

GEOGRAPHIC VARIATION IN DIETHYLHEXYL PHTHALATE, POLYCHLORINATED BIPHENYL AND POLYBROMINATED DIPHENYL ETHER CONCENTRATIONS IN SHEEP TISSUES IN SCOTLAND

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BACKGROUND

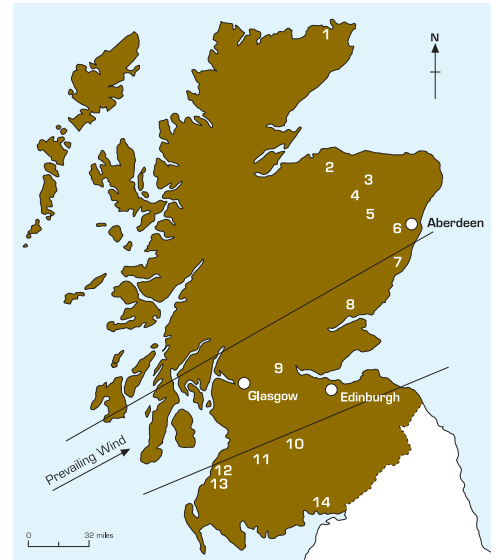
- Synthesis and release of endocrine disrupting compounds (EDC) is generally localised.
- Geographic distribution, following release, may differ with chemical class.
- Exposure to, and accumulation by, animals may also differ with chemical class.

AIM

- To determine patterns of tissue accumulation of EDC in sheep with respect to:
 - a) EDC class (PCB, PBDE and phthalate) and
 - b) Geographic location (industrialised Central Belt to remote hill areas).

METHOD

- Lamb muscle samples collected in abattoirs from animals derived from 14 sites throughout Scotland.
- Analysed for diethylhexyl phthalate and selected PCB congeners 28, 52, 101, 118, 138, 153 and 180 and PBDE congeners 28, 47, 99, 100, 153, 154, 183, using gas chromatography linked to mass spectrometry.

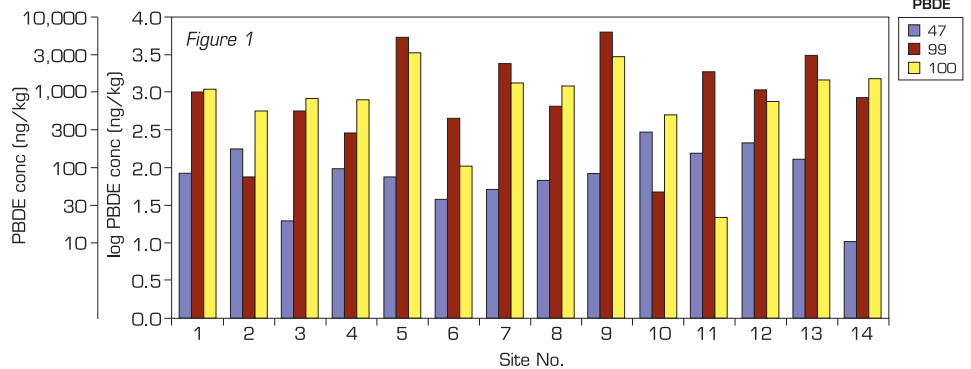


RESULTS

- PCB congeners 52 and 118 were mostly near to, or below, the limit of detection (10ng/kg DM but congeners 28, 101, 138, 153 and 180 were detected (Figure 1).
- Only PBDE congeners 47, 99 and 100 were consistently detected (Figure 2)
- EDC concentrations varied greatly between individuals (Table 1).
- Total PBDE concentrations were higher at sites within 40km of major cities but PCB and DEHP concentrations were not consistently related to site or prevailing wind direction (Table 2).

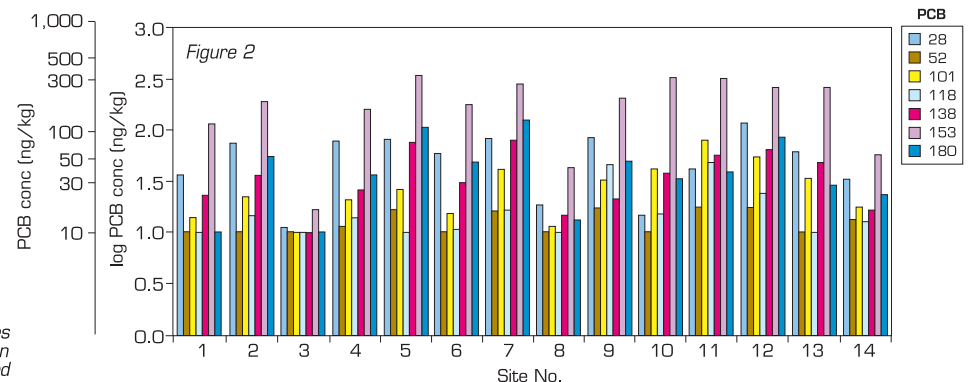
	Minimum	Maximum
DEHP (µg/kg DM)	30	4290
Total PCB (ng/kg DM)	70	8,918
Total PBDE (ng/kg DM)	70	24,909

Table 1 Range of concentrations of selected EDC classes present in muscle tissue of individual lambs from sites across Scotland



	<40km from city	>40km from city	Significance
Log DEHP (µg/kg DM)	2.96 (912)	2.93 (851)	NS
Log total PCB (ng/kg DM)	2.65 (447)	2.54 (346)	NS
Log total PBDE (ng/kg DM)	3.60 (3981)	3.37 (2344)	*

Table 2 Mean log concentrations of selected EDC classes present in muscle tissue of lambs from sites less than or greater than 40km from major cities (back transformed data in brackets).



CONCLUSIONS

- Accurate prediction of the risk of EDC exposure of individuals on the basis of location relative to the source of pollutant is impossible.
- Distance from potential sources does not preclude significant tissue accumulation.