Integrated One Health Surveillance of Salmonella, Antimicrobial Resistance, and Stakeholder Food Safety Practices in Poultry Markets in Mindanao, Philippines

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Salmonella remains a leading global foodborne pathogen, with poultry products serving as major transmission vehicles along the farm-to-market chain, particularly in low- and middle-income countries where informal market systems and limited biosecurity persist. In the Philippines, integrated surveillance examining pathogen prevalence, antimicrobial resistance (AMR), and stakeholder practices across poultry market systems remains limited. Addressing these gaps requires not only pathogen and AMR surveillance but also an understanding of stakeholder behaviors, including gender roles in egg marketing and handling, to inform effective food safety interventions. This study integrates pathogen detection, antimicrobial resistance profiling, and role and gender-disaggregated behavioral analysis to investigate the prevalence and risk factors of *Salmonella*contamination in chicken table eggs and spent hens sold in public markets across Mindanao, Philippines, and to assess stakeholder knowledge, attitudes, and practices (KAP) on *Salmonella* prevention. Sampling covered 25 towns and cities across four regions of Mindanao, yielding 7,200 eggs and 720 spent hens sampled. Egg samples were pooled in groups of ten, with both eggshells and internal contents tested, while cloacal and organ swabs (liver, oviduct, cecum, cloaca) were collected from hens. Isolation using XLD agar and PCR confirmed *Salmonella*contamination. In Bukidnon, 90 pooled egg samples and 30 necropsied hens were additionally tested for Escherichia coli, and AMR profiling of *Salmonella*isolates was conducted using the Kirby–Bauer disk diffusion method. A total of 960 egg sellers and consumers were surveyed to assess market practices and behavioral risk factors. *Salmonella* prevalence was 0.9% in eggs and 7.1% in spent hens, with significant variation across locations, egg components, and organs. Eggshells were more frequently contaminated than internal contents, indicating contamination during handling and distribution. Cloacal and oviduct samples showed higher prevalence than liver samples. Significant risk factors included infrequent stall sanitation, frequent egg delivery, sourcing from unregulated suppliers, outsider access to poultry areas, and absence of pest control. Detection of *Escherichia coli*further indicated hygiene deficiencies in market handling. Antimicrobial resistance profiling showed that 90.9% of *Salmonella* isolates were resistant to at least one of ten commonly used antibiotics, with 81.8% exhibiting multidrug resistance, particularly to ceftriaxone and ampicillin, while all isolates remained susceptible to amikacin. KAP analysis indicated favorable attitudes but low to moderate knowledge and inconsistent practices. Role- and sex-disaggregated analysis showed higher knowledge among consumers than sellers, and among female respondents than male, although overall knowledge remained limited. These findings confirm *Salmonella*as a persistent food safety and public health concern in poultry market systems in Mindanao, driven by gaps in hygiene practices, informal market conditions, and the emergence of antimicrobial resistance. Addressing these risks requires strengthened farm-to-market biosecurity, improved sanitation in informal markets, enhanced AMR surveillance, and targeted food safety interventions that reflect the roles of key stakeholders in food handling and decision-making. Integrating pathogen surveillance, antimicrobial resistance monitoring, and behavioral insights within a One Health framework provides a practical and scalable approach to improving food safety. Such strategies can support more resilient, equitable, and evidence-based poultry market systems in low- and middle-income settings.

Keywords: Salmonella, AMR, Market Eggs, Spent Hens, Food Safety.

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