
High Institute of Public Health
Department of Nutrition

Dietary Risk Assessment of Pesticide Residues in Some Commonly Consumed Fresh Fruits and Vegetables

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In

Food Analysis

Presented by

Nehad Khaled Abd Ellatef Abd Ellatef

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ABSTRACT

The aim of this study was to assess dietary risk assessment of pesticide residues in some commonly consumed fresh fruits and vegetables.

A total of 36 samples of fresh fruits and vegetables samples collected from Egyptian markets during November to December 2019. Selection of fresh fruits and vegetables based on their popularity and consumption at all socioeconomic levels during the winter season. Samples were subjected to pesticide residues analysis using multi residues standard method (QuEChERS). The determination of residues carried out using GC-MS/MS and LC-MS/MS. The samples were analyzed using an accredited method that is capable of quantify 450 pesticide residues from different pesticide groups. Thirty one pesticides were detected in all analyzed samples.

The study showed the following results:

- Out of 36 tasted samples of fruits and vegetables .only 4 samples were free of pesticides residues (11.11 %). Out of 32 samples (88.88%) had detectable pesticide residues of which 13 samples (36.11%) were contaminated at level above the MRLs and while 19 samples (52.77%) had residues below the permissible limits (MRLs).
- All fruit samples had detectable pesticide residues. Whereas, 100% (18 samples) had detectable pesticide residues of which 55.55% contaminated at level above the MRLs and 44.44% (8 samples) had residues below the permissible limits.
- Four vegetables samples, (22.22%) had no detectable residue. Whereas, 77.77% (14 samples) had detectable pesticide residues of which 61.11% contaminated at level above the MRLs and 16.66% (3 samples) had residues below the permissible limits.
- The hazard index (HI %), representing the long – term risk assessment was in the range of 0.135692% – 1.978846% in tomato samples, 0.019972% – 8.737660% in guava samples, 0.415385% - 49.326923% in orange samples and 0.415385% - 49.326923% in orange samples of the ADI's.
- The hazard index (HI %), representing the long – term risk assessment was in the range of 0.013074% %- 0.115049% in lettuce samples, 0.016346% - 8.173077 % in cucumber samples and 0.012529%- 1.294647% in pepper samples of the ADI's. The highest exposure was observed for carbendazim in lettuce samples, propamocarb in cucumber samples and fipronil in pepper samples of ADI respectively.
- Overall, the EDIs of the different pesticides from vegetable and fruit consumption are not considered a public health problem, as HRI % value less than 100% is considered as safe for human health.