

# Final Report

## **SUREmilk study - SURveillance of RESidues in human milk: Pilot studies to explore alternative methods for the recruitment, collection, storage and management of an archive of breast milk samples.**

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## Abbreviations

### General abbreviations:

<b>ADI</b>	Acceptable Daily Intake (see Glossary, Scientific and dietary terms)
<b>IPCS</b>	International Programme on Chemical Safety
<b>MAFF</b>	Ministry of Agriculture, Fisheries and Food
<b>mg/kg</b>	milligrams per kilogram, units in which organochlorine pesticide residues commonly reported ( $1\text{mg} = 10^{-6}\text{kg}$ )
<b>ng</b>	nanograms, billionth of gram ( $10^{-9}$ ), $10^{-12}$ of a kg
<b>ng/g or ng/kg fat</b>	nanograms per gram, or per kilogram of fat - units in which PCB congeners and dioxins commonly reported
<b>mg</b>	micrograms, millionth of a gram ( $10^{-6}$ ), $10^{-9}$ of a kg
<b>mg/kg</b>	micrograms per kilogram - units in which phthalates and metals commonly reported
<b>ppb</b>	parts per billion
<b>ppm</b>	parts per million
<b>TEF</b>	Toxic Equivalent Factors
<b>TEQ</b>	Toxic Equivalents
<b>WHO</b>	World Health Organization

### Scientific abbreviations:

#### Phthalates:

DPP	dipropyl phthalate
DBP	dibutyl phthalate
DiBP	di- <i>iso</i> -butyl phthalate
BBP	butylbenzyl phthalate
DEHP	di-2-ethylhexyl phthalate
DiPP	di- <i>iso</i> -propyl phthalate
DHP	hexyl phthalate
DcHP	dicyclohexyl phthalate
DHpP	diheptyl phthalate
DNP	dinonyl phthalate
DiOP	di- <i>iso</i> -octyl phthalate
DiDP	di- <i>iso</i> -decyl phthalate

DDP didecyl phthalate  
 DiNP di-*iso*-nonyl phthalate  
 DOP dioctyl phthalate  
 DMP dimethyl phthalate  
 DEP diethyl phthalate

PBDEs – polybrominated diphenyl ethers

PCBs - polychlorinated biphenyls (PCBs)

Co-planar forms of non-ortho PCBs:

PCB77 3,3',4,4'-tetrachlorobiphenyl (PCB 77)  
 PCB81  
 PCB126 3,3',4,4',5-pentachlorobiphenyl (PCB 126)  
 PCB169 3,3',4,4',5,5'-hexachlorobiphenyl (PCB 169)

Ortho-PCBs:

PCB18  
 PCB28 2,4,4'-trichlorobiphenyl (PCB 28)  
 PCB31  
 PCB52  
 PCB74 2,4,4',5- tetrachlorobiphenyl (PCB 74)  
 PCB99  
 PCB101  
 PCB105  
 PCB114  
 PCB118 2,3',4,4',5-pentachlorobiphenyl (PCB 118)  
 PCB123 2',3,4,4',5-pentachlorobiphenyl (PCB 123)  
 PCB128  
 PCB138 2,2',3,4,4',5'-hexachlorobiphenyl (PCB 138)  
 PCB153 2,2',4,4',5,5'-hexachlorobiphenyl (PCB 153)  
 PCB156 2,3,3',4,4',5-hexachlorobiphenyl (PCB 156)  
 PCB157 2,3,3',4,4',5'-hexachlorobiphenyl (PCB 157)  
 PCB167 2,3',4,4',5,5'-hexachlorobiphenyl (PCB 167)  
 PCB170 2,2',3,3',4,4',5-heptachlorobiphenyl (PCB 170)  
 PCB180 2,2',3,4,4',5,5'-heptachlorobiphenyl (PCB 180)  
 PCB189

OCs Organochlorine pesticide residues  
 DDT 1,1-dichloro-2,2-bis(p-chlorophenyl)ethylene  
 αHCH α-hexachlorocyclohexane  
 βHCH β-hexachlorocyclohexane  
 HCB hexachlorobenzene  
 dieldrin 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-2,7:3,6-dimethanonaphth(2,3-b)oxirene  
 aldrin 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4:5,8-dimethano=naphthalene  
 p,p'-DDE 1,1'-(dichloroethenylidene)bis(4-chlorobenzene)  
 o,p'-DDE 1-chloro-2-(2,2-dichloro-1-(4-chlorophenyl)ethenyl)benzene  
 o,p'-DDT 1-chloro-2-(2,2,2-trichloro-1-(4-chlorophenyl)ethyl)benzene  
 p,p'-DDT 1,1'-(2,2,2-trichloroethylidene)bis(4-chlorobenzene)

Dioxins - polychlorinated dibenzo-p-dioxins (PCDDs)

TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD
PeCDD	1,2,3,7,8-pentachlorodibenzodioxin	1,2,3,7,8-PCDD
HxCDD	1,2,3,4,7,8-hexachlorodibenzodioxin	1,2,3,4,7,8-HxCDD
HxCDD	1,2,3,6,7,8-hexachlorodibenzodioxin	1,2,3,6,7,8-HxCDD
HxCDD	1,2,3,7,8,9-hexachlorodibenzodioxin	1,2,3,7,8,9-HxCDD
HpCDD	1,2,3,4,6,7,8-heptachlorodibenzodioxin	1,2,3,4,6,7,8-HpCDD
OCDD	octachlorodibenzodioxin	

Furans - polychlorinated dibenzofurans (PCDFs)

TCDF	2,3,7,8-tetrachlorodibenzofuran	2,3,7,8-TCDF
PeCDF	1,2,3,7,8-pentachlorodibenzofuran	1,2,3,7,8-PeCDF
PeCDF	2,3,4,7,8-pentachlorodibenzofuran	2,3,4,7,8-PeCDF
HxCDF	1,2,3,4,7,8-hexachlorodibenzofuran	1,2,3,4,7,8-HxCDF
HxCDF	1,2,3,6,7,8-hexachlorodibenzofuran	1,2,3,6,7,8-HxCDF
HxCDF	1,2,3,7,8,9-hexachlorodibenzofuran	1,2,3,7,8,9-HxCDF
HxCDF	2,3,4,6,7,8-hexachlorodibenzofuran	2,3,4,6,7,8-HxCDF
HpCDF	1,2,3,4,6,7,8-heptachlorodibenzofuran	1,2,3,4,6,7,8HpCDF
HpCDF	1,2,3,4,7,8,9-heptachlorodibenzofuran	1,2,3,4,7,8,9HpCDF
OCDF	octachlorodibenzofuran	

PCP pentachlorophenol

**Abbreviations of methods:**

HPLC-MS high performance liquid chromatography/mass spectrometry  
 GC-MS gas chromatography mass spectrometry

**Other abbreviations:**

MTD Maximum Tolerated Dose  
 SIR standardised incidence ratio  
 SMR standardised mortality ratio  
 TDI tolerable daily intake  
 TEQ toxic equivalents  
 TEF toxic equivalent factors  
 2,4-D 2,4-dichlorophenoxyacetic acid  
 2,4,5-T 2,4,5-trichlorophenoxyacetic acid

**Study materials (available on request)**

**Contents**

Leaflets Planning to breastfeed?  
 Participants information leaflet, group 1  
 Participants information leaflet, group 2  
 Participants information leaflet, group 3  
 Participants information leaflet, matched group

Forms	Recruitment and consent forms, groups 1 and 2 Recruitment and consent forms, group 3 Recruitment and consent forms, matched group
Posters	Help needed with research Our project needs your milk
Shell pack forms	Using your breast shells Sample bag form – shell sample
Pump pack forms	Expressing your milk with the pump Notes on expressing with your cylinder pump Sample bag form – pump sample Cover note with contents list
Other sample forms	Sample bag form – formula sample Sample bag form – group 3 Check list for return of milk samples by post
Questionnaires	Dietary questionnaire Lifestyle questionnaire
Letters to participants	Request for consent form (sample received) Request for consent form (prior to sending pump) Request for formula sample in place of pump sample ‘now that you have changed your method of feeding’ Thank you, with Lifestyle questionnaire Thank you, with Lifestyle questionnaire, to later group 3 mothers
Staff	Presentation Staff information about groups 1 and 2 Staff information about group 3 Ethnic origins form Alert sticker, matched group
Letters to:	Heads of Midwifery <ul style="list-style-type: none"><li>• Letter 1 with Summary of study, Flow chart of recruitment</li><li>• Letters 2-4</li></ul> Managers of Research and Development (R&D) departments General Practitioners Obstetricians Paediatricians
Printouts of computer screens	Lifestyle Survey Diet Survey Laboratory sample database Data Management software