

DIETARY EXPOSURE ASSESSMENT OF VETERINARY DRUG RESIDUE IN CHICKEN MEAT SAMPLE FROM SMALL AND MEDIUM SCALE CHICKEN SLAUGHTERHOUSES IN PENINSULAR MALAYSIA

M.R. Marzura^{1*}, M. Nor Ainy², U.Z.A. Ungku Fatimah², L.C. Chai³, S. Marni¹ and M. Khairunnisak⁴

¹*Makmal Kesihatan Awam Veterinar, Bandar Baru Salak Tinggi, 43900 Sepang, Selangor, Malaysia.*

²*Faculty of Food Science and Technology, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor, Malaysia.*

³*Faculty of Science, University of Malaya, 50603 Kuala Lumpur, Malaysia.*

⁴*Makmal Veterinar Kawasan Johor Bahru, Lot PTB 11098 Jalan Taruka off Jalan Datin Halimah, 80350 Johor Bahru, Johor, Malaysia.*

*Corresponding author: marzura@dvs.gov.my

Dietary intake of significant amounts of veterinary drug residue can lead to adverse health effects and development of antimicrobial resistance in the population. The aim of the current study was to estimate potential public health risk to antibiotic residues through chicken consumption amongst children and adult group in Peninsular Malaysia. Estimates were made using deterministic and probabilistic methods and the resulted exposures were compared to the acceptable daily intake (ADI). Determination of veterinary drug residues was carried out from 637 chicken meat samples collected from selected chicken slaughterhouses throughout Peninsular Malaysia. Residues in the samples were screened using microbial inhibition test and confirmed with LC-MS/MS. The chicken consumption data were obtained from the Malaysian Adults Nutrition Survey (MANS) 2014 and Malaysian Dietary Guidelines for Children and Adolescents 2013. The average concentration of tetracyclines (TCs) residues in chicken meat was 193.4 µg/kg, approximately two times greater than the maximum residue limit (MRL) set by the Codex Standards. Among four different tetracycline analysed, doxycycline residue was the highest at 413.9 µg/kg and oxytetracycline was frequently detected in the sample (0.78%) at the average concentration of 105.25 µg/kg. Enrofloxacin was detected below MRL in 1 sample, whereas none of the sulphonamide was detected. Hence, estimation of dietary exposure was conducted on tetracyclines (TCs) group only. Through deterministic approach, higher estimated daily exposure to TCs were found in children aged group 1<y<3 and 4<y<6 (1.45617 and 0.97098 µg/kg bw/day), followed by adult (0.65682 µg/kg bw/day) and children aged 7<y<10 at 0.64719 µg/kg bw/day. Based on probabilistic approach, dietary exposure of Malaysian adults to TCs through chicken meat consumption was estimated to range from 0.00174 - 0.35209 µg/kg bw/day. In comparison, for children group, the estimated exposure was higher in aged 1<y<3 at 0.0137 - 1.9845 µg/kg bw/day followed by children aged 4<y<6 and 7<y<10 at 0.00718 - 1.3967 µg/kg bw/day and 0.00834 - 0.91841 µg/kg bw/day, respectively. However, the estimated risk calculated for all groups were < 10 % ADI. These indicate that toxicological risk with regard to the consuming of chicken meat could not be considered as a public health problem, but the result can be informative for the safety authorities to instigate policies to control the present potential risk.