

Short communication

THE OCCURRENCE OF *SALMONELLA* IN BROILER MEAT PRIOR TO ENTER THE MARKET AT ONE FOOD BUSINESS OPERATOR IN SERBIA

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Abstract

The occurrence of *Salmonella* spp. in broiler meat remains a critical public health concern and a major challenge for the food industry. This study systematically examined the occurrence and serovar distribution of *Salmonella* in fresh broiler meat on the Serbian market over a five-year period (2020–2024). A total of 400 samples, including broiler carcasses (n=100), fillets (n=100), leg quarters (n=100), and wings (n=100), were collected from a food business operator's warehouse and analyzed using the VIDAS UP *Salmonella* (SPT) automated screening method and standard ISO 6579-1:2017/A1:2020 protocols.

The results revealed an overall *Salmonella* spp. prevalence of 10% (40/400). Among the positive isolates, *S. Infantis* was identified as the predominant serovar, accounting for 82.5% of cases (n=33), while *S. Enteritidis* was detected in 17.5% (n=7). Distribution analysis across different meat categories showed that broiler wings had the highest contamination rate (15%), followed by whole carcasses (11%), leg quarters (9%), and fillets (5%). The lower frequency observed in fillets indicates that the removal of the skin serves as a critical factor in significantly reducing the overall microbial load.

Furthermore, seasonal trends indicated a rise in *Salmonella* occurrences during warmer months, emphasizing the need for enhanced control strategies during

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summer. These findings underscore the importance of comprehensive facility preparation from veterinary-sanitary and construction-technical perspectives as a prerequisite for effective laboratory monitoring. The results highlight that while current hygiene measures are in place, the high occurrence of *S. Infantis* necessitates more stringent biosecurity and systematic surveillance throughout the broiler meat production chain to mitigate risks to consumer health.

Key words: *Salmonella*, *Salmonella infantis*, *Salmonella enteritidis*, poultry meat, food safety

INTRODUCTION

Salmonella species are among the most significant pathogens associated with foodborne illnesses and rank as the third leading cause of deaths from diarrheal diseases worldwide (Ferrari et al., 2019). With the rapid growth of the poultry industry and the corresponding increase in consumption, maintaining hygiene is becoming crucial to prevent contamination and control foodborne diseases (WHO, 2023) during processing. The most common carriers of foodborne *Salmonella* spp. infections in humans are animal-derived, with eggs, poultry, and pork being the most frequently associated sources (Löfström et al., 2015, Thames et al., 2022). Consuming undercooked, contaminated broiler meat poses the greatest threat to human health. Although rare, the prevalence of human salmonellosis is difficult to diagnose due to non-specific symptoms and intermittent presentation (Rašeta, 2014). Taxonomically, the species *Salmonella enterica* has been identified, including the highly pathogenic serovars *Salmonella enterica* subsp. *enterica* serovar Enteritidis (further *S. Enteritidis*) and *S. Typhimurium*, which have been responsible for more than 78 million cases of illness, 59,153 deaths (Havelaar et al., 2015), and roughly 4,068,000 disability-adjusted life years (DALYs) lost. *Salmonella* serovars in poultry meat and products pose a high risk for consumers. Serovars which constitute the primary security concern for causing foodborne diseases in humans are *S. Enteritidis* and *S. Typhimurium* as globally predominant (Hendriksen et al., 2011). Moreover, other region-specific serovars are reported as sources of human illness, such as *S. Infantis* (Rašeta, 2014) or *S. Indiana* (Xia et al., 2009). Several studies have reported the existence of this pathogen, highlighting the role of elimination and control for the safety of the human health sector (Shaji et al., 2023; Toloee et al., 2025; Brasileiro et al., 2025). Subsequent changes in dominant foodborne serovars are anticipated over time (Foley et al., 2008), indicating that surveillance of the emergence and distribution of serotypes for improving efforts on salmonellosis control is necessary.

Slaughterhouses are a principal site of contamination because *Salmonella* spp., when transmissible by intestinal matter at the time of processing, can be passed through equipment, transport containers, water, and human contacts. Processing

processes, such as bleeding, scalding, plucking, and evisceration, increase the risks of cross-contamination (Boubendir et al., 2021).

Therefore, the aim of this study was to provide data regarding the burden of *Salmonella* spp. in fresh broiler meat products (broiler carcasses and primal cuts) intended for human consumption after the application of routine control measures and prescribed food safety procedures. The study particularly focused on the occurrence of *Salmonella* spp. in products that had already passed standard production and inspection processes, thereby contributing to the identification and assessment of residual public health risks associated with broiler meat consumption. In addition, the collected data are expected to contribute to a comprehensive risk assessment of *Salmonella* presence throughout the broiler meat production and distribution chain. However, since the study included only one food business operator, the findings should be interpreted with caution and should not be directly extrapolated to the national level without considering the broader epidemiological context of *Salmonella* spp. occurrence in broiler meat.

MATERIAL AND METHODS

The presence of *Salmonella* was systematically examined over a five-year period (2020-2024) as part of the food business operator's self-control plan, involving a total of 400 samples of fresh broiler meat. Testing for the presence of *Salmonella* was conducted on fresh packaged broiler meat in the finished product cold storage room at the FBO premises, immediately prior to distribution to the market. Samples were systematically collected over a five-year period, consistent with the FBO self-control plan. Sampling was performed on a bi-weekly basis, with one to two samples obtained per interval, depending on the type and availability of the finished product in the cold storage room. A detailed overview of the sampling volume dynamics by month is presented in Supplementary table S1. Each sample comprised five individual units to enhance representativeness, in compliance with the Guidelines for the Application of Microbiological Criteria for Food (Serbian Regulation, 2011; 2024). Sampling was performed in FBO warehouse for packaged fresh poultry, immediately prior to shipment. The objective was to determine the occurrence of *Salmonella* at the FBO's dispatch point. The FBO implements all legally prescribed control measures and maintains a fully operational food safety management system (HACCP). Furthermore, the broilers from which the meat was obtained exhibited no clinical signs of disease, nor did they show reduced weight gain during the fattening period. Sampling was conducted at the stage of finished product storage within the FBO dispatch cold store. This represents the point of entry into the distribution chain; subsequent market handling necessitates appropriate storage within the defined shelf-life under 'cold chain' conditions. The established contamination level will not be eliminated during distribution; conversely, it may only increase due to potential logistical failures.

Sampling was performed in accordance with domestic (Serbian regulation 2019, 2024) and EU (European regulation 2002, 2005). The carcass and primal cuts were sampled in its original packaging, after cooling, immediately before being sent to the dispatch cold store. The following parts were sampled and tested: broiler carcasses (n=100), broiler fillets (n=100), broiler leg quarters (n=100), and broiler wings (n=100). These primal cuts, along with the whole carcass, were selected as they represent the most widely sold fresh broiler meat products in retail. It is the standard production practice of the FBO to utilize the remaining parts of the broiler carcass (broiler backs with pelvis and broiler necks) in the production of mechanically separated meat (MSM). All birds were slaughtered in accordance with the provisions of the Animal Welfare Act (Serbian regulation 2009; European regulation 2009) and relevant bylaws (Serbian regulation 2010). The slaughter process ensured that the animals were deprived of life exclusively in an unconscious state, strictly adhering to both national and international guidelines (Raj and Tserveni-Gousi, 2000) for the ethical treatment and welfare of animals during slaughter. Every positive isolate was subjected to serotyping.

When taking and preparing samples for testing, the relevant ISO (International Organization for Standardization) standards and Codex Alimentarius guidelines are applied as reference methods. For the detection of *Salmonella* spp., the method SRPS EN ISO 6579-1:2017/A1:2020 is utilized—Microbiology of the food chain - Horizontal method for the detection, enumeration and serotyping of *Salmonella* - Part 1: Detection of *Salmonella* spp. - Amendment 1: Broader range of incubation temperatures, amendment to the status of Annex D, and correction of the composition of MSRV and SC (ISO 6579-1:2017/Amd 1:2020).

The detection of *Salmonella* antigens in the samples was performed using the Enzyme-Linked Fluorescent Assay (ELFA) method (Rohonczy et al., 2014), specifically via the VIDAS UP *Salmonella* (SPT) assay on VIDAS series analyzers (Manufacturer BioMérieux) (Cetin et al., 2019). This automated, rapid, and sensitive screening method utilizes specific antibodies for the detection of *Salmonella* in food and environmental samples, providing high reliability within approximately 48 hours.

All positive samples identified by the VIDAS immunoanalyzer were subcultured onto differential media, such as Xylose Lysine Deoxycholate (XLD) agar (Merck KGaA, Darmstadt, Germany) and Rambach agar (Merck KGaA, Darmstadt, Germany), for the isolation of *Salmonella* using standard microbiological procedures (Carrique-Mas et al., 2009). The inoculated plates were incubated for 24 hours at 37 °C. On Rambach agar, *Salmonella* typically forms distinct red colonies. On XLD agar, characteristic colonies appear red with black centers, although some isolates may present as yellow colonies with black centers (Hess et al., 2023). Further identification of the isolates was performed by serotyping using polyvalent and monovalent antisera according to the White–Kauffmann–Le Minor scheme (Issenhuth-Jeanjean et al., 2014).

Statistical analysis was performed to evaluate the association between broiler meat sample type, environmental temperature, and the occurrence of *Salmonella* spp. Categorical data were analyzed using the chi-square (χ^2) test of independence to assess the relationship between broiler meat sample type and the presence of *Salmonella* spp. A significance level of $p < 0.05$ was applied throughout the study.

To evaluate differences in the distribution of *Salmonella* serovars, a binomial test was performed comparing the proportions of *S. Infantis* and *S. Enteritidis* among positive samples.

The relationship between environmental conditions and *Salmonella* occurrence was assessed by correlation analysis between the average monthly ambient temperature and the number of *Salmonella*-positive samples. Pearson's correlation coefficient (r) was used for normally distributed data, while Spearman's rank correlation coefficient (ρ) was applied when normality assumptions were not met.

Simple linear regression analysis was additionally performed to evaluate the effect of average monthly temperature on the occurrence of *Salmonella*-positive samples. The number of positive samples was treated as the dependent variable, while average monthly temperature ($^{\circ}\text{C}$) was included as the independent variable.

Binary logistic regression analysis was used to assess the effect of broiler meat sample type on the likelihood of *Salmonella* contamination. The dependent variable was the presence of *Salmonella* spp. (0 = negative, 1 = positive), while broiler meat sample type was included as the independent variable, with broiler fillet used as the reference category. Results were expressed as odds ratios (OR) with 95% confidence intervals (CI). All statistical analyses and graphical visualizations were performed using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) with the RegressIt add-on for regression analyses. Results were considered statistically significant at $p < 0.05$.

RESULTS AND DISCUSSION

Out of 400 samples examined, 40 tested positive for *Salmonella*; among these, *S. Infantis* was identified in 82.5% of cases ($n=33$), while *S. Enteritidis* was detected in 17.5% of cases ($n=7$). The distribution of positive samples varied across different broiler meat categories. The highest frequency was observed in wings (15%), followed by carcasses (11%) and leg quarters (9%), while fillets showed the lowest contamination rate (5%).

The results of positive samples across the investigated categories of fresh poultry meat are presented in Table 1.

Table 1 shows significant differences in contamination depending on the type of sample.

Table 1. Positive cases across the investigated sample types of fresh broiler meat

Sample types of fresh broiler meat	n (samples)	Positive samples
		(%)
Broiler fillet	100	5
Broiler leg quarters	100	9
Broiler carcass	100	11
Broiler wings	100	15
Total	400	10

Based on the data from Table 1 (fillet: 5 positive / 95 negative; broiler leg quarters: 9/91; carcass: 11/89; wings: 15/85), a chi-square test of independence was performed to assess whether contamination differed significantly among broiler meat sample types. The analysis revealed a statistically significant association between broiler sample type and the presence of *Salmonella* spp. ($\chi^2 = 8.72$, $df = 3$, $p = 0.033$), indicating that contamination was not uniformly distributed across different types of broiler meat. A clear numerical trend of increasing contamination was observed from fillets (5%) to wings (15%). Logistic regression results are presented in Table 2.

Table 2. Logistic regression analysis of *Salmonella* spp. occurrence relative to product type

Variable	β (Coeff.)	S.E.	Wald	<i>p</i> -value	Odds ratio (OR)	95% CI for OR
Broiler fillet	/	/	/	/	1.000 (Ref.)	/
Leg quarters	0.628	0.587	1.144	0.285	1.872	0.592-5.881
Broiler carcass	0.855	0.569	2.258	0.133	2.351	0.771-7.152
Broiler wings	1.210	0.541	5.003	0.025*	3.353	1.161-9.682
Constant	-2.944	0.459	41.134	< 0.001	0.053	/

Legend: β : Regression coefficient; S.E.: Standard Error; Wald: Wald chi-square statistic; CI: Confidence Interval.

* Statistically significant difference ($p < 0.05$)

The binary logistic regression model identified the sample type as a significant predictor for *Salmonella* contamination ($p < 0.05$). Using broiler fillet as the reference group (OR = 1.00), broiler wings showed a statistically significant increase in the odds of contamination (OR = 3.35, $p = 0.025$). Although broiler carcasses and leg quarters displayed higher odds of contamination (OR = 2.35 and OR = 1.87,

respectively), these differences did not reach statistical significance within the 95% confidence interval. To present the logistic regression results more transparently and clearly, a Forest Plot was utilized. This graph illustrates which factors increase the risk, indicated by values positioned to the right of the reference line (1.0).

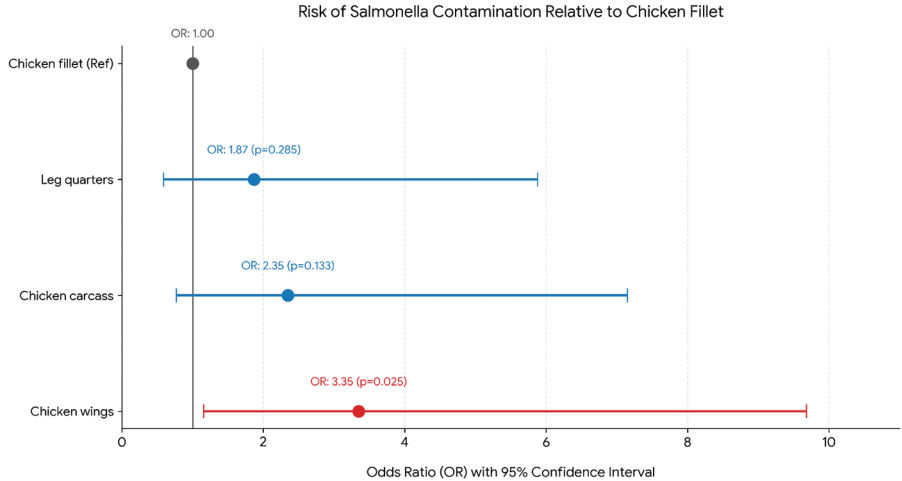


Figure 1. Visualization of Risk (Odds Ratio)

The logistic regression model demonstrates that the broiler sample type is a significant predictor of *Salmonella* contamination ($p<0.05$). Broiler wings are identified as a sample with the highest risk of contamination. Samples from broiler wings were 3.35 times more likely to be contaminated compared to skinless fillets ($OR=3.35$; 95%CI: 1.16-9.68; $p=0.025$). Other categories: while carcasses ($OR=2.35$) and leg quarters ($OR=1.87$) showed numerically higher *Salmonella* occurrence than fillets, their results did not reach the threshold of statistical significance ($p>0.05$) primarily due to the wide confidence intervals associated with the sample size. Reference Point: The vertical line at 1.0 represents the baseline risk (broiler fillet). Any interval that does not cross this line (like broiler wings) is considered statistically significant.

The serotyping results of the positive cases across the investigated sample types are presented in Figures 2–5.

Figures 2-5 illustrate the temporal distribution of pathogens. Seasonal trend is present in all figures, a discernible increase in the frequency of positive samples is observed across all figures during the summer months (May, June, and July). While *S. Infantis* remains endemic throughout the year, *S. Enteritidis* exhibits sporadic occurrence, with peak detection typically recorded between May and June (Figures 2 and 3).

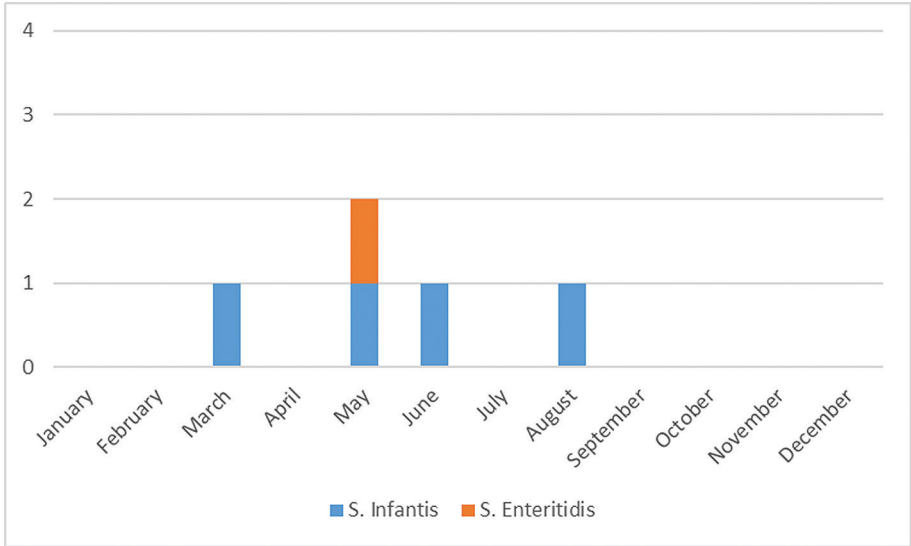


Figure 2. *Salmonella* serovars occurrence in relation to the month of the year from broiler fillet in period 2020-2024.

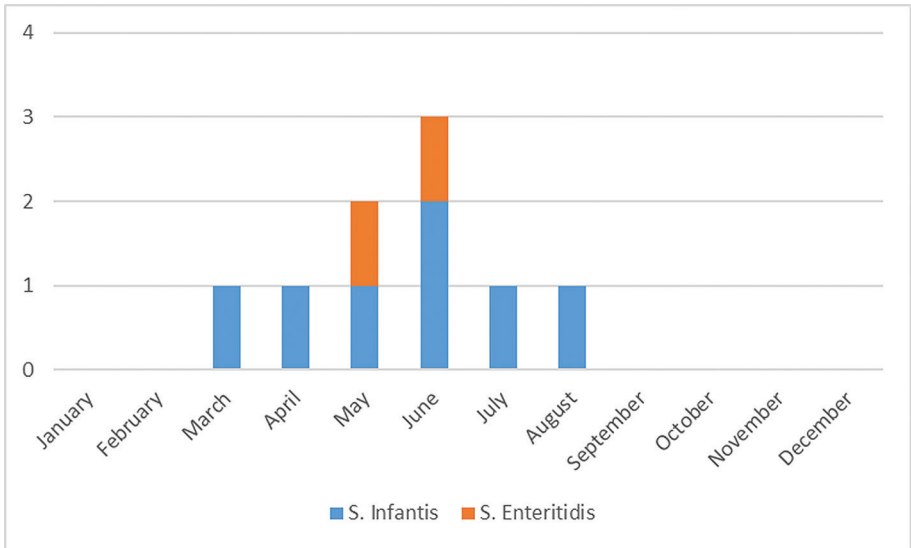


Figure 3. *Salmonella* serovars occurrence in relation to the month of the year from broiler leg quarters in period 2020-2024.

Comparing the prevalence of the serovars *S. Infantis* and *S. Enteritidis*, out of 40 positive samples, 33 were identified as *S. Infantis* and 7 as *S. Enteritidis*. The binomial test (or Chi-square) resulted in a p-value < 0.0001, indicating a highly significant difference in serovar distribution.

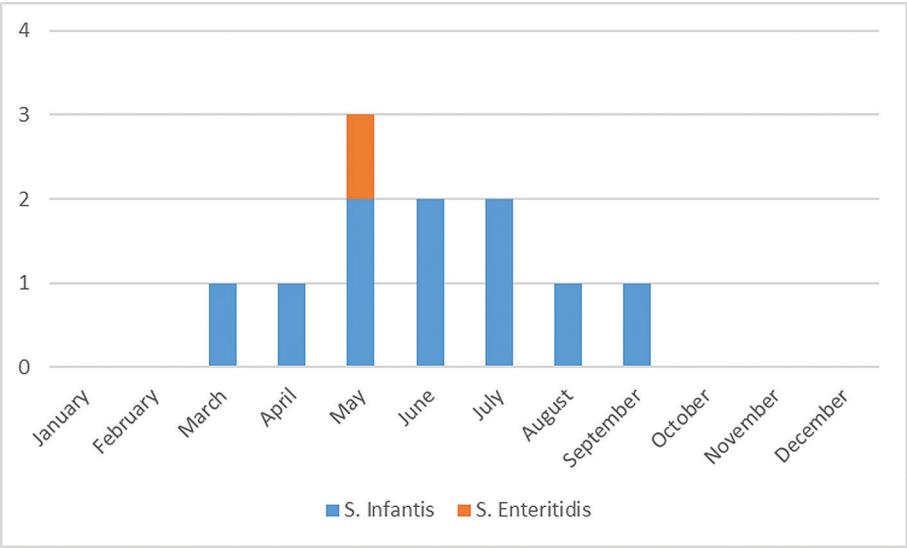


Figure 4. *Salmonella* serovars occurrence in relation to the month of the year from broiler carcass in period 2020-2024.

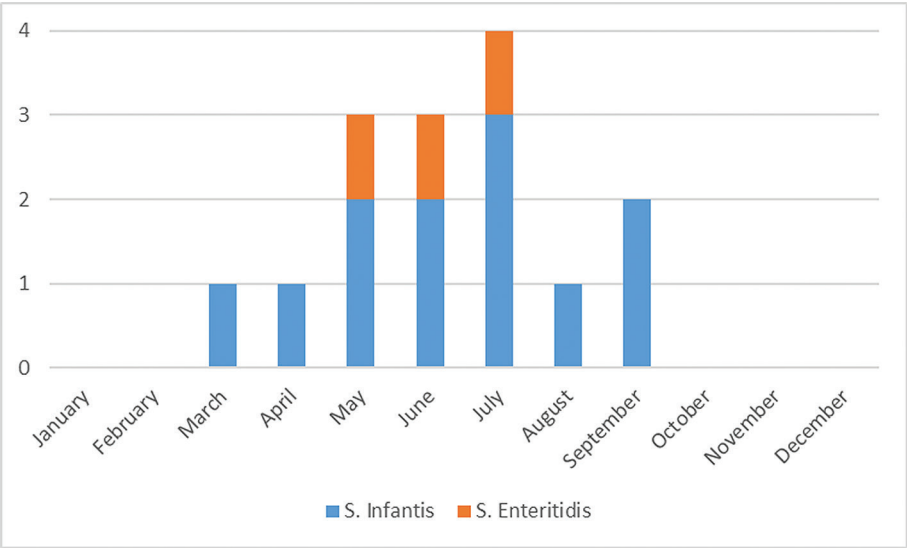


Figure 5. *Salmonella* serovars occurrence in relation to the month of the year from broiler wings in period 2020-2024.

By comparing the obtained results of *Salmonella* occurrence in fresh broiler meat with the official monthly average temperature data for the period 2020–2024, provided by the Republic Hydrometeorological Service of Serbia (RHMZ, 2024), a statistically significant positive correlation was found between average medium temperature and the occurrence of both *S. Infantis* and *S. Enteritidis* across the fresh broiler meat sample types. Results are presented in Table 3.

Table 3. Results of *Salmonella* prevalence and average medium air temperature

<i>Salmonella</i> strain	Coefficient (Temperature)	<i>p</i> -value	Interpretation
S. Infantis	0.1161	< 0.001	Highly significant; occurrence increases as temperature rises
S. Enteritidis	0.1409	0.044	Significant; also increases with temperature, though fewer overall cases

The regression coefficient (0.116) indicated a positive association between average ambient temperature and *Salmonella* occurrence, demonstrating that the frequency of positive samples increased with rising temperature. Both serovars showed peak occurrence during the warmest months (May to September; 18.5–24.5 °C). During the coldest months (January, February, November, and December; below 9 °C), positive detections decreased to nearly zero across almost all sample types. Broiler wings and carcasses consistently exhibited the highest numbers of *S. Infantis*-positive samples during warmer periods compared to fillets and leg quarters (Figures 2–5).

Salmonella can contaminate broiler carcasses at any point along the production chain, starting from breeder farms and extending to retail outlets (Zeng et al., 2021). *Salmonella* spp. is present throughout all stages of production and distribution and cold chain maintenance (0–4 °C) effectively inhibits the proliferation of the pathogen, but it does not achieve inactivation or elimination (Gonçalves-Tenório et al., 2018).

Through using the indicator microorganisms—specifically total viable count (TVC), *Enterobacteriaceae* count (EC), and the occurrence of *Salmonella* spp. monitored on carcasses—the risk-based classification of slaughterhouses should be established according to process hygiene performance (Mrdović et al., 2018). Comparing results a study conducted in China reports slaughterhouses as main contamination sources 62,9%, followed by retail 54,7% and farm level with only 7.0% *Salmonella* spp. prevalence (Ren et al., 2016). Such a high prevalence in slaughterhouses necessitates an evaluation of primary production characteristics, as well as an assessment of cross-contamination, which is inevitable on high-capacity poultry slaughter lines. The presence of *Salmonella* spp. in the gastrointestinal tract of broilers can be asymptomatic, meaning that clinical symptoms may be absent (Chlebicz and Śliżewska, 2018); consequently, during evisceration and the opening of the body cavity, the pathogen can contaminate the carcass surface if the integrity of the gastrointestinal tract is compromised. This also accounts for the lower *Salmonella* occurrence observed in broiler fillets in the present research (5%), as the skin—which serves as a primary carrier of the microbial load—is removed during the preparation of the broiler breast.

The contamination level of fresh broiler meat identified in the present study (10%) was higher: 7,1% (Gonçalves-Tenório et al., 2018), 9% (Kim et al., 2025) and lower than similar studies: 18% (Brasileiro et al., 2025); 18,1% (Regalado-Pineda et al., 2020); 26,4% (Wang et al., 2014, Sun et al., 2021); 32% (Thames et al., 2022); 32,55% (Di Taranto et al., 2025); 40% (McKee, 2011), 46,1% (Lunara Santos Pavelquesi et al., 2023) and 50% (Yang et al., 2011). Pathogen control across the poultry production and distribution chain must be rigorous in order to mitigate contamination risks (Brasileiro et al., 2025), while cross contamination can occur (Xiao et al., 2019). Research conducted in Switzerland revealed a 6% *Salmonella* prevalence, with *S. Infantis* emerging as the dominant serovar (Barmettler et al., 2025); similar trends were observed in Italy (Di Taranto et al., 2025) and Belgium (Zeng et al., 2021). In a study conducted in Japan, *S. Infantis* was identified in 32.1% of the cases (Ishihara et al., 2020). In China *S. Enteritidis* was the most dominant serovar (Zhou et al., 2025), while in Iran *S. Thompson* (Dillal et al., 2014).

Seasonal patterns in *Salmonella* contamination exist in many food products (Williams et al., 2014). In the context of current global climatic shifts, extreme weather events are of particular concern as they may facilitate the dissemination of *Salmonella*. Elevated temperatures promote accelerated growth rates, leading to a higher microbial load on broiler meat during the summer months (Mahmud et al., 2011, Naurin et al., 2013, Williams et al., 2014, Ishihara, 2020).

Seasonal trends indicated a rise in *Salmonella* occurrences in slaughterhouses during the warmer months, which is similar to findings of this research, which emphasizes the necessity for improved control strategies. These results underscore the crucial need for biosecurity measures on farms and the enforcement of stringent hygiene practices in processing facilities to mitigate *Salmonella* contamination in poultry production. Broiler fillet was selected as the reference category (OR = 1) due to its lowest observed contamination rate (5%). Broiler wings were the only sample type where the increase in risk was statistically significant ($p=0.025$). Specifically, the odds of a wing sample testing positive for *Salmonella* were 3.35 times higher than those for fillets. This significant increase in risk is likely associated with the combined effect of high skin surface-to-mass ratio and the anatomical positioning of wings during the suspension phase of the processing line. While carcasses and leg quarters showed numerically higher risks (OR 2.35 and 1.87, respectively), their confidence intervals were wider and crossed the reference line (1.0). This indicates that a larger sample size would be required to confirm statistical significance for these sample types.

A comparison of serovar proportions revealed that the prevalence of *S. Infantis* (82.5%) was highly significantly higher ($p<0.001$) compared to *S. Enteritidis* (17.5%). This finding indicates a strong adaptation of *S. Infantis* within this specific production chain, suggesting its endemic presence within the facilities or among suppliers. In early 2023 *S. Enteritidis* was now co-occurring, indicating either a shift in the microbial landscape or a collapse of control in peak summer months.

Looking at the colder months (November–February) versus the warmer months (May–August), a clear seasonal increase in pathogen occurrence was observed during warmer periods. The specific temperature cut-off points (7°C for inactivity and 17°C for *S. Enteritidis* emergence) serve as valuable data for risk assessment in either food safety or environmental monitoring.

Occurrence of *Salmonella* serotypes and environmental conditions are presented in Supplementary tables S1. The main conclusion is the great positive relationship of average monthly temperature with detection of *S. Infantis* and *S. Enteritidis*. By decreasing the ambient temperature drop to 7 °C, the detection of *Salmonella* spp. is almost 0. *S. Infantis* remains constant once temperature is in excess of 10–12 °C with a high correlation coefficient ($r=0.75$) that temperature is the primary force for its global distribution. *S. Enteritidis* occurs in the dataset when temperatures go beyond 17.5°C, with highest occurrence at 28.4 °C in 2024. Over the 5-year period, signs of contamination seem to rise. In 2020, only 2 positive samples were generated throughout the length of the year. By 2024, this number rose to 13 positive samples. Difference between the earlier years (2020–2022) was represented by *S. Infantis* alone.

The results of this study are indicative of a positive association between temperature and *S. Infantis* and *S. Enteritidis* in fresh broiler meat. Seasonal variations in Serbia, as represented by RHMZ 2020–2024 data, played a vital part in the evaluation and assessment of microbial safety for poultry specimens in Serbia. In particular, the rise of average medium temperature, more than 18 °C at the end of spring (May) and 24.5°C during summer months (July and August), increases *Salmonella* frequency. The period 2020–2024 has been marked by record-breaking temperatures, with 2024 officially recorded as the warmest year since 1888, featuring mean temperatures up to 2.7 °C above the historical average. Climatic influence is evident and this correlation is attributed to elevated ambient temperatures, which facilitate the accelerated proliferation of *Salmonella* spp. within production facilities and throughout the transport chain. This observation is consistent with the previously known biological behaviour of *Salmonella* spp., which respond to mesophilic environments. In addition, the almost complete lack of both strains during December–February (when the ambient temperature drops to about 2.4°C) indicates that low ambient temperature is its own natural deterrent and high temperature can disrupt the cold chain.

CONCLUSION

The presence of *Salmonella* spp. in fresh broiler meat and retail cuts represents a significant public health concern. The findings of this study revealed that *Salmonella* spp. occurrence in fresh broiler meat at a single FBO, immediately prior to market distribution and following all control measures, amounts to 10%. Among these cases, *S. Infantis* was the dominant serovar at 82.5%, as opposed to *S. Enteritidis* at

17.5%. The wide variability in the contamination rates—from 5% in skinless fillets to 15% in broiler wings—suggests the skin and inverted position of the carcass during the process as the main sources of microbial load. Additionally, the seasonal peaks (in summer) showed that warmer ambient temperatures greatly aid pathogen growth.

This paper verifies that both serovar distribution and environmental conditions play a very substantial role in determining the microbiological safety of broiler meat.

Although the broiler meat tested positive for *Salmonella* spp., broilers remained asymptomatic, showing no clinical signs of disease or growth impairment during the fattening period. The bacteria colonized the gastrointestinal tract of the birds, subsequently leading to carcass contamination during the slaughter process. Given the high intensity of commercial broiler meat production, currently implemented control measures are insufficient to completely guarantee the absence of *Salmonella* on the surface of retail broiler meat.

Author's contribution:

Mladen Rašeta, Becskei Zsolt: Conceptualization, methodology, and study design. Mladen Rašeta, Jelena Jovanović, Mirjana Lukić: Investigation, sampling, and laboratory microbiological analysis. Elmin Tarić, Becskei Zsolt, Boris Mrdović: Formal analysis, data curation, and software-assisted visualization of seasonal trends. Snežana Paskaš: Literature review and validation of results. Mladen Rašeta, Becskei Zsolt: Writing – original draft preparation. Mirjana Lukić, Jelena Jovanović, Snežana Paskaš: Writing – review and editing. Mladen Rašeta: Project administration and final supervision of the manuscript. All authors have read and agreed to the published version of the manuscript

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Ethical statement

This study did not involve experimental research on live animals. All procedures were conducted in accordance with applicable institutional and ethical standards. ARRIVE guidelines are not applicable to this study.

Data availability statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Competing interests

No potential conflict of interest was reported by the authors

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NALAZ *SALMONELLA* U MESU BROJLERA PRE ISPORUKE NA TRŽIŠTE U JEDNOM SUBJEKTU U POSLOVANJU HRANOM U SRBIJI

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Kratak sadržaj

Prisustvo *Salmonella* spp. u mesu brojlera ostaje bitan problem za javno zdravlje i veliki izazov za prehrambenu industriju. U ovom radu je sistematski ispitana pojava i distribucija serovarijeteta *Salmonella* u svežem mesu brojlera na srpskom tržištu tokom pet godina (2020–2024). Ukupno 400 uzoraka, uključujući trupove brojlera (n=100), grudi (n=100), batake sa karabatakom (n=100) i krila (n=100), prikupljeno je iz skladišta jednog subjekta u poslovanju hranom i analizirano korišćenjem automatizovane metode skrininga VIDAS UP *Salmonella* (SPT) i standardnih protokola ISO 6579-1:2017/A1:2020.

Rezultati su pokazali ukupnu prevalenciju *Salmonella* od 10% (40/400). Identifikovana su dva serovarijeteta: *S. Infantis*, u 82,5% (n=33), i *S. Enteritidis* u 17,5% (n=7) pozitivnih slučajeva. Analiza distribucije u različitim delovima trupa brojlera pokazala je da su krila imala najveću stopu kontaminacije (15%), zatim celi trupovi (11%), bataci sa karabatakom (9%) i grudi (5%). Najniža učestalost zabeležena u mesu grudi ukazuje na to da je uklanjanje kože ključni faktor u značajnom smanjenju ukupnog mikrobnog opterećenja.

Sezonski trendovi koji ukazuju na učestaliju pojavu salmonele u toplijim mesecima ističu potrebu za poboljšanim strategijama kontrole tokom leta. Ovi nalazi naglašavaju važnost sveobuhvatne pripreme objekata sa veterinarsko-sanitarnog i građevinsko-tehničkog stanovišta kao preduslova za efikasan laboratorijski monitoring. Rezultati pokazuju da, uprkos sprovođenju postojećih higijenskih mera, značajna prevalencija *S. Infantis* zahteva strožu biološku bezbednost i sistematski nadzor u celokupnom lancu proizvodnje mesa brojlera kako bi se smanjile pretnje po zdravlje potrošača.

Ključne reči: *Salmonella*, *Salmonella Infantis*, *Salmonella Enteritidis*, meso živine, bezbednost hrane