

AN OVERVIEW IN THE REGION REGARDING DIFFERENT TOXIC RESIDUES IN THE PRODUCTS OF ANIMAL ORIGIN AND FUTURE COOPERATION POSSIBILITIES FOR A BETTER FOOD SAFETY

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Abstract

The objectives of this presentation are focused to identify some potential risk of food safety from different residues in animal products for public consumption. This paper is a brief review of Albanian scientific publications of the recent years. Some papers are in cooperation with authors from Pristina and Tetovo. The purpose of the paper is the interdisciplinary regional future cooperation to strengthen food safety according to the veterinary law with the main target to minimize public health risks. There are studies of authors from Albania, Kosovo and Tetovo (North Macedonia) on different issues like antibiotics residue in milk, the concentration level of heavy metals in fish, contamination of aflatoxins in dairy cow feed and milk, the residue of hormones in animal tissues and contamination of honey from pesticides. The above results of different scientific publications of the recent years and the different analyses in the national plan of residue monitoring in the Institute of food safety and veterinary in Albania, showed that we have a small number of samples over the Maximum Residue Level (MRLs) according to the European Union Regulation and still it causes a risk for public health. We need continuously scientific monitoring of the situation and update of public information.

Keywords: Residue, Maximum Residue Level (MRLs), contaminants, food safety.

1. Introduction

Residues are considered the foreign substances, that can be accumulated in a cell, tissue or animal organs, as well as in their products like milk, eggs, honey etc. (Biba N and Mavromati J, 2014; Botsoglou N.A and Fletouris D.J, 2001).

When there are clinical symptoms in animals from toxic substances, then the problem is more prominent and leads us to go to the nearest veterinary clinic or hospital. In the above case, we are talking about an animal or a flock of animals and it would be good and our intervention would be as quick as possible.

In the focus of veterinarians are the animal health problems and it is normal to take care of treatment in a herd or an animal with acute clinical signs of various diseases. But in the case of residues, the problem

generally develops without acute but with chronic clinical symptoms and can kill not just one animal or a human being, but it can be a serious threat to the public health of thousands of human beings.

Pollution from pesticides and heavy metals, residues of veterinary medicines in feed and food (animals and humans) is a frequent risk to public health, not only in Albania, Kosovo and North Macedonia, but also in other countries (Shahu E et al, 2017; Shaqiri L et al, 2018; Botsoglou N.A and Fletouris D.J, 2001).

The objectives of this study are to identify the risks of contaminants and residues in products of animal origin for public consumption, to respect the safety factors in accordance with veterinary legislation with the primary objective of minimizing the risks to public health.

2. Material and methods

The study is a review of Albanian scientific publications of the recent years and the national plan of residue monitoring in the Food Safety and Veterinary Institute in Albania (FSVI).

The purpose of the paper is maximizing the interdisciplinary regional cooperation to strengthen food safety according to the veterinary law with the main target to minimize public health risks.

3. Results and discussion

Environmental pollution from pesticides is today one of the biggest problems. The mode of action of pesticides on different insects is through contact or systemic way. In the first group (contacting action) belong various insecticides with active substances such as: Malathion, Parathion, Methyl parathion, Dipterex, Tetraethyl pyrophosphate etc. In the second group (systemic action) belong active substances such as: Octamethyl, Mercaptophos, Rogor etc (Biba N and Mavromati J, 2014; Botsoglou N.A and Fletouris D.J, 2001). Insects should consume or absorb plant liquid to be poisoned by the Pesticide Group of Systemic Action. Their duration of action in the plant is up to one month. In these cases, water purification cannot remove these substances, therefore they are dangerous for animals and humans (Biba N and Mavromati J, 2014; Botsoglou N.A and Fletouris D.J, 2001).

Researcher Shahu et al-2017 by the chromatographic method determined the percentage of coumaphos in honey. The results of the study showed the presence of coumaphos in 62% of the samples analyzed from 10 µg / kg to 129 µg / kg. Only one sample was above the required limits.

Different authors have studied the mycotoxin residues in the feed of dairy cows and in milk and flour (Mavromati J and Shaqiri L, 2018; Guri R et al 2017; Spahiu et al., 2017; Mavromati J 2018). From Guri et al, 2017 analytical results showed that 7 of the 30 samples were positive for aflatoxin in milk. Aflatoxins act and delay development in broiler chicken in cattle and cause various diseases in different animals and humans. We should all make an effort to protect our natural environment from various pollution.

Spahiu et al., 2017 studied the level of ochratoxin in flour in the Pristina region in Kosovo. The results showed positive ochratoxin from 0.125 to 0.967 µg / kg, and from 0.97 to 1.25 µg / kg and 0.86 µg / kg, respectively, for 2016 and 2017. None of the samples exceeded the maximum levels of 3 µg / kg, in accordance with European legislation.

Ozuni et al., 2018, studied heavy metals in *Sparus aurata* fish. In the fresh fish market in 40 muscle tissue samples where measurements were made in Atomic Absorption Spectroscopy. The heavy metal

concentration of the fish samples in both groups (small and large fish sizes), expressed in mg/kg body wet weight, ranged for Mercury (Hg) it was from 0.211 to 0.041 mg/kg ww and lead (Pb) it was 0.022 mg/kg ww, resulted below the allowable limits.

Shaqiri L et al, 2018 has investigated the effect of environmental conditions and urban discharges on zinc (Zn) accumulation in skin, muscles and liver of European Chub (*Squalius cephalus*) and Common barbell (*Barbus barbus*) from Vardar river stream in Macedonia. Samples are collected in nine different points (Hot Spots) in a total distance of 301 km and approximate 33 km between sampling sites. The zinc (Zn) analyses were performed using flame atomic absorption spectroscopy (AAS). The lowest levels of the zinc were detected in the muscles from 8.82 to 13.81 mcg/gr wet weight. The level of concentration of zinc (Zn) in the skin were 44.84 to 50.89 mcg/gr wet weight and in the liver were 30.87 to 44.84 mcg/gr wet weight.

In the bay of Karaburun (Vlora) there was a suspicion of Mercury (Hg) in fish. Several analyzes by the Food Safety and Veterinary Institute in Albania, showed that the proportion of Mercury (Hg) in fish was within the required limits.

From the above studies, the first conclusion is that it is not possible the Zero Tolerance for Various contaminants. That is why we need safeguards, we need conditions that will ensure that residues do no longer cause a risk to public health.

Acceptable Daily Intake (ADI) is the maximum level of intake of toxic substance that could be taken without running any risk.

The National Residue Plan in Albania at the Food Safety and Veterinary Institute monitors residues in products of animal origin like honey, milk, meat, fish, like Insecticides, pesticides, mycotoxins, hormones, antibiotics, etc. At the Food Safety and Veterinary Institute more than 3000 samples are taken each year, over 7000 analyzes are made in 150 different methods.

Different authors have studied the residues of various antibiotics in milk (Mavromati J et al 2018; Roko Xh et al., 2015). Residues of various antibiotics in eggs (Heta et al, 2016) from the use of antibiotics as growth factors (Heta et al., 2018). Roko Xh et al., 2015 examined the relationship between antibiotic residues and the number of somatic cells.

By Mavromati J et al, 2018, antibiotic residues of the quinolone group in cow's milk were discovered. The use of antibiotics has been done to treat mastitis in cows. Cow's milk that is being treated for mastitis should not be given for public consumption on a few days after the end of treatment. The problem is getting bigger when we do not respect the withdrawal time of the antibiotics.

The author Aydin A et al 2017 highlights the link between use and residues of various antibiotics with antibiotic resistance in animal and human therapies.

Other authors have studied the residues of various hormones in animal tissues (Lilo A et al 2014; Bijo B et al., 2015, Rexhepi et al., 2018). Few samples from the studies are above the maximum residue level (MRLs).

4. Conclusion

The results of several scientific publications in recent years and the various analyzes of the residues in the Food Safety and Veterinary Institute (FSVI) in Albania have shown that we have a small number of samples above the MRLs in accordance with the Code Regulation of the European Union and cause a risk to public health. We need continuous scientific monitoring of the situation and updating the information to the public.

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