

LEVELS OF PCDD/PCDF IN FOOD: MONITORING 2005 IN AUSTRIA

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Introduction

The Commission Recommendation of 11 October 2004 on the monitoring of background levels of dioxins and dioxin-like PCBs in foodstuffs (2004/705/EG) recommends that Member States perform random monitoring of the presence of dioxins, furans and dioxin-like PCBs in foodstuffs².

The recommended minimum frequency of samples to be analysed yearly should be considered and the results should be reported to the European Commission. The aim of the monitoring is to get more reliable data and to have a clear picture of the background presence of these substances in foodstuffs².

Materials and Methods

In all 9 provinces of Austria samples were taken by supervisory organs (food inspectors) over a period of August to November 2005 and analysis were done by the Federal Environmental Agency. A total of 50 samples were tested for dioxins, furans and dioxin-like PCBs.

After extraction samples were spiked with 17 ¹³C₁₂-labeled PCDD/F congeners and with 12 ¹³C₁₂-labeled PCBs, cleaned-up by the column chromatography and coupled with a standard through an injection system. Qualitative and quantitative determination of dioxins and furans was done by GC/MS. The Soxhlet-extraction and the ASE-extraction were used as lipid extraction methods.

Results and Discussion

The results of the monitoring 2005 are summarised in Table 1 giving the levels of PCDD and PCDF in foodstuffs. Additionally, these levels are compared to maximum levels, regulated in the Council Regulation (EC) No 2375/2001 and to action levels according to the Commission Recommendation 2002/201/EC^{1, 3}.

Regarding the results of the monitoring 2005 it is obvious that Austrian products are contaminated only to a minor degree. The comparison to maximum and action levels shows that the analysed levels of PCDD and PCDF in foodstuffs are well below the current EC limits. Only in a few cases the analysed levels exceed the maximum or action levels. These levels are highlighted in the Table with (!). The exceedings arise due to the limit of detection of the analytical method and assuming the concentrations of non-detected congeners equal the limits of determination. Due to this fact analytical experts should be informed and analytical methods should be improved.

The monitoring data of 2005 indicate that free ranged eggs do not contain significant higher levels than caged eggs. Furthermore, the results show no significant differences in the contamination of eggs collected in the East and in the West of Austria. Due to the small number of samples collected, these results and conclusions are not representative.

The estimates of dietary intakes of dioxins and furans are based on the combination of food consumption data (USER, median) and of analysed PCDD/F concentrations in food groups using the upper bound of the highest PCDD/F level^{4, 5}. This estimated dietary intake is about 209 pg WHO-TEQ/day which on a body weight basis would correspond to approximately 3 pg WHO-TEQ/kg bw/day. The main contributors to the daily intake of dioxins and furans are milk and milk products (22%), cereals (21%), meat and meat products, liver and derived products (15%), followed by fish and fish products (8%), animal fat (8%), fish oil (8%) and vegetable oil (7%). Vegetables contribute 6%, fruits 4% and eggs and egg products 1%. It has to be noted that the estimates of dietary intakes are limited because of the lack of food consumption data and because of uncertainties related to existing consumption data. Furthermore, there are uncertainties related to analytical methods and to methods used to estimate the dietary intake. In cases of results which are non-detectable for specific congeners, using the

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upper bound estimates may overestimate the concentration and exposure. Additionally, as already mentioned before the results or estimates are often not representative because of the small number of samples collected.

Table 1: Results of the monitoring 2005

Products ¹	Number of samples	PCDD/PCDF (WHO-PCDD/F-TEQ)	Maximum levels (PCDD+PCDF / WHO-PCDD/F-TEQ) ¹	Action levels (PCDD+PCDF / WHO-PCDD/F-TEQ) ³
Meat and meat products: - Ruminants (bovine animals, sheep) - Poultry and farmed game - Pigs	6 3 4	0,42 – 1,22 pg/g fat 0,40 – 0,85 pg/g fat 0,32 – 0,90 (!) pg/g fat	3,0 pg/g fat 2,0 pg/g fat 1,0 pg/g fat	2,0 pg/g fat 1,5 pg/g fat 0,6 pg/g fat
Liver and derived products	2	0,51 – 2,02 pg/g fat	6,0 pg/g fat	4,0 pg/g fat
Muscle meat of fish and fishery products and products thereof	6	0,04 – 0,11 pg/g fw	4,0 pg/g fw	3,0 pg/g fw
Milk and milk products, including butter fat	6	0,74 – 1,11 pg/g fat	3,0 pg/g fat	2,0 pg/g fat
Hen eggs and egg products	10	0,51 – 1,17 pg/g fat	3,0 pg/g fat	2,0 pg/g fat
Animal fat - from ruminants - from poultry and farmed game - from pigs - mixed animal fat	1	0,83 (!) pg/g fat	1,0 pg/g fat	0,6 pg/g fat
Vegetable oil	3	0,05 – 1,04 (!) pg/g fat	0,75 pg/g fat	0,5 pg/g fat
Fish oil intended for human consumption	3	0,82 – 1,02 pg/g fat	2,0 pg/g fat	1,5 pg/g fat
Fruits	2	0,03 – 0,05 ng/kg product	—————	0,4 ng/kg product
Vegetables	2	0,03 – 0,06 ng/kg product	—————	0,4 ng/kg product
Cereals	2	0,26 – 0,28 ng/kg product	—————	0,4 ng/kg product

Acknowledgements

The authors would like to thank the Federal Environmental Agency for their cooperation and for doing the analysis of the monitoring.

References

1. Council Regulation (EC) No 2375/2001 of 29 November 2001 amending Commission Regulation (EC) No 466/2001 setting maximum levels for certain contaminants in foodstuffs (OJ L 321, 06.12.2001, p. 5).
2. Commission Recommendation of 11 October 2004 on the monitoring of background levels of dioxins and dioxin-like PCBs in foodstuffs (2004/705/EC), (OJ L 321, 22.10.2004, p. 45).
3. Commission Recommendation of 4 March 2002 on the reduction of the presence of dioxins, furans and PCBs in feedingstuffs and foodstuffs (2002/201/EC), (OJ L 67, 09.03.2002, p. 73).
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