Determination of Some Metallic Elements and their Effect on Physical Properties of Edible Olive Oil in Palestine

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Abstract

The physical properties: density, refractive index, viscosity, and acidity of samples of olive oil from different geographical location and heights in Palestine were measured. The measured physical properties agreed with International and local standards. The concentration of Al, Cd, Cu, Fe, K, Mg, Mn, Na, Ni, Pb and Zn elements of olive oil are measured by inductively coupled plasma mass spectrometry ICP-MS. Magnesium (Mg) is the most concentrated metal detected (294.738 - 782.968µg/g), followed by concentration of sodium (Na) (73.401 - 390.699 µg/g) and potassium (K) (18.473 -168.883 µg/g). Concentrations of iron, copper and lead in Palestinian olive oil don't agree with concentration of International Olive Council (IOC). The differences of concentration of metals of olive oil depend on the type of olive oil tree, storage age, height and geographical location. There is a positive relation between the concentration of metals of olive oil and physical properties: density, refractive index, viscosity, and acidity. The daily intake rate of these metals shows no risk to human health according to US Environmental Protection Agency (US EPA).