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7.SUMMARY

The use of pesticides is clearly increased in the recent period to protect and improve the agricultural and livestock production from pests and this led to pollution of the environment surrounding the human being, but also extended to his own food. There are many types of pesticides divided according to terms of use against various pests into fungicides, herbicides, rodenticides, insecticides and others. Among these toxic pesticides: (in terms of chemical composition) the organochlorine and pyrethroid pesticides and each of them has a significant influence in arriving into meat and meat products, which leads to a threat to public health. Organochlorine pesticides considered the most dangerous type for humans as they are chemicals complex installation of chlorine (60% of its composition) and has a great ability to resist degradation therefore remain in the environment for long periods up to tens years in addition to that these substances are fat soluble and not water soluble, therefore when they reach to the animal either by feeding contaminated foods or by spraying the animal to resist certain parasites or insects, they are stored in animal fat after a certain period. Pyrethroids are modern materials extracted from plant material called pyrethrum and have the advantages of being less toxic than previous pesticides because they are rapidly decomposed to its basic elements.

As the liver is the main indicator of the presence of these toxic pesticide residues within the body and it is responsible for its disposal, this study was applied on 40 random samples of fresh livers were collected on the day of slaughtering from 40 carcasses of native breeds of cattle. About 20 gm of each liver sample was taken directly after inspection at slaughter

houses belonging to EL-Gharbia governorate over the period of the four year seasons (spring –summer –autumn –winter) from April 2014 to January 2015, each sample was kept in a separate sterile plastic bag in a deep freezer unit (-20°C) and then transferred to the lab in an insulated ice box for detection and determination of their content of pesticide residues. All the collected cattle liver samples were examined for eight OCPs residues (HCB, Heptachlor, Aldrin, Heptachlor epoxide, Endrin, ppDDE, ppDDT and Methoxychlor) during the four year seasons and five pyrethroid pesticide residues (Meothrin, Fenpropathrin, Lambdacyhalothrin, Cypermethrin and Deltamethrin) during winter.

GC-ECD used for determination of the concentrations of pesticide residues in the samples, confirmation using GC-MS/MS, while LC- MS/ MS used for screening of the liver samples for detection of the possibilities of pesticide residues presence and determination of their types.

The obtained results revealed that ppDDE was the predominant OC pesticide present in liver samples during spring, summer and autumn with a mean value of 58.276 ± 8.29 ppb, 4.183 ± 1.09 and 14.32 ± 8.12 ppb, respectively.

According to the MRL stipulated by **Gracey and Collins (2002)** 10% of the examined liver samples with Heptachlor epoxide and Endrin and 90% of the examined liver samples with ppDDE during spring, 10% of the examined liver samples with Heptachlor during summer and all the examined liver samples with ppDDE during summer and autumn, were

acceptable and fit for human consumption where they did not exceed the MRL.

Concerning to winter season, all OCPs under examination were detected with different incidence in which the mean concentrations of HCB, Heptachlor, Heptachlor epoxide, Endrin, ppDDE, ppDDT and Methoxychlor in the examined samples of liver were 1.69 ± 0.569 ppb; 2.24 ± 0.763 ppb; 6.74 ± 2.04 ppb; 3.56 ± 1.815 ppb; 2.62 ± 1.451 ppb; 2.69 ± 1.467 ppb and 1.67 ± 0.122 ppb, respectively. According to the MRL stipulated by **Gracey and Collins (2002)** and **ATSDR (2002)** 90% of the examined liver samples with Heptachlor epoxide and ppDDE, 70% of the examined liver samples with HCB, 60% of the examined liver samples with Heptachlor and ppDDT, 30% of the examined liver samples with Methoxychlor, 20% of the examined liver samples with Endrin and 10% of the examined liver samples with Aldrin , were acceptable and fit for human consumption where they did not exceed the MRL.

Regarding to pyrethroids, Lambdacyhalothrin was the predominant pyrethroid pesticide in the examined liver samples during winter with a mean value of 60.9 ± 27.7 ppb. According to the MRL stipulated by **FAO/WHO (2004)** 10% of the examined liver samples with Fenpropathrin and 20% of the examined liver samples with Lambdacyhalothrin, were acceptable and fit for human consumption where they did not exceed the MRL.

Analysis of Variance (ANOVA) revealed high significant differences ($P < 0.05$) between (HCB, Heptachlor, Heptachlor epoxide, Endrin, ppDDE, ppDDT, Methoxychlor and Lambdacyhalothrin) separately during winter.

Concerning to some public health hazards due to exposure to pesticide residues (cancer, central nervous system diseases such as neurodevelopmental deficits, immune system diseases such as disrupting the body's ability to produce antibodies or produce T-cells which fight against tumors and viruses, reproductive system diseases such as early abortion – reduce fertility or fertility loss – birth defects and hormonal disturbance in both males and females, in addition to diseases of kidney, cardiovascular and respiratory systems).

Incidence with possible sources of contamination and public health significance of these environmental pollutants as well as some recommendations to safeguard the Egyptian people from the hazards associated with the consumption of the contaminated liver with pesticides and indiscriminate use of these pesticides and the need for controls and tighten government control with the development of guidance awareness programs for users of these pesticides were discussed.