1. INTRODUCTION

This report is designed to be used as an interim report to update the status of the program to determine the Aroclor 1254 content of monkey tissue resulting from an oral feeding program. Numerous samples of several sample types have been analyzed to date. These include baby skin and fat tissue, adult skin and fat tissue, placenta samples, and milk (colostrum) samples.

The samples reported in this report have been received during May, June and August 1978. Subsequent interim reports will be issued at later dates to include the backlogged samples received.

2. EXPERIMENTAL PROCEDURES

2.1 A Summary of the Procedure Used

The procedure used to analyze monkey tissue is taken primarily from the article entitled "Tissue Residues from Subacute Oral Feeding of Polychlorinated Biphenyl Dielectric Fluids," by Kaley, at al, appearing in the Bulletin of Environmental Contamination and Toxicology, Vol. 15, No. 6, 1976. Briefly, the method is as follows: the entire sample received is accurately weighed and homogenized three times with three 25 ml portions of hexane. The combined supernatants and washings are filtered through a bed of anhydrous sodium sulfate (that has previously been dried to 400°C), and diluted to 100 ml in a volumetric flask. A 25 ml aliquot of the solution is evaporated to determine the lipid weight of the sample. A separate 25 ml portion of the sample is pipetted onto an adsorption column prepared by placing a plug of glass wool (previously dried at 400°C) in a chromatography column followed by a 15-20 cm bed of alumina (dried at 400°C and then deactivated to 5% with distilled water) and then a 2-3 cm bed of anhydrous sodium

sulfate. The PCB's are eluted with approximately 100 ml of pesticide grade hexane. The eluate is transferred to a 500 ml Kuderna-Danish evaporative concentrator fitted with a three-ball Snyder column and reduced on a steam bath to approximately 5 ml. The resulting concentrate is analyzed by gas chromatography utilizing an electron capture detector. The gas chromatographic conditions are listed in Table 1.

TABLE 1. GAS CHROMATOGRAPHIC CONDITIONS

Instrument:	Varian Model 3700 Gas Chromatograph with Ni-63 Electron Capture Detector
Column:	2m x ¼" glass column packed with 4% XE-60 on 80/100 mesh Chromosorb W-HP
Injection Port Temp:	220°C
Detector Temperature:	350°C
Column Temperature:	200°C isothermal
Carrier Gas:	High Purity Nitrogen
Carrier Gas Flow Rate:	40 ml/min

2.2 Modifications to the Procedure

Several modifications to the procedure are necessary to accommodate the reduced sample sizes of the baby monkey skin and fat samples, and the special handling problems encountered with the minute sample sizes of the milk samples.

2.2.1 Modifications Required for Baby Skin and Fat Samples

Baby monkey samples submitted for analysis are analyzed following the procedure by Kaley, et al, with volumes reduced when possible due to the smaller sample sizes received. The entire sample received is homogenized three times with separate 5 ml portions of hexane. The combined supernatants and

washings are filtered through sodium sulfate and diluted to 25 ml in a volumetric flask. Ten ml of the resulting solution is evaporated to determine the lipid weight of the sample. A separate 10 ml portion is placed through an adsorption column composed of approximately 7 cm of alumina and 2 cm of anhydrous sodium sulfate. The PCB's are eluted with about 100 ml of hexane. The column eluate is collected and placed in a Kuderna-Danish evaporative concentrator and reduced to a volume of approximately 3-5 ml. The resulting concentrate is then analyzed by gas chromatography.

2.2.2 Modifications Required for Milk (Colostrum) Samples

Due to the minute milk samples received, micro techniques for PCB analysis are required. A 100 µl syringe is accurately weighed containing approximately 100 µl of monkey milk. The milk is then discharged to the top of an adsorption column prepared by placing a small glass wool plug in a disposable, graduated, 10 ml pyrex pipette cut to approximately 150 cm in length, followed by 60 cm of alumina and 20 cm of anhydrous sodium sulfate. The syringe is weighed again to determine the weight of milk by difference. The milk is washed through the column by 7 ml of hexane and collected in a vial. The hexane eluate is then placed under a gentle stream of purified dry nitrogen and reduced to approximately 100 µl. The resulting solution is analyzed by gas chromatography.

3. DATA INCLUDED IN THIS REPORT

The data presented in this interim report includes the Aroclor 1254 values obtained for several sample sets received during the months of May, June and August of 1978. Table 2 consists of placenta samples, Tables 3, 4 and 5 are baby monkey skin and fat samples, and Tables 6 and 7 are adult monkey fat samples. Table 8 lists values of milk samples submitted for analysis.

TABLE 2. PCB CONTENT OF PLACENTA SAMPLES SHIPPED 23 MAY 1978

Sample I.D.	Type	Date Shipped	Date Sample Taken	Dose Level	8ng Arocior 1254	Wet Weight (g)	PPM on Wet Wt. Basis (µg/g)	Lipid Weight (g)	PPM on Lipid Wt. Basis (µg/g)	Lipid Wt. / Wet Wt. (%) x 100%
578-H f*	P	5/23/78		Control	17.14	3.2464	0.0053	0.0176	0.97	0.54
605-F f	P	5/23/78		Low	n.d.	16.2450	n.d.	0.0144	n.d.	0.08
757-I f	P	5/23/78		Medium	16.62	6.4375	0.0026	0.0376	0.44	0.58
273-I f	P	5/23/78		Medium	23.88	7.1279	0.0034	0.0340	0.70	0.47
763-H f	P	5/23/78		Medium	22.53	5.4291	0.0042	0.0244	0.66	0.44

Key to Sample Type:

M = Milk (Colostrum) Sample
P = Placental Sample
B = Baby Skin Sample
Bf = Baby Fat Sample
F = Fat Sample (Adult Animal)
S = Skin Sample (Adult Animal)
(n.d. = not detected)

*f = female
m = male

TABLE 3. PCB CONTENT OF BABY SKIN SAMPLES SHIPPED 21 MAY 1978

Sample I.D.	Type	Date Shipped	Date Sample Taken	Dose Level	0ng Aroclor 1254	Wet Weight (g)	PPM on Wet Wt. Basis (µg/g)	Lipid Weight (g)	PPM on Lipid Wt. Basis (µg/g)	Lipid Wt. / Wet Wt. x 100% (%)
B-0557 a	B	5/23/78	5/8/78	Control	4.485	0.1677	0.03	0.0305	0.15	18
B-0576 a	B	5/23/78	5/15/78	Control	5.761	0.1697	0.03	0.0268	0.21	16
B-0562 f	B	5/23/78	5/12/78	Low	33.44	0.1635	0.21	0.0350	0.96	21
B-0546 f	B	5/23/78	5/3/78	Medium	131.9	0.2280	0.58	0.0200	6.36	9.1
B-0568	B	5/23/78	5/12/78	Medium	20.11	0.1130	0.25	0.0085	3.31	7.5
B-0592 f	Bf	5/23/78	5/23/78	Medium	51.96	0.1111	0.47	0.0155	3.35	14

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TABLE 4. PCB CONTENT OF BABY SKIN SAMPLES SHIPPED 15 JUNE 1978

Sample I.D.	Type	Date Shipped	Date Sample Taken	Dose Level	ng Aroclor 1254	Wet Weight (g)	PPM on Wet Wt. Basis (µg/g)	Lipid Weight (g)	PPM on Lipid Wt. Basis (µg/g)	Lipid Wt. / Wet Wt. x 100% (%)
B-8532 f	B	6/15/78	5/24/78	Control	n.d.	0.1371	n.d.	0.0153	n.d.	11
B-8518 m	B	6/15/78	5/24/78	Control	24.26	0.1183	0.21	0.0135	1.80	11
B-8533 f	B	6/15/78	5/24/78	Control	4.16	0.2341	0.02	0.0413	0.10	18
B-8557 m	B	6/15/78	6/6/78	Control	16.88	0.2328	0.07	0.0543	0.31	23
B-8621 f	B	6/15/78	6/8/78	Control	25.50	0.1616	0.16	0.0423	0.60	26
B-8527 f	B	6/15/78	5/24/78	Low	16.88	0.1321	0.13	0.0305	0.55	23
B-8604 m	B	6/15/78	5/30/78	Low	7.62	0.1218	0.06	0.0095	0.80	7.8
B-8562 f	B	6/15/78	6/6/78	Low	5.94	0.2116	0.03	0.0503	0.12	24
B-8603	B	6/15/78	5/30/78	Medium	81.83	0.1500	0.55	0.0043	19.3	2.9
B-8546 f	B	6/15/78	6/5/78	Medium	433.2	0.1612	2.69	0.0173	25.0	11
B-8559	B	6/15/78	6/9/78	Medium	199.7	0.0958	2.09	0.0143	14.0	15
B-8560	B	6/15/78	6/9/78	Medium	172.8	0.1201	1.44	0.0053	32.9	4.4
B-8542 f	B	6/15/78	6/5/78	High	276.2	0.1518	1.02	0.0065	61.4	3.0

TABLE 5. PCB CONTENT OF BABY SKIN AND FAT SAMPLES SHIPPED 24 AUGUST 1978

Sample I.D.	Type	Date Shipped	Date Sample Taken	Dose Level	Ang Aroclor 1254	Wet Weight (g)	PPM on Wet Wt. Basis (ug/g)	Lipid Weight (g)	PPM on Lipid Wt. Basis (ug/g)	Lipid Wt. / Wet Wt. (%) x 100%
B-8533 f	Bf	8/24/78	6/26/78	Control	1,480	1.6380	0.90	1.0716	1.38	65
B-8533 f	B	8/24/78	6/26/78	Control	619.6	0.9700	0.63	0.2232	1.88	23
B-8532 f	Bf	8/24/78	6/26/78	Control	962.4	0.6825	1.41	0.3912	2.46	57
B-8532 f	B	8/24/78	6/26/78	Control	134.8	0.4052	0.33	0.094	1.43	23
B-8518 m	Bf	8/24/78	6/19/78	Control	987.6	1.0886	0.90	0.6980	1.50	60
B-8518 m	B	8/24/78	6/19/78	Control	220.0	0.4989	0.44	0.0544	4.04	11
B-8684 m	B	8/24/78	6/27/78	Low	301.6	0.2700	1.11	0.0280	10.8	10
B-8527 f	Bf	8/24/78	6/23/78	Low	1,802	0.8873	2.03	0.5760	3.12	65
B-8527 f	B	8/24/78	6/23/78	Low	2,318	0.5001	4.63	0.2764	8.38	55
B-8511 m	Bf	8/24/78	6/19/78	Medium	723.6	0.7883	0.92	0.4484	1.61	57
B-8511 m	B	8/24/78	6/19/78	Medium	80.0	0.1954	0.41	0.0488	1.67	25
B-8603	B	8/24/78	6/27/78	Medium	1,381	0.2001	6.63	0.0280	49.3	13
B-8542 f	B	8/24/78	6/23/78	Medium	1,302	0.1429	9.11	0.0360	36.2	26
B-8542 f	B	8/24/78	6/30/78	High	2,050	0.1494	13.8	0.0232	88.7	16

TABLE 6. CONTENT OF ADULT FAT SAMPLES SHIPPED 15 JUNE 1978

Sample I.D.	Type	Date Shipped	Date Sample Taken	Dose Level	8ng Aroclor 1254	Wet Weight (g)	PPM on Wet Wt. Basis (µg/g)	Lipid Weight (g)	PPM on Lipid Wt. Basis (µg/g)	Lipid Wt. / Wet Wt. x 100% (%)
604-I f	F	6/15/78	5/24/78	Control	320	0.5140	0.62	0.3612	0.89	70
618-I f	F	6/15/78	6/6/78	Control	80.8	1.0436	0.08	0.0716	0.09	84
764-E f	F	6/15/78	5/24/78	Control	68.4	0.5686	0.12	0.4372	0.16	77
276-F f	F	6/15/78	5/24/78	Control	69.2	0.5875	0.12	0.4884	0.17	70
569-H f	F	6/15/78	6/6/78	Control	68.8	1.1526	0.06	1.1088	0.06	96
626-G m	F	6/15/78	6/6/78	Control	72.8	0.1960	0.37	0.0300	2.36	16
739-F m	F	6/15/78	6/6/78	Control	30.4	0.3023	0.13	0.0776	0.49	26
418-J m	F	6/15/78	6/6/78	Control	80.0	0.3218	0.25	0.1644	0.49	51
227-J m	F	6/15/78	6/6/78	Control	36.0	1.6667	0.02	1.5636	0.02	94
605-F f	F	6/15/78	6/6/78	Low	1,856	0.9093	2.04	0.7120	2.60	78
646-E f	F	6/15/78	6/6/78	Low	1,318	0.7240	1.82	0.5792	2.27	80
624-I f	F	6/15/78	5/24/78	Low	950.4	0.9182	1.01	0.7232	1.31	79
838-H f	F	6/15/78	6/9/78	Low	2,128	1.0091	2.10	0.7476	2.85	74
516-G m	F	6/15/78	6/6/78	Low	1,292	0.3655	3.53	0.1628	7.94	45
119-H m	F	6/15/78	6/6/78	Low	1,032	0.6739	2.72	0.2336	7.04	35
632-J m	F	6/15/78	6/6/78	Low	800.8	0.3657	1.00	0.0888	7.73	24
628-J m	F	6/15/78	6/6/78	Low	1,862	0.4866	3.83	0.3444	5.41	71
763-E f	F	6/15/78	6/5/78	Medium	7,135	0.5687	13.0	0.3896	18.3	71
273-I f	F	6/15/78	6/5/78	Medium	4,947	0.5700	8.68	0.3920	12.6	69
201-G f	F	6/15/78	6/5/78	Medium	8,474	0.4069	20.8	0.2364	35.8	58
841-H f	F	6/15/78	5/24/78	Medium	19,010	0.5105	38.8	0.3696	53.6	72
757-I f	F	6/15/78	6/5/78	Medium	14,530	0.4977	29.2	0.3240	44.9	65
307-I f	F	6/15/78	6/5/78	Medium	12,670	0.8562	14.8	0.6792	18.7	79
762-E f	F	6/15/78	6/5/78	Medium	12,000	0.5619	21.4	0.3864	30.1	37
540-H f	F	6/15/78	6/5/78	Medium	8,500	0.3837	22.2	0.2924	29.1	76
46-I m	F	6/15/78	6/6/78	Medium	8,052	0.7769	10.4	0.6156	13.1	79
595-E m	F	6/15/78	6/6/78	Medium	743.2	0.2237	3.32	0.0080	92.9	3.6
599-I m	F	6/15/78	6/6/78	Medium	20,680	0.9645	21.4	0.5896	35.1	61
20-I m	F	6/15/78	6/6/78	Medium	13,200	0.7243	18.2	0.4732	27.9	65
312-I f	F	6/15/78	6/5/78	High	35,480	0.6441	55.0	0.4940	71.7	77
269-I f	F	6/15/78	6/5/78	High	21,418	0.4847	43.3	0.1296	165	27
287-I f	F	6/15/78	6/5/78	High	6,375	0.3611	17.7	0.0184	346	5.1
336-F f	F	6/15/78	6/5/78	High	18,470	0.4116	42.8	0.3504	52.7	81
138-I f	F	6/15/78	6/5/78	High	13,000	0.3884	67.0	0.2836	166	52
425-J m	F	6/15/78	6/5/78	High	16,220	0.3431	47.3	0.1852	87.6	54
427-J m	F	6/15/78	6/5/78	High	28,030	0.5980	33.5	0.3976	50.4	67
600-I m	F	6/15/78	6/5/78	High	39,730	0.5305	74.9	0.2712	146	51
706-E m	F	6/15/78	6/5/78	High	7,500	0.3243	23.1	0.0440	167	14

TABLE 7. PCB CONTENT OF ADULT FAT SAMPLES SHIPPED 24 AUGUST 1978

Sample I.D.	Type	Date Shipped	Date Sample Taken	Dose Level	8ng Aroclor 1254	Wet Weight (g)	PPM on Wet Wt. Basis (µg/g)	Lipid Weight (g)	PPM on Lipid Wt. Basis (µg/g)	Lipid Wt. / Wet Wt. x 1000 (%)
570-H f	F	8/24/78	6/14/78	Control	106.8	0.2463	0.43	0.0968	1.1	39
764-H f	F	8/24/78	7/31/78	Control	73.2	0.6101	0.12	0.2288	0.32	38
570-H f	F	8/24/78	7/31/78	Control	56.0	0.3256	0.17	0.1248	0.45	38
604-I f	F	8/24/78	7/31/78	Control	58.8	0.4237	0.14	0.1228	0.48	29
618-I f	F	8/24/78	7/31/78	Control	22.0	0.7790	0.03	0.2764	0.08	35
569-H f	F	8/24/78	7/31/78	Control	69.2	0.9992	0.07	0.3196	0.22	32
274-F f	F	8/24/78	7/31/78	Control	59.6	0.3473	0.17	0.1640	0.36	47
200-F f	F	8/24/78	7/31/78	Control	90.4	0.8250	0.11	0.3604	0.25	44
739-F m	F	8/24/78	8/1/78	Control	75.6	0.4742	0.16	0.2284	0.33	48
227-G m	F	8/24/78	8/1/78	Control	89.2	0.6738	0.13	0.1996	0.45	30
418-J m	F	8/24/78	8/1/78	Control	62.4	0.3834	0.16	0.1172	0.53	31
426-G m	F	8/24/78	8/1/78	Control	17.6	0.2642	0.06	0.0844	0.21	32
273-I f	F	8/24/78	8/1/78	Medium	9,632	0.0217	11.7	0.6973	13.8	85
757-I f	F	8/24/78	8/1/78	Medium	1,771	0.2980	5.94	0.8252	70.3	8.4
763-E f	F	8/24/78	7/31/78	Medium	10,800	0.5970	18.1	0.4344	24.9	72
891-H f	F	8/24/78	8/1/78	Medium	5,220	0.3646	14.3	0.1332	39.2	36
540-H f	F	8/24/78	8/1/78	Medium	3,730	0.4327	8.62	0.1824	20.4	42
281-G f	F	8/24/78	8/1/78	Medium	15,940	0.7413	21.5	0.5888	27.1	79
307-I f	F	8/24/78	8/1/78	Medium	11,420	0.7069	16.2	0.5792	19.7	82
599-I m	F	8/24/78	8/2/78	Medium	4,098	0.3688	11.1	0.2036	20.1	55
595-I m	F	8/24/78	8/2/78	Medium	8,910	0.3198	27.9	0.2380	37.4	74
20-I m	F	8/24/78	8/2/78	Medium	6,680	0.4897	13.8	0.2124	31.5	43
46-I m	F	8/24/78	8/2/78	Medium	8,330	1.0042	8.30	0.8624	9.65	86
282-I f	F	8/24/78	8/6/78	High	1,144	0.3301	3.47	0.0244	46.9	7.4
312-I f	F	8/24/78	8/1/78	High	11,460	0.2895	39.6	0.1436	79.8	50
269-I f	F	8/24/78	8/1/78	High	15,300	0.5580	27.4	0.2620	58.4	47
226-I f	F	8/24/78	8/1/78	High	3,983	0.2911	13.7	0.0444	89.7	15
338-I f	F	8/24/78	8/1/78	High	480.0	0.2442	1.97	0.0560	8.57	23
427-J m	F	8/24/78	8/2/78	High	2,851	0.4747	6.01	0.2000	14.3	42
560-I m	F	8/24/78	8/2/78	High	7,626	0.5828	13.1	0.2792	27.3	48
425-J m	F	8/24/78	8/2/78	High	5,850	0.4591	12.7	0.1908	30.7	42

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TABLE 8. PCB CONTENT OF MILK SAMPLES SHIPPED 2 MAY 1978 AND 23 MAY 1978

Sample I.D.	Type	Date Shipped	Dose Level	#ng Aroclor 1254	Weight of Milk Analyzed (g)	PPM on Weight Basis (µg/g)
604-I f	M	5/2/78	Control	8.0	0.0992	0.08
618-I f	M	5/23/58	Control	0.6	0.1039	0.01
764-E f	M	5/23/78	Control	3.1	0.1041	0.03
274-F f	M	5/23/78	Control	21.1	0.1075	0.20
624-I f	M	5/23/78	Low	22.5	0.1037	0.22
540-H f	M	5/23/78	Medium	43.6	0.1048	0.42
273-I f	M	5/23/78	Medium	60.9	0.1063	0.51
757-I f	M	5/23/78	Medium	49.0	0.1074	0.46
312-I f	M	5/23/78	High	100.1	0.1055	0.95

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