SALMONELLA ISOLATION FROM POULTRY FARMS IN MALAYSIA FROM 2011 TO 2013

L. P. ONG[1], K. MUNIANDY[1]*, S. P. HOW[2], L. S. YIP[3] and B. K. LIM[3]

[1]Vet Food Agro Diagnostics (M) Sdn Bhd, [2]Asia-Pacific Special Nutrients Sdn Bhd, [3]Rhone Ma Malaysia Sdn Bhd, Lot 18B, Jalan 241, Seksyen 51A, 41600 Petaling Jaya, Selangor

**Corresponding author:vfad.bacti@rhonema.com*

ABSTRACT

Salmonella is a primary foodborne pathogen which causes salmonellosis in humans and animals worldwide. Poultry is a principal source of Salmonella which may be transmitted to humans via the food chain. This study involves testing 12664 samples collected from poultry farms in Malaysia in 2011-2013 for Salmonella via conventional microbiological methods. From the 12664 samples processed, 11.9% were found to be positive for Salmonella (3.1% *Salmonella* Enteritidis, 1.3% *Salmonella* Typhimurium and 7.5% unidentified serotypes grouped as *Salmonella* species). Preventive and control measures in poultry farms should be put into place to reduce Salmonella contamination and subsequent transmission to humans.

INTRODUCTION

Salmonella is a global public health concern as it is one of the major causes of foodborne diseases in the world. Salmonella infects both humans and animals. The Salmonella serotypes isolated from farms have also been found to cause illness in humans, suggesting a Salmonella transmission from animals to humans via the food chain (Li *et al*., 2013). Poultry is believed to be the principle food reservoir responsible for salmonellosis (Rusul *et al*., 1996), particularly non-typhoid human Salmonella infections (Tsai and Hsiang, 2004). Therefore, information on the prevalence of Salmonella in poultry is important in order to devise effective preventive and control measures.

The present study was carried out to evaluate Salmonella isolated from poultry farms in Malaysia over a three-year period of 2011-2013.

MATERIALS AND METHODS

A total of 12664 samples submitted to Vet Food Agro Diagnostics (M) Sdn Bhd from 2011 to 2013 were tested for the presence of Salmonella. The samples were collected from various broiler, breeder and layer poultry farms in Pahang, Kedah, Penang, Perak, Selangor, Negeri Sembilan, Melaka, Johor and Sabah. Sample types include organs, embryos, egg shell and fluff, cloacal and faecal swabs, feed, water, eggs, chick box liners, litter and environmental swabs. Samples were transported to the laboratory under refrigerated conditions and tested on the day of receipt.

The samples were tested for Salmonella based on the microbiological method described by Department of Veterinary Services (DVS, 2008) with some modifications. The samples were subjected to non-selective pre-enrichment, selective enrichment, selective plating, biochemical tests and serotyping. Serotyping was

conducted with polyvalents 'O', 'H' and six other antisera to identify mainly *Salmonella* Enteritidis and *Salmonella* Typhimurium. The other unidentified serotypes were grouped as *Salmonella* species.

RESULTS AND DISCUSSION

Table 1. Salmonella from poultry farms (2011-2013).

Sample Type	*Salmonella* Enteritidis	*Salmonella* Typhimurium	*Salmonella* species	Total positive	No. of samples
Organs	281 (8.1%)	16 (0.5%)	125 (3.6%)	422 (12.2%)	3471
Eggs	1 (0.3%)	-	9 (2.8%)	10 (3.1%)	320
Cloacal/Faecal Swabs	42 (2.2%)	54 (2.8%)	188 (9.8%)	284 (14.9%)	1911
Environmental Samples	65 (1.4%)	74 (1.6%)	499 (10.9%)	638 (14.0%)	4571
Feed	1 (0.1%)	16 (1.1%)	95 (6.6%)	112 (7.8%)	1443
Water	6 (0.6%)	3 (0.3%)	35 (3.7%)	44 (4.6%)	948
Total	**396 (3.1%)**	**163 (1.3%)**	**951 (7.5%)**	**1510 (11.9%)**	**12664**

Out of the 12664 samples tested from 2011 to 2013, 11.9% were found to be positive for Salmonella (3.1% S. Enteritidis, 1.3% S. Typhimurium and 7.5% S. species). The highest percentage of positive samples was from cloacal/faecal swabs (14.9%), followed by environmental samples (14.0%) and organs (12.2%). As indicated by the results, environmental sampling is a good indicator for the presence of Salmonella in poultry flocks. Salmonella transmission from the environment to flocks may be aggravated by unhygienic farming activities such as improperly cleaned or disinfected poultry houses, overcrowding and lack of biosecurity measures in the farm (Frederick *et al.*, 2011). Therefore, there is a need to introduce and implement proper hygiene control measures in poultry farms to reduce or prevent Salmonella from entering the food chain.

REFERENCES

Department of Veterinary Services. 2008. Salmonella MVK/BACT 01.

Frederick A., and N. Huda. 2011. Salmonellas, Poultry House Environments and Feeds: A Review. *Journal of Animal and Veterinary Advances* 10 (5): 679-685.

Li R., J. Lai, Y. Wang, S. Liu, Y. Li, K. Liu, J. Shen and C. Wu. 2013. Prevalence and characterization of *Salmonella* species isolated from pigs, ducks and chickens in Sichuan Province, China. *International Journal of Food Microbiology* 163:14-18.

Rusul G, J. Khair, S. Radu, C. T. Cheah, and R. Md Yassin. 1996. Prevalence of *Salmonella* in broilers at retail outlets, processing plants and farms in Malaysia. *International Journal of Food Microbiology* 33: 183-194.

Tsai H. J. and P. H. Hsiang. 2005. The prevalence and antimicrobial susceptibilities of *Salmonella* and *Campylobacter* in ducks in Taiwan. *Journal of Veterinary Medical Science* 67(1): 7-12.