Prevalence of zoonotic food-borne pathogens across commercial broiler farms and live bird shops in South India

Vasudevan Gowthaman[1], Thippichettipalayam Ramasamy Gopala Krishna Murthy[1], Samuel Masilamoni Ronald[2], Murugesan Ananda Chitra[3], Alagarsamy Alagesan[1], Arumugam Balakrishnan[1], Muthusamy Raman[2], Vijayasanthi, Ramalingam[2], Damer Blake[4], Guillaume Fournie[4] and Fiona Tomley[4]

[1]Poultry Disease Diagnosis and Surveillance Laboratory, Veterinary College and Research Institute Campus, Namakkal – 637 002, Tamil Nadu, India.
[2]Department of Veterinary Microbiology, Madras Veterinary College, Chennai – 600 007, Tamil Nadu, India.
[3]Central University Laboratory, Centre for Animal Health Studies, Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), Chennai – 600 051, Tamil Nadu, India.
[4]Department of Pathobiology and Population Sciences, The Royal Veterinary College, London, United Kingdom

Objectives

✓Selection of major poultry production regions through PDNs.
✓To find out 10 LBS from each 5 districts of Tamil Nadu.
✓To collect questionnaire data from LBS and concerned farm.
✓To collect farm and LBS samples to isolate and identify the FBPs
✓Assess the prevalence of food-borne pathogens in poultry from farm to live bird shops in Tamil Nadu.

Introduction

✓Poultry plays a significant role in the Indian food industry
✓According to 2023 livestock sensex, Tamil Nadu has the largest poultry producer in India
✓Poultry industry contributes to the economy and employment, but it also poses health challenges.
✓This poultry industry caused by zoonotic food-borne pathogens (FBPs) such as
E. coli, Non-Typhoidal Salmonella, and *Campylobacter* species.
✓These FBPs are caused by illnesses that can be transmitted between animals and humans.
✓Understanding the potential for transmission from poultry to humans is crucial for public health.
✓Therefore, the study was carried out to identify the transmission of FBPs from farm to LBS.
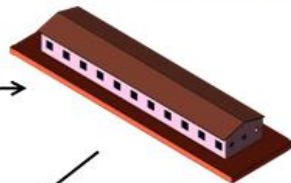
Methodology

Prevalence of food-borne pathogens

Description	Farm	LBS		Chi square value
		Broiler	**Commercial Desi**	
E. coli	94% (47/50)	96% (48/50)	90% (45/50)	1.5
NTS	46% (23/50)	42% (21/50)	40% (20/50)	0.38
Campylobacter	23.2% (58/250)	34.8% (87/250)	38% (95/250)	13.93**
C. coli	18.8% (47/250)	34% (85/250)	38% (95/250)	24.31**
C. jejuni	4.4% (11/250)	0.8% (2/250)	0% (0/250)	16.13**

Conclusion
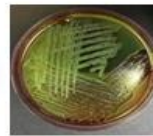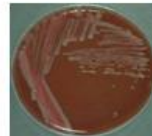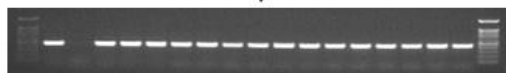
❖Transmission of FBPs from farm to live bird shops other factors such as improper handling, poor management, and hygiene practices during transport might have played a major role in higher prevalence of *Campylobacter* in LBS than farms.
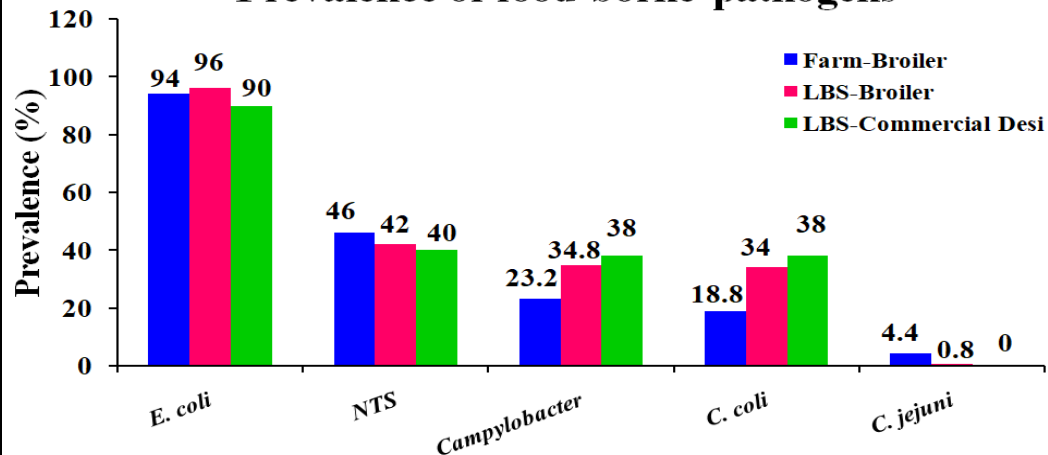
Salient Findings of the study

❖The association between the prevalence in farms and live bird shops for food-borne pathogens were analyzed by chi-square ($\chi2$) test.

❖It revealed that *Campylobacter* species had more prevalence in LBS than in farms ($p < 0.01$).

❖Moreover, *C. coli* was also more prevalent in LBS than in farms and *C. jejuni* had a higher prevalence in farms when compared to LBS ($p < 0.01$).

❖In contrast, there is no significant difference between farms and LBS associated with FBPs of *E. coli* and NTS.

Future Directions

A detailed investigation is needed to understand the other risk factors associated with *C. jejuni* from farms to LBS