

Cold storage: an option in reducing pesticide residue levels in cabbage (*Brassica oleracea*) heads

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Abstract

Laboratory analysis to establish the residue levels of pesticides in cabbage heads harvested from farms in the forest ecozone of Ghana revealed the presence of organochlorines, and further analysis quantified the amounts present. Analysis of organochlorine residue levels in heads of cabbage at harvest indicated alpha-BHC, gamma-BHC (Lindane), beta-BHC, delta-BHC, beta-Endosulfan and Heptachlor residue levels of 0.321, 0.908, 0.883, 0.394, 0.207 and 0.140 mg/kg, respectively, which are all higher than the FAO/WHO guideline value of 0.05 mg/kg. However, DDT, DDE, Endrin, Dieldrin and Endosulfan sulphate showed residue levels of 0.017, 0.07, 0.022, 0.010 and 0.005 mg/kg, respectively, which are all below the FAO/WHO guideline value of 0.02 mg/kg for DDT and DDE, and 0.05 mg/kg for Endrin, Dieldrin and Endosulfan sulphate, respectively. Analysis of residue levels of the organochlorines, after 14 days of storage in a refrigerator at 5°C, showed significant reductions ($p < 0.05$) in pesticide residues in the cabbage heads. All of the pesticide levels fell below the FAO/WHO recommended levels, except gamma-BHC (Lindane) and beta-BHC, whose levels dropped significantly ($p < 0.05$) but were still higher than the FAO/WHO recommended levels. From the results of the analyses, storing cabbage for 14 days could remove all traces of Aldrin, Dieldrin and Endosulfan sulphate. Organochlorine pesticides are banned for vegetable production in Ghana; therefore, the detection of these organochlorine pesticides residues in cabbage samples indicates misuse of agrochemicals among cabbage producers in the forest ecozone, and these cabbages therefore pose health hazards for consumers, particularly if they are consumed soon after harvest.