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COUNTRY REPORT

CONTAMINATION OF FOOD AND AGRO PRODUCTS IN HUNGARY

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This report gives a short survey of the situation concerning chemical contamination of foods in Hungary. It starts with a legal background and lists the institutions partaking in control and monitoring of food contamination. The report gives the most important food contaminants analysed in Hungary, and in some cases provides information about the actual levels. It concludes by stressing the importance and the need to unify the national monitoring system.

Key words:
heavy metals, mycotoxins, PAH, PCB, pesticide residues, polychlorinated compounds, residues

The aim of this paper is to give a short review of chemical food contamination, trends, and levels found, and the handling of this problem in Hungary.

REVIEW OF FOOD CONTAMINATION FINDINGS IN THE COUNTRY

The data on food contamination reviewed herein have mainly been collected from unpublished sources by institutions involved in food investigation. The sampling procedures and analytical methods used by these institutions are Hungarian standard methods, mainly based on the standards of the European Committee for Standardization, or in a few cases, other validated methods.

There are several sources of chemical contamination of foods and agro products (Figure 1). All these sources can result in contamination with remarkable risk to human health and they arouse questions of chemical safety of foods. The undesirable effect of some of them can be eliminated or decreased by applying systems like Hazard Analysis Critical Control Points (HACCP) or Good Manufacturing Practice (GMP), but not of all.

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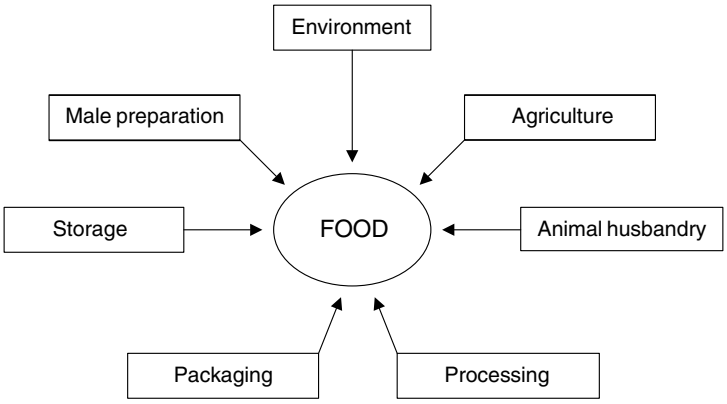

Figure 1 *Sources of chemical contamination of foods and agro products*

The basis of chemical safety of foods should be an up-to-date system of regulations which would bring enough safety for the consumers and could be fully observed by food producers. The regulations should include an appropriate food law, fair authorisation processes, Maximum Limits (ML), and Maximum Residue Limits (MRL), and other limitations and restrictions. The Hungarian regulations related to food safety have been adjusted to the international requirements for decades (Codex Alimentarius, West European food laws), as the country's food export was always remarkable and had to meet the requirements of the West European countries and the USA. Therefore the legal harmonization with the EU, which is a prerequisite of joining it, is proceeding smoothly, and the greater portion of it has already been completed.

In Hungary it is the right of the Minister of Health to establish maximum limits for food contaminants. There are three orders that cover the issue. Order No. 17/1999. (IV. 16.) of the Minister of Health (1) regulates the MLs of several chemical contaminants in foods, while order No. 2/1999. (II. 5.) (2) does it to the MLs of the veterinarian drug residues. Both integrate the relevant EU regulations and extend the list of MLs to more contaminants and more food items. The scope of the two orders is rather broad. It contains limitations for the following type of contaminants:

- residues of pesticides presently allowed and previously banned in foods of animal origin and residues of fumigants in fumigated foods;
- contaminants of technological origin (metals from utensils, benzo(a)pyren, polar compounds in frying oils, residues of cleaning/disinfecting agents;
- contaminants of environmental origin (PCB-s, metals from all sources, some banned pesticides);
- contaminants of biological origin (mycotoxins, histamine);
- harmful substances of natural origin (HCN, methanol, morphine, narcotin, tebain, codein, nitrate, nitrite).

The third order which regulates the maximum residue limits of pesticides in foods of plant origin is under revision and subject to harmonization with relevant EU regulations.

Hungary has adopted all EU regulations published until now which are related to materials and articles coming into contact with food. Issues which have not yet been regulated by the EU are handled according to German regulations.

Rules are as good as they are observed, which means that they need control. In Hungary, institutes of three ministries are involved in food control. These are the National Institute of Food Hygiene and Nutrition, Institutes? of the National Service of Public Health and Medical Officers (Ministry of Health), National Food Investigation Institute, Veterinarian and Food Control Stations, Plant Health and Soil Protection Stations (Ministry of Agriculture), and Inspectorate of Consumer Protection (Ministry of Industry and Commerce).

The distribution of contaminants in approximately 30,000 food samples tested by these institutes every year is: metals 37%, pesticides 23%, food additives 20%, mycotoxins 12%, other toxins of natural origin 2.5%, veterinarian drug residues 1.5%, PCBs 1.5%, and PAHs 0.5%.

These investigations are mainly control tests for legal limits; they do not give the exact levels of the contaminants, but the ratio of nonconforming v. conforming samples. The general participation of nonconforming samples is below 4%.

Only a smaller portion of investigations give information about the actual levels of contaminants. These findings have been used as a basis for the general overview of the situation and tendencies in chemical food contamination in Hungary.

OVERVIEW OF CHEMICAL FOOD CONTAMINATION

The lead content in foodstuffs has continuously been decreasing over the past ten years and has substantially reached the European values. According to the 1997 data the calculated average daily intake of lead from food was 131 μg, that is 52% of the Tolerable Daily Intake (TDI) (with the assumed average body mass of 70 kg) established by the Joint FAO/WHO Expert Committee on Food Additives and Contaminants (JECFA).

In the case of cadmium the situation is less advantageous; the measured concentrations are stagnating or are slightly increasing.

The mercury content found in the domestic food is rather low, while in fish it was 35 μg/kg.

The analysis of metals also includes As, Cu, Zn, Ni, and Al. The average levels are well under the MLs. Exceptions are spirits with a higher copper content which were distilled in small distilleries using old copper apparatus.

The concentrations of PAHs or benzo(a)pyrene alone are mainly controlled in smoked foodstuffs. Concerning environmental contamination of vegetables and cereals only a small number of investigations are done annually.

Thirty years after the ban of chlorinated pesticides in Hungary, their residues are being detected only in trace levels in domestic foods. However, they were quite often found in imported foodstuffs, which led to import ban in several cases.

PCBs and/or PCB congeners are investigated in food of animal origin and human milk. The results of a 1997 survey on the PCB content in human milk (Table 1) suggest that PCB contamination in Hungary is not heavy (3).

Table 1 *PCBs in human milk (1997)(μg/kg, calculated for fat content)*

	PCB-138	PCB-153	PCB-180
Area with average pollution (41 samples)			
Range	<0.1 – 53.6	<0.1 – 115.54	<0.1 – 23.70
Median	2.71	38.61	2.86
90%	37.18	84.33	15.55
Area with higher pollution (29 samples)			
Range	10.33 – 35.65	30.14 – 110.0	6.97 – 24.64
Median	17.47	53.53	11.38
90%	24.72	91.92	17.22

The control of natural toxic compounds includes methanol in spirits, cyanide, solanin, histamine, NO_2, NO_3, and – perhaps uniquely – morphine content in poppy seed. In few cases did the control establish excessive histamine content in fish and cheese samples.

Pesticide residues were detected in less than half of the tested samples. The annual average percent of samples exceeding the MRL is 2–3%. An exception are early spring vegetables (lettuce, paprika, tomato, radish, and cucumber) grown in greenhouses with 6–8% of samples exceeding the MRL. It is remarkable that generally the reason of the increase is not the excessive use, but the use of a forbidden agent.

Aflatoxins and ochratoxin A are given the greatest attention amongst mycotoxins. The control involves great quantities of samples of imported and domestic foods. The ratio of nonconforming and conforming samples is 1-2%, but the detectable amount (1–2 μg/kg) of the contaminants was found in most samples of coffee, cocoa, beans, muesli, flour, rice, bran, and red wine).

Generally, zearalenon (F-2 toxin) and T-2 toxin were not detected in the investigated foods. They were observed around the detection limit in 4–8% of the samples.

CONCLUSIONS

Hungarian regulations concerning food contaminants practically conform to those of the European Union. The difference is that the former are even more detailed, specifying maximum limits for more contaminants and more food items. Most laboratories authorised for food control have been accredited, whereas the rest are in the process of obtaining accreditation.

We believe that the hot spot, the burning issue related to food contaminants are not the levels found or the lack of the controlling capacities, but the absence of a unified national monitoring system in Hungary. The technical and intellectual potential of the workforce is rembarkable, but its effectiveness should be improved. The hazard

identification, risk assessment, and risk management systems should be built to the benefit of all involved, but first and foremost of the consumers. The most urgent task of the Hungarian administration is to organise a unified and coordinated leadership of what is now several partial monitoring systems run by different ministries.

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Ključne riječi:
mikotoksini, organoklorovi spojevi, ostaci pesticida, PAU, PCB, teški metali

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