

LEVELS OF POLYCHLORINATED DIBENZO-p-DIOXINS AND DIBENZOFURANS
IN THE BREAST MILK OF NEW ZEALAND MOTHERS

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ABSTRACT

Analysis of samples of human milk from mothers living in urban and rural districts of New Zealand gave levels of PCDDs and PCDFs which were at the low to mid end of the range when compared with the levels documented from similar studies in other developed countries.

INTRODUCTION

Samples of human milk have been analysed for PCDDs and PCDFs from a total of 37 mothers living in 2 urban (Auckland and Christchurch) and 2 rural (Northland and North Canterbury) districts of New Zealand. The selection criteria for participating mothers were based on those recommended by the World Health Organisation (WHO) for such studies.

EXPERIMENTAL

Collected samples were spiked with $^{13}\text{C}_{12}$ surrogate standards, subject to solvent extraction, the extract purified with chemical treatment and solid phase chromatographic techniques and analysed by high resolution GCMS on a VG 70 250S mass spectrometer interfaced to a VG 11 250J data system.

RESULTS AND DISCUSSION

Mean levels of PCDDs and PCDFs quantified on a lipid weight basis for the 4 districts are given in Table 1.

1. Total TCDD toxic equivalents (Nordic basis) have been determined in the range 15-19 ppt.

Table 1. PCDDs and PCDFs in New Zealand breast milk (ppt, lipid weight)

Congener	District			
	Auckland mean (n=11)	Christchurch mean (n=9)	Northland mean (n=9)	N. Canterbury mean (n=8)
2,3,7,8-TCDF	0.80	0.74	1.1	0.78
2,3,7,8-TCDD	4.6	5.7	4.7	5.6
1,2,3,7,8-PeCDF	0.35	0.23	0.22	0.20
2,3,4,7,8-PeCDF	4.9	5.8	4.7	6.6
1,2,3,7,8-PeCDD	6.0	8.2	6.8	8.4
1,2,3,4,7,8- 1,2,3,6,7,8-HxCDF*	5.9	7.7	8.6	8.8
2,3,4,6,7,8-HxCDF	0.71	0.84	1.1	0.91
1,2,3,7,8,9-HxCDF	<0.6#	<0.9	<0.7	<0.6
1,2,3,4,7,8- 1,2,3,6,7,8-HxCDD*	26	34	39	38
1,2,3,7,8,9-HxCDD	5.1	6.3	5.5	7.2
1,2,3,4,6,7,8-HpCDF	6.2	7.4	7.5	7.8
1,2,3,4,7,8,9-HpCDF	<0.5#	<0.8	<0.7	<0.7
1,2,3,4,6,7,8-HpCDD	53	51	51	53
OCDF	<6	<6	<8	<6
OCDD	200	240	180	220
Total TE (Nordic)	15	19	17	19

* Not resolved. Quantified as the 1,2,3,4,7,8 - isomer
n=9 for this isomer

From this data it is apparent that the levels of PCDD and PCDF isomers found in the breast milk fat of New Zealand women are at the low to mid end of the range of levels found in comparable studies of women from other developed countries. This is a significant change from the conclusion in the original WHO report (1) which, on the basis of the results from only 2 sample analyses, reported samples from New Zealand as (along with Thailand) being the lowest documented. The larger sample size of this survey provides a better basis with which to make comparison with overseas data.

REFERENCES

1. Levels of PCBs, PCDDs and PCDFs in breast milk, Ed. E.J. Yrjänheikki, Environmental Health Series No. 34, World Health Organisation, FADL Publishers, Copenhagen, 1989.