Evaluation on the Methods of Pesticide Residue Reduction for Vegetables and Fruits

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ABSTRACT

In this study eleven methods of pesticide residue reduction was evaluated for eight vegetables and friuts [(1) three leafy vegetables and (2) five vegetables and fruits] applied with five pesticides including two organophosphates, two two 3''5''-dichloroanilide fungicide, and one carbamate on them. The three replicates experimental data were subjected to the static software of SPSS using multi-way ANOVA. Significant differences between means were determined by Duncan ’ s multiple range tests with α ＝0.05. (1) With the analyzed by two-way ANOVA the higher residual pesticide was found from Spinach and Amarants than from Cabbage. The higher residual pesticide in Spinach was determined as the organophosphate and the carbamate and higher concentration of 3''5''-dichloroanilide fungicide was found in Amarants. The amount of residue of pesticide was followed the order of Chlorpyrifos, Methomyl, Procymidone,Acephate, and Iprodione in three leafy vegetables. (2) With the analyzed by two-way ANOVA the higher residual pesticide was found from Luffa and Kidney bean than from Carambola and Eggplant and Cucumber. The higher residual pesticide in Carambola was determined as the organophosphate and higher concentration of carbamate was found in Luffa and Kidney bean and higher concentration of 3 ’ 5 ’ -dichloroanilide fungicide was found in Luffa. The amount of residue of pesticide was followed the order of Methomyl, Procymidone, Chlorpyrifos, Acephate, and Iprodione in five vegetables and fruits. The data of the residue of pesticide after pesticide reduction analyzed by three-way ANOVA was shown than the different methods have significant difference in between. (1) The pesticide resulted in best for reduction was Methomyl and the Chlorpyrifos was found less level of reduction. For leafy vegetables the level of pesticide reduction was followed the order of Amarants, Spinach, and Cabbage. For comparison of the reducing method the boiling water treatment was the best result of reduction and the others followed the order of the ozone treatment, the soy powder soaking, the flour soaking, the sun light exposure, and the UV light exposure. (2) The pesticide resulted in best for reduction was Iprodione and the Chlorpyrifos was found less level of reduction. For vegetables and fruits the level of pesticide reduction was followed the order of Kidney bean, Cucumber, Luffa, Carambola and Eggplant. For comparison of the reducing method the boiling water treatment was the best result of reduction and the others followed the order of the ozone treatment,the soy powder soaking,the flour soaking, the UV light exposure,and the sun light exposure. With boiling water treatment the level of pesticide reduction increase when the treatment time was increased. The pan cover applied or not would not influence the reduction level. For salad usage the vegetables and fruits was recommended by using proper water wash with the ozone treatment and it will reduce almost 50% of pesticides.

Keywords : vegetables and fruits ; leafy vegetables ; pesticide reduction ; organophosphates ; carbamates

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