

Table O-2-12. (Continued)
Interaction Table for Double Labelled Cells: CD4 with CD8 (cells/mm³)
(Nonzero Measurements)

e) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race: Table 19-16)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^b	p-Value ^c
Black	Comparison	15	46.2		
	Background RH	5	20.7	-25.5 --	0.021
	Low RH	5	25.4	-20.8 --	0.083
	High RH	7	32.5	-13.7 --	0.249
	Low plus High RH	12	29.3	-16.9 --	0.078
Non-Black	Comparison	345	28.6		
	Background RH	121	32.5	3.9 --	0.087
	Low RH	80	26.8	-1.8 --	0.434
	High RH	88	27.0	-1.6 --	0.476
	Low plus High RH	168	26.9	-1.7 --	0.328

Table O-2-12. (Continued)
Interaction Table for Double Labelled Cells: CD4 with CD8 (cells/mm³)
(Nonzero Measurements)

f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Occupation: Table 19-16)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^b	p-Value ^c
Officer	Comparison	127	32.4		
	Background RH	89	31.7	-0.7 --	0.020
	Low RH	34	27.2	-5.2 --	0.083
	High RH	5	29.5	-2.9 --	0.249
	Low plus High RH	39	27.5	-4.9 --	0.078
Enlisted Flyer	Comparison	71	30.3		
	Background RH	12	35.8	5.5 --	0.087
	Low RH	23	29.9	-0.4 --	0.434
	High RH	21	32.1	1.8 --	0.476
	Low plus High RH	44	30.9	0.6 --	0.328
Enlisted Groundcrew	Comparison	162	31.9		
	Background RH	25	43.5	11.6 --	0.033
	Low RH	28	29.9	-2.0 --	0.632
	High RH	69	29.5	-2.4 --	0.427
	Low plus High RH	97	29.6	-2.3 --	0.392

^a Transformed from natural logarithm scale.

^b Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^c P-value is based on difference of means on natural logarithm scale.

Note: Analysis based on measurements above 0 cells/mm³ only.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-2-13.
Interaction Table for Double Labelled Cells: CD3 with CD16+56
(Zero vs. Nonzero)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 19-17)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Zero	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Officer	Low	31	3.2	--	--
	Medium	13	0.0		
	High	1	0.0		
Enlisted Flyer	Low	16	6.2	--	--
	Medium	20	0.0		
	High	12	0.0		
Enlisted Groundcrew	Low	17	0.0	2.30 (1.01,5.24)	0.048
	Medium	34	2.8		
	High	59	0.2		

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Physical Activity Index: Table 19-17)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Zero	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Sedentary	Low	63	0.0	2.62 (1.45,4.76)	0.002
	Medium	51	2.0		
	High	78	7.7		
Moderate	Low	22	4.5	0.93 (0.44,1.97)	0.845
	Medium	21	9.5		
	High	22	4.5		
Very Active	Low	31	6.5	0.22 (0.03,1.89)	0.169
	Medium	35	0.0		
	High	21	0.0		

Table O-2-13. (Continued)
Interaction Table for Double Labelled Cells: CD3 with CD16+56
(Zero vs. Nonzero)

c) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Physical Activity Index: Table 19-17)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Zero	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Sedentary	Low	64	0.0	2.59 (1.44,4.64)	0.001
	Medium	54	1.9		
	High	74	8.1		
Moderate	Low	19	5.3	1.04 (0.54,2.00)	0.900
	Medium	25	4.0		
	High	21	9.5		
Very Active	Low	29	6.9	0.39 (0.08,1.84)	0.233
	Medium	37	0.0		
	High	21	0.0		

d) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Physical Activity Index: Table 19-17)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Zero	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Sedentary	Low	64	0.0	2.45 (1.35,4.46)	0.003
	Medium	54	1.9		
	High	74	8.1		
Moderate	Low	19	5.3	0.98 (0.50,1.92)	0.953
	Medium	25	4.0		
	High	21	9.5		
Very Active	Low	29	6.9	0.37 (0.08,1.73)	0.206
	Medium	37	0.0		
	High	21	0.0		

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table O-2-14.
Interaction Table for TLC (cells/mm³)
(Continuous)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Physical Activity Index: Table 19-18)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean ^a	Adjusted Slope (Std. Error) ^b	p-Value
Sedentary	Low	25	2,202.8	-0.033 (0.031)	0.288
	Medium	39	2,127.4		
	High	50	2,046.0		
Moderate	Low	14	1,771.2	0.124 (0.051)	0.017
	Medium	14	1,925.9		
	High	11	2,588.2		
Very Active	Low	25	2,086.7	-0.063 (0.044)	0.150
	Medium	14	1,934.1		
	High	11	1,785.0		

Table O-2-14. (Continued)
Interaction Table for TLC (cells/mm³)
(Continuous)

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Age: Table 19-18)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.)^c	p-Value^d
Born ≥ 1942	Comparison	183	2,041.1		
	Background RH	47	1,958.0	-83.1 --	0.439
	Low RH	21	2,214.7	173.6 --	0.283
	High RH	65	2,106.7	65.6 --	0.502
	Low plus High RH	86	2,132.6	91.5 --	0.308
Born < 1942	Comparison	217	2,013.1		
	Background RH	93	2,120.7	107.6 --	0.200
	Low RH	74	1,926.7	-86.4 --	0.324
	High RH	41	1,959.4	-53.7 --	0.630
	Low plus High RH	115	1,938.3	-74.8 --	0.321

^a Transformed from natural logarithm scale.

^b Slope and standard error based on natural logarithm of TLC versus log₂ dioxin.

^c Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-2-15.
Interaction Table for IgA (mg/dl)

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Race: Table 19-19)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^b	p-Value ^c
Black	Comparison	55	225.7		
	Background RH	14	204.3	-21.4 --	0.461
	Low RH	23	292.6	66.9 --	0.020
	High RH	13	234.3	8.6 --	0.787
	Low plus High RH	36	270.0	44.3 --	0.063
Non-Black	Comparison	996	218.7		
	Background RH	353	217.7	-1.0 --	0.875
	Low RH	233	207.0	-11.7 --	0.095
	High RH	242	216.2	-2.5 --	0.730
	Low plus High RH	475	211.6	-7.1 --	0.199

^a Transformed from natural logarithm scale.

^b Difference of means after transformation to original scale; confidence interval and difference of means not presented because analysis was performed on natural logarithm scale.

^c P-value is based on differences of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin $\leq$ 10 ppt.

Background (Ranch Hand): Current Dioxin $\leq$ 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin $\leq$ 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table O-2-16.
Interaction Table for IgG (mg/dl)

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Occupation: Table 19-20)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^b	p-Value ^c
Officer	Comparison	395	1,127.8		
	Background RH	233	1,121.4	-6.4 --	0.754
	Low RH	101	1,077.4	-50.4 --	0.061
	High RH	9	897.4	-230.4 --	0.002
	Low plus High RH	110	1,061.4	-66.4 --	0.010
Enlisted Flyer	Comparison	172	1,142.6		
	Background RH	39	1,079.1	-63.5 --	0.141
	Low RH	54	1,072.5	-70.1 --	0.063
	High RH	53	1,117.3	-25.3 --	0.514
	Low plus High RH	107	1,094.7	-47.9 --	0.109
Enlisted Groundcrew	Comparison	468	1,152.5		
	Background RH	92	1,140.9	-11.6 --	0.688
	Low RH	98	1,171.1	18.6 --	0.509
	High RH	189	1,145.2	-7.3 --	0.736
	Low plus High RH	287	1,154.0	1.5 --	0.937

^a Transformed from natural logarithm scale.

^b Difference of means after transformation to original scale; confidence interval and difference of means not presented because analysis was performed on natural logarithm scale.

^c P-value is based on differences of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin $\leq$ 10 ppt.

Background (Ranch Hand): Current Dioxin $\leq$ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin $\leq$ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-2-17.
Interaction Table for IgM (mg/dl)

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Race: Table 19-21)						
Stratum	Occupational Category	Group	n	Adjusted Mean ^a	Difference of Adjusted Means (95% C.I.) ^b	p-Value ^c
<i>Black</i>	<i>All</i>	<i>Ranch Hand</i>	55	79.6	-19.1 --	0.027
		<i>Comparison</i>	73	98.7		
<i>Non-Black</i>	<i>All</i>	<i>Ranch Hand</i>	871	106.1	-0.1 --	0.986
		<i>Comparison</i>	1,173	106.2		
Black	Officer	Ranch Hand	7	71.9	-0.8 --	0.969
		Comparison	6	72.7		
	Enlisted Flyer	Ranch Hand	10	78.7	-31.0 --	0.135
		Comparison	15	109.7		
	Enlisted Groundcrew	Ranch Hand	38	81.2	-17.9 --	0.088
		Comparison	52	99.1		
Non-Black	Officer	Ranch Hand	356	107.1	0.9 --	0.831
		Comparison	479	106.2		
	Enlisted Flyer	Ranch Hand	147	103.0	-7.5 --	0.243
		Comparison	185	110.5		
	Enlisted Groundcrew	Ranch Hand	368	106.5	1.8 --	0.632
		Comparison	509	104.7		

Table O-2-17. (Continued)
Interaction Table for IgM (mg/dl)

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Physical Activity Index: Table 19-21)						
Stratum	Occupational Category	Group	n	Adjusted Mean ^a	Difference of Adjusted Means (95% C.I.) ^b	p-Value ^c
<i>Sedentary</i>	<i>All</i>	<i>Ranch Hand</i>	<i>531</i>	<i>93.4</i>	<i>-6.7 --</i>	<i>0.026</i>
		<i>Comparison</i>	<i>700</i>	<i>100.1</i>		
<i>Moderate</i>	<i>All</i>	<i>Ranch Hand</i>	<i>165</i>	<i>96.6</i>	<i>-1.4 --</i>	<i>0.795</i>
		<i>Comparison</i>	<i>235</i>	<i>98.0</i>		
<i>Very Active</i>	<i>All</i>	<i>Ranch Hand</i>	<i>230</i>	<i>106.2</i>	<i>11.8 --</i>	<i>0.013</i>
		<i>Comparison</i>	<i>311</i>	<i>94.4</i>		
<i>Sedentary</i>	<i>Officer</i>	<i>Ranch Hand</i>	<i>189</i>	<i>95.1</i>	<i>-7.6 --</i>	<i>0.150</i>
		<i>Comparison</i>	<i>238</i>	<i>102.7</i>		
	<i>Enlisted Flyer</i>	<i>Ranch Hand</i>	<i>87</i>	<i>87.4</i>	<i>-15.1 --</i>	<i>0.037</i>
		<i>Comparison</i>	<i>125</i>	<i>102.5</i>		
	<i>Enlisted Groundcrew</i>	<i>Ranch Hand</i>	<i>255</i>	<i>94.1</i>	<i>-3.3 --</i>	<i>0.442</i>
		<i>Comparison</i>	<i>337</i>	<i>97.4</i>		
<i>Moderate</i>	<i>Officer</i>	<i>Ranch Hand</i>	<i>72</i>	<i>98.1</i>	<i>4.2 --</i>	<i>0.604</i>
		<i>Comparison</i>	<i>107</i>	<i>93.9</i>		
	<i>Enlisted Flyer</i>	<i>Ranch Hand</i>	<i>33</i>	<i>100.7</i>	<i>-5.3 --</i>	<i>0.698</i>
		<i>Comparison</i>	<i>35</i>	<i>106.0</i>		
	<i>Enlisted Groundcrew</i>	<i>Ranch Hand</i>	<i>60</i>	<i>92.8</i>	<i>-7.1 --</i>	<i>0.414</i>
		<i>Comparison</i>	<i>93</i>	<i>99.9</i>		
<i>Very Active</i>	<i>Officer</i>	<i>Ranch Hand</i>	<i>102</i>	<i>103.9</i>	<i>12.0 --</i>	<i>0.085</i>
		<i>Comparison</i>	<i>140</i>	<i>91.9</i>		
	<i>Enlisted Flyer</i>	<i>Ranch Hand</i>	<i>37</i>	<i>105.4</i>	<i>4.6 --</i>	<i>0.721</i>
		<i>Comparison</i>	<i>40</i>	<i>100.8</i>		
	<i>Enlisted Groundcrew</i>	<i>Ranch Hand</i>	<i>91</i>	<i>108.9</i>	<i>13.8 --</i>	<i>0.068</i>
		<i>Comparison</i>	<i>131</i>	<i>95.1</i>		

Table O-2-17. (Continued)
Interaction Table for IgM (mg/dl)

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Physical Activity Index: Table 19-21)					
Stratum	Dioxin Category	n	Adjusted Mean ^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.) ^b	p-Value ^c
Sedentary	Comparison	574	99.3		
	Background RH	193	93.3	-6.0 --	0.173
	Low RH	139	93.2	-6.1 --	0.220
	High RH	164	92.0	-7.3 --	0.115
	Low plus High RH	303	92.5	-6.8 --	0.069
Moderate	Comparison	195	96.9		
	Background RH	70	110.9	14.0 --	0.077
	Low RH	51	83.8	-13.1 --	0.092
	High RH	39	94.0	-2.9 --	0.753
	Low plus High RH	90	88.1	-8.8 --	0.171
Very Active	Comparison	266	92.4		
	Background RH	102	99.5	7.1 --	0.246
	Low RH	63	118.1	25.7 --	0.001
	High RH	48	107.2	14.8 --	0.083
	Low plus High RH	111	113.3	20.9 --	0.001

Table O-2-17. (Continued)
Interaction Table for IgM (mg/dl)

d) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 19-21)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Adjusted Mean^a	Adjusted Slope (Std. Error)^d	p-Value
0-1 Drinks/Day	Low	223	89.5	0.019 (0.014)	0.176
	Medium	218	90.0		
	High	239	93.3		
>1-4 Drinks/Day	Low	58	120.9	-0.091 (0.037)	0.016
	Medium	71	115.4		
	High	44	84.0		
>4 Drinks/Day	Low	7	83.8	-0.168 (0.126)	0.213
	Medium	3	178.6		
	High	6	49.8		

^a Transformed from natural logarithm scale.

^b Difference of means after transformation to original scale; confidence interval on difference of means not presented because analysis was performed on natural logarithm scale.

^c P-value is based on difference of means on natural logarithm scale.

^d Slope and standard error based on natural logarithm of IgM versus log₂ dioxin.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Table O-2-18.
Interaction Table for Lupus Panel: Antinuclear Antibody (ANA)

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 19-22)					
Stratum	Dioxin Category	n	Percent Present	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Comparison	53	17.0		
	Background RH	20	10.0	0.58 (0.11,2.96)	0.509
	Low RH	15	20.0	1.18 (0.27,5.10)	0.827
	High RH	23	13.0	0.80 (0.19,3.30)	0.756
	Low plus High RH	38	15.8	0.95 (0.30,2.97)	0.931
>0-40 Drink-years	Comparison	701	17.0		
	Background RH	255	15.3	0.80 (0.54,1.20)	0.281
	Low RH	167	17.4	0.97 (0.62,1.52)	0.898
	High RH	162	11.1	0.71 (0.41,1.21)	0.206
	Low plus High RH	329	14.3	0.85 (0.58,1.23)	0.388
>40 Drink-years	Comparison	279	16.8		
	Background RH	86	17.4	0.96 (0.50,1.84)	0.913
	Low RH	68	7.4	0.38 (0.15,1.01)	0.053
	High RH	63	11.1	0.70 (0.30,1.64)	0.411
	Low plus High RH	131	9.2	0.52 (0.27,1.03)	0.060

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Race: Table 19-22)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Black	Low	11	27.3	0.34 (0.12,0.91)	0.032
	Medium	21	9.5		
	High	17	0.0		
Non-Black	Low	275	16.4	0.97 (0.84,1.12)	0.713
	Medium	267	15.0		
	High	268	11.6		

Table O-2-18. (Continued)
Interaction Table for Lupus Panel: Antinuclear Antibody (ANA)

c) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 19-22)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drinks/Day	Low	17	5.9	1.11 (0.69,1.79)	0.663
	Medium	18	16.7		
	High	23	17.4		
>0-40 Drinks/Day	Low	201	16.4	0.97 (0.82,1.15)	0.729
	Medium	193	17.1		
	High	190	10.5		
>40 Drinks/Day	Low	68	20.6	0.83 (0.61,1.13)	0.230
	Medium	77	7.8		
	High	72	9.7		

d) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Race: Table 19-22)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Black	Low	12	25.0	0.36 (0.15,0.89)	0.027
	Medium	22	9.1		
	High	15	0.0		
Non-Black	Low	278	15.1	0.99 (0.88,1.12)	0.856
	Medium	264	16.3		
	High	268	11.6		

e) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 19-22)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drink-years	Low	18	11.1	1.07 (0.71,1.61)	0.741
	Medium	14	21.4		
	High	26	11.5		
>0-40 Drink-years	Low	203	15.3	0.99 (0.86,1.15)	0.921
	Medium	198	17.2		
	High	183	11.5		
>40 Drink-years	Low	69	17.4	0.87 (0.69,1.10)	0.246
	Medium	74	10.8		
	High	74	9.5		

Table O-2-18. (Continued)
Interaction Table for Lupus Panel: Antinuclear Antibody (ANA)

f) MODEL 6: RANCH HANDS – CURRENT DIOXIN – ADJUSTED (Current Dioxin-by-Race: Table 19-22)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Black	Low	12	25.0	0.36 (0.15,0.88)	0.026
	Medium	22	9.1		
	High	15	0.0		
Non-Black	Low	277	15.2	0.96 (0.85,1.10)	0.591
	Medium	264	16.3		
	High	268	11.6		

g) MODEL 6: RANCH HANDS – CURRENT DIOXIN – ADJUSTED (Current Dioxin-by-Lifetime Alcohol History: Table 19-22)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.) ^b	p-Value
0 Drink-years	Low	18	11.1	1.05 (0.70,1.57)	0.830
	Medium	14	21.4		
	High	26	11.5		
>0-40 Drink-years	Low	202	15.3	0.96 (0.83,1.13)	0.645
	Medium	198	17.2		
	High	183	11.5		
>40 Drink-years	Low	69	17.4	0.85 (0.67,1.08)	0.193
	Medium	74	10.8		
	High	74	9.5		

^a Relative risk and confidence interval relative to Comparisons.

^b Relative risk for a twofold increase in current dioxin.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table O-2-19.
Interaction Table for Lupus Panel: Thyroid Microsomal Antibody

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Current Cigarette Smoking: Table 19-23)						
Stratum	Occupational Category	Group	n	Percent Present	Adj. Relative Risk (95% C.I.)	p-Value
<i>0-Never Smoked</i>	<i>All</i>	<i>Ranch Hand</i>	<i>245</i>	<i>2.0</i>	<i>0.49 (0.18,1.40)</i>	<i>0.184</i>
		<i>Comparison</i>	<i>343</i>	<i>4.1</i>		
<i>0-Former Smoker</i>	<i>All</i>	<i>Ranch Hand</i>	<i>422</i>	<i>5.2</i>	<i>1.85 (0.97,3.51)</i>	<i>0.060</i>
		<i>Comparison</i>	<i>604</i>	<i>3.0</i>		
<i>> 0-20 Cigarettes/Day</i>	<i>All</i>	<i>Ranch Hand</i>	<i>151</i>	<i>3.3</i>	<i>2.93 (0.56,15.34)</i>	<i>0.204</i>
		<i>Comparison</i>	<i>187</i>	<i>1.1</i>		
<i>> 20 Cigarettes/Day</i>	<i>All</i>	<i>Ranch Hand</i>	<i>97</i>	<i>8.2</i>	--	--
		<i>Comparison</i>	<i>109</i>	<i>0.0</i>		
<i>0-Never Smoked</i>	Officer	<i>Ranch Hand</i>	<i>131</i>	<i>1.5</i>	<i>0.49 (0.16,1.49)</i>	<i>0.208</i>
		<i>Comparison</i>	<i>188</i>	<i>4.8</i>		
	Enlisted Flyer	<i>Ranch Hand</i>	<i>24</i>	<i>4.2</i>	<i>0.78 (0.14,4.42)</i>	<i>0.776</i>
		<i>Comparison</i>	<i>26</i>	<i>0.0</i>		
	Enlisted Groundcrew	<i>Ranch Hand</i>	<i>90</i>	<i>2.2</i>	<i>0.48 (0.14,1.60)</i>	<i>0.231</i>
		<i>Comparison</i>	<i>129</i>	<i>3.9</i>		
<i>0-Former Smoker</i>	Officer	<i>Ranch Hand</i>	<i>175</i>	<i>4.0</i>	<i>1.74 (0.74,4.08)</i>	<i>0.204</i>
		<i>Comparison</i>	<i>234</i>	<i>2.6</i>		
	Enlisted Flyer	<i>Ranch Hand</i>	<i>82</i>	<i>6.1</i>	<i>2.77 (0.67,11.50)</i>	<i>0.160</i>
		<i>Comparison</i>	<i>106</i>	<i>2.8</i>		
	Enlisted Groundcrew	<i>Ranch Hand</i>	<i>165</i>	<i>6.1</i>	<i>1.71 (0.74,3.95)</i>	<i>0.209</i>
		<i>Comparison</i>	<i>264</i>	<i>3.4</i>		
<i>> 0-20 Cigarettes/Day</i>	Officer	<i>Ranch Hand</i>	<i>34</i>	<i>5.9</i>	<i>2.67 (0.43,16.40)</i>	<i>0.289</i>
		<i>Comparison</i>	<i>34</i>	<i>2.9</i>		
	Enlisted Flyer	<i>Ranch Hand</i>	<i>24</i>	<i>4.2</i>	<i>4.26 (0.54,33.85)</i>	<i>0.171</i>
		<i>Comparison</i>	<i>46</i>	<i>0.0</i>		
	Enlisted Groundcrew	<i>Ranch Hand</i>	<i>93</i>	<i>2.2</i>	<i>2.63 (0.48,14.39)</i>	<i>0.266</i>
		<i>Comparison</i>	<i>107</i>	<i>0.9</i>		
<i>> 20 Cigarettes/Day</i>	Officer	<i>Ranch Hand</i>	<i>19</i>	<i>21.1</i>	--	--
		<i>Comparison</i>	<i>28</i>	<i>0.0</i>		
	Enlisted Flyer	<i>Ranch Hand</i>	<i>24</i>	<i>0.0</i>	--	--
		<i>Comparison</i>	<i>21</i>	<i>0.0</i>		
	Enlisted Groundcrew	<i>Ranch Hand</i>	<i>54</i>	<i>7.4</i>	--	--
		<i>Comparison</i>	<i>60</i>	<i>0.0</i>		

Table O-2-19. (Continued)
Interaction Table for Lupus Panel: Thyroid Microsomal Antibody

b) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Current Alcohol Use: Table 19-23)						
Stratum	Occupational Category	Group	n	Percent Present	Adj. Relative Risk (95% C.I.)	p-Value
0-1 Drinks/Day	All	Ranch Hand	715	4.9	1.78 (1.07,2.96)	0.026
		Comparison	989	2.8		
>1-4 Drinks/Day	All	Ranch Hand	182	2.2	0.90 (0.24,3.40)	0.873
		Comparison	214	2.3		
>4 Drinks/Day	All	Ranch Hand	18	5.6	2.49 (0.15,42.36)	0.528
		Comparison	40	2.5		
0-1 Drinks/Day	Officer	Ranch Hand	251	4.0	1.45 (0.67,3.11)	0.341
		Comparison	364	3.3		
	Enlisted Flyer	Ranch Hand	124	5.6	3.48 (0.87,13.97)	0.079
		Comparison	154	1.9		
	Enlisted Groundcrew	Ranch Hand	340	5.3	1.79 (0.87,3.66)	0.111
		Comparison	471	2.8		
>1-4 Drinks/Day	Officer	Ranch Hand	101	4.0	0.74 (0.18,3.00)	0.674
		Comparison	108	3.7		
	Enlisted Flyer	Ranch Hand	25	0.0	1.78 (0.27,11.52)	0.546
		Comparison	34	0.0		
	Enlisted Groundcrew	Ranch Hand	56	0.0	0.92 (0.21,4.03)	0.907
		Comparison	72	1.4		
>4 Drinks/Day	Officer	Ranch Hand	7	14.3	1.89 (0.10,34.03)	0.667
		Comparison	12	0.0		
	Enlisted Flyer	Ranch Hand	5	0.0	4.53 (0.21,97.28)	0.335
		Comparison	11	0.0		
	Enlisted Groundcrew	Ranch Hand	6	0.0	2.33 (0.13,41.91)	0.566
		Comparison	17	5.9		

Table O-2-19. (Continued)
Interaction Table for Lupus Panel: Thyroid Microsomal Antibody

c) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Lifetime Alcohol History: Table 19-23)						
Stratum	Occupational Category	Group	n	Percent Present	Adj. Relative Risk (95% C.I.)	p-Value
0	<i>All</i>	<i>Ranch Hand</i>	<i>62</i>	<i>3.2</i>	<i>0.72 (0.12,4.46)</i>	<i>0.722</i>
Drink-years		<i>Comparison</i>	<i>69</i>	<i>4.3</i>		
>0-40	<i>All</i>	<i>Ranch Hand</i>	<i>620</i>	<i>4.4</i>	<i>1.30 (0.76,2.21)</i>	<i>0.343</i>
Drink-years		<i>Comparison</i>	<i>847</i>	<i>3.4</i>		
>40	<i>All</i>	<i>Ranch Hand</i>	<i>233</i>	<i>4.7</i>	<i>7.94 (1.75,36.00)</i>	<i>0.007</i>
Drink-years		<i>Comparison</i>	<i>327</i>	<i>0.6</i>		
0	Officer	Ranch Hand	14	0.0	0.55 (0.08,3.85)	0.551
		Comparison	22	9.1		
	Enlisted Flyer	Ranch Hand	13	7.7	1.27 (0.14,11.80)	0.835
		Comparison	12	8.3		
	Enlisted Groundcrew	Ranch Hand	35	2.9	0.75 (0.11,4.91)	0.763
		Comparison	35	0.0		
>0-40	Officer	Ranch Hand	250	4.4	1.02 (0.48,2.19)	0.950
		Comparison	337	3.9		
	Enlisted Flyer	Ranch Hand	94	3.2	2.34 (0.57,9.58)	0.236
		Comparison	121	0.8		
	Enlisted Groundcrew	Ranch Hand	276	4.7	1.38 (0.66,2.92)	0.394
		Comparison	389	3.9		
>40	Officer	Ranch Hand	95	4.2	6.07 (1.22,30.27)	0.028
		Comparison	125	0.8		
	Enlisted Flyer	Ranch Hand	47	6.4	13.89 (1.98,97.61)	0.008
		Comparison	66	1.5		
	Enlisted Groundcrew	Ranch Hand	91	4.4	8.20 (1.65,40.75)	0.010
		Comparison	136	0.0		

Table O-2-19. (Continued)
Interaction Table for Lupus Panel: Thyroid Microsomal Antibody

d) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Cigarette Smoking: Table 19-23)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0-Never Smoked	Low	45	0.0	1.25 (0.48,3.26)	0.648
	Medium	36	0.0		
	High	49	4.1		
0-Former Smoker	Low	88	6.8	1.02 (0.68,1.53)	0.936
	Medium	79	6.3		
	High	63	9.5		
>0-20 Cigarettes/Day	Low	23	13.0	0.10 (0.01,1.18)	0.067
	Medium	28	0.0		
	High	33	0.0		
>20 Cigarettes/Day	Low	12	16.7	0.37 (0.10,1.39)	0.141
	Medium	24	8.3		
	High	18	0.0		

e) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Lifetime Alcohol History: Table 19-23)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0 Drink-years	Low	10	0.0	5.03 (0.17,152.38)	0.353
	Medium	12	0.0		
	High	16	6.3		
>0-40 Drink-years	Low	116	4.3	0.98 (0.68,1.41)	0.893
	Medium	108	5.6		
	High	105	4.8		
>40 Drink-years	Low	42	14.3	0.40 (0.16,0.98)	0.045
	Medium	47	2.1		
	High	42	4.8		

Table O-2-19. (Continued)
Interaction Table for Lupus Panel: Thyroid Microsomal Antibody

f) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Cigarette Smoking: Table 19-23)					
Stratum	Dioxin Category	n	Percent Present	Adjusted Relative Risk (95% C.I.)^b	p-Value
0-Never Smoked	Comparison	276	4.3		
	Background RH	106	1.9	0.41 (0.19,0.90)	0.026
	Low RH	68	0.0	--	--
	High RH	62	3.2	0.75 (0.35,1.60)	0.461
	Low plus High RH	130	1.5	0.34 (0.07,1.53)	0.157
0-Former Smoker	Comparison	516	2.9		
	Background RH	164	3.0	1.11 (0.51,2.41)	0.792
	Low RH	123	7.3	2.61 (1.14,5.98)	0.023
	High RH	107	7.5	2.89 (1.37,6.11)	0.005
	Low plus High RH	230	7.4	2.73 (1.33,5.58)	0.006
>0 Cigarettes/Day	Comparison	241	0.4		
	Background RH	91	6.6	15.82 (7.28,34.38)	<0.001
	Low RH	59	10.2	23.81 (6.68,84.88)	<0.001
	High RH	79	1.3	2.97 (1.41,6.27)	0.004
	Low plus High RH	138	5.1	11.74 (1.44,95.58)	0.021

g) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Current Alcohol Use: Table 19-23)					
Stratum	Dioxin Category	n	Percent Present	Adjusted Relative Risk (95% C.I.)^b	p-Value
0-1 Drinks/Day	Comparison	820	2.9		
	Background RH	277	3.2	1.11 (0.51,2.44)	0.792
	Low RH	191	7.3	2.49 (1.26,4.92)	0.009
	High RH	203	5.4	1.98 (0.94,4.16)	0.072
	Low plus High RH	394	6.3	2.24 (1.26,4.00)	0.006
>1 Drinks/Day	Comparison	213	1.9		
	Background RH	84	4.8	2.56 (0.62,10.55)	0.194
	Low RH	59	1.7	0.88 (0.10,8.02)	0.910
	High RH	45	0.0	--	--
	Low plus High RH	104	1.0	0.51 (0.06,4.62)	0.551

Table O-2-19. (Continued)
Interaction Table for Lupus Panel: Thyroid Microsomal Antibody

h) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Alcohol History: Table 19-23)					
Stratum	Dioxin Category	n	Percent Present	Adjusted Relative Risk (95% C.I.)^b	p-Value
0	Comparison	53	3.8		
Drink-years	Background RH	20	5.0	1.48 (0.13,17.50)	0.755
	Low RH	15	0.0	--	--
	High RH	23	4.3	1.19 (0.10,13.74)	0.892
	Low plus High RH	38	2.6	0.69 (0.06,8.03)	0.769
> 0-40	Comparison	701	3.4		
Drink-years	Background RH	255	3.9	1.15 (0.52,2.52)	0.730
	Low RH	167	5.4	1.53 (0.69,3.37)	0.296
	High RH	162	4.3	1.30 (0.55,3.04)	0.551
	Low plus High RH	329	4.9	1.42 (0.71,2.83)	0.323
> 40	Comparison	279	0.7		
Drink-years	Background RH	86	2.3	3.26 (0.45,23.44)	0.240
	Low RH	68	8.8	12.43 (2.44,63.32)	0.002
	High RH	63	4.8	7.67 (1.26,46.74)	0.027
	Low plus High RH	131	6.9	10.30 (2.12,50.01)	0.004

Table O-2-19. (Continued)
Interaction Table for Lupus Panel: Thyroid Microsomal Antibody

i) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 19-23)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.)^c	p-Value
0-1 Drinks/Day	Low	222	3.2	1.16 (0.93,1.44)	0.195
	Medium	218	6.9		
	High	239	5.4		
>1-4 Drinks/Day	Low	58	3.4	0.54 (0.21,1.36)	0.190
	Medium	71	2.8		
	High	44	0.0		
>4 Drinks/Day	Low	7	14.3	0.66 (0.15,2.92)	0.584
	Medium	3	0.0		
	High	6	0.0		

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

^c Relative risk for a twofold increase in current dioxin.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Model 4: Low = ≤ 8.1 ppt; Medium = > 8.1-20.5 ppt; High = > 20.5 ppt.

Table O-2-20.
Interaction Table for Lupus Panel: MSK Parietal Antibody

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Race: Table 19-26)						
Stratum	Occupational Category	Group	n	Percent Present	Adj. Relative Risk (95% C.I.)	p-Value
<i>Black</i>	<i>All</i>	<i>Ranch Hand</i>	55	5.5	--	--
		<i>Comparison</i>	73	0.0		
<i>Non-Black</i>	<i>All</i>	<i>Ranch Hand</i>	871	2.2	0.75 (0.42,1.32)	0.316
		<i>Comparison</i>	1,173	2.8		
Black	Officer	Ranch Hand	7	0.0	--	--
		Comparison	6	0.0		
	Enlisted Flyer	Ranch Hand	10	10.0	--	--
		Comparison	15	0.0		
	Enlisted Groundcrew	Ranch Hand	38	5.3	--	--
		Comparison	52	0.0		
Non-Black	Officer	Ranch Hand	356	3.1	1.41 (0.59,3.37)	0.440
		Comparison	479	2.1		
	Enlisted Flyer	Ranch Hand	147	1.4	0.70 (0.15,3.25)	0.650
		Comparison	185	2.2		
	Enlisted Groundcrew	Ranch Hand	368	1.6	0.42 (0.17,1.03)	0.057
		Comparison	509	3.7		

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Table O-2-21.
Interaction Table for Lupus Panel: Rheumatoid Factor

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Age: Table 19-27)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.)^a	p-Value
Born ≥ 1942	Low	55	18.2	0.71 (0.51,0.98)	0.038
	Medium	72	9.7		
	High	109	10.1		
Born < 1942	Low	116	18.1	0.91 (0.67,1.23)	0.548
	Medium	100	14.0		
	High	59	18.6		

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Occupation: Table 19-27)					
Initial Dioxin Category Summary Statistics				Analysis Results for Log₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.)^a	p-Value
Officer	Low	76	14.5	1.55 (0.66,3.60)	0.312
	Medium	33	21.2		
	High	1	100.0		
Enlisted Flyer	Low	35	25.7	0.36 (0.17,0.76)	0.008
	Medium	43	9.3		
	High	30	3.3		
Enlisted Groundcrew	Low	60	18.3	2.78 (2.15,3.60)	<0.001
	Medium	96	10.4		
	High	137	14.6		

Table O-2-21. (Continued)
Interaction Table for Lupus Panel: Rheumatoid Factor

c) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Occupation: Table 19-27)					
Stratum	Dioxin Category	n	Percent Present	Adjusted Relative Risk (95% C.I.) ^b	p-Value
Officer	Comparison	395	19.7		
	Background RH	234	13.7	0.65 (0.42,1.02)	0.064
	Low RH	101	16.8	0.77 (0.43,1.39)	0.388
	High RH	9	22.2	1.08 (0.22,5.32)	0.925
	Low plus High RH	110	17.3	0.81 (0.46,1.40)	0.445
Enlisted Flyer	Comparison	172	18.6		
	Background RH	39	15.4	0.85 (0.33,2.21)	0.738
	Low RH	54	24.1	1.45 (0.69,3.03)	0.323
	High RH	53	1.9	0.08 (0.01,0.60)	0.014
	Low plus High RH	107	13.1	0.66 (0.33,1.31)	0.233
Enlisted Groundcrew	Comparison	468	13.7		
	Background RH	92	22.8	1.92 (1.10,3.38)	0.023
	Low RH	98	16.3	1.24 (0.68,2.25)	0.486
	High RH	189	12.7	0.93 (0.56,1.54)	0.777
	Low plus High RH	287	13.9	1.03 (0.68,1.59)	0.875

Table O-2-21. (Continued)
Interaction Table for Lupus Panel: Rheumatoid Factor

d) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Physical Activity Index: Table 19-27)					
Stratum	Dioxin Category	n	Percent Present	Adjusted Relative Risk (95% C.I.)^b	p-Value
Sedentary	Comparison	574	17.8		
	Background RH	193	15.5	0.84 (0.53,1.32)	0.450
	Low RH	139	13.7	0.73 (0.43,1.24)	0.244
	High RH	164	11.6	0.63 (0.37,1.08)	0.092
	Low plus High RH	303	12.5	0.68 (0.46,1.03)	0.066
Moderate	Comparison	195	13.3		
	Background RH	70	27.1	2.41 (1.23,4.73)	0.011
	Low RH	51	23.5	1.92 (0.89,4.15)	0.098
	High RH	39	7.7	0.56 (0.16,1.98)	0.371
	Low plus High RH	90	16.7	1.30 (0.65,2.61)	0.459
Very Active	Comparison	266	17.3		
	Background RH	102	9.8	0.51 (0.25,1.06)	0.071
	Low RH	63	23.8	1.48 (0.76,2.87)	0.249
	High RH	48	10.4	0.59 (0.22,1.58)	0.290
	Low plus High RH	111	18.0	1.08 (0.60,1.94)	0.792

^a Relative risk for a twofold increase in initial dioxin.

^b Relative risk and confidence interval relative to Comparisons.

Note: Model 2: Low = 39-98 ppt; Medium = > 98-232 ppt; High = > 232 ppt.

Model 3: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-2-22.
Interaction Table for Lupus Panel: B Cell Clones Detected by Serum Protein Electrophoresis

a) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 19-28)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-1 Drinks/Day	Low	227	1.8	1.09 (0.76,1.56)	0.634
	Medium	218	1.8		
	High	235	1.7		
>1-4 Drinks/Day	Low	59	5.1	0.95 (0.58,1.53)	0.821
	Medium	68	7.4		
	High	46	2.2		
>4 Drinks/Day	Low	6	16.7	--	--
	Medium	4	0.0		
	High	6	0.0		

b) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Alcohol Use: Table 19-28)					
Current Dioxin Category Summary Statistics				Analysis Results for Log₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-1 Drinks/Day	Low	226	1.8	1.05 (0.72,1.53)	0.792
	Medium	218	1.8		
	High	235	1.7		
>1-4 Drinks/Day	Low	59	5.1	0.91 (0.56,1.50)	0.717
	Medium	68	7.4		
	High	46	2.2		
>4 Drinks/Day	Low	6	16.7	--	--
	Medium	4	0.0		
	High	6	0.0		

^a Relative risk for a twofold increase in current dioxin.

--: Adjusted relative risk, confidence interval, and p-value not presented due to the sparse number of abnormalities.

Note: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

Table O-2-23.
Interaction Table for Lupus Panel: Other Antibodies (ANA and MSK)

a) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Race: Table 19-29)					
Current Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Current Dioxin + 1)	
Stratum	Current Dioxin	n	Percent Present	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Black	Low	12	8.3	0.13 (0.01,3.20)	0.210
	Medium	23	0.0		
	High	15	0.0		
Non-Black	Low	279	3.2	1.15 (0.90,1.46)	0.276
	Medium	268	3.0		
	High	276	3.3		

^a Relative risk for a twofold increase in current dioxin.

Note: Low = ≤ 46 ppq; Medium = > 46-128 ppq; High = > 128 ppq.

APPENDIX O-3.

Immunology Analysis Tables Occupation Removed from Final Model

This appendix contains results of exposure analyses after occupation has been removed from those final dioxin models (Models 2 through 6) that contained occupation. These analyses are performed to investigate the relationship of the dependent variable to dioxin without removing any effects due to occupation. The format of these tables closely parallels the adjusted panels of Chapter 19 tables. A summary of the tables found in this appendix follows.

Appendix O-3 Table	Chapter 19 Table	Dependent Variable
O-3-1	19-4	Composite Skin Test Diagnosis
O-3-2	19-5	CD3 Cells
O-3-3	19-6	CD4 Cells
O-3-4	19-7	CD5 Cells
O-3-5	19-8	CD8 Cells
O-3-6	19-9	CD14 Cells
O-3-7	19-10	CD16 + 56 Cells
O-3-8	19-11	CD20 Cells
O-3-9	19-12	CD25 Cells
O-3-10	19-13	CD4-CD8 Ratio
O-3-11	19-14	Double Labelled Cells: CD3 with CD25
O-3-12	19-16	Double Labelled Cells: CD4 with CD8
O-3-13	19-17	Double Labelled Cells: CD3 with CD16 + 56
O-3-14	19-19	IgA
O-3-15	19-20	IgG
O-3-16	19-21	IgM
O-3-17	19-27	Lupus Panel: Rheumatoid Factor
O-3-18	19-28	Lupus Panel: B Cell Clones Detected By Serum Protein Electrophoresis

Table O-3-1.
Analysis of Composite Skin Test Diagnosis
Occupation Removed from Final Model

a) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED				
Analysis Results for Log ₂ (Current Dioxin + 1)				
Model ^a	n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
6 ^c	863	0.82 (0.67,1.01)	0.062	AGE (p=0.041) RACE (p=0.048) CSMOK (p=0.078)

^a Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^b Relative risk for a twofold increase in current dioxin.

^c Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Table O-3-2.
Analysis of CD3 Cells (cells/mm³)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log₂ (Initial Dioxin)^a			
Initial Dioxin	n	Adj. Mean^{ab}	R²	Adj. Slope (Std. Error)^c	p-Value	Covariate Remarks
Low	64	1,517.8	0.526	-0.017 (0.029)	0.566	AGE (p=0.393)
Medium	65	1,567.4				CSMOK (p=0.004)
High	71	1,473.0				DRKYR (p=0.151)

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, examination group (batch-to-batch) variation, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of CD3 cells versus log₂ (initial dioxin).

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	400	1,441.0**			DXCAT*AGE (p=0.024) CSMOK (p<0.001) ALC (p=0.115)
Background RH	140	1,501.9**	60.9 —**	0.294**	
Low RH	95	1,417.1**	-23.9 —**	0.718**	
High RH	106	1,487.9**	46.9 —**	0.463**	
Low plus High RH	201	1,454.0**	13.0 —**	0.790**	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, examination group (batch-to-batch) variation, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

**Categorized dioxin-by-covariate interaction (0.01 < p ≤ 0.05); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table O-4-1 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-3-3.
Analysis of CD4 Cells (cells/mm³)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	403	920.6**			DXCAT*AGE (p=0.046) CSMOK (p<0.001)
Background RH	141	966.9**	46.3 ---**	0.220**	
Low RH	95	915.5**	-5.1 ---**	0.906**	
High RH	108	953.3**	32.7 ---**	0.427**	
Low plus High RH	203	935.4**	14.8 ---**	0.647**	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, examination group (batch-to-batch) variation, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interaction ($0.01 < p \leq 0.05$); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table O-4-2 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin $\leq$ 10 ppt.

Background (Ranch Hand): Current Dioxin $\leq$ 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin $\leq$ 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table O-3-4.
Analysis of CD5 Cells (cells/mm³)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log₂ (Initial Dioxin)^a			
Initial Dioxin	n	Adj. Mean^{ab}	R²	Adj. Slope (Std. Error)^c	p-Value	Covariate Remarks
Low	64	1,573.5	0.526	-0.015 (0.030)	0.623	AGE (p=0.285)
Medium	65	1,631.5				CSMOK (p=0.009)
High	71	1,526.2				DRKYR (p=0.141)

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, examination group (batch-to-batch) variation, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of CD5 cells versus log₂ (initial dioxin).

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED						
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks	
Comparison	400	1,481.2**			DXCAT*AGE (p=0.016) CSMOK (p<0.001) ALC (p=0.076)	
Background RH	140	1,544.1**	62.9 --**	0.293**		
Low RH	95	1,461.1**	-20.1 --**	0.769**		
High RH	106	1,544.0**	62.8 --**	0.344**		
Low plus High RH	201	1,504.2**	23.0 --**	0.657**		

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, examination group (batch-to-batch) variation, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interaction (0.01 < p ≤ 0.05); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table O-4-3 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-3-5.
Analysis of CD8 Cells (cells/mm³)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^a			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	64	615.7	0.055	-0.008 (0.027)	0.761	CSMOK (p=0.006) ALC (p=0.028)
Medium	66	610.9				
High	71	616.1				

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of CD8 cells versus log₂ (initial dioxin).

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean ^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d	Covariate Remarks
Comparison	400	631.6			AGE (p=0.264) CSMOK (p<0.001) ALC (p=0.051)
Background RH	140	634.8	3.2 --	0.914	
Low RH	95	605.5	-26.1 --	0.430	
High RH	106	622.0	-9.6 --	0.765	
Low plus High RH	201	614.1	-17.5 --	0.485	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-3-5. (Continued)
Analysis of CD8 Cells (cells/mm³)
Occupation Removed from Final Model

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	622.9 (115)	659.0 (107)	590.8 (119)	0.048	-0.008 (0.018)	0.679	CSMOK (p<0.001) ALC (p=0.140)

^a Transformed from natural logarithm scale.

^b Log₂ (lipid-adjusted current dioxin + 1).

^c Slope and standard error based on natural logarithm of CD8 cells versus log₂ (current dioxin + 1).

Note: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Table O-3-6.
Analysis of CD14 Cells (cells/mm³)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	403	****			DXCAT*AGE (p=0.001) RACE (p=0.016) CSMOK (p<0.001) PHYACT (p=0.113)
Background RH	141	****	****	****	
Low RH	95	****	****	****	
High RH	108	****	****	****	
Low plus High RH	203	****	****	****	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, examination group (batch-to-batch) variation, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

**** Categorized dioxin-by-covariate interaction ($p \leq 0.01$); adjusted mean, difference of adjusted means, confidence interval, and p-value not presented; refer to Appendix Table O-4-4 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-3-6. (Continued)
Analysis of CD14 Cells (cells/mm³)
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^c	Current Dioxin Category Adjusted Mean ^{ab} /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^d	p-Value	Covariate Remarks
4	476.5 (116)	453.5 (107)	466.4 (121)	0.331	0.003 (0.014)	0.818	AGE (p=0.098) RACE (p=0.015) CSMOK (p<0.001)
5	479.2 (112)	439.0 (116)	486.9 (116)	0.332	0.007 (0.012)	0.556	AGE (p=0.081) RACE (p=0.015) CSMOK (p<0.001)
6 ^e	493.2 (112)	444.0 (116)	482.7 (116)	0.341	-0.003 (0.013)	0.819	AGE (p=0.117) RACE (p=0.026) CSMOK (p<0.001)

^a Transformed from natural logarithm scale.

^b Adjusted for examination group (batch-to-batch) variation and covariates specified under "Covariate Remarks" column.

^c Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^d Slope and standard error based on natural logarithm of CD14 cells versus log₂ (current dioxin + 1).

^e Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table O-3-7.
Analysis of CD16 + 56 Cells (cells/mm³)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^a			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	64	244.2	0.436	-0.001 (0.042)	0.983	CSMOK (p=0.117)
Medium	67	238.4				PHYACT (p=0.173)
High	72	243.0				

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of CD16 + 56 cells versus log₂ (initial dioxin).

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean ^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d	Covariate Remarks
Comparison	399	250.3**			DXCAT*DRKYR (p=0.042) AGE (p=0.003) RACE (p=0.219) CSMOK (p=0.008) PHYACT (p=0.833)
Background RH	139	241.0**	-9.3 —**	0.496**	
Low RH	94	221.1**	-29.2 —**	0.060**	
High RH	106	241.4**	-8.9 —**	0.561**	
Low plus High RH	200	231.7**	-18.6 —**	0.115**	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, examination group (batch-to-batch) variation, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interaction (0.01 < p ≤ 0.05); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table O-4-5 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-3-8.
Analysis of CD20 Cells (cells/mm³)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	400	211.8			AGE (p < 0.001) CSMOK (p < 0.001) ALC (p = 0.006)
Background RH	140	235.3	23.5 --	0.046	
Low RH	95	222.9	11.1 --	0.402	
High RH	106	222.3	10.5 --	0.410	
Low plus High RH	201	222.6	10.8 --	0.279	

^a Transformed from natural logarithm (X + 1) scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm (X + 1) scale.

^d P-value is based on difference of means on natural logarithm (X + 1) scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-3-9.
Analysis of CD25 Cells (cells/mm³)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	399	269.3**			DXCAT*AGE (p=0.032) DXCAT*PACKYR (p=0.030)
Background RH	139	277.0**	7.7 --	0.550**	DXCAT*DRKYR (p=0.041)
Low RH	94	267.7**	1.6 --	0.914**	RACE (p=0.046)
High RH	106	271.8**	2.5 --	0.862**	CSMOK (p<0.001)
Low plus High RH	200	269.9**	0.6 --	0.961**	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, examination group (batch-to-batch) variation, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interactions ($0.01 < p \leq 0.05$); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of these interactions; refer to Appendix Table O-4-6 for further analysis of these interactions.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-3-10.
Analysis of CD4-CD8 Ratio
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	399	1.480			AGE (p=0.008) CSMOK (p=0.005) DRKYR (p=0.071)
Background RH	139	1.538	0.058 --	0.360	
Low RH	94	1.576	0.096 --	0.191	
High RH	106	1.540	0.060 --	0.390	
Low plus High RH	200	1.557	0.077 --	0.161	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin $\leq$ 10 ppt.

Background (Ranch Hand): Current Dioxin $\leq$ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin $\leq$ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-3-11.
Analysis of Double Labelled Cells: CD3 with CD25 (cells/mm³)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	399	215.7**			DXCAT*PACKYR (p=0.023)
Background RH	139	221.2**	5.5 --**	0.612**	DXCAT*DRKYR (p=0.018)
Low RH	94	212.8**	-2.9 --**	0.818**	RACE (p=0.022)
High RH	106	221.2**	5.5 --**	0.651**	CSMOK (p<0.001)
Low plus High RH	200	217.2**	1.5 --**	0.877**	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, examination group (batch-to-batch) variation, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interactions ($0.01 < p \leq 0.05$); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of these interactions; refer to Appendix Table O-4-7 for further analysis of these interactions.

Note: RH = Ranch Hand.

Comparison: Current Dioxin $\leq$ 10 ppt.

Background (Ranch Hand): Current Dioxin $\leq$ 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin $\leq$ 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table O-3-12.
Analysis of Double Labelled Cells: CD4 with CD8 (cells/mm³)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean ^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d	Covariate Remarks
Comparison	360	****			DXCAT*AGE (p=0.006) RACE (p=0.059) CSMOK (p<0.001) PACKYR (p=0.046)
Background RH	126	****	****	****	
Low RH	85	****	****	****	
High RH	95	****	****	****	
Low plus High RH	180	****	****	****	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

**** Categorized dioxin-by-covariate interaction ($p \leq 0.01$); adjusted mean, difference of adjusted means, confidence interval, and p-value not presented; refer to Appendix Table O-4-8 for further analysis of this interaction.

Note: Analysis based on measurements above 0 cells/mm³ only.

RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, $10 \text{ ppt} < \text{Initial Dioxin} \leq 143$ ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-3-13.
Analysis of Double Labelled Cells: CD3 with CD16+56 (Zero vs. Nonzero)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED			
Analysis Results for Log _e (Initial Dioxin) ^a			
n	Adj. Relative Risk (95% C.I.) ^b	p-Value	Covariate Remarks
203	1.52 (0.86,2.68)	0.147	PHYACT (p=0.158)

^a Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^b Relative risk for a twofold increase in initial dioxin.

Table O-3-13. (Continued)
Analysis of Double Labelled Cells: CD3 with CD16+56 (Nonzero Measurements)
Occupation Removed from Final Model

b) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^b			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	62	118.0	0.499	-0.211 (0.072)	0.004	RACE (p=0.126)
Medium	64	104.3				CSMOK (p=0.039)
High	65	68.6				PACKYR (p=0.051) DRKYR (p=0.024)

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of CD3 with CD16+56 versus log₂ (initial dioxin).

Note: Analysis based on measurements above 0 cells/mm³ only.

Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table O-3-14.
Analysis of IgA (mg/dl)
Occupation Removed from Final Model

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.)^c	p-Value^d	Covariate Remarks
Comparison	1,051	231.2**			DXCAT*RACE (p=0.030) AGE (p=0.004)
Background RH	367	226.2**	-5.0 --**	0.429**	
Low RH	256	224.3**	-6.9 --**	0.336**	
High RH	255	233.7**	2.5 --**	0.740**	
Low plus High RH	511	228.9**	-2.3 --**	0.687**	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

** Categorized dioxin-by-covariate interaction ($0.01 < p \leq 0.05$); adjusted mean, difference of adjusted means, confidence interval, and p-value derived from a model fitted after deletion of this interaction; refer to Appendix Table O-4-9 for further analysis of this interaction.

Note: RH = Ranch Hand.

Comparison: Current Dioxin $\leq$ 10 ppt.

Background (Ranch Hand): Current Dioxin $\leq$ 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin $\leq$ 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Table O-3-14. (Continued)
Analysis of IgA (mg/dl)
Occupation Removed from Final Model

b) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	229.3 (289)	231.5 (295)	242.9 (294)	0.019	0.020 (0.011)	0.062	AGE (p=0.002) RACE (p=0.010)
5	229.5 (294)	235.9 (292)	237.5 (292)	0.017	0.012 (0.009)	0.191	AGE (p=0.003) RACE (p=0.010)
6 ^d	225.3 (292)	235.0 (292)	240.8 (292)	0.027	0.024 (0.010)	0.019	AGE (p=0.005) RACE (p=0.011) PACKYR (p=0.050)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of IgA versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table O-3-15.
Analysis of IgG (mg/dl)
Occupation Removed from Final Model

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED						
Initial Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Initial Dioxin) ^a			
Initial Dioxin	n	Adj. Mean ^{ab}	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
Low	169	1,139.3	0.099	0.010 (0.008)	0.236	RACE (p<0.001)
Medium	169	1,167.4				CSMOK (p=0.004)
High	166	1,150.2				ALC (p=0.007)

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Slope and standard error based on natural logarithm of IgG versus log₂ (initial dioxin).

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED					
Dioxin Category	n	Adj. Mean ^{ab}	Difference of Adj. Mean vs. Comparisons (95% C.I.) ^c	p-Value ^d	Covariate Remarks
Comparison	1,035	1,146.0			AGE (p=0.553) RACE (p<0.001) CSMOK (p<0.001) PACKYR (p=0.189) ALC (p=0.071)
Background RH	364	1,127.6	-18.4 --	0.231	
Low RH	253	1,116.9	-29.1 --	0.096	
High RH	251	1,131.0	-15.0 --	0.399	
Low plus High RH	504	1,123.9	-22.1 --	0.104	

^a Transformed from natural logarithm scale.

^b Adjusted for percent body fat at the time of duty in SEA, change in percent body fat from the time of duty in SEA to the date of the blood draw for dioxin, and covariates specified under "Covariate Remarks" column.

^c Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm scale.

^d P-value is based on difference of means on natural logarithm scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table O-3-15. (Continued)
Analysis of IgG (mg/dl)
Occupation Removed from Final Model

c) MODELS 4, 5, AND 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED							
Model ^b	Current Dioxin Category Adjusted Mean ^a /(n)			Analysis Results for Log ₂ (Current Dioxin + 1)			
	Low	Medium	High	R ²	Adj. Slope (Std. Error) ^c	p-Value	Covariate Remarks
4	1,138.0 (288)	1,120.4 (292)	1,155.8 (289)	0.078	0.002 (0.005)	0.660	RACE (p < 0.001) CSMOK (p < 0.001) ALC (p = 0.012)
5	1,141.4 (292)	1,127.2 (290)	1,145.6 (287)	0.078	-0.001 (0.005)	0.787	RACE (p < 0.001) CSMOK (p < 0.001) ALC (p = 0.011)
6 ^d	1,127.9 (291)	1,123.0 (290)	1,152.3 (287)	0.084	0.003 (0.005)	0.538	RACE (p < 0.001) CSMOK (p < 0.001) ALC (p = 0.018)

^a Transformed from natural logarithm scale.

^b Model 4: Log₂ (lipid-adjusted current dioxin + 1).

Model 5: Log₂ (whole-weight current dioxin + 1).

Model 6: Log₂ (whole-weight current dioxin + 1), adjusted for log₂ total lipids.

^c Slope and standard error based on natural logarithm of IgG versus log₂ (current dioxin + 1).

^d Adjusted for log₂ total lipids in addition to covariates specified under "Covariate Remarks" column.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = >46-128 ppq; High = >128 ppq.