ECRONICON OPEN ACCESS

EC NUTRITION
Mini Review

Pesticide Residues in Food

Maria Zohra Chelbabi*

Pharmacist Specialist in Hydrology and Food Science, Algeria

***Corresponding Author:** Maria Zohra Chelbabi, Pharmacist Specialist in Hydrology and Food Science, Algeria.

Received: August 28, 2020; **Published:** September 29, 2020

Abstract

Our food comes from our immediate environment, but also more and more from various countries.

We demand that our food be safe for our health. However, various contaminants can be captured by the food chain and transferred to humans through the digestive tract, such as pesticide residues.

Keywords: *Pesticide; Food; Contaminant*

Contaminant is any substance which is not voluntarily added to the foodstuff, but which is nevertheless present in it as a residue of the production, processing, packaging, transport or storage of foodstuff or as a result of environmental contamination.

Pesticides

Definition

Pesticides are chemicals with toxicological properties used in agriculture to protect crops against predators and parasitic diseases.

Pesticides can be dangerous for health, because once their function is performed they leave residues in foodstuffs, and some of them are dispersed in the atmosphere and disseminated by the wind sometimes far from their place of application, they fall with the rains directly on water bodies and on the ground.

Classification

According to use:

- Insecticides: Used against insects.
- Rodenticides: Used against rodents.
- Fungicides: Used against fungi.
- Herbicides: Used against weeds.

According to the chemical nature:

- Organophosphates: Are synthetic compounds which degrade quickly in the environment but have neurotoxic effects on vertebrates.
- Carbamates: Very toxic, are used as insecticides and fungicides.
- Triazines: Reacting with the soil during their migration, it is difficult to evaluate their fate and their impact.

- Organochlorines: Like DDT (dichloro-diphenyl-trichloroethane), are chemically stable. DDT was used all over the world as insecticide until it was discovered that it was poorly degradable and could be concentrated in organisms at the end of the food chain, by bio-accumulation, with certain risks for human health.

Its use is now banned in many temperate countries, but it is still widely found in aquatic environments. They continue to be used in some tropical countries.

- Pyrethroids: Are synthetic insecticides very toxic to aquatic organisms.

Factors conditioning the persistence of pesticides

Physical factors:

- Vapor pressure: Pesticides will be more persistent the lower their vapor pressure; conversely, volatile products will be eliminated quickly.
- Solubility in water favors removal by rainwater.

The solubility in lipids promotes retention in plants with lipid enclaves, so organophosphate esters, which are used to control the olive fly, can be found in olive oil.

Chemical factors:

- The most important is stability against hydrolysis or oxidizing agents.
- Organophosphorus esters tend to hydrolyze, while organochlorines, fat soluble, have a much longer stability.

Biological factors:

- Artichokes, for example, with their interlocking bracts, promote the retention of pesticides.
- Some organophosphate class do not remain on the surface of the plant after treatment, but pass through the cuticle of the leaves or the epidermis of the stems, entering the sap and are distributed in all parts of the plant.
- The enzymes contained in plants can act on pesticides and transform them into more toxic or more stable products.

Assessment and management of the risk linked to the presence of pesticide residues in food

Risk assessment

03 elements are decisive to predict effects on health of pesticide residues in food:

1. The toxicological evaluation of the pesticides used because in the long term, pesticides are the cause of cancer, neurological effects and reproductive disorders.
2. The amount of contaminant in the food: the establishment of admissible or tolerated residual levels for each pesticide and each indication according to the mode of application recommended by the manufacturer.
3. Assessment of exposure of populations by measuring the concentration of pesticide residues in foods and evaluation of the consumption of foods containing pesticide residues.

Risk management

- Selection of plant species resistant to predator attacks.

- Systematic observation of the parasite's cycle as well as the vegetative cycle of the threatened plant in order to arrive at one of the links in the cycle on which we can act.
- Treatment with ionizing rays (irradiation).
- Retain selective pesticides and legally require for any pesticide before use, a file containing: the chemical specification, the reference method of analysis, the toxicological evaluation, the setting of an Acceptable Daily Dose (ADI), agronomic studies (minimum level of residues necessary to destroy the target parasite with the minimum of pesticide products) [1-3].

Conclusion

Exposure to low doses could have long-term health consequences for the consumer and therefore the presence of pesticide residues in food as well as in feed water should not be neglected, regulatory measures and adequate and rigorous control are necessary.

Bibliography

1. Algiers University - Faculty of Medicine - Laboratory of Hydrology and Food Science (2011).
2. National Nutrition Institute of Tunis, African Seminar on Pesticides (1990).
3. "Pesticides, risks and food safety". By Aprifel (Agence pour la recherche et l'information en fruits et légumes frais = Agency for Research and Information in Fresh Fruits and Vegetables) (2004).

Volume 3 Issue 10 October 2020