Bovine meat versus pork in Toxoplasma gondii transmission in Italy: A quantitative risk assessment model

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Bovine meat versus pork in *Toxoplasma gondii* transmission in Italy: a quantitative risk assessment model.

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Abstract

Toxoplasma gondii is a widespread zoonotic parasite with a high seroprevalence in the human population and the ability to infect almost all warm blooded animals. Humans can acquire toxoplasmosis from different transmission routes and food plays a critical role. Within the food category, meat is of utmost importance, as it may contain bradyzoites inside tissue cysts, which can potentially cause infection after ingestion if parasites are not inactivated through freezing or cooking before consumption. In Italy, the most commonly consumed meat-producing animal species are bovines and pigs. However, *T. gondii* prevalence and consumption habits for meat of these animal species are very different. There is debate within the scientific community concerning which of these animal species is the main source of meat-derived human toxoplasmosis. The aim of this work was to build a quantitative risk assessment model to estimate the yearly probability of acquiring toxoplasmosis infection due to consumption of bovine meat and pork (excluding cured products) in Italy, taking into account the different eating habits. The model was fitted with data obtained from the literature regarding: bradyzoite concentrations, portion size, dose-response relation, prevalence of *T. gondii* in bovines and swine, meat consumption and meat preparation habits. Alternative handling scenarios were considered. The model estimated the risk per year of acquiring *T. gondii* infection in Italy from bovine and swine meat to be 0.034% and 0.019%, respectively. Results suggest that, due to existing eating habits, bovine meat can be a not negligible source of toxoplasmosis in Italy.