DETERMINATION OF *SALMONELLA* SPP. *SALMONELLA* ENTERİTİDİS AND *SALMONELLA* TYPHİMURİUM PREVALENCE BY ISO 6579-1:2017 AND REAL-TIME PCR IN CARCASSES COLLECTED FROM BROILER SLAUGHTERING STAGES BY DIFFERENT SAMPLING METHODS

AHMET GÖKHAN COŞKUN
0000-0002-51981-7577
BURSA ULUDAG UNIVERSITY
GRADUATE SCHOOL OF HEALTH SCEINCES
FOOD HYGIENE AND TECHNOLOGY DEPARTMENT
PhD PROGRAM

GRADUATION DATE: 17.05.2024

SUPERVISOR

Prof. Dr. Seran TEMELLİ
0000-0002-8869-4929
BURSA ULUDAG UNIVERSITY
GRADUATE SCHOOL OF HEALTH SCIENCES
FOOD HYGIENE AND TECHNOLOGY DEPARTMENT
BURSA – TÜRK

THESIS ABSTRACT

This study aimed to determine the presence of *Salmonella* spp., *S.* Enteritidis and *S.* Typhimurium, and the effectiveness of sampling methods in carcasses collected from various sampling stages by different sampling methods at a broiler slaughterhouse and to compare the effectiveness of the sampling methods. EN/ISO 6579-1:2017 method was applied to determine the presence of *Salmonella* spp., where isolate confirmation was done by *Salmonella* specific real-time PCR (Salm-rPCR) analysis. Serotyping of *Salmonella* was implemented according to EN/ISO 6579-3:2014 method. Additionally, *S.* Enteritidis and *S.* Typhimurium specific rPCR (SE/ST-rPCR) analysis was carried out to determine the presence of these serovars. *Salmonella* spp. was detected in 83.33% (105/126) of the samples, where all isolates were confirmed by Salm-rPCR analysis. No statistically meaningful difference was determined between the sampling methods compared, in terms of their effectiveness for detecting *Salmonella*, while the difference between the sampling stages was significant ($p < 0.05$). Absence of *S.* Enteritidis and *S.* Typhimurium, determined by serotyping, was confirmed by SE/ST-rPCR analysis. The most common serovar was Virchow (82.86%), followed by Schwarzengrund (14.29%), and Bredeney (0.95%).

APPLICATION AREAS OF THE THESIS RESULTS

Considering that the study is the first to use both the relevant updated EN/ISO standards and to compare sampling methods in determining *Salmonella* spp. and serovars during broiler slaughtering stages, it is believed that it will contribute current and original data to national and international literature as well as to the poultry sector. Furthermore, apart from SE/ST, which are required to be examined according to regulations, the study is thought to provide an impartial and reliable reference for future legal regulations and updates due to the broilers being asymptomatic carriers of other pathogenic *Salmonella* serovars such as Virchow and Schwarzengrund, whose prevalence rates and infection incidences have increased in recent years.

ACADEMIC ACTIVITIES

RESEARCH ARTICLES

1. Demircioglu, A., **Coskun, A. G.,** Kanar, T. S., Eyigor, A., & Temelli, S. (2024). High Salmonella Load with Serovar Virchow Dominance Pose Major Public Safety Risk in Post-Chill Broiler Carcasses. Poultry Science, 103584.
2. Akgun, Z., **Coskun, A. G.,** Cetin, E., Temelli, S., & Eyigor, A. (2024). Salmonella Carriage and Change in Serovar Distribution in Broiler Giblets at Slaughterhouse Level in Turkiye: First Report Using ISO 6579-1: 2017 and ISO 6579-3: 2014. Poultry Science, 103805.
3. Yilmaz, U., **Coşkun, A. G.**, Özel, Y., Ünlü, M., & Vardar-Ünlü, G. (2024). Synergistic interactions of essential oil components with antibiotics against multidrug-resistant Corynebacterium striatum. Journal of Applied Microbiology, lxae090.
4. Ardıçlı, Ö., Kanar, T. S., Demirbilek, S. K., Özdemir, A., Erdoğan, S., **Coşkun, A. G.**, & Carlı, T. (2023). Concurrent infection of Infectious Bronchitis Virus and Mycoplasma gallisepticum in a backyard poultry. Ankara Üniversitesi Veteriner Fakültesi Dergisi, 1-8.
5. Çetin, E., Ertekin, A., **Coşkun, A. G.**, Temelli, S., & Eyigör, A. (2021). Evaluation of the hygiene profile in cattle carcasses and their offal according to the criteria in legal regulations.

***DERLEMELER**

6. **Coşkun, A. G.**, Temelli, S., & Eyigör, A. (2022). Clues for zoonotic potential and transmission of Sars-CoV-2 via food and water. *Journal of Istanbul Veterinary Sciences*, *6*(2), 52-64.
7. **Coşkun, A.** G., Demircioğlu, A., Temelli, S., & Eyigör, A. (2021). Current status of major foodborne and waterborne viral infections and their prevention strategies. *Food and Health*, *7*(3), 227-241.
8. **Coşkun, A.** G., Temelli, S., & Eyigör, A. (2019). Mechanically deboned poultry meat: characteristics, current areas of use and relevant legislation *Veteriner Hekimler Derneği Dergisi*, *90*(2), 164-177.

***SÖZLÜ BİLDİRİLER**

9. Determination of Thermophilic Campylobacter Prevalence in Butcher Cattle Carcass, Cecum & Gallbladder Samples Using ISO 10272-1:2017. X.Veterinary Food Hygiene Congress. 25-27/04/2024.
10. Current Distribution of *Salmonella* Serovars in Broiler Carcasses from Slaughterhous. International Poultry Congress 08-11/05/2024.

***PROJELER**

11. Determination of *Salmonella* Presence in Edible Broiler Giblets Using ISO 6579-1:2017 and Salmonella-Specific Real-Time PCR (TGA-2021-488)
12. Determination of the Presence and Quantity of Salmonella in Samples Taken from Different Stages of the Broiler Slaughter Process Using Real-Time PCR and ISO 6579-2:2012 (TGA-2021-398)
13. Comparison of Virulence Gene Profiles in Campylobacter Isolates from Human, Broiler, and Cattle Sources (TOA-2022-1138

KEY WORDS

- ✓ Broiler
- ✓ Food Security
- ✓ Sampling
- ✓ Salmonella
- ✓ Serovar

CONTACT

E-MAIL:
ahmetgokhancoskun@hotmail.com

THESIS SUPERVISOR

TELEPHONE:
(+9 0224) 294 12 07

E-MAIL:
seran@uludag.edu.tr