

**Investigation of a Hazardous Metabolite, Ethylenethiourea, in
Ethylene Bis-Dithiocarbamates, Fresh and Processed
Tomatoes: Case of Mwea Division, Kirinyaga District**

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ABSTRACT

Ethylenethiourea (ETU), an EBDC metabolite with adverse health effects was studied. The overall objective of the study was to investigate how the fungicide formulation and value chain of tomatoes influence dietary exposure to ETU. The set-up involved a case study survey using semi-structured questionnaire in Mwea Division, field experimentation, stratified random sampling of DCs and copper formulation from retail outlets and fresh tomatoes from open-air markets. The effect of washing of surface fungicide deposits on ETU levels was also done alongside the combined effect of washing and cooking. ETU extraction from samples was by 20:80 methanol:water and filtration with hyflo supercel. Samples were analyzed under a reversed phase HPLC with Lichrosorb^R100 RP8 (5µm) column and a UV detector. Sancozeb^R (mancozeb) had 4.7 % ETU, which was higher than 0.5% standard of IHA and that of EU. No ETU was detected in copper and propineb formulations. Tomatoes sprayed with Oshothane^R (mancozeb) and Antracol^R (propineb) had 10.20 mg/kg and 0.61mg/kg of ETU respectively. With prior washing t-test indicated no significant differences ($P>0.05$) in ETU levels in raw and cooked tomatoes. Conversely, independent t-test, cooked-washed and cooked-unwashed indicated significant differences ($P<0.05$) between means. Canned tomato products, namely puree, paste and ketch-up showed mixed levels of ETU. The research findings showed that dietary exposure to ETU can be reduced by proper choice of fungicide and washing of tomatoes before consumption.