

Organochlorine and Organophosphate Pesticide Residues in Buffalo Milk Samples of Varanasi, India

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The research work was aimed at assessing the possible health hazards from the pesticide residues in milk by exploring their concentration level in buffalo milk samples from Varanasi district of India. One hundred and eighty buffalo milk samples were collected from 20 different villages of Varanasi district, India during the three seasons over one year duration and analyzed for different organochlorine (OCP) and organophosphate (OPP) pesticide residues through GCMS (GCMS 2010 Plus, Shimadzu, Japan). It was revealed that buffalo milk from Varanasi district were contaminated with different prevalence rate and concentration level of OCP residues viz., aldrin, endosulfan, α -HCH, β -HCH, γ -HCH, δ -HCH, 4,4'DDE, 2,4'DDD, 2,4'DDT, 4,4'DDT and OPP residues viz., chlorpyrifos, monocrotophos, phorate and dimethoate. Total 25.00% buffalo milk samples were found positive with aldrin residues whereas 30.00% buffalo milk samples were found to be contaminated with endosulfan residues. In buffalo milk samples the residues of α -HCH, β -HCH, γ -HCH, δ -HCH were observed 0.00546, 0.00533, 0.00886 and 0.00857 mg/kg, respectively. The prevalence of residues of 2,4' DDD, 2,4' DDT and 4,4' DDT in buffalo milk was 19.44%, 26.11% and 30.00%, respectively. Mean concentration of chlorpyrifos, monocrotophos, phorate and dimethoate were detected at levels of 0.00401, 0.01502, 0.00462 and 0.01663 mg/kg, respectively. Regular trend of seasonal variation in terms of prevalence and concentration of OCP and OPP residues were observed i.e., the prevalence and concentration of all the OCP and OPP residues were maximum during the winter season followed by summer and rainy season. It was concluded that although the buffalo milk samples from the study area were invariably contaminated with one or other OCPs and OPPs residues with prevalence rate as high as 49.44% for OCPs and 55.00% for OPPs, the above MRL prevalence of OCP residues was quite low being only 6.11% (11 out of 180) and that of OPP residues was 8.89% (16 out of 180).

Keywords: Pesticide residues, Buffalo milk, Organochlorine, Organophosphate, Food safety

Biography:

Dr. V.K. Paswan is Bachelor in Veterinary Science from Ranchi Veterinary College, Ranchi and Master's and Ph.D. in Animal Nutrition from IVRI, Izatnagar, Bareilly, India. Presently, Dr. Paswan is working as Assistant Professor in the Department of Animal Husbandry and Dairying at Banaras Hindu University, Varanasi, India. Dr. Paswan has made outstanding contribution through his applied research in the fields of animal nutrition and food-feed safety. He has published several articles in the area of Animal Nutrition and Feed Technology, Food-Feed Safety in Different National and International Journals and Magazines. For his efforts, he has been awarded with prestigious Cochran Fellowship by United States Department of Agriculture (USDA) and Mississippi State University in 2014 and Best Teacher Award by Banaras Hindu University in 2016. Presently, Dr. Paswan is engaged in active research in the area of Feed-Food Quality and Safety, Nutrition and Health and Fortification of milk with Micronutrients.