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[JEP](#) > Vol.2 No.2, April 2011



Health Risk Associated with Pesticide Contamination of Fish from the Densu River Basin in Ghana

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ABSTRACT

The Densu River Basin constitutes one of the largest agricultural areas in Ghana. The practice of using pesticides such as organochlorines, organophosphates, carbamates, pyrethroids and several others in agriculture and public health programs has raised concerns about potentially adverse effects on human health and the environment. In this study, a field survey was conducted to assess farmers' knowledge of safe handling and use of pesticides. Residues of pesticides in fish samples as well as the potential health risk associated with exposure to these pesticides were also evaluated. Data obtained from the field survey indicate that a very high proportion of farmers are at high risk of pesticide poisoning from occupational exposure. More than 90% of farm workers do not practice safety precaution during pesticide formulation and application leading to considerable prevalence of pesticide related illness in this agricultural community. Pesticide residues in fish samples varied greatly; from 0.10 µgKg⁻¹ to 30.90 µgKg⁻¹, consumption of fish and fisheries product from the basin was no zero risk. The estimated dose for aldrin, methoxychlor, γ-chlordane, endrin aldehyde, endrin ketone, endrin, p,p'-DDT and δ- HCH do not pose a direct hazard to human health, although present in fish samples since the values were lower than toxic thresholds as well as reference dose. However, γ- HCH, heptachlor, α-endosulfan, endosulfan Sulphate, p,p'-DDE and dieldrin levels exceeded the reference dose, indicating a great potential for systemic toxicity in children who are considered to be the most vulnerable population subgroup.

KEYWORDS

Ghana, Pesticide Residue, Exposure, Health Risk, Densu

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