

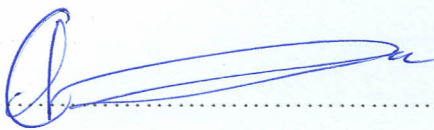
**INVESTIGATION OF DITHIOCARBAMATE FUNGICIDES AND
ETHYLENETHIOUREA METABOLITE RESIDUES IN SOME VEGETABLES FROM
KIRINYAGA AND NAIROBI COUNTIES**

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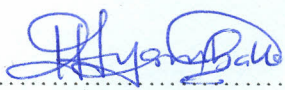
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ABSTRACT

Vegetables are a major source of minerals, proteins, energy and roughage. Some vegetables such as tomato and sweet pepper can be eaten raw or cooked. Pests and diseases that destroy vegetables are controlled using pesticides among which are fungicides such as dithiocarbamates (DTCs). These chemicals are toxic to animals including man at high concentrations and injurious to the environment. DTCs are commonly used in different combinations in Kenya and one of their metabolites ethylenthiourea (ETU) which has a long residual time of between five to ten weeks is believed to be carcinogenic. Cooking degrades DTCs to metabolites such as ETU while proper cleaning or processing can remove the residues considerably. There is therefore a need to investigate the levels of these pesticides and their metabolite in food. This study proposes to determine the residue levels of DTCs zinc propylene bisdithiocarbamate (propineb), zinc manganese ethylenebisdithiocarbamate (mancozeb) and the metabolite ETU in tomato (*Lycopersicon esculentum*) and sweet pepper (*Capsicum annum l*). The samples will be obtained from some markets in Kirinyaga and Nairobi Counties during dry and wet seasons. The study will also determine the effect of different washing methods and temperature on the residues of samples obtained from an Experimental garden. Samples will be analyzed when cooked at different temperatures and when washed with water or sodium hypochlorite to note variation and levels of DTCs and ETU in processed food. The pesticides will be extracted by solvent extraction (liquid-liquid extraction) using acetonitrile-dichloromethane-chloroform mixture in the ratio of 1:1:1 and analyzed using HPLC. Residue levels will be compared with the acceptable daily intake (ADI) and maximum residue limits (MRLs) allowed by WHO/FAO and EU. The results will inform relevant authorities for action if necessary with an expected impact of a more cancer free population. Results will be used to educate farmers, vendors and consumers through publications and seminars the best methods of handling the said produce to ameliorate the effects.