing serum, heart and diaphragm collected from 405 ovine (215 adults and 109 young animals) at two slaughterhouses placed in Lazio e Campania region (Central/South Italy). Only animals raised in Italian regions (Lazio, Toscana, Campania and Basilicata) were selected as study population. One ovine out of two resulted positive after the execution of the serological tests (218/405, 53.8%) and the occurrence of *T. gondii* antibodies was significantly more frequent in adults (135/215, 62.8%) than in young ovine (83/190, 43.7%). Non-parametric tests revealed that the seropositivity rate was significantly different between groups on the basis of class of age ($p < 0.001$), place of sampling ($p < 0.000$) and province of provenience ($p < 0.02$). Bio molecular tests were applied only on samples from animals slaughtered in Lazio region. The overall occurrence of *T. gondii* DNA in at least one of the two examined organs was 4.8% (9/189). All positive subjects were adult (9/114, 7.9%). The concordance between the two used techniques (ELISA and PCR) calculated through Cohen's kappa test was very low ($k = 0.112$), even when the same statistics was applied considering only the adult animals ($k = 0.132$). The presence of *T. gondii* cysts in heart portions from 40 seropositive ovine

was not detected after the histological examination. Our study confirms that ovine can play an important role as source of toxoplasmosis for humans although the relevant seropositive rates cannot be interpreted as the corresponding presence of infectious forms of the parasite in muscle/hearth tissue. To obtain an accurate correlation between presence of antibodies in ovine and consequent presence of bradizoites in edible tissues from the derived carcasses it would be necessary an “ad hoc” study carried out selecting a conspicuous number of subjects and testing a relevant amount of muscle.

Title: Prevalence of main pathogens in the sheep’s sector in Central Italy and related risk factors.

Key words: *Escherichia coli*; *Listeria monocytogenes*; Sheep’s milk; *Toxoplasma gondii*; sheep meat.