



Parasitological and Microbiological Investigation of Consumed Meat and Offal

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ABOUT THE STUDY

The strong connection between food consumption and human diseases was defined by Hippocrates in ancient times and foodborne pathogens were reported as biological agents causing foodborne diseases. According to the World Health Report, 1/10 of the people worldwide get sick due to food contamination and 1.8 million people die from foodborne diseases every year. Consumption of animal foods such as meat, milk and eggs is increasing due to globalization, rapid population growth, changing dietary habits and lifestyle. Consequently; Mass production and global movement of products occur, increasing the risk of contamination of foodborne pathogens at any stage of the chain from farm to fork.

Meats; tools, knives, hands, clothes and air can be easily contaminated during cutting, transportation, processing, packaging and distribution and cause biological, chemical, physical and especially microbial food hazards. For example; beef was reported to be the vector of 7% of the 1.7 million cases of foodborne illness in England and Wales between 1996 and 2000. *Listeria spp.*, *Salmonella* species, *Escherichia coli* (*E. coli*), *Staphylococcus aureus* (*S. aureus*) and *Toxoplasma gondii* (*T. gondii*) are the most common and serious pathogens and parasites that can be transmitted through meat. Approximately 1.4 million cases are caused by non-typhoid *Salmonella* serotypes and 270.000 cases are caused by pathogenic *E. coli*, including *E. coli* O157:H7.

Meat consumption increases worldwide in parallel with increasing challenges in meat hygiene and safety. Infections of foodborne *Salmonella spp.* are important worldwide and are recognized as the second most common foodborne pathogen in the European Union. Types of *Salmonella spp.*, isolated from meat products are resistant to many drugs and can cause very serious problems. As a result of *Salmonella spp.* infection in the

United States, 26.500 hospitalizations, 1.35 million cases and 420 deaths occur each year. Most of which seen in children aged up to 4, 155.000 deaths occur per year due to Salmonellosis caused by the most common serotypes *S. enteritidis* and *S. typhimurium*.

Undercooked and raw meat is considered to be the most important cause of *T. gondii* infections that are effective in muscle and nerve tissues in humans. This parasite leads to clinical manifestations such as encephalitis, hepatitis, pneumonia, myalgia and myocarditis in immunosuppressed individuals. In the study of raw and smoked sausage, ham, dried bacon and minced meat, 5.4% of the samples were positive for *T. gondii*. 45.1% of the positive samples were sausages, 27.4% were smoked meat products, 19.4% were minced meat and 8% were ham. In a study conducted in Turkey, *T. gondii* was present in 20% of the ovine muscle, 19% of fermented sausage, 6% of the bovine muscle, 4.17% of the ovine brain and 2% of the bovine brain.

L. monocytogenes is a major pathogen known worldwide as the causative agent of listeriosis and contaminates with food. This pathogen is a bacterium that causes meningoencephalitis, cerebral abscesses, cerebritis, bacteremia, meningitis and sepsis, especially in immunosuppressed individuals and pregnant women, and has a high mortality rate (20%-30%). In a study conducted by Bouymajane et al. (2021) in Morocco, 520 food samples were examined. It was found that 15 (2.9%) of the analyzed samples were contaminated with *L. monocytogenes*. It was observed in 5.7% of raw minced meat and raw sausage, while was found in 1.9% of raw beef, poultry and raw fish samples. Additionally, it was observed that all strains detected carried the *actA* gene. In another study, the prevalence of *L. monocytogenes* in consumption-ready products was examined and 783 delicatessen products were analyzed.

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