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Description Notes

Handwritten notes and calculations by Alvin L. Young.

# DETERMINATIONS OF 2,3,7,8-TCDD IN HUMAN ADIPOSE TISSUE

	total # of samples	no. of samples above detection limit	Range (ppt)	mean ± S.D.	<i>Remarks</i>
Canada	23	22	4.1-130	10.7 ± 5.4	
Veterans Administration	33	25	3 - 87	7.1 ± 5.5	
a. Biopsy Volunteers who served in Vietnam	21	17	3 - 13, 29, 81 3 - 29, 81	8.3 ± 6.9	} N.S.
b. Biopsy Volunteers who did not serve in Vietnam	12	11	3 - 14	5.7 ± 3.1	
<i>Totals</i> EPA	20 6	8 (Adults) 6	5 - 127	~ 10 ppt	
	5 6	53	3 - 120 ppt	282 ND 283 ND 284 10 285 19*	
		4 TCDF - 28 ppt			
		6 PCDF - 2-60 ppt			
		17 ppt			
PCB in Adipose				3.5 ± 4.2 (n=23)	Exact Media

64

83%

53

282 ND  
283 ND  
284 10  
285 19\*

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = \frac{8.27 - 5.68}{5.47 \sqrt{\frac{1}{13} + \frac{1}{11}}} = \frac{2.59}{2.24} = 1.156$$

$$s_p^2 = \frac{(N_1 - 1)S_1^2 + (N_2 - 1)S_2^2}{N_1 + N_2 - 2} \quad P > 0.1$$

$$= \frac{(12 \times 47.1) + (10 \times 9.4)}{13 + 11 - 2} = \frac{585.2 + 94}{22} = 29.96$$

$$s_p = 5.47$$

Grand  $\frac{107.5 + 62.5}{13 + 11} = 7.08$

$$\frac{1903.6 - (170)^2 / 24}{24 - 1} = 30.4$$

$$s^2 = 5.5$$

A. Volunteers who served in Vietnam

$X_{1i}$	$X_{1i}^2$
29	841
<hr/>	
81	(6561)
7.5	56.25
5	25
5	25
5	25
3	9
9	81
4	16
5	25
11	121
13	169
5	25
6	36
<hr/>	

$$N_1 = 13$$

$$\bar{X}_1 = \frac{107.5}{13} = 8.27$$

$$S_1^2 = \frac{1454.3 - (107.5)^2/13}{13 - 1}$$

$$= \frac{1454.3 - 888.9}{12}$$

$$= 47.1$$

$$S_1 = 6.86$$

$$\sum X_{1i} = 107.5 \quad \sum X_{1i}^2 = 1454.3$$

B. Volunteers who did not served in Vietnam

4	16
>	1
3.5	12.25
5	25
6	36
7	49
7	49
4	16
14	196
r	25
k	16
<hr/>	
62.5	449.3

$$N_2 = 11$$

$$\bar{X}_2 = \frac{62.5}{11} = 5.68$$

$$S_2^2 = \frac{449.3 - (62.5)^2/11}{11 - 1}$$

$$= 9.4$$

$$S_2 = 3.07$$

Ryan 1979-1981

10ppt  
1.5ppt  
diet

Sex

Age

Residence

Cause of Death (Stroke, H.D., CA, Acc)

Origin

Kingston 13

Ottawa 10

PCB

Kingston ~~8.9~~  
~~8.0~~

Ottawa

12.4 ± 5.8 (12)  
21.3 ± 33.1 (13)

8.6 ± 4.4 (10)

fr-f

TOTAL 10.

8.0

4.1

10.1

21.8

14.0

8.9

21.2

18.6

10.4

15.4

130

SAMPLE

TCDF

PCDF

1

1.4

20

18.6

2

12.2

46

V

1.8

7.2

59.3

5

3.2

16.4

6

4.1.0

2

7

6.1

4.4

How much fat in a normal 70 kg man?

Fat 5% = 3.5 kg

if adipose contained 10 ppt

$\therefore 10 \text{ ng/kg} \times 3.5 = 35 \text{ ng in a 70 kg man?}$

350,000

$\frac{.5 \text{ ng}}{\text{kg}} = 10 \text{ ppt}$

35,000 ppt

192.60

# DETERMINATIONS OF 2,3,7,8-TCDD IN HUMAN ADIPOSE TISSUE

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Canada	23	22	4.1-130	10.7 ± 5.4
Veterans Administration	33	24	3 - 29	7.1 ± 5.5
a. Biopsy Volunteers who served in Vietnam	21	13	3 - 13, 29, 81	8.3 ± 6.9
b. Biopsy Volunteers who did not serve in Vietnam	12	11	3 - 29	5.7 ± 3.1
EPA	20	8 (Adults)	15 - 127	~10 ppt

64  
5  
6  
83%

53  
3  
4 TCDF-288F  
6 PCDF 2-60  
17 ppt

ATP 282 ND  
283 ND  
294 10  
285 19\*

PCB in Adipose 3.5 ± 4.2 (n=23)

Exact Mass

Continued

N.S.

A. Volunteers who served in Vietnam

$X_{1i}$	$X_{1i}^2$
29	841
<del>81</del>	<del>(6561)</del>
2.5	56.3
5	25
5	25
5	25
3	7
9	81
4	16
5	25
11	121
13	169
5	25
6	36

$$N_1 = 13$$

$$\bar{X}_1 = \frac{107.5}{13} = 8.27$$

$$S_1^2 = \frac{1454.3 - (107.5)^2/13}{13 - 1}$$

$$= \frac{1454.3 - 898.9}{12}$$

$$= 47.1$$

$$S_1 = 6.86$$

$$\sum X_{1i} = 107.5 \quad \sum X_{1i}^2 = 1454.3$$

B. Volunteers who did not served in Vietnam

4	16
3	9
3.5	12.3
5	25
6	36
7	49
7	49
4	16
14	196
5	25

$$N_2 = 11$$

$$\bar{X}_2 = \frac{62.5}{11} = 5.4?$$

$$S_2^2 = \frac{449.3 - (62.5)^2/11}{11 - 1}$$

$$= 9.4$$

$$S_2 = 3.07$$



$$n = 14$$

$$\bar{x} = \frac{188.5}{14} = 13.5$$

$$s^2 = \frac{8015.3 - 35532.5/14}{14 - 1}$$

$$= 421.2$$

$$\sum x = 188.5$$

$$(\sum x)^2 = 35532.25$$

$$\sum x^2 = 8015.3$$

$$s = 20.53$$

VA

(a) volunteer served in Vietnam	21	14	3 - 81	$13.5 \pm 20$
(b)	12	11	3 - 14	$5.7 \pm 3.1$
	33	25	3 - 81	

$$13.5 \pm 20.5$$

$$\begin{array}{r} 188.5 \\ 62.5 \\ \hline 251 \end{array}$$

$$\begin{array}{r} 8015.3 \\ 4491.3 \\ \hline 8464.6 \end{array}$$

$$\frac{251}{25} = 10.04$$

$$s^2 = \frac{8464.6 - \frac{63001}{25}}{24} = 247.7$$

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = \frac{8.27 - 5.68}{5.47 \sqrt{\frac{1}{13} + \frac{1}{11}}} = \frac{2.59}{2.24} = 1.156$$

$$p > 0.1$$

0.0769  
0.0

$$s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

$$= \frac{(12 \times 47.1) + (10 \times 9.4)}{13 + 11 - 2} = \frac{585.2 + 94}{22} = 29.96$$

$$s_p = 5.47$$

Overall  $\frac{107.5 + 62.5}{13 + 11} = 7.08$

$$\frac{1903.6 - (170)^2 / 24}{24 - 1} = 30.4$$

$$s^2 = 5.5$$

555

290 hospitals

SSN

520 - 44 - 1612

BIRLS

DMDC

SSN

1969 - 1981

EPA Human Adipose Tissue Survey

15,000

1937 - 1952 - males

5.0 gms

No of sample above detection limit	Range	mean $\pm$ SD
n = 25	3 - 81	10.04 $\pm$ 15.7
n = 24	3 - 29	7.08 $\pm$ 5.5
n = 14	3 - 81	13.5 $\pm$ 20.5
n = 17	3 - 29	8.3 $\pm$ 6.9
n = 11	3 - 14	5.7 $\pm$ 3.1

8.3 vs 5.7 NS (P > 0.1)  
 13.5 vs 5.7 NS (P > 0.1)

$$t = \frac{\bar{x}_1 - \bar{x}_2}{sp \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = \frac{13.5 - 5.7}{15.56 \sqrt{\frac{1}{14} + \frac{1}{11}}} = \frac{7.8}{6.27} = 1.24$$

7.14 vs 10.2  
 P > 0.1

$$sp^2 = \frac{(14-1)421.3 + (11-1)9.4}{14+11-2} = \frac{5570.9}{23} = 242.2$$

$$sp = 15.56$$