PCBS AND DIOXINS IN EEL FROM THE NETHERLANDS

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An extensive survey has been carried out on PCB and dioxin contamination of eel from the Netherlands. The survey was initiated because earlier research revealed considerable levels of PCBs and dioxins in some fresh water eel samples.

Among the 39 fresh water locations there were main river systems, small rivers, canals and lakes. The farmed eel was randomly sampled from farmers in the Netherlands and the eel used for smoking originated from some of the farmed eel batches. The imported eel was included as it is available on the Dutch market.

Table 1. Levels of PCBs and dioxins in eel samples from the Netherlands (µg/kg ww)

Samples	n	PCB 153 (ng/g ww)	Sum 7 PCBs[1]	no/mo PCBs pg TEQ/g ww	PCDD/Fs	Total-TEQ[2]
Freshwater eel	39	4.7-650	13-1740	0.8-44	0.3-7.9	1.0-52
Farmed eel	10	6.6-22	21-58	3.9-7.7	0.9-3.1	4.6-11
Smoked eel	5	5.9-16	21-52	1.8-6.4	0.5-2.2	2.3-8.6
Imported eel	15	<0.2-22	<1.1-65	0.3-6.8	0.2-3.0	0.5-9.8

[1] So called indicator PCBs (No. 28, 52, 101, 118, 138, 153 and 180)
[2] Sum of dioxins and dioxin-like (non-ortho and mono-ortho) PCBs

The results show that the sum of the indicator-PCBs includes high concentrations, up to 1.7 µg/g ww. The most heavily contaminated eel samples originated from main water systems which are subjected to a high degree of indutrialisation, whereas small rivers, canals and lakes which are not directly influenced by industries showed much lower levels, generally below 10 µg/kg ww. Three samples (Hollands Diep, Nieuwe Merwede (both river Rhine delta) and the river Meuse) exceeded the Dutch tolerance level for PCB 153 (500 µg/kg ww). The levels of PCBs in farmed, smoked and imported eel were relatively low compared with wild eel.

Levels of dioxin-like PCBs ranged from 0.8 to 44 pg TEQ/g ww and was contributing for 67 to 96% to the total sum of dioxins and dioxin-like PCBs. The levels of dioxins ranged from 0.3 to 7.9 pg TEQ/g ww which is just below the current Dutch dioxin tolerance level of 8 pg TEQ/g ww. However, 6 out of 39 fresh water eel samples exceeded the new European Union dioxin tolerance level of 4 pg TEQ/g ww. This shows that fresh water eel from at least part of the current fishing areas in the Netherlands is no longer suitable for human consumption. This will be valid for even more areas when dioxin-like PCBs will be included in a possible future European tolerance level for dioxins and PCBs. None of the farmed eel samples exceeded the new EU dioxin tolerance limit of 4 pg TEQ/g ww.