

# HUMAN EXPOSURE - POSTERS

## THE CONCENTRATIONS AND TEQ LEVELS OF PCDFs AND PCDDs IN HUMAN ADIPOSE TISSUE OF KOREANS

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### Introduction

2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) and congeners produce a variety of toxic effects in some species of experimental animals<sup>1-2)</sup>. These compounds are also detected in high concentrations in human tissues<sup>3-5)</sup>. Thus these polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDDs/PCDFs) have attracted considerable attention regarding public health. This study is to measure the concentrations of PCDDs/PCDFs and calculated the TEQ levels by product TEF values in human adipose tissues of Korean.

### Materials and Methods

**Sample:** The samples measured in this study have been collected at hospital in Seoul. After collection, the adipose tissue samples were frozen and kept at  $-20^{\circ}\text{C}$  until analysis.

**Analytical Method:** The analysis was done by the isotope-dilution-method with  $\text{C}^{13}$  surrogates for all 17 2,3,7,8-substituted congeners. 2 g of adipose tissue was homogenized with anhydrous sodium sulfate and added 30% KOH solution for base digestion. Extraction was carried out three times by ultra-sonication with 50 ml n-hexane. After dryness to 10ml, the extracted solution was passed to the activated silica and florisil column cartridge. The eluted solution was washed with concentrated sulfuric acid, 5 % NaCl and 20 % KOH. The washed solution was passed through anhydrous sodium sulfate and concentrated to 10 ml for solid phase clean-up; silica, alumina and carbon column by USEPA 1613 method. Eluent to be spiked recovery standards 20  $\mu\text{l}$  was concentrated to 20  $\mu\text{l}$ . 2  $\mu\text{l}$  was injected to HRGC/HRMS.

**GC/MS analysis;** Determination were performed with HP 5890 series II gas chromatograph and Finnigan MAT 95S mass spectrometer at resolution 10,000 using Ultra 2 capillary column (Hewlett Pacard).

### Results and Discussions

The mean concentrations of PCDFs in human adipose tissues were determined 0~2.42  $\mu\text{g/g}$  and the mean TEQ levels were 0~1.210  $\mu\text{gTEQ/g}$  (Table 1). Total concentrations and TEQ levels of PCDFs were showed 5.812  $\mu\text{g/g}$  and 1.485  $\mu\text{gTEQ/g}$ , respectively. The mean concentrations of PCDDs in human adipose tissues were determined 0~17.321  $\mu\text{g/g}$  and the mean TEQ levels were 0~0.816  $\mu\text{gTEQ/g}$  (Table 2). Total concentrations and TEQ levels of TCDFs were showed 26.648  $\mu\text{g/g}$  and 1.176  $\mu\text{gTEQ/g}$ , respectively. The residue levels of PCDFs/PCDDs in human adipose tissues in Korea were generally lower than those of other countries<sup>3-8)</sup>. Figure 1 show the TEQ levels of PCDFs/PCDDs in human adipose tissues of Korean by bar graph. Figure 2 show the distribution of TEQ values of PCDFs/PCDDs by spot graph.

### References

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### ORGANOHALOGEN COMPOUNDS

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Table 1. The Concentrations and TEQ Values of PCDFs in Human Adipose Tissue.

Compound	concentration (pg/g, n=10)			pgTEQ/g (n=10)		
	mean	SD	min-max	mean	SD	min-max
2,3,7,8-TCDF	0.375	0.283	0.000-0725	0.038	0.028	0.000-0073
1,2,3,7,8-PeCDF	0.032	0.100	0.000-0315	0.002	0.005	0.000-0016
2,3,4,7,8-PeCDF	2.420	0.829	0.900-3805	1.210	0.414	0.450-1903
1,2,3,4,7,8-HxCDF	1.204	0.764	0.000-2370	0.120	0.076	0.000-0237
1,2,3,6,7,8-HxCDF	1.038	0.616	0.000-1810	0.104	0.062	0.000-0174
1,2,3,7,8,9-HxCDF	0.104	0.329	0.000-1040	0.010	0.033	0.000-0104
2,3,4,6,7,8-HxCDF	0.000	0.000	0.000-0000	0.000	0.000	0.000-0000
1,2,3,4,6,7,8-HpCDF	0.000	0.000	0.000-0000	0.000	0.000	0.000-0000
1,2,3,4,7,8,9-HpCDF	0.000	0.000	0.000-0000	0.000	0.000	0.000-0000
OCDF	0.639	1.232	0.000-3665	0.001	0.001	0.000-0004
Total PCDFs	5.812	4.153		1.485	0.619	

Table 2. The Concentrations and TEQ Values of PCDDs in Human Adipose Tissue.

Compound	concentration (pg/g, n=10)			pgTEQ/g (n=10)		
	mean	SD	min-max	mean	SD	min-max
2,3,7,8-TCDD	0.056	0.118	0.000-0.315	0.056	0.118	0.000-0.315
1,2,3,7,8-PeCDD	1.633	3.110	0.000-10.195	0.816	1.555	0.000-5.098
1,2,3,4,7,8-HxCDD	0.000	0.000	0.000-0.000	0.000	0.000	0.000-0.000
1,2,3,6,7,8-HxCDD	2.336	1.824	0.000-6.030	0.234	0.182	0.000-0.603
1,2,3,7,8,9-HxCDD	0.000	0.000	0.000-0.000	0.000	0.000	0.000-0.000
1,2,3,4,6,7,8-HpCDD	5.302	4.794	0.000-11.810	0.053	0.048	0.000-0.157
OCDD	17.321	9.848	0.000-41.335	0.017	0.010	0.005-0.041
Total PCDDs	26.648	19.694		1.176	1.913	

Figure 1. The Total TEQ Values of PCDFs and PCDDs in Human Adipose Tissue.

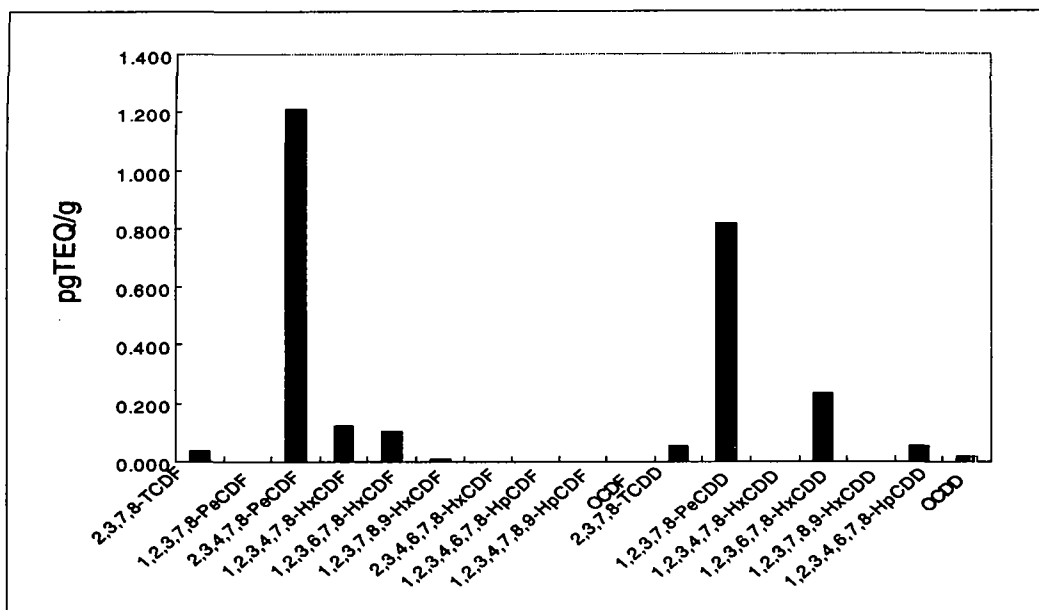


Figure 2. The Distribution of TEQ Values of PCDFs and PCDDs in Human Adipose Tissue.

