

A Study of DDT Residues in Milk Samples of Cow from Kanpur District (U.P.), India

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Abstract

In all 117 milk samples from cow of 7 regions of Kanpur district were analysed. The results (Table-1) revealed that 37.68 percent samples were contaminated with DDT in the range of 0.003 to 1.749 ppm, of which 4.52 percent samples exceeded the maximum permissible limit of 1.25 ppm. The percentage of contaminated samples in cow milk was 61.61 in the range of 0.003 to 1.415 ppm of which 5.4 percent samples, one each from Ram Nagar and Bithore exceeded the permissible limit. Inoue et al. (1979) reported that 70 percent of cow milk samples were contaminated with a maximum of 0.002 ppm residues.

Keywords: Milk Sample, Cow, DDT.

Introduction

About 120 pesticides are registered for use in India of which two insecticides DDT and BHC most common, because of their efficacy as broad spectrum, to insect pests in agriculture and in public health, occupied with reasonable low prices compared to other organochlorine, organophosphorus, carbamate and pyrethroid insecticides. Pesticides have come in for severe criticism at various forums in the world and India is no exception, since, the publication of Rachel Carson's "Silent Sprint" in 1962 with its emotional denunciation of chemical pesticides. Pesticides are an essential part of production technology that makes it possible for the farmers to meet the demands of our growth population. Without pesticides, crop pest would make monoculture impossible and this would also make scientific farming impracticable. Plant diseases and insect pests could spell disaster in any given year, were it not for the protection of agriculture. If we do not use pesticides, it is estimated that crop losses would be high as 70-100 percent on an average and in some cases, pest damage or competition would make is pointless even to plant the crop. Substantial gains from the use of pesticides in agriculture as well as public health programme have been acknowledge by all. None the less, the harmful residual that remain on the crop, especially edible portion has cause great concern to everyone. Besides the contamination of feed and food commodities with pesticide, there is a growing, risk, that pesticides particularly which persist and then types that get translocated through air, water and soil system from the point of initial application, thus endanger the normal functioning of non target organisms. Bioaccumulation of these pesticides in food commodities and other environmental components is an important area, which needs immediate attention.

Material and Method

The present investigation was undertaken with the objective of monitoring DDT and BHC residues in market/ field samples of various commodities like okra, milk and water from Kanpur Districts of U.P. State (India). The analysis of DDT and BHC residue estimation was done as per the procedure described in ISI bulletin, AFDC-56 (2326) P, (1982) and AFDC 56 (2332) PC 1982 with little modifications. The materials used and methods followed are described below. Chemicals required of DDT and BHC residue estimation. Sodium Chloride, Anhydrous sodium sulphate, Acetone (redistilled), Methylene cyanide (redistilled), n-hexane (redistilled), Petroleum ether (redistilled), Sulphuric acid (sp. gr. 1.84), m,p'; and p,p' and p.p' – DDT isomers, Alpha, Beta and Gamma HCH. Animal milk samples were homogenized by vigorous shaking and reduced to 100 ml and 5 ml respectively. Animal milk samples measuring 100 ml and 5 ml respectively were taken in blender, extracted in acetone + hexane mixture (1:1). Hexane extract (50ml) was transferred in separatory funnel and about 100 ml sulphuric acid was added drop wise till hexane layer got clear. The lower phase of sulphuric acid was discarded. The upper phase was washed with distilled water till it became neutral, dried over anhydrous sodium sulphate and concentrated to 10ml.

Result and Discussion

In all 117 milk samples from cow of 7 regions of Kanpur district were analysed. The results (Table-1) revealed that 37.68 percent samples were contaminated with DDT in the range of 0.003 to 1.749 ppm, of which 4.52 percent samples exceeded the maximum permissible limit of 1.25 ppm. The percentage of contaminated samples in cow milk was 61.61 in the range of 0.003 to 1.415 ppm of which 5.4 percent samples, one each from Ram Nagar and Bithore exceeded the permissible limit. Inoue et al. (1979) reported that 70 percent of cow milk samples were contaminated with a maximum of 0.002 ppm residues. In the present investigation quite a high amount (1.415 ppm) of DDT was detected. It is obvious from these results that 5.4 percent of the cow milk samples were unfit for direct consumption. Indirect contamination of feeds may be the source of contamination of milk. Similarly DDT is pasted to the animals for the control of pest like ticks. This may also lead to contamination. Similar results are also found by Dhaliwal, *et al.* (1977) DDT residues in milk samples from Ludhiana and surrounding areas, Khan, *et al.* (2013), Mathiyazhagan, N., & Natarajan, D. (2013). Phytoremediation efficiency of edible and economical crops on waste dumps of bauxite mines, Salem district, Tamil Nadu. On a sustainable future of the Earth natural resources, Nassar, *et al.* (2018), Ozemen-M, *et al.* (2008), Ochiai, M. and Hanya, T. (1976). Alpha and gamma BHC in Tamgava river water, Japan, Rozpara E, *et al.* (2016), Sarwar M, Salman M (2015), Senthil-Nathan S (2015), Shahab-Ghayoor H, Saeidi K (2015), Szolyga B, *et al.* (2014) and Tak JH *et al.* (2016).

Table 1.DDT residues in milk samples of Cow from Kanpur district (U.P.), India

S. No.	Comm-odity	No. of samples analysed	No. of samples containing DDT residues				Residue level	
			BDL	No. contam-inated sample	1.25ppm	1.25 ppm	Min.	Max.
1	Cow milk	117	80 (68.37)	37	35 (29.91) (94.59)*	2 (1.70) (5.40)*	0.003	1.415

*Based on 5 observations

**Figures in brackets are $\sqrt{n+1}$ transformations

***Significant

Fig.In Parentheses and Transformed value

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