

表1 コントロール血清中 PCDD、PCDF 及びノンオルソ PCB 分析値の再現性

(2013 年、SC1 ~ SC18)

	Mean	Median	SD	Min	Max	CV (%)
2,3,7,8-TCDD	1.46	1.48	0.39	ND	2.21	
1,2,3,7,8-PeCDD	6.15	6.30	0.60	4.97	7.23	9.8%
1,2,3,4,7,8-HxCDD	5.79	5.93	0.87	4.12	7.39	15.0%
1,2,3,6,7,8-HxCDD	45.39	44.60	3.81	38.75	52.82	8.4%
1,2,3,7,8,9-HxCDD	8.75	8.71	1.18	7.03	12.29	13.5%
1,2,3,4,6,7,8-HpCDD	131.18	128.49	15.70	101.96	155.83	12.0%
OCDD	859.16	764.54	264.87	622.98	1579.04	30.8%
Total PCDDs	1057.88	967.78	270.88	809.76	1786.79	25.6%
2,3,7,8-TCDF	0.53	ND	0.14	ND	1.08	
1,2,3,7,8-PeCDF	0.56	ND	0.19	ND	1.09	
2,3,4,7,8-PeCDF	5.71	5.70	0.44	5.10	6.42	7.7%
1,2,3,4,7,8-HxCDF	6.18	6.20	0.75	4.71	7.59	12.1%
1,2,3,6,7,8-HxCDF	6.04	6.06	0.47	5.28	6.97	7.7%
2,3,4,6,7,8-HxCDF	1.07	ND	0.30	ND	2.28	
1,2,3,7,8,9-HxCDF	ND					
1,2,3,4,6,7,8-HpCDF	14.31	14.17	1.21	11.94	17.09	8.4%
1,2,3,4,7,8,9-HpCDF	ND					
OCDF	ND					
Total PCDFs	38.41	38.01	2.12	34.32	42.82	5.5%
344'5-TCB(#81)	ND					

33'44'-TCB(#77)	38.06	37.89	2.29	34.05	43.27	6.0%
33'44'5-PenCB(#126)	22.17	22.07	1.49	20.00	24.83	6.7%
33'44'55'-HxCB(#169)	18.00	18.00	1.29	15.54	20.53	7.1%
Total Non-ortho PCBs	83.23	83.00	4.21	75.67	91.40	5.1%
Total	1179.52	1088.49	270.84	927.73	1906.77	23.0%
【WHO-98】						
T PCDDs-TEQ	15.00	14.92	0.41	14.47	16.00	2.8%
T PCDFs-TEQ	4.52	4.54	0.29	4.07	5.00	6.4%
T Non-ortho PCBs-TEQ	2.40	2.39	0.16	2.17	2.67	6.6%
Total TEQ	21.92	21.92	0.43	21.08	22.76	1.9%
【WHO-05】						
T PCDDs-TEQ	15.17	15.06	0.43	14.60	16.23	2.8%
T PCDFs-TEQ	3.36	3.38	0.21	3.04	3.74	6.2%
T Non-ortho PCBs-TEQ	2.76	2.75	0.18	2.50	3.05	6.4%
Total TEQ	21.30	21.31	0.41	20.53	22.10	1.9%
Lipid(%)	0.30	0.30	0.020	0.27	0.33	6.7%

CB: chlorinated biphenyl, CDD: chlorinated dibenzo-p-dioxins, CDF: chlorinated dibenzofurans, Hx: hexa, Hp: hepta, ND: less than the determination limit, OCDD: octachlorodibenzo-p-dioxin, OCDF: octachlorodibenzofurans, PCB: polychlorinated biphenyl, PCDD: polychlorinated dibenzo-p-dioxin, PCDF: polychlorinated dibenzofuran, Pe: penta, TCB: tetrachlorobiphenyl, TCDD: tetrachlorodibenzo-p-dioxin, TCDF: tetrachlorodibenzofuran, TEQ: toxic equivalent quantity.

表2 油症認定患者及び未認定者血液中 PCDDs、PCDFs 及びノンオルソ PCB 濃度測定結果 (2013 年)

(pg/g
lipid)

Congeners	2013 年検診結果								一般人 (2004 年)			
	油症認定患者 (N=219)				未認定者 (N=165)				(N=127)			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
2,3,7,8-TCDD	1.4	1.05	ND	7.4	1.2	0.92	ND	4.9	1.9	0.84	ND	4.3
1,2,3,7,8-PeCDD	8	4.7	1.6	28	6.1	4.0	ND	23	9.0	3.4	3.2	20
1,2,3,4,7,8-HxCDD	1.9	1.5	ND	13	1.8	1.2	ND	7.6	3.6	1.9	ND	13
1,2,3,6,7,8-HxCDD	29	27	5.3	169	18	15	2.1	78	28	11	7.3	70
1,2,3,7,8,9-HxCDD	3.0	2.6	ND	26	2.6	2.8	ND	28	4.5	2.8	ND	16
1,2,3,4,6,7,8-HpCDD	44	85	6.7	1224	36	30	5.1	251	78	55	18	470
OCDD	392	556	72	7881	337	281	65	1942	1200	640	180	7600
Total PCDDs	479	647	102	9221	402	316	88	2144	1300	1000	210	8200
2,3,7,8-TCDF	1.1	0.9	ND	7	0.7	0.5	ND	3	1.0	0.72	ND	4.5
1,2,3,7,8-PeCDF	0.9	0.77	ND	8.3	0.70	0.4	ND	3	0.67	0.55	ND	4.6
2,3,4,7,8-PeCDF	83	142	3.5	1113	15	12	1.5	79	17	7.7	6.0	63
1,2,3,4,7,8-HxCDF	18	38	ND	343	3.0	2.1	ND	14	5.0	2.7	ND	20
1,2,3,6,7,8-HxCDF	9	14	ND	107	3.4	2.2	ND	13	5.7	2.6	ND	16
2,3,4,6,7,8-HxCDF	1.2	0.7	ND	7.0	1.0	0.08	ND	2.0	1.2	0.8	ND	5.2
1,2,3,7,8,9-HxCDF	ND				ND				ND			
1,2,3,4,6,7,8-HpCDF	2.3	5.4	ND	74	1.5	1.1	ND	9	2.2	2.1	ND	14
1,2,3,4,7,8,9-HpCDF	ND				ND				ND			
OCDF	ND				ND				2.1	1.4	ND	18
Total PCDFs	119	192	12	1578	29	16	11	105	37	14	15	86
344'5'-TCB(#81)	5.3	1.8	ND	25	5.2	1.0	ND	14	5.6	2.3	ND	24
33'44'-TCB(#77)	5.7	2.6	ND	20	5.1	0.8	ND	12	8.4	4.8	ND	31

33'44'5-PenCB(#126)	83	74	ND	591	78	80	ND	455	110	80	17	520
33'44'55'-HxCB(#169)	141	120	13	630	67	56	ND	308	64	27	16	190
Total Non-ortho PCBs	234	173	37	1125	155	129	ND	703	190	110	59	740
Total	832	778	167	9683	587	403	138	2841	1600	1000	290	8500
【WHO-98】												
T PCDDs-TEQ	13	8	3.2	48	10	6.1	1.6	34	15	5.7	5.0	34
T PCDFs-TEQ	44	76	2.2	602	8	6	1.3	42	10	4.3	3.5	33
T Non-ortho PCBs-TEQ	10	8.1	0.8	64	8	8	0.6	47	12	8.2	2.0	54
Total-TEQ	67	85	7.5	659	27	19	3.5	92	37	16	12	100
【WHO-05】												
T PCDDs-TEQ	13	8	3.3	48	10	6.2	1.6	34	16	5.9	5.1	35
T PCDFs-TEQ	28	47	1.5	380	5.4	4	0.9	26	6.6	2.5	2.3	14
T Non-ortho PCBs-TEQ	12	10	1.3	74	10	9	0.7	51	13	8.6	2.6	58
Total-TEQ	53	59	7.2	446	25	18	3.3	89	37	16	12	100
Lipid(%)	0.26	0.05	0.17	0.43	0.28	0.05	0.15	0.41	0.33	0.05	0.2	0.5
Age(years)	61.6	12.1	40	91	56.2	19.3	10	89	68.1	5.4	60	86

CB: chlorinated biphenyl, CDD: chlorinated dibenzo-p-dioxins, CDF: chlorinated dibenzofurans, Hx: hexa, Hp: hepta, ND: less than the determination limit, OCDD: octachlorodibenzo-p-dioxin, OCDF: octachlorodibenzofurans, PCB: polychlorinated biphenyl, PCDD: polychlorinated dibenzo-p-dioxin, PCDF: polychlorinated dibenzofuran, Pe: penta, TCB: tetrachlorobiphenyl, TCDD: tetrachlorodibenzo-p-dioxin, TCDF: tetrachlorodibenzofuran, TEQ: toxic equivalent quantity.

表3 油症認定患者及び一般住民の男女別血液中ダイオキシン類濃度

Congeners	油症認定患者 (2001-2013年)								一般住民 (2004年)							
	男性 (N=403)				女性 (N=451)				男性 (N=51)				女性 (N=76)			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
2,3,7,8-TCDD	1.5	1.0	ND	4.9	1.7	1.1	ND	8.6	1.8	0.9	ND	4.0	2.0	0.8	ND	4.3
1,2,3,7,8-PeCDD	7.9	4.4	1.2	28	11	6.4	1.4	48	8.4	3.4	3.2	19	9.3	3.3	3.3	20
1,2,3,4,7,8-HxCDD	2.2	1.7	ND	14	2.7	2.0	ND	15	3.3	1.7	ND	7.6	3.7	2.1	ND	13
1,2,3,6,7,8-HxCDD	29	24.3	2.5	173	47	42	4.7	314	26	10.1	7.3	47	29	11.4	13	70
1,2,3,7,8,9-HxCDD	3.1	2.6	ND	24	4.4	3.8	ND	36	3.7	2.0	ND	9.1	5.1	3.1	ND	16
1,2,3,4,6,7,8-HpCDD	37	24.4	6.7	269	47	69	ND	1224	65	35.9	17.6	170	88	63.8	22	470
OCDD	591	440.3	72	5245	660	664.9	79.2	7905	1100	676.1	181.2	3300	1300	1066.8	370	7600
Total PCDD	671	476	102	5607	773	733.9	106.8	9221	1200	724.3	214.4	3600	1500	1139.4	430	8200
2,3,7,8-TCDF	1.5	1.7	ND	14	1.8	1.9	ND	14	1.1	0.9	ND	4.5	0.8	0.6	ND	2.9
1,2,3,7,8-PeCDF	1.0	1.0	ND	8	1.1	1.0	ND	8.3	0.8	0.7	ND	4.6	0.6	0.4	ND	2.7
2,3,4,7,8-PeCDF	62	91.8	2.7	673	179	239.2	3.5	1792	16	6.5	6.0	36	18	6.5	7.5	37
1,2,3,4,7,8-HxCDF	12	20.9	ND	187	44	75.6	ND	600	4.7	2.3	ND	13	5.2	3.0	ND	20
1,2,3,6,7,8-HxCDF	7.7	8.6	ND	77	18	24.7	ND	202	5.6	2.6	ND	14	5.7	2.6	ND	16
2,3,4,6,7,8-HxCDF	1.3	0.9	ND	8.7	1.2	0.8	ND	9.6	1.4	0.9	ND	5.2	1.2	0.6	ND	4.9
1,2,3,7,8,9-HxCDF	ND	0.0	1.0	1.0	ND				ND				ND			
1,2,3,4,6,7,8-HpCDF	2.2				2.6	4.5	ND	74	2.4	2.4	ND	13	2.0	1.8	ND	14
1,2,3,4,7,8,9-HpCDF	1.0	0.1	ND	2.7	1.0	0.1	ND	3.3	ND				ND			
OCDF	ND				2.1	1.7	ND	38	ND				2.2	1.8	ND	18

Total PCDF	91	119.6	12	854	252	334.9	12	2558	36	13.8	15	86	38	13.3	18	82
3,4,4',5-TCB(#81)	6.0	4.0	ND	37	5.3	1.6	ND	22	5.8	3.0	ND	24	5.4	1.7	ND	14
3,3',4,4'-TCB(#77)	7.5	7.2	ND	81	7.2	8.8	ND	150	8.6	5.4	ND	31	8.3	4.4	ND	21
3,3',4,4',5-PeCB(#126)	106	101.2	ND	684	93	66.7	ND	428	120	83.6	17	360	110	78.9	26	520
3,3',4,4',5,5'-HxCB(#169)	156	116.6	ND	839	186	164.1	13	1281	69	27.4	32	160	60	26.3	16	190
Total Non-ortho PCBs	275	203.4	30	1542	291	195.3	37	1524	200	108.4	59	520	190	104.5	64	740
Total	1038	634.1	167	5933	1316	929.0	222	9683	1400	796.1	290	3900	1700	1175. 6	550	8500
[WHO-98]																
T PCDDs-TEQ	13	7.4	2.7	48	18	11.3	2.8	79	14	5.6	5.0	29	16	5.7	6.0	34
T PCDFs-TEQ	33	48.6	1.9	354	96	128.8	2.2	971	9.5	3.8	3.5	22	10	3.7	4.7	21
T Non-ortho PCBs-TEQ	12	10.9	0.7	77	11	7.3	0.8	44	12	8.5	2.0	38	12	8.1	2.9	54
Total TEQ(WHO-98)	59	57.4	6.3	411	126	140.5	7.2	1068	36	16.5	12	83	38	15.5	15	100
[WHO-05]																
T PCDDs-05-TEQ	13	7.6	2.8	49	18	11.1	2.9	79	14	5.7	5.1	30	16	5.8	6.2	35
T PCDFs-05-TEQ	20	30.1	1.3	219	56	75.2	1.5	519	6.2	2.5	2.3	14	6.8	2.4	3.1	14
T Non-ortho PCBs-05-TEQ	15	13.1	1.0	94	15	9.4	1.5	61	14	8.9	2.6	40	13	8.5	3.5	58
Total -TEQ(WHO-05)	48	42.1	6.3	285	89	90.0	7	634	34	15.9	11	80	36	15.0	14	98
Lipid(%)	0.30	0.06	0.1 6	0.53	0.31	0.07	0.16	0.64	0.32	0.05	0.22	0.49	0.33	0.05	0.24	0.47
Age(years)	64.9	13.3	31	94	65.5	13.6	32	97	68.1	5.0	60	79	68.0	5.7	60	86

(pg/g
lipid)

CB: chlorinated biphenyl, CDD: chlorinated dibenzo-p-dioxins, CDF: chlorinated dibenzofurans, Hx: hexa, Hp: hepta, ND: less than the determination limit, OCDD: octachlorodibenzo-p-dioxin, OCDF: octachlorodibenzofurans, PCB: polychlorinated biphenyl, PCDD: polychlorinated dibenzo-p-dioxin, PCDF: polychlorinated dibenzofuran,

Pe:penta, TCB:tetrachlorobipheny, TCDD:tetrachlorodibenzo-p-dioxin, TCDF:tetrachlorodibenzofuran, TEQ:toxic equivalent quantity.

図1 油症認定患者の血液中2,3,4,7,8-PeCDF濃度分布 (n=854)
(pg/g lipid)

