

**QUALITY AND SAFETY CHARACTERISTICS OF HONEY PRODUCED IN
DIFFERENT REGIONS OF KENYA**

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ABSTRACT

Honey possesses numerous nutritional, healing and prophylactic properties. Honey has the image of being natural, healthy and clean. However, currently honey is produced in an environment polluted by contaminants from different sources. In order to have a beneficial effect, honey must be free of any contaminating agents. Heavy metals, chlorinated and phosphorous containing pesticides as well as medicinal substances of veterinary use are considered among the important potential harmful polluting agents. The extent of contamination of honey samples on sale in various important beekeeping zones of Kenya was evaluated. These zones include Mwingi, Kitui, Ntubo, Tharaka, Embu, Mbeere, Timboroa, Turbo, Malaba forest, Lenana forest, Thika Kakuzi, Kakamega forest and Taita Taveta. Parameters analyzed included moisture content, hydroxymethylfurfural (HMF), reducing sugars and sucrose content, free acidity, ash content, heavy metals (cadmium, lead, zinc, copper), residues of oxytetracycline, tetracycline, organochlorine and organophosphorous pesticides. Average constituent values were: Moisture (15.27-20.29%), HMF (2.69-263.36 mg/kg), pH (3.62-4.52), Free acidity (17.22-43.0 meq/kg), Total reducing sugars (63.24-73.34%), Ash content (0.05-0.3%), Sucrose (0.172-16.15%). Cadmium (0.01-0.05 mg/kg), Lead (0.01-0.05 mg/kg), Copper (0.07-0.24 mg/kg) and Zinc (1.01-2.10 mg/kg). Most of the samples had constituent levels within the limits sets by the Codex Alimentarius, indicating that most farmers' harvested ripened capped honey and that generally honey was stored under suitable conditions. There was significant difference in the honey samples from different regions, this was expected. However, some samples had values of sucrose (11.16-15.47%) and HMF (59.03-263.36 mg/kg) way beyond the set limits of not more than 5% for sucrose and 40 mg/kg for HMF respectively, indicating adulteration of the honey. Most of the

honey samples had tetracycline and oxytetracycline residues below the limit of detection which was set at 0.005 µg/ml. This showed that most farmers did not use drugs to treat their bees and if they do they are administered. Chlorinated and phosphorous containing pesticides analyzed included; Aldrin, pp-DDE, Endosulfan, Lindane, Dicofol and Chloropyrifos. The limit of detection was in the range of 0.002-0.008 µg/ml. No pesticide residues were detected in all the samples analyzed from different regions, indicating that the bees collected their nectar and water in pesticide- free environments. It is recommended that regulatory mechanisms for heavy metals, residues of antibiotics and residues of pesticides be put in place; this will strength honey monitoring and inspection within the industry.