

Appendix J

Dermatologic Assessment

TABLE J-1.

Summary of Dioxin-by-Covariate Interactions for Dermatology Variables

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Pre/Post-SEA	Adj. Relative Risk (95% C.I.) ^a	p-Value
Acne Relative to SEA Tour (Pre/Post- SEA vs. Pre-SEA) (Minimal-- 11-3 [c3])	Initial-by- Race	Black	Low	2	100.0	--	--
			Medium	1	0.0	--	--
			High	0	--	--	--
	Initial-by- Age	Non-Black Born≥1942	Low	6	66.7	1.35 (0.55,3.26)	0.511
			Medium	14	92.9		
			High	13	92.3		
		Non-Black Born<1942	Low	4	50.0	--	--
			Medium	10	100.0	--	--
			High	3	100.0	--	--
Acne Relative to SEA Tour (Pre/Post SEA vs. Pre-SEA) (Maximal-- 11-3 [d3])	Initial-by- Race	Black	Low	1	100.0	--	--
			Medium	3	66.7	--	--
			High	0	--	--	--
	Initial-by- Age	Non-Black Born≥1942	Low	8	75.0	1.43 (0.74,2.77)	0.294
			Medium	19	84.2		
			High	14	92.9		
		Non-Black Born<1942	Low	8	62.5	9.69 (1.12,83.55)	0.039
			Medium	15	80.0		
			High	3	100.0		

TABLE J-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Dermatology Variables

Ranch Hands and Comparisons by Current Dioxin Category

Variable/ (Table Ref.)	Interaction	Stratum	Current Dioxin Category	n	Percent Pre/Post-SEA and Post-SEA Contrast	Adj. Relative Risk (95% C.I.)	p-Value	
Acne Relative to SEA Tour (Pre/Post- SEA and Post-SEA vs. Pre-SEA and None) (11-3 [j1])	Categorized Current Dioxin-by- Race	Black	Background	48	52.1	A11	0.037	
			Unknown	12	75.0	U vs. B	3.62 (0.83,15.82)	0.088
			Low	12	25.0	L vs. B	0.29 (0.07,1.24)	0.095
		High	8	37.5	H vs. B	0.52 (0.11,2.52)	0.420	
		Non-Black	Background	738	48.0	A11		0.482
			Unknown	333	47.5	U vs. B	1.01 (0.78,1.31)	0.938
	Low		184	54.4	L vs. B	1.29 (0.93,1.79)	0.130	
			High	179	51.4	H vs. B	1.00 (0.72,1.39)	0.997

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Interaction	Stratum	Initial Dioxin	n	Percent Temples/ Eyes/Ears	Adj. Relative Risk (95% C.I.) ^a	p-Value
Location of Acne (Post-SEA) (Minimal-- 11-6 [c1])	Initial-by- Age	Born ≥ 1942	Low	16	18.8	1.35 (0.93,1.97)	0.118
			Medium	53	20.8		
			High	35	22.9		
		Born < 1942	Low	43	16.3	0.69 (0.38,1.23)	0.206
			Medium	58	17.2		
			High	20	10.0		

APPENDIX J-1
TABLE J-1. (Continued)

Summary of Dioxin-by-Covariate Interactions for Dermatology Variables

The following figures graphically display relationships between the dependent variables and measures of dioxin for the dermatologic assessment. The panels are arranged as follows:

Ranch Hands - Log₂ (Initial Dioxin)

Variable/ (Assumption-- Table Ref.)	Panel Interaction	Group Stratum	Initial Dioxin	n	Percent Yes	Adj. Relative Risk (95% C.I.) ^a	p-Value	
Hyper- pigmentation (Maximal-- 11-12 [d])	Initial-by- Age	Born≥1942	Low	9	0.0	--	--	
		Yes	Medium	21	0.0			
			High	14	14.3			
	Initial-by- Presence of Pre-SEA Acne	Born≥1942	Low	62	17.7	0.98 (0.79,1.22)	0.883	
			No	Medium	105			15.2
				High	103			16.5
Born<1942		Low	114	4.4	1.47 (1.18,1.82)	<0.001		
		Medium	245	15.9				
		High	69	21.7				

^aRelative risk for a twofold increase in dioxin.

--: Relative risk/confidence interval/p-value not given due to the sparse number of abnormalities.

Note: Initial Dioxin: Minimal--Low: 52-93 ppt; Medium: >93-292 ppt; High: >292 ppt.

Maximal--Low: 25-56.9 ppt; Medium: >56.9-218 ppt; High: >218 ppt.

All: All categories.

Background (B) (Comparisons): Current Dioxin ≤10 ppt.

Unknown (U) (Ranch Hands): Current Dioxin ≤10 ppt.

Low (L) (Ranch Hands): 15 ppt < Current Dioxin ≤33.3 ppt.

High (H) (Ranch Hands): Current Dioxin >33.3 ppt.

(Figures J-1-1, J-1-2, and J-1-7 to J-1-14)

Dioxin Interval	Dioxin Scale Midpoint	Panel			
		a	b	c	d
		Sample Size			
		n	p	z	p
0.0-0.5	0.25	0	0	0	42
>0.5-1.0	1	0	0	0	28
>1.0-4.0	4	0	0	0	681
>4.0-16.0	16	0	23	52	408
>16.0-64.0	64	219	417	1	158
>64.0-256.0	256	234	234	0	30
>256.0-1024.0	1024	65	65	0	2
>1024.0	4096	3	3	0	0

APPENDIX J-1.

Data Displays for the Dermatologic Assessment

The following figures graphically display relationships between the dependent variables and measures of dioxin for the dermatologic assessment. The panels are arranged as follows:

Panel	Group	Assumption	Dioxin Measure
a	Ranch Hand	Minimal	Initial
b	Ranch Hand	Maximal	Initial
c	Comparison	--	Current
d	Ranch Hand	--	Current

Dioxin measures are presented in original units, but spacing of intervals is based on the logarithm (base 2) scale, similar to the statistical analysis. The percent of participants that exhibited an abnormal condition is displayed on the vertical axis for given intervals of dioxin. Sample sizes within a specified dioxin interval are presented below for several sets of participants. The different sets of sample sizes reflect the various contrasts applied for the analysis of acne relative to SEA tour (e.g., pre/post-SEA versus pre-SEA) or the different exclusions applied for the analysis of location of acne (e.g., post-SEA acne only). Centered above each table of sample sizes is a descriptor that identifies the particular group of participants used for a specified graphic display. Applicable figures for these sample sizes are listed parenthetically below each centered descriptor. A list of figures found in this appendix follows the tables.

All Participants (Figures J-1-1, J-1-2, and J-1-7 to J-1-14)

Dioxin Interval	Dioxin Scale Midpoint	Panel			
		a	b	c	d
0.0-0.5	0.25	0	0	42	8
>0.5-2.0	1	0	0	28	8
>2.0-8.0	4	0	0	681	249
>8.0-32.0	16	0	23	52	408
>32.0-128.0	64	219	417	1	158
>128.0-512.0	256	234	234	0	33
>512.0-2,048.0	1024	65	65	0	2
>2,048.0	4096	3	3	0	0

**Participants With Post-SEA Acne Only or With
No Occurrences of Acne
(Figure J-1-3)**

Dioxin Interval	Dioxin Scale Midpoint	Panel			
		a	b	c	d
		Sample Size			
0.0-0.5	0.25	0	0	37	7
>0.5-2.0	1	0	0	27	5
>2.0-8.0	4	0	0	603	227
>8.0-32.0	16	0	22	49	368
>32.0-128.0	64	196	377	0	141
>128.0-512.0	256	216	216	0	28
>512.0-2,048.0	1024	53	563	0	2
>2,048.0	4096	3	3	0	0

**Participants With Pre/Post-SEA Acne or
With Pre-SEA Acne Only
(Figure J-1-4)**

Dioxin Interval	Dioxin Scale Midpoint	Panel			
		a	b	c	d
		Sample Size			
0.0-0.5	0.25	0	0	5	1
>0.5-2.0	1	0	0	1	3
>2.0-8.0	4	0	0	78	22
>8.0-32.0	16	0	1	3	40
>32.0-128.0	64	23	40	1	17
>128.0-512.0	256	18	18	0	5
>512.0-2,048.0	1024	12	12	0	0
>2,048.0	4096	0	0	0	0

**Participants With Post-SEA Acne Only
(Figure J-1-5)**

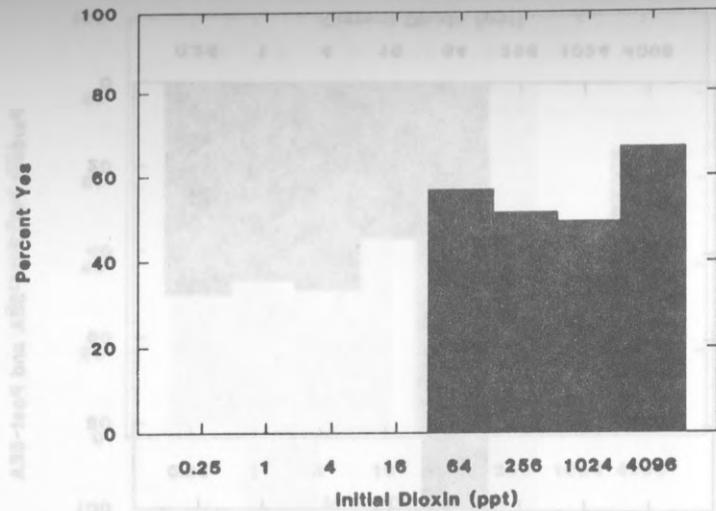
Dioxin Interval	Dioxin Scale Midpoint	Panel			
		a	b	c	d
0.0-0.5	0.25	0	0	17	2
>0.5-2.0	1	0	0	12	2
>2.0-8.0	4	0	0	267	103
>8.0-32.0	16	0	8	19	181
>32.0-128.0	64	101	190	0	64
>128.0-512.0	256	102	102	0	13
>512.0-2,048.0	1024	20	20	0	1
>2,048.0	4096	2	2	0	0

**Participants With Pre/Post-SEA Acne or
With Post-SEA Acne Only
(Figure J-1-6)**

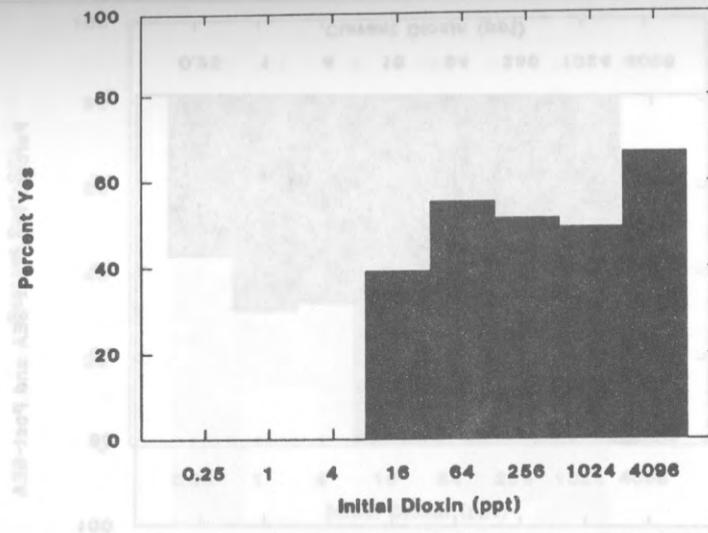
Dioxin Interval	Dioxin Scale Midpoint	Panel			
		a	b	c	d
0.0-0.5	0.25	0	0	21	3
>0.5-2.0	1	0	0	13	4
>2.0-8.0	4	0	0	332	120
>8.0-32.0	16	0	8	19	212
>32.0-128.0	64	119	220	1	80
>128.0-512.0	256	119	119	0	18
>512.0-2,048.0	1024	31	31	0	1
>2,048.0	4096	2	2	0	0

Figure		Page
J-1-1	Acne (Lifetime) versus Dioxin.....	J-1-5
J-1-2	Acne Relative to SEA Tour (Pre/Post-SEA and Post-SEA versus Pre-SEA and None) versus Dioxin.....	J-1-6
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J-1-5	Location of Acne (Post-SEA) versus Dioxin.....	J-1-9
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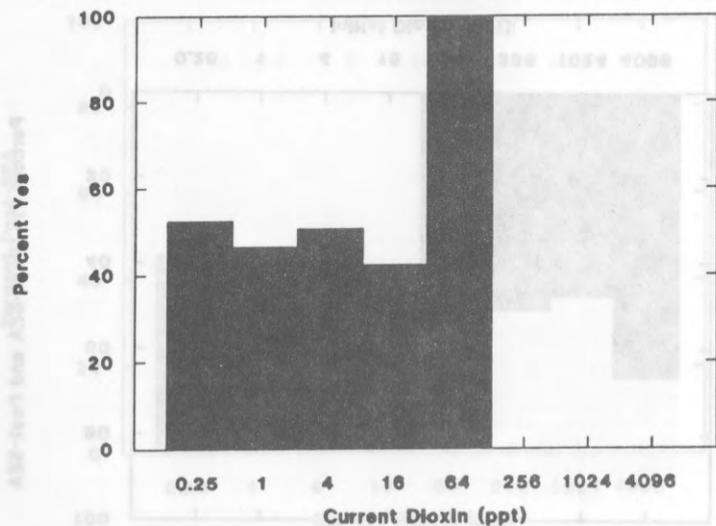
(a) Ranch Hands Minimal Assumption - Initial Dioxin



(b) Ranch Hands Maximal Assumption - Initial Dioxin



(c) All Comparisons - Current Dioxin



(d) All Ranch Hands - Current Dioxin

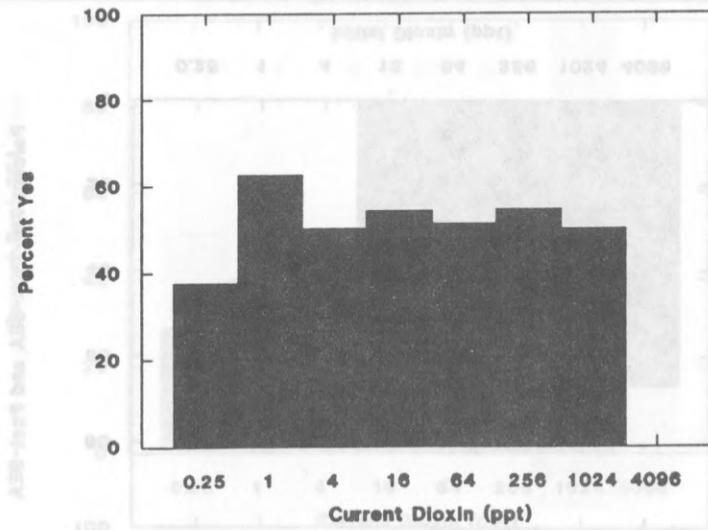


FIGURE J-1-1. Occurrence of Acne (Lifetime) versus Dioxin

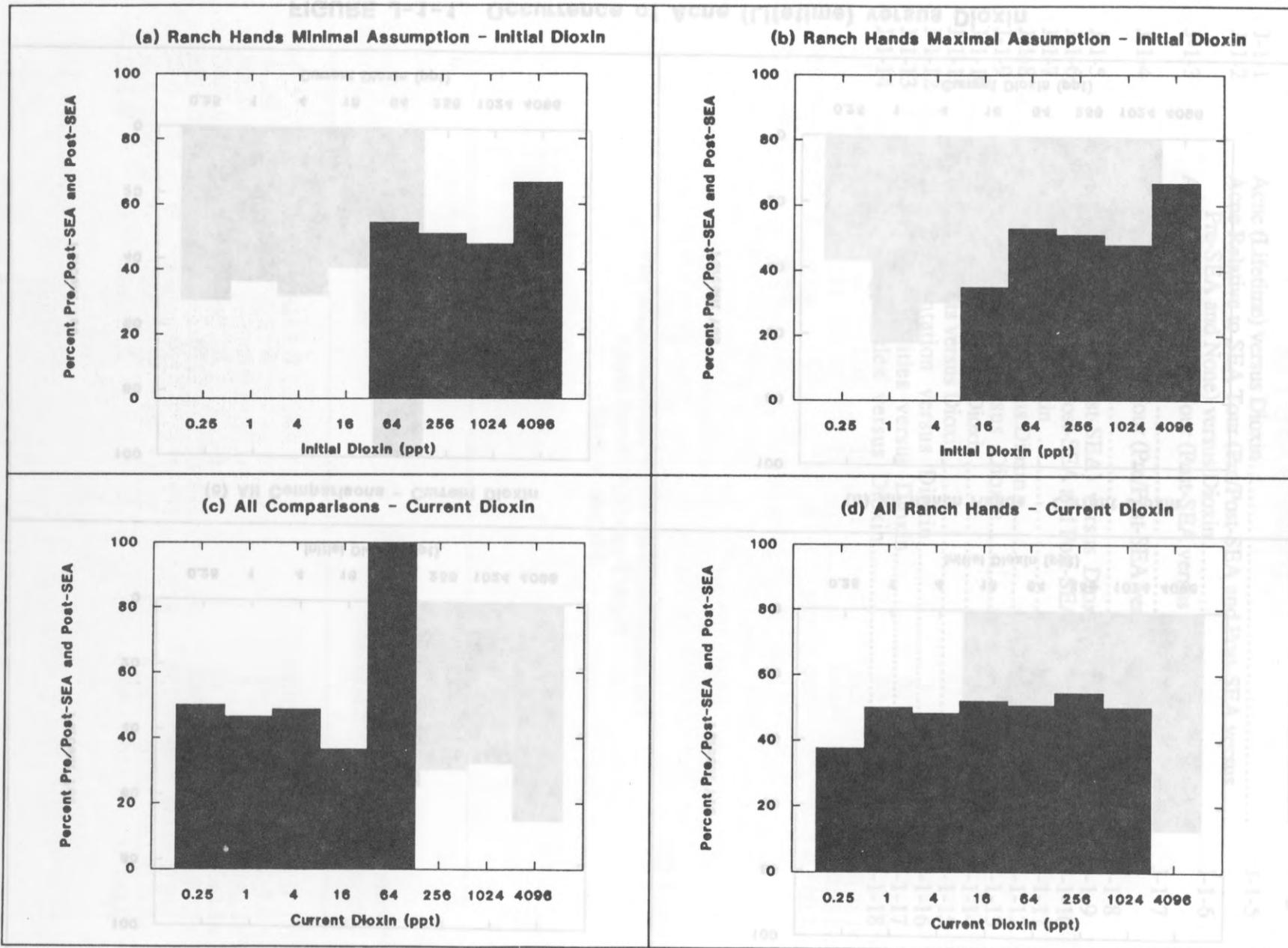
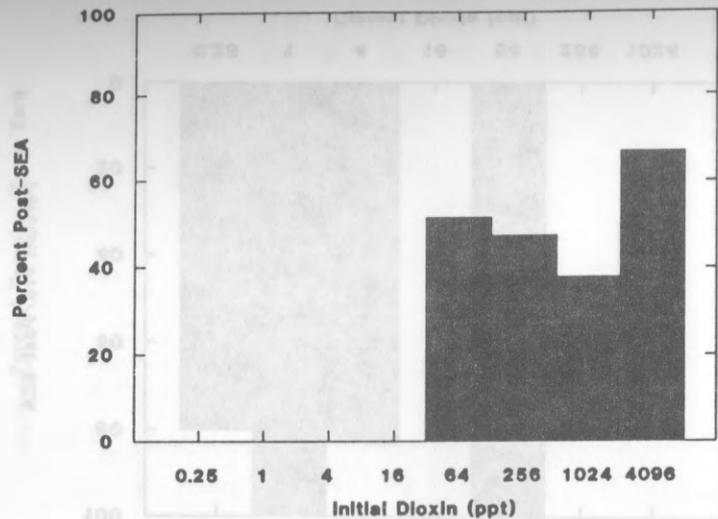
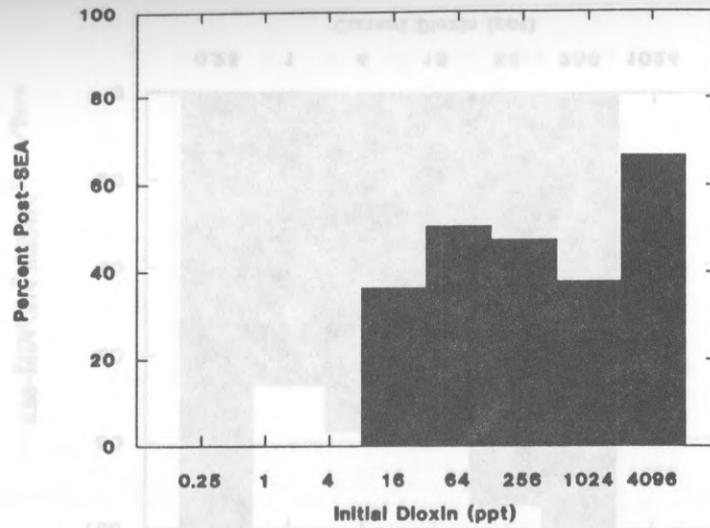


FIGURE J-1-2. Acne Relative to SEA Tour (Pre/Post-SEA and Post-SEA versus Pre-SEA and None) versus Dioxin

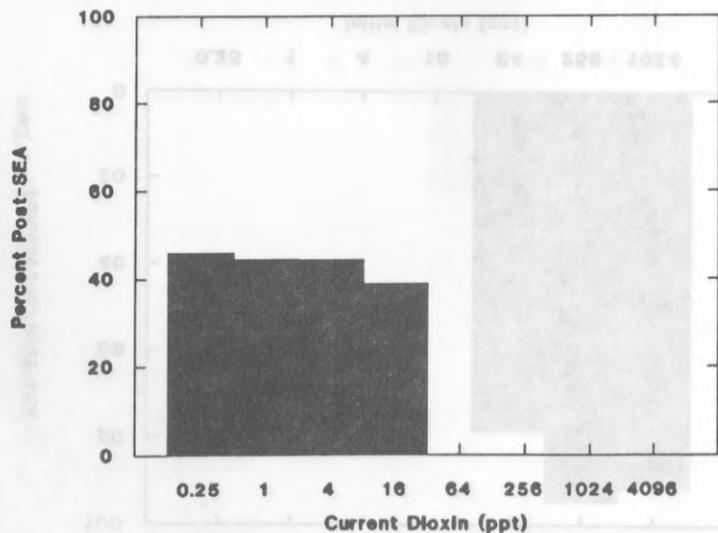
(a) Ranch Hands Minimal Assumption - Initial Dioxin



(b) Ranch Hands Maximal Assumption - Initial Dioxin



(c) All Comparisons - Current Dioxin



(d) All Ranch Hands - Current Dioxin

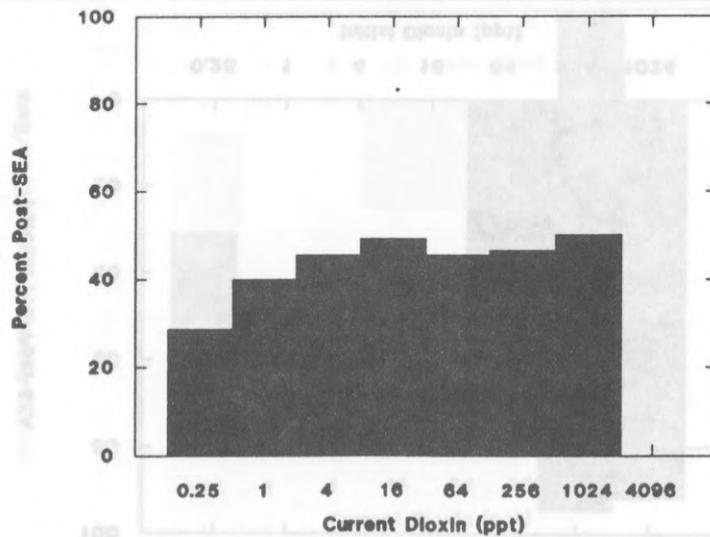


FIGURE J-1-3. Acne Relative to SEA Tour (Post-SEA versus None) versus Dioxin

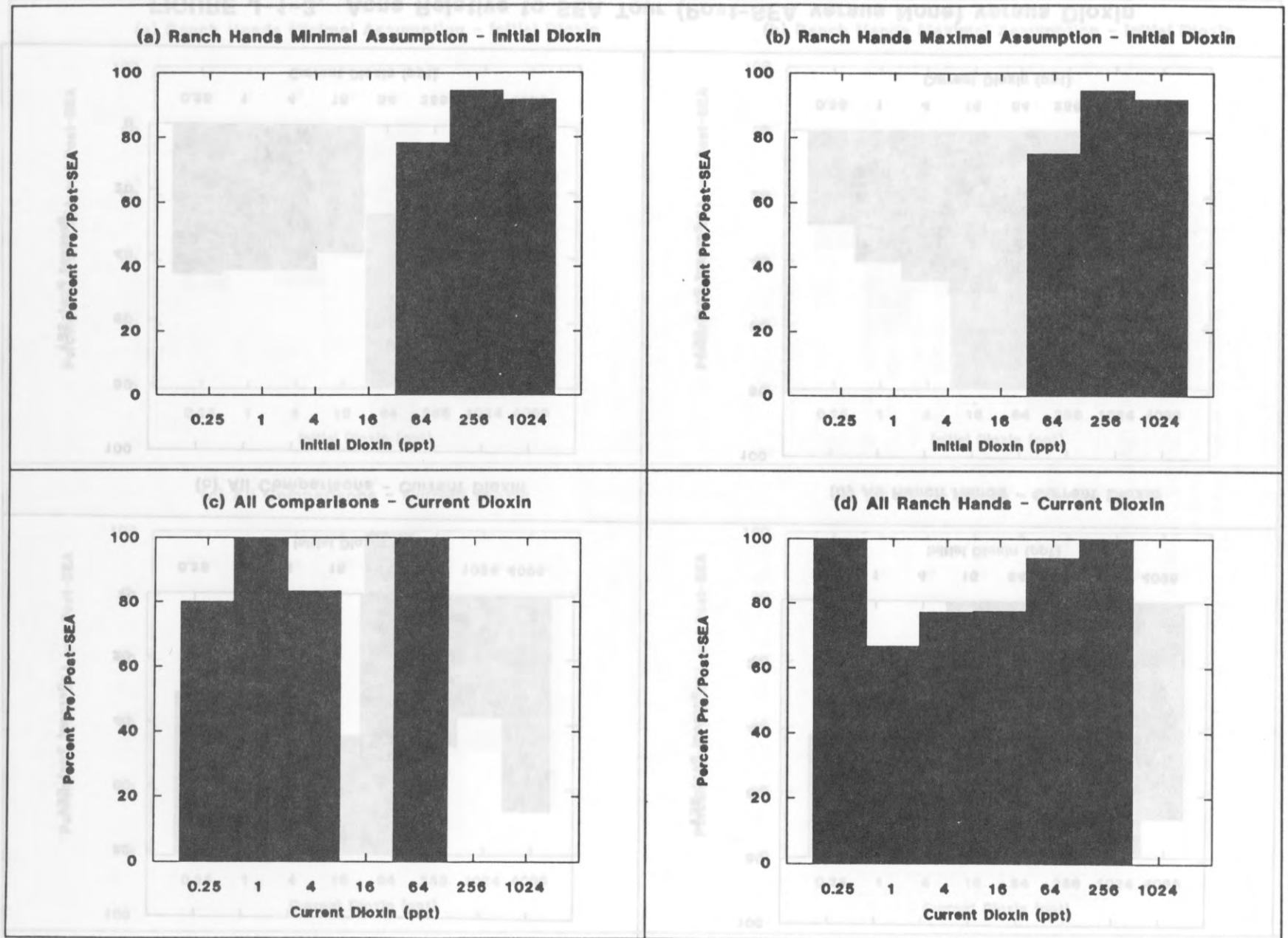


FIGURE J-1-4. Acne Relative to SEA Tour (Pre/Post-SEA versus Pre-SEA) versus Dioxin

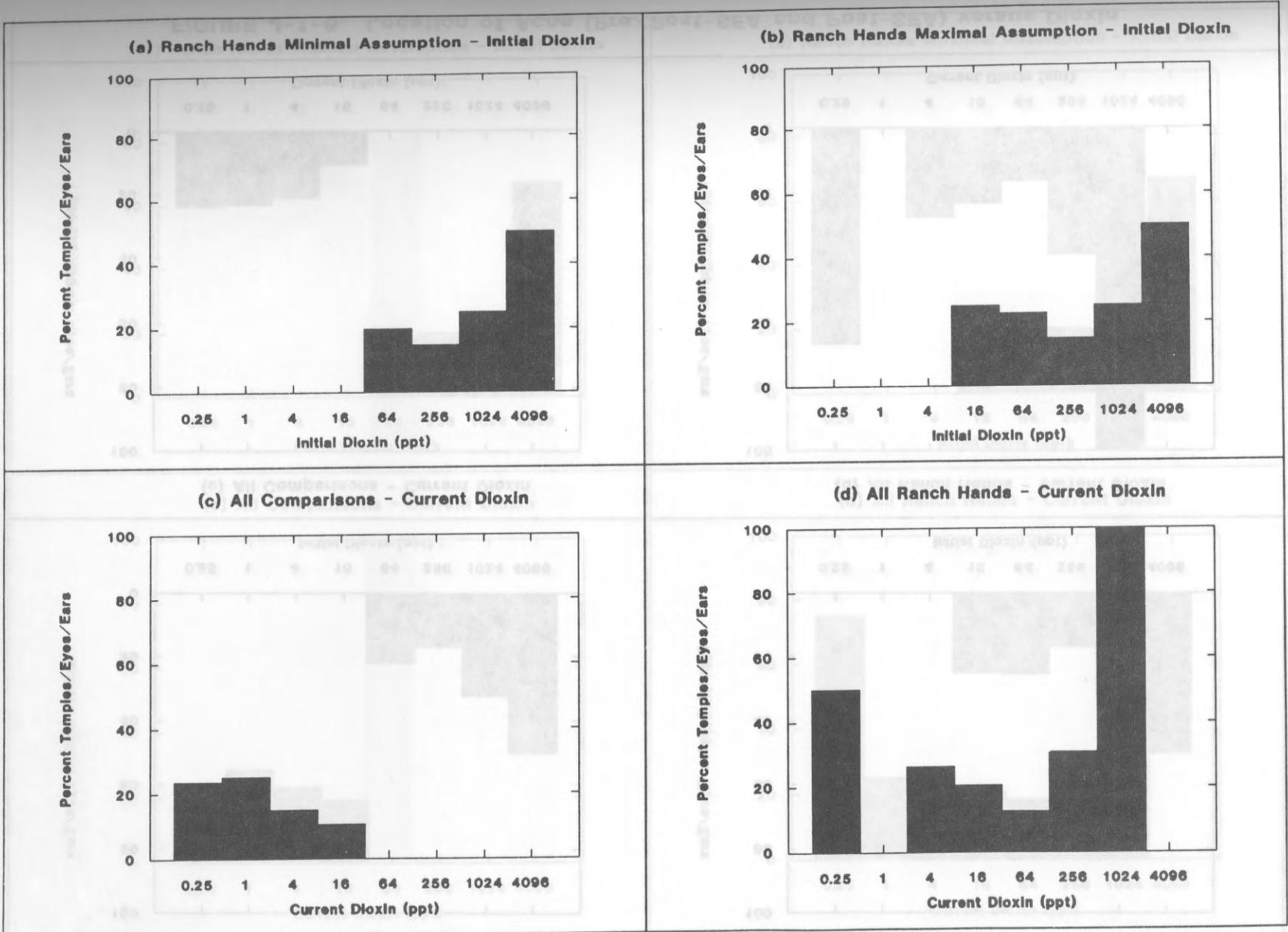
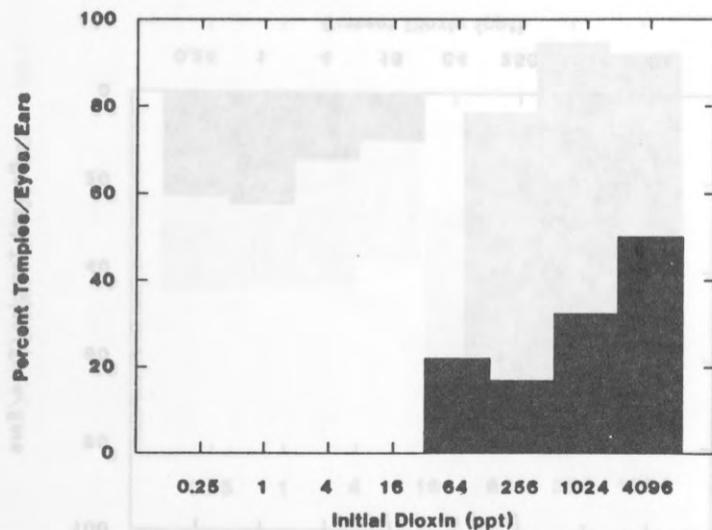


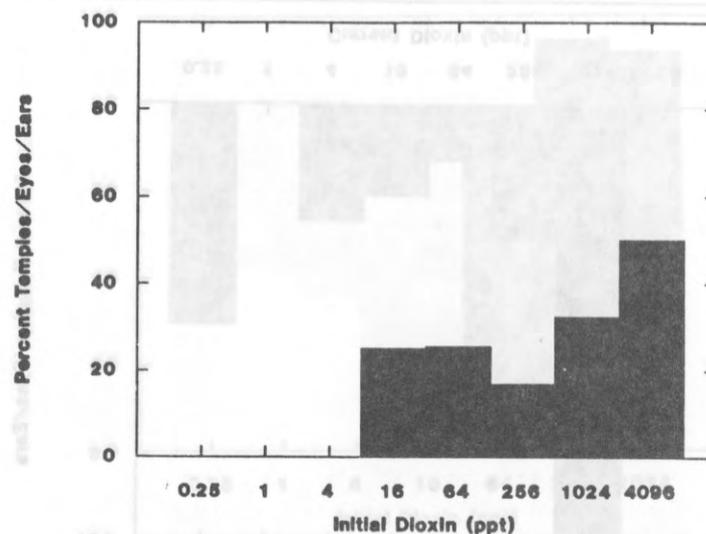
FIGURE J-1-5. Location of Acne (Post-SEA) versus Dioxin

J-1-10-f

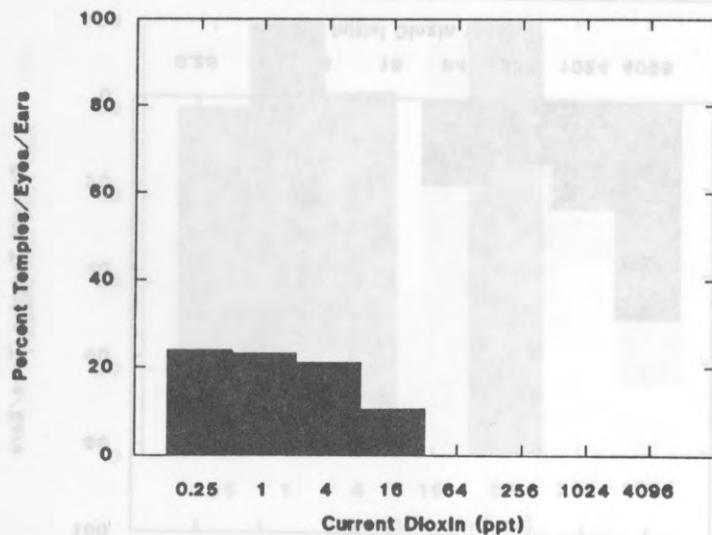
(a) Ranch Hands Minimal Assumption - Initial Dioxin



(b) Ranch Hands Maximal Assumption - Initial Dioxin



(c) All Comparisons - Current Dioxin



(d) All Ranch Hands - Current Dioxin

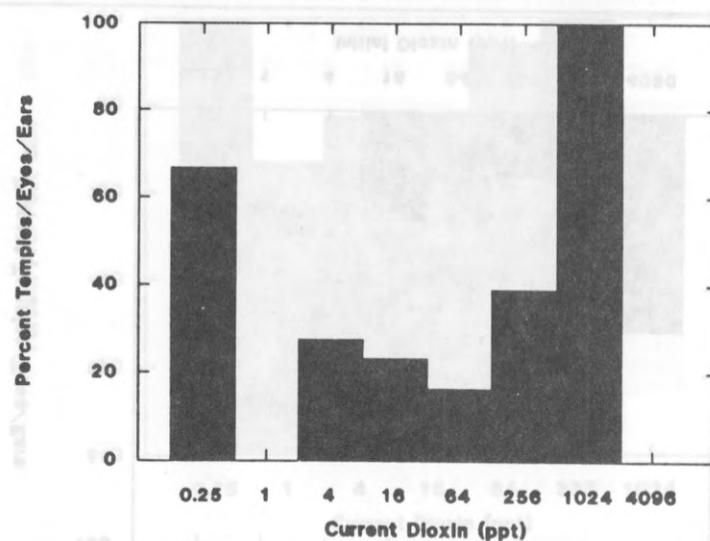
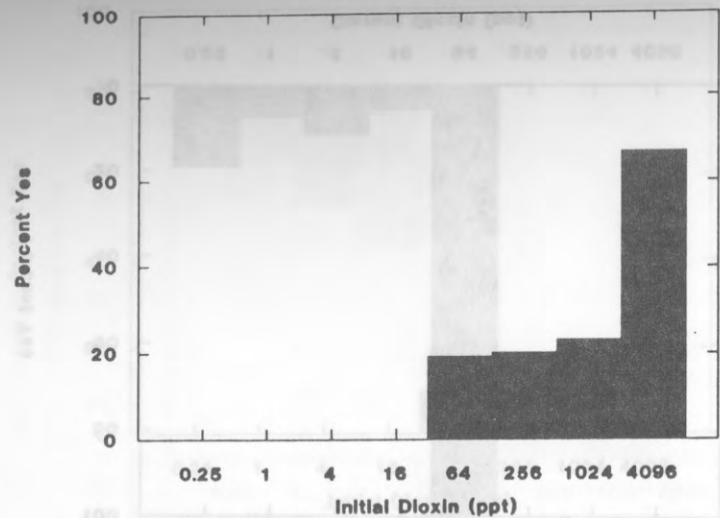


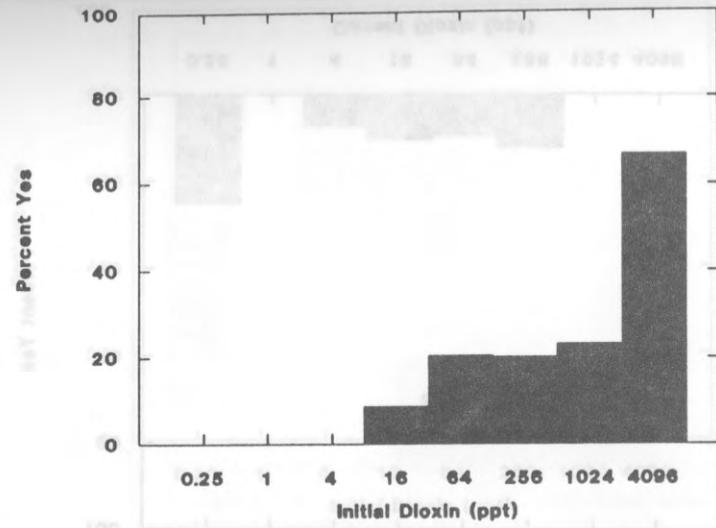
FIGURE J-1-6. Location of Acne (Pre/Post-SEA and Post-SEA) versus Dioxin

11-1-f

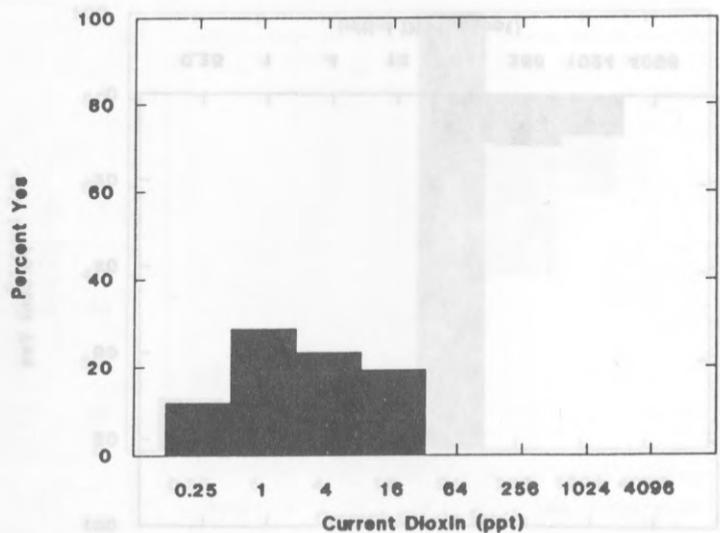
(a) Ranch Hands Minimal Assumption - Initial Dioxin



(b) Ranch Hands Maximal Assumption - Initial Dioxin



(c) All Comparisons - Current Dioxin



(d) All Ranch Hands - Current Dioxin

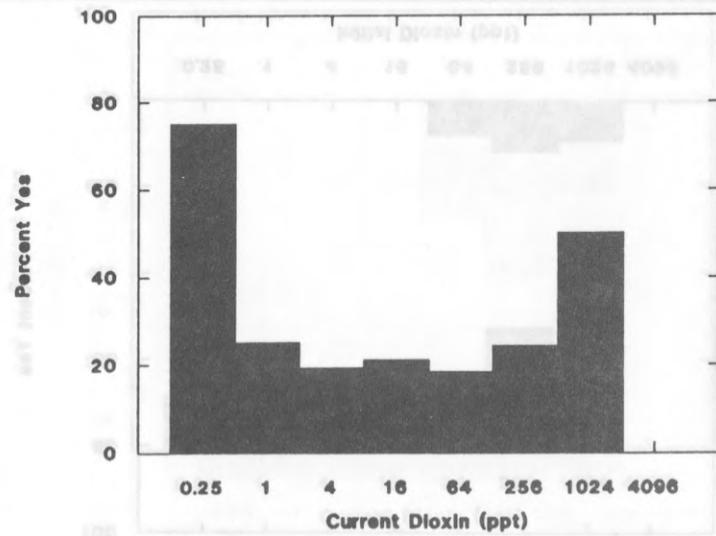
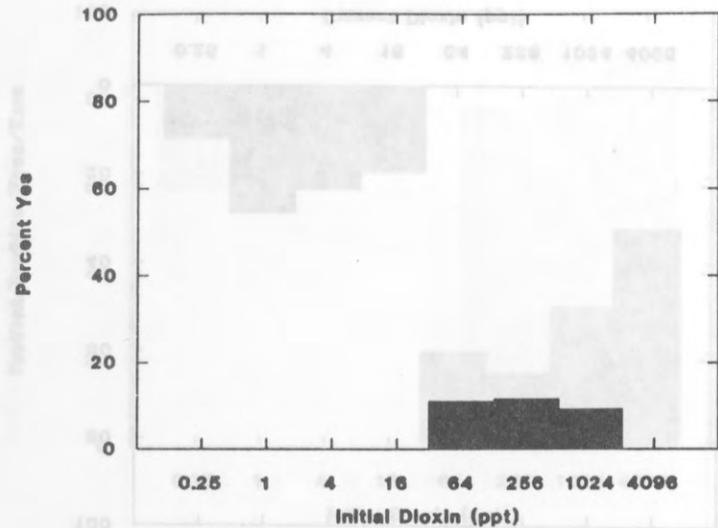


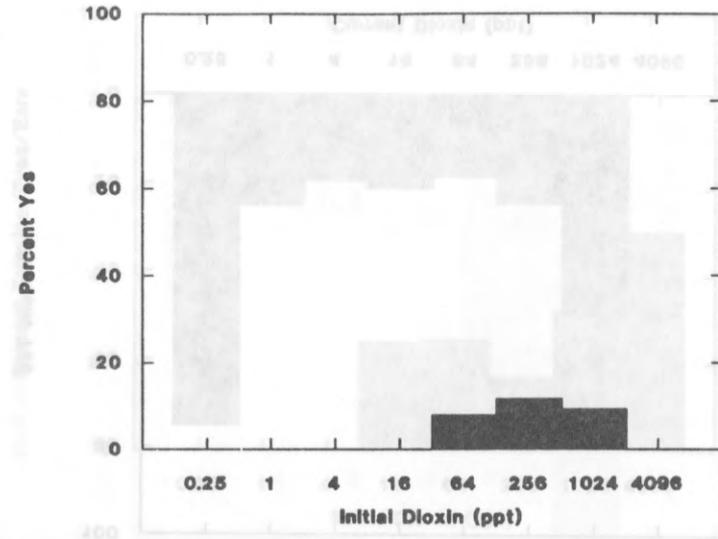
FIGURE J-1-7. Comedones versus Dioxin

J-1-12

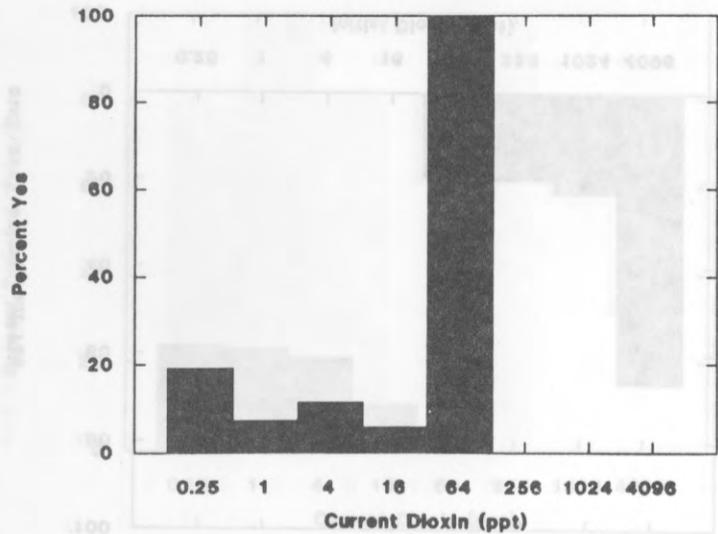
(a) Ranch Hands Minimal Assumption - Initial Dioxin



(b) Ranch Hands Maximal Assumption - Initial Dioxin



(c) All Comparisons - Current Dioxin



(d) All Ranch Hands - Current Dioxin

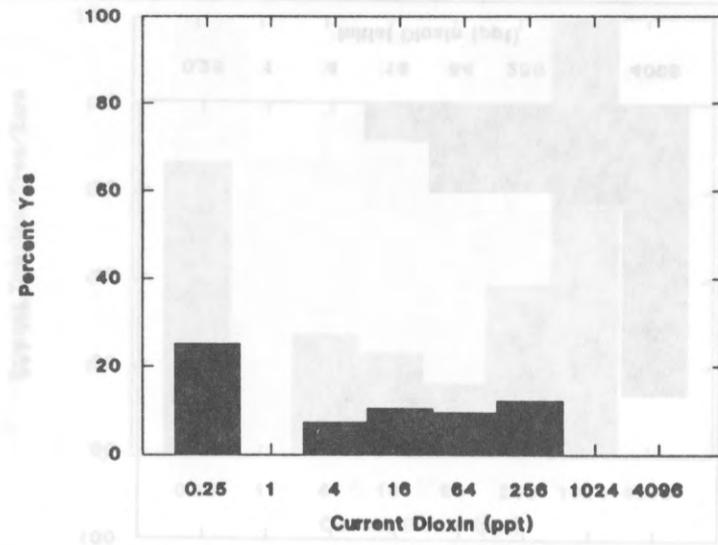
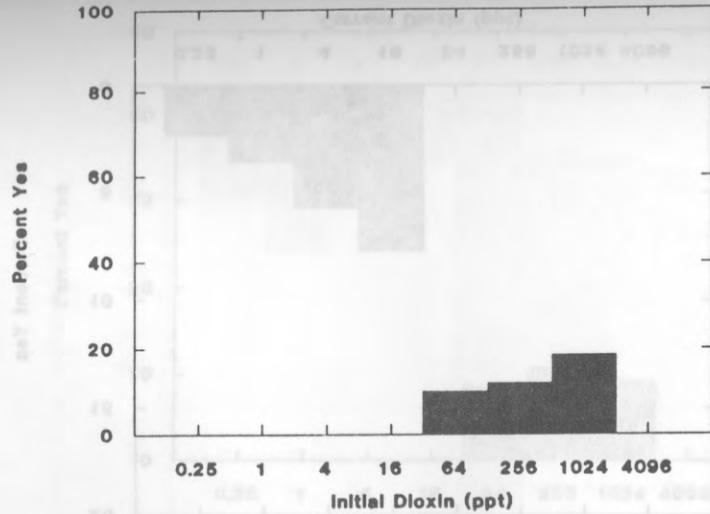
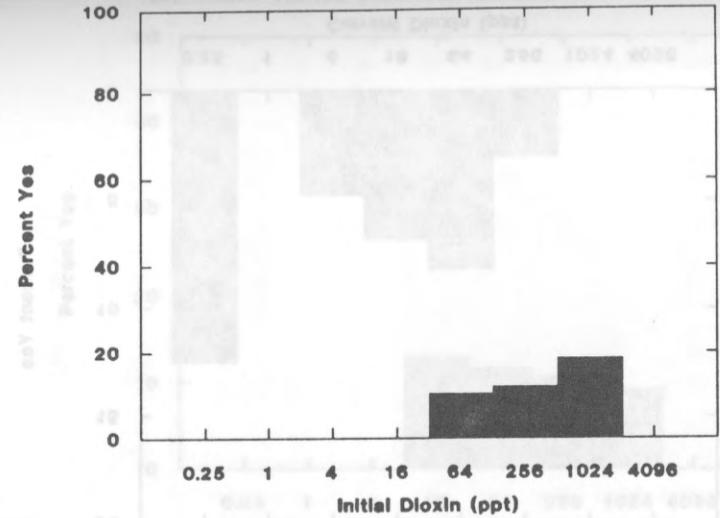


FIGURE J-1-8. Acneiform Lesions versus Dioxin

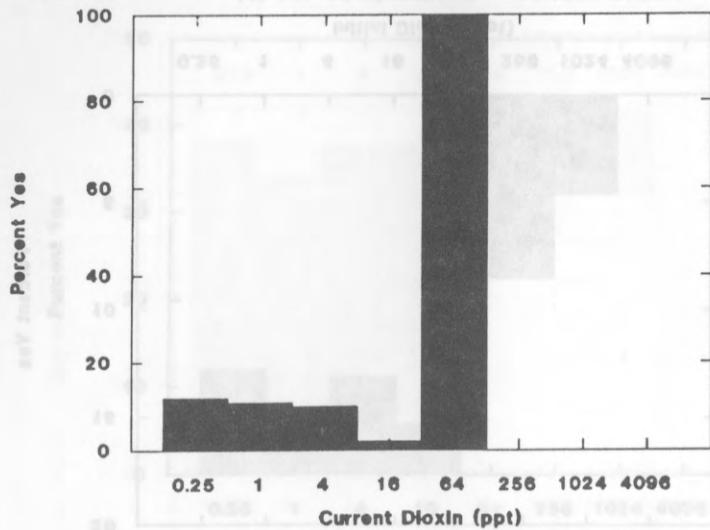
(a) Ranch Hands Minimal Assumption - Initial Dioxin



(b) Ranch Hands Maximal Assumption - Initial Dioxin



(c) All Comparisons - Current Dioxin



(d) All Ranch Hands - Current Dioxin

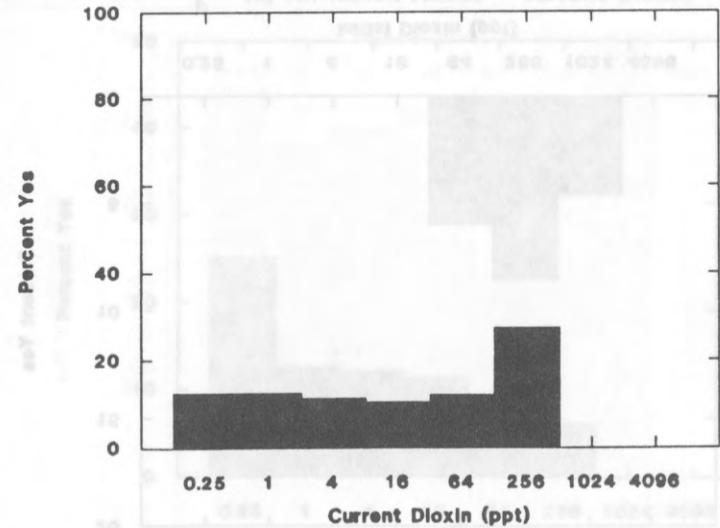
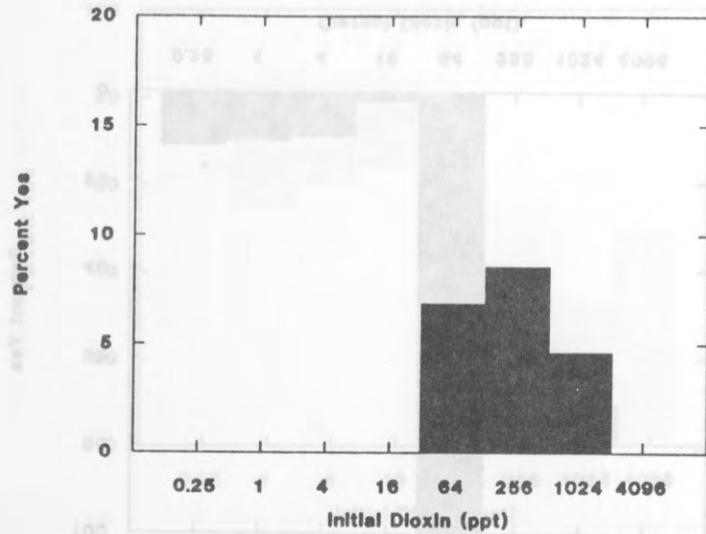
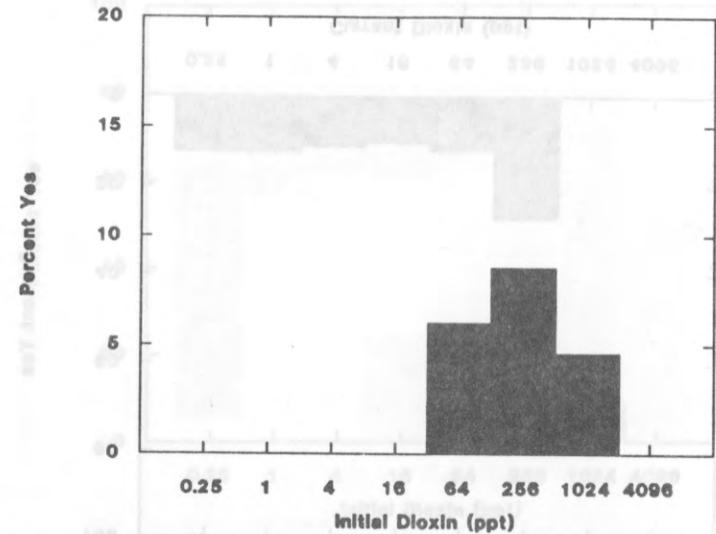


FIGURE J-1-9. Acneiform Scars versus Dioxin

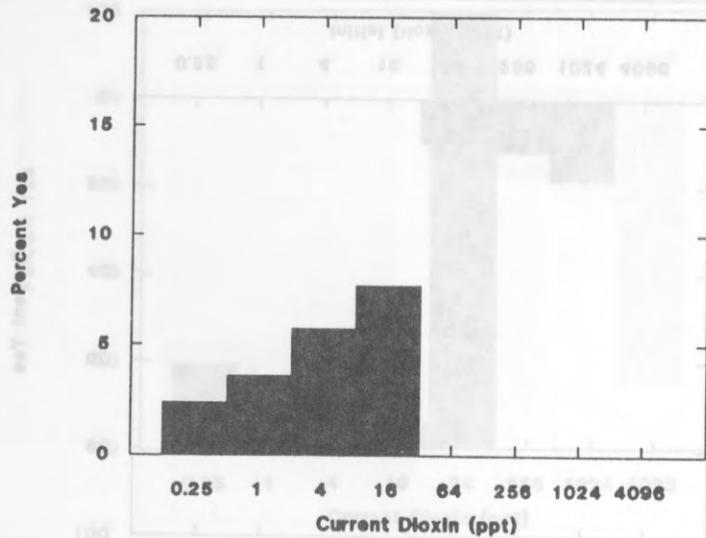
(a) Ranch Hands Minimal Assumption - Initial Dioxin



(b) Ranch Hands Maximal Assumption - Initial Dioxin



(c) All Comparisons - Current Dioxin



(d) All Ranch Hands - Current Dioxin

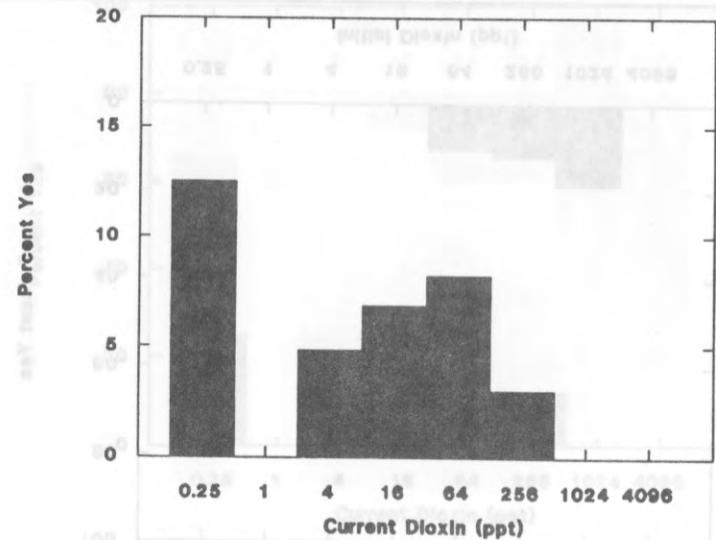


FIGURE J-1-10. Depigmentation versus Dioxin

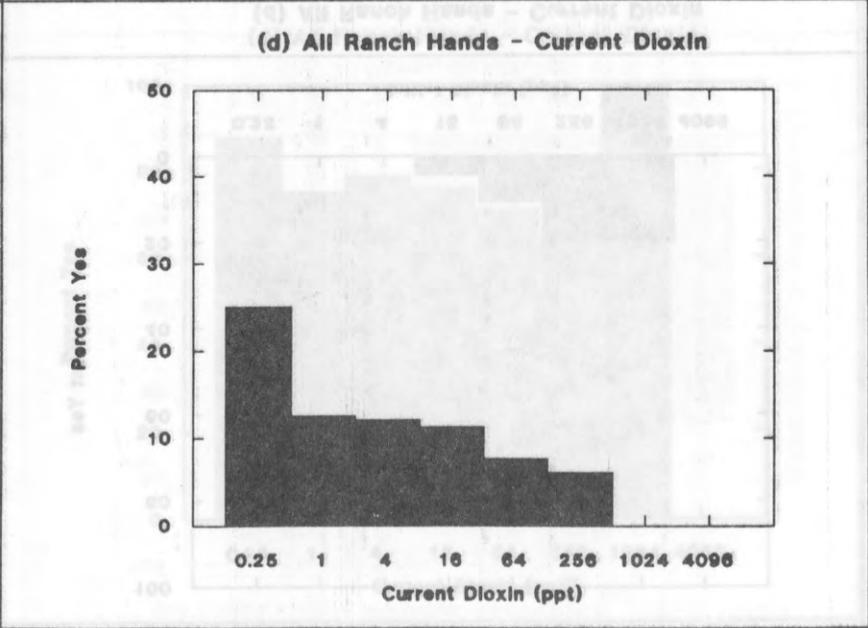
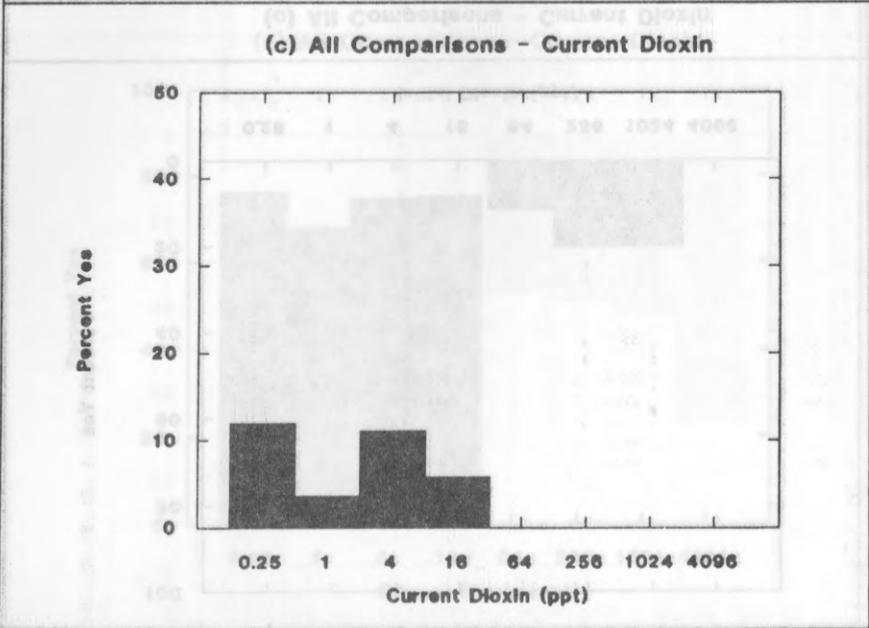
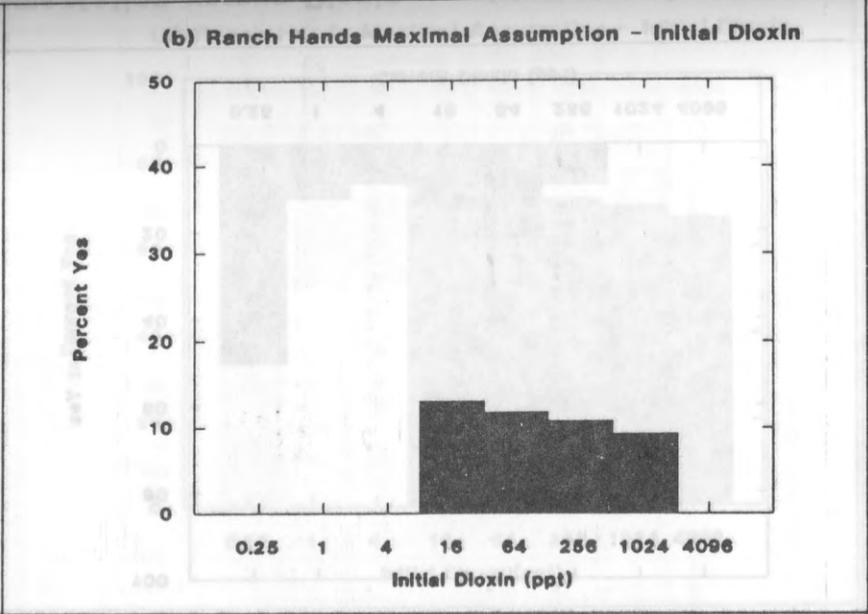
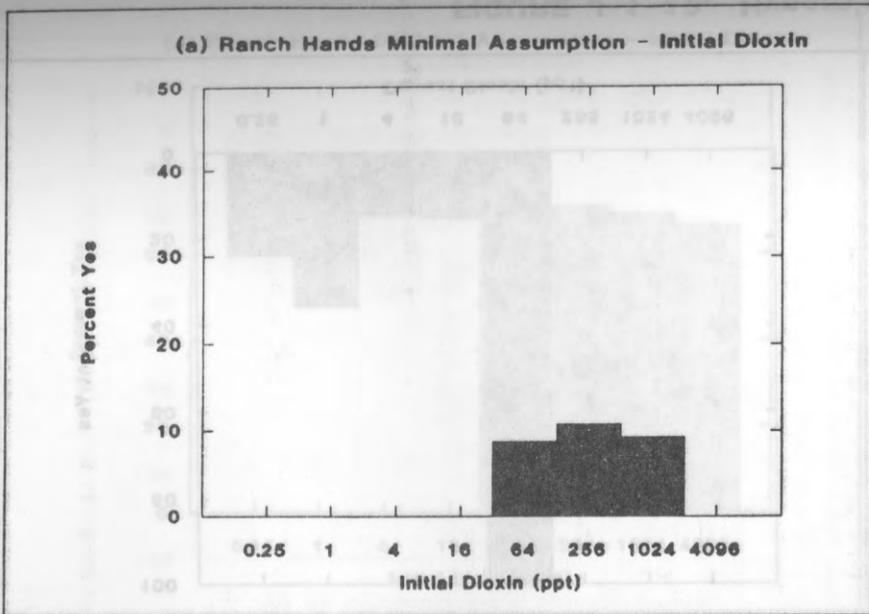


FIGURE J-1-11. Inclusion Cysts versus Dioxin

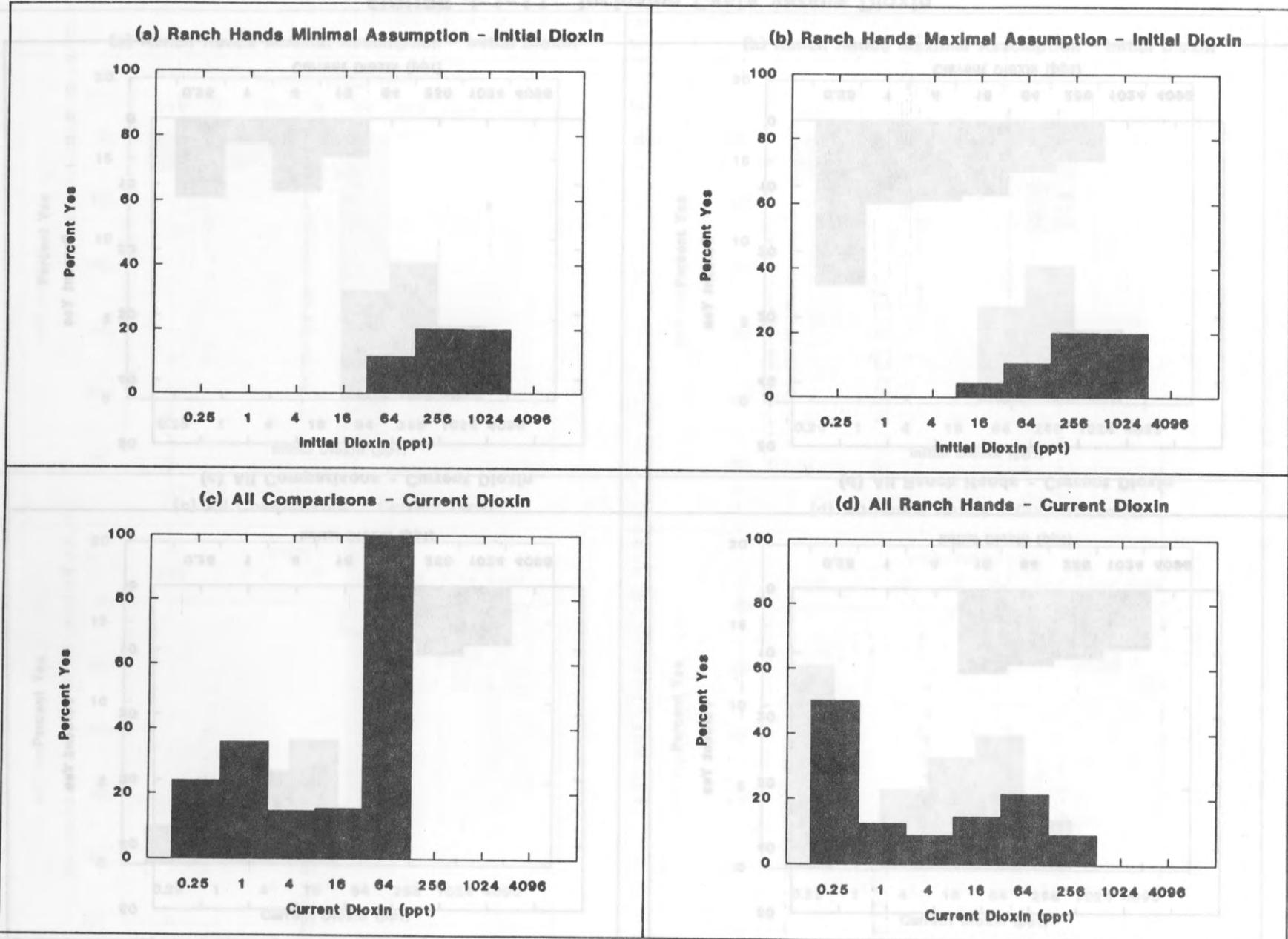


FIGURE J-1-12. Hyperpigmentation versus Dioxin

J-1-17

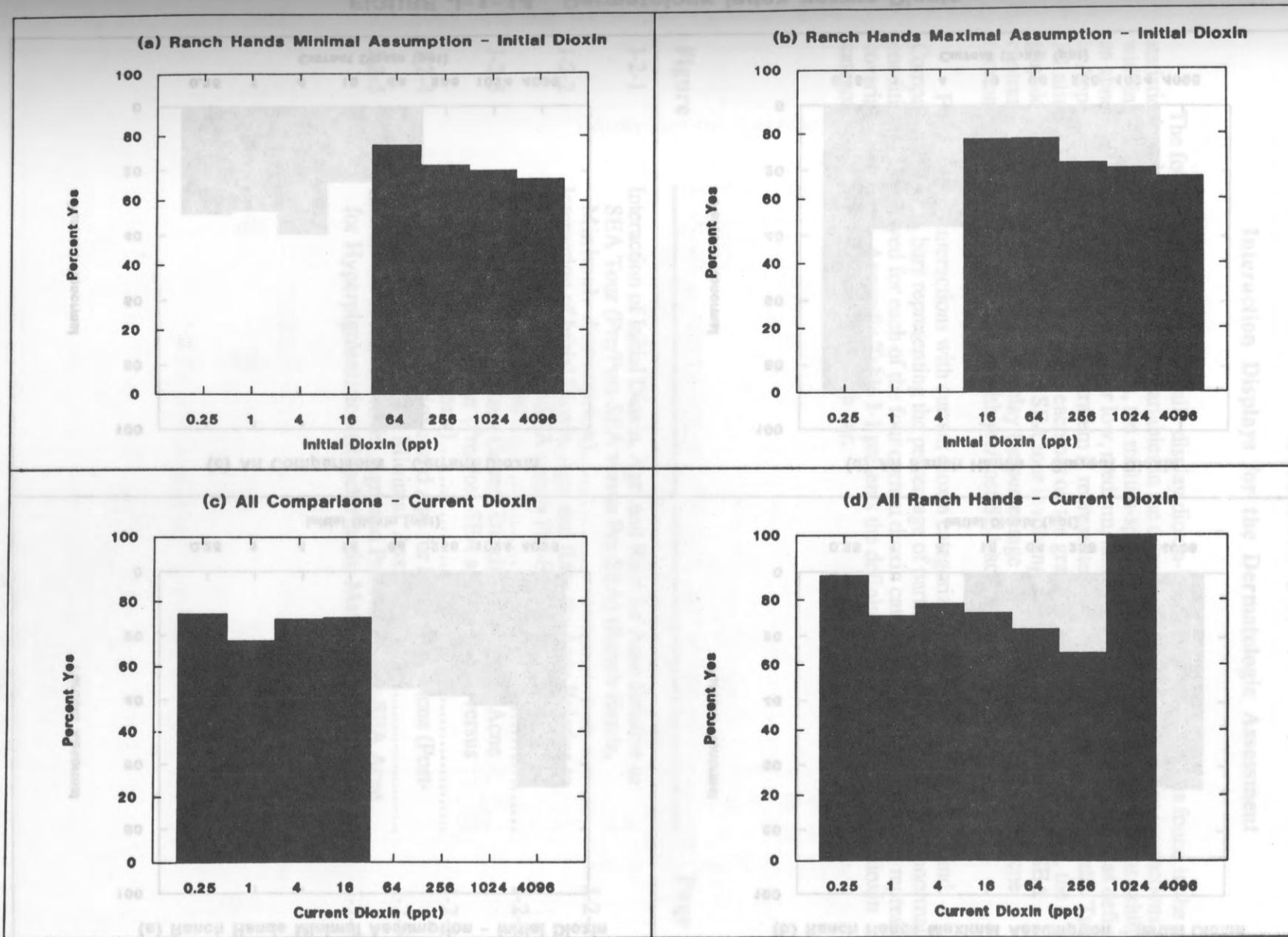
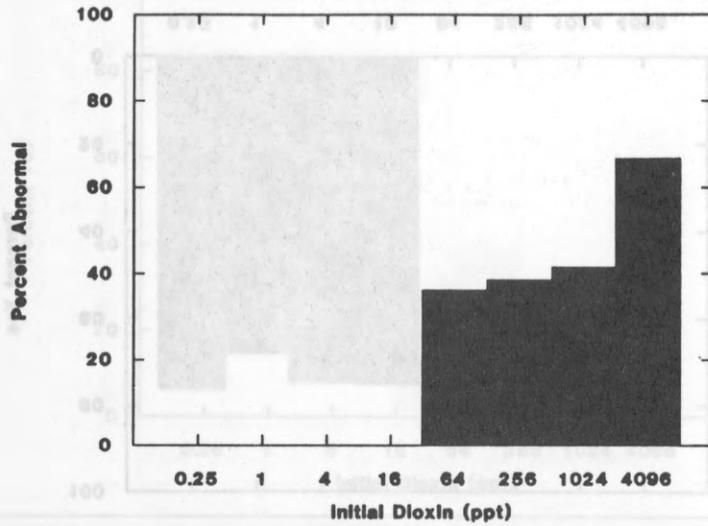
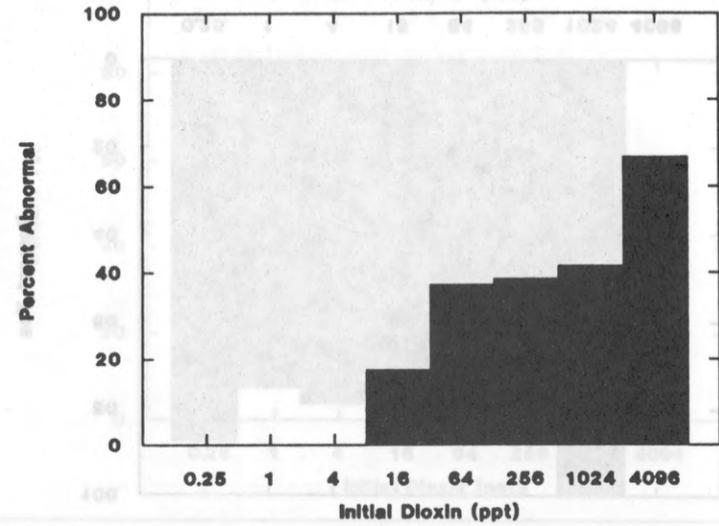


FIGURE J-1-13. Other Abnormalities versus Dioxin

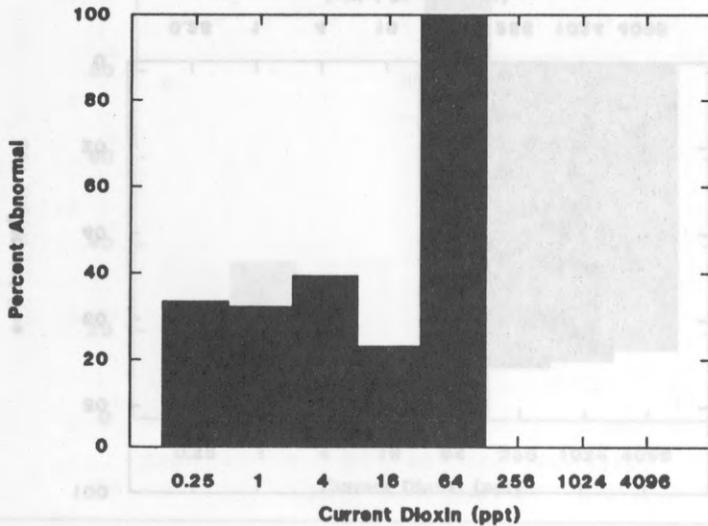
(a) Ranch Hands Minimal Assumption - Initial Dioxin



(b) Ranch Hands Maximal Assumption - Initial Dioxin



(c) All Comparisons - Current Dioxin



(d) All Ranch Hands - Current Dioxin

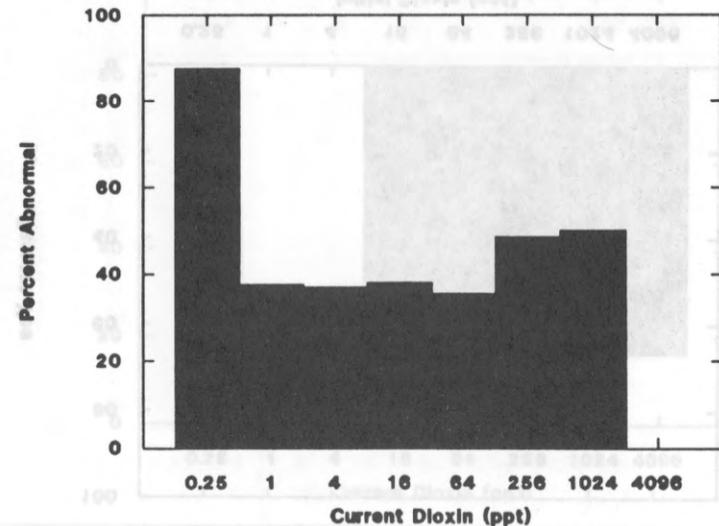


FIGURE J-1-14. Dermatology Index versus Dioxin

APPENDIX J-2.

Interaction Displays for the Dermatologic Assessment

The following figures graphically display dioxin-by-covariate interactions found in the statistical analyses of the dependent variables in the dermatologic assessment. For interactions with initial dioxin in the Ranch Hands, the stratum-specific percentage of participants that exhibited an abnormal condition is displayed for low, medium, and high initial dioxin categories (as defined in Appendix J, Table J-1), and each stratum is represented by a different design. Appendix Table J-1 also displays the sample sizes for each bar on the graph. For presentation purposes, the graphical displays for acne relative to SEA tour involving the pre/post-SEA versus pre-SEA contrast (Figures J-2-1 and J-2-2) display the percentage of participants with pre-SEA acne (normal) rather than the percentage with pre/post-SEA acne (abnormal).

For covariate interactions with current dioxin categorized within the Ranch Hand and Comparison groups, bars representing the percentage of participants that exhibited an abnormal condition are displayed for each of the four current dioxin categories. Different designs represent covariate categories. Appendix Table J-1 presents the definition of each of the current dioxin categories and the sample size for each bar.

Figure		Page
J-2-1	Interaction of Initial Dioxin, Age, and Race for Acne Relative to SEA Tour (Pre/Post-SEA versus Pre-SEA) (Ranch Hands, Minimal Assumption).....	J-2-2
J-2-2	Interaction of Initial Dioxin, Age, and Race for Acne Relative to SEA Tour (Pre/Post-SEA versus Pre-SEA)(Ranch Hands, Maximal Assumption).....	J-2-3
J-2-3	Interaction of Categorized Current Dioxin and Race for Acne Relative to SEA Tour (Pre/Post-SEA and Post-SEA versus Pre-SEA and None).....	J-2-4
J-2-4	Interaction of Initial Dioxin and Age for Location of Acne (Post-SEA) (Ranch Hands, Minimal Assumption).....	J-2-5
J-2-5	Interaction of Initial Dioxin, Age, and Presence of Pre-SEA Acne for Hyperpigmentation (Ranch Hands, Maximal Assumption).....	J-2-6

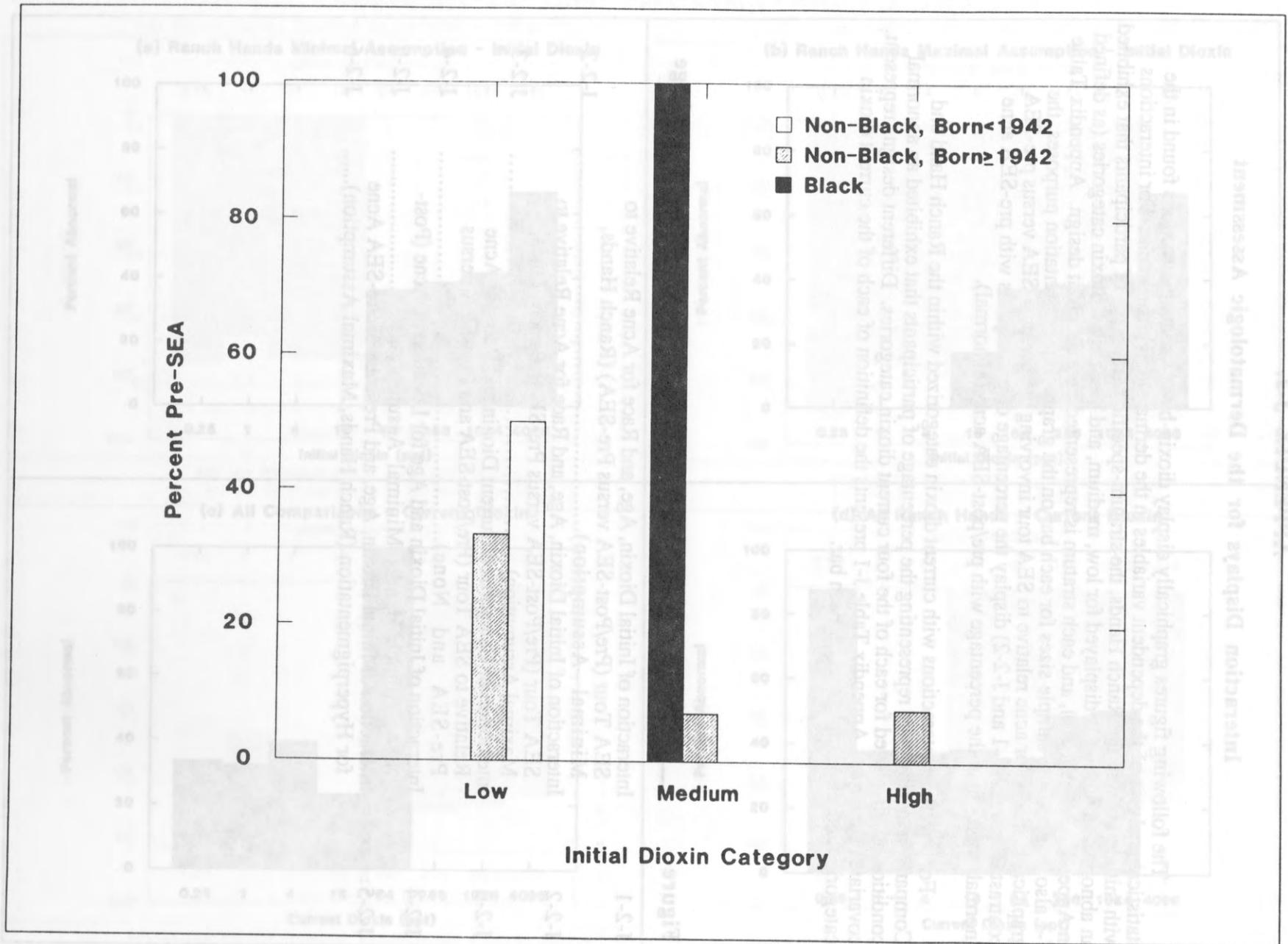


FIGURE J-2-1. Interaction of Initial Dioxin, Age, and Race for Acne Relative to SEA Tour (Pre/Post-SEA versus Pre-SEA) (Ranch Hands, Minimal Assumption)

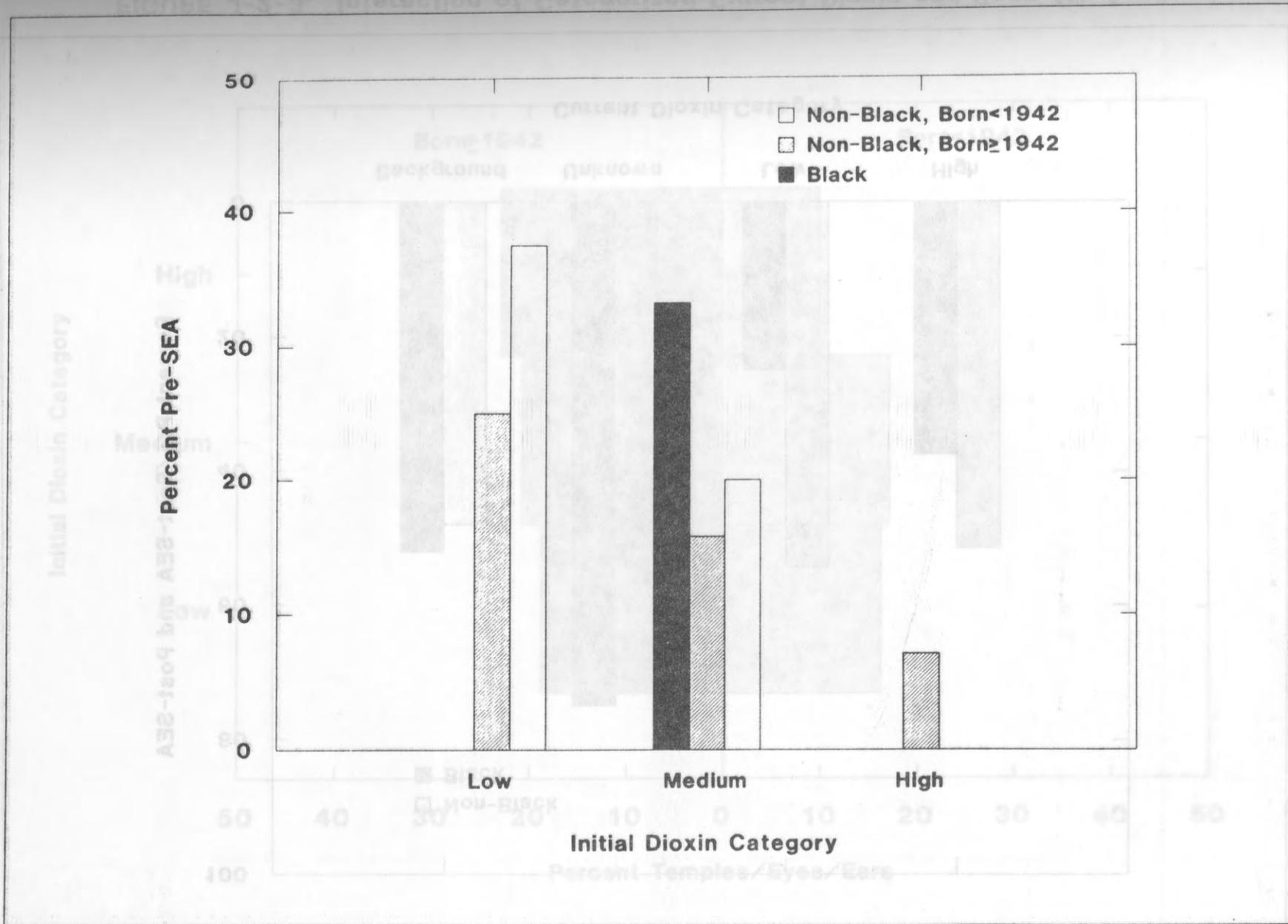


FIGURE J-2-2. Interaction of Initial Dioxin, Age, and Race for Acne at SEA Relative to SEA Tour (Pre/Post-SEA versus Pre-SEA) (Ranch Hands, Maximal Assumption)

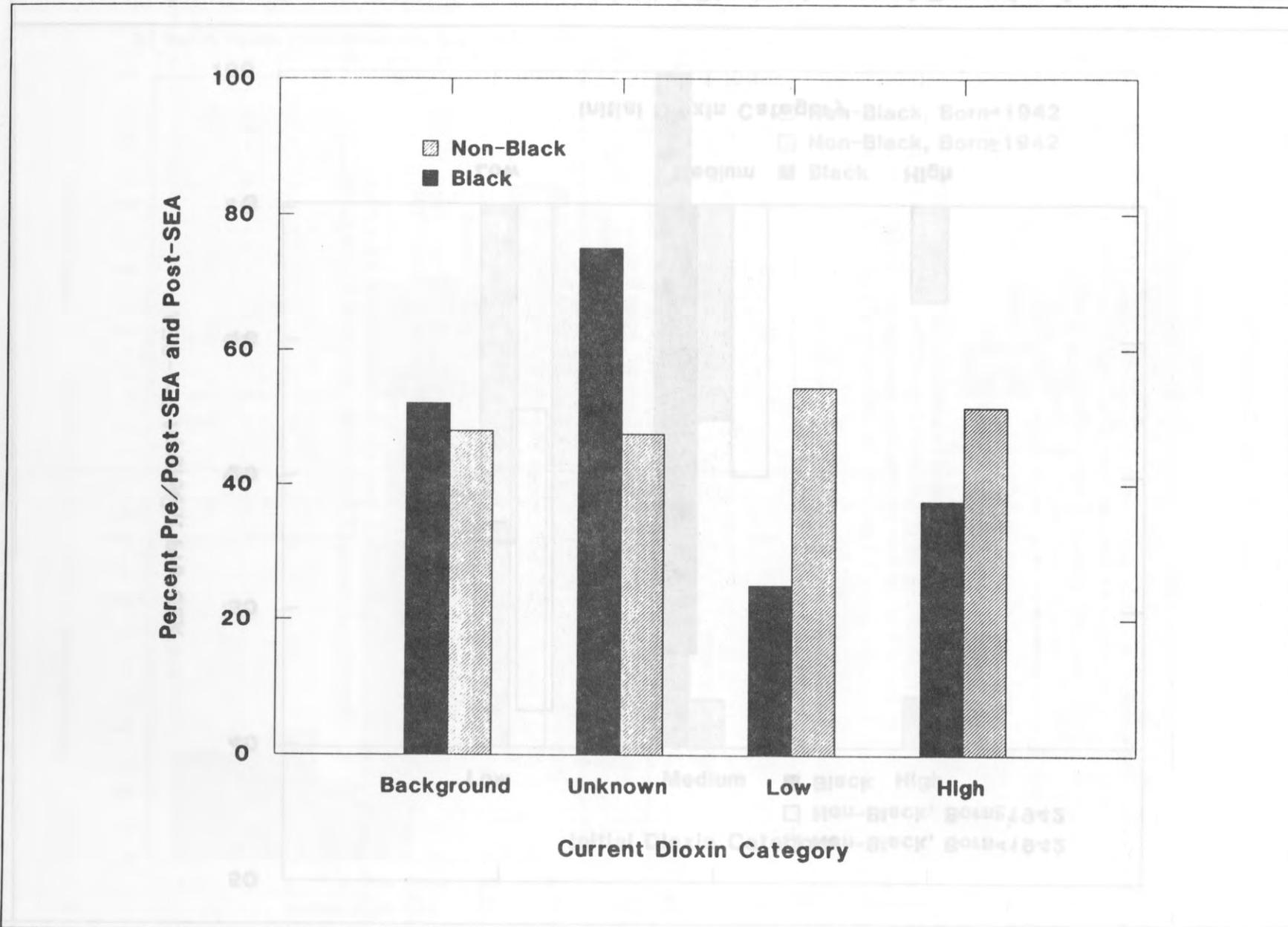


FIGURE J-2-3. Interaction of Categorized Current Dioxin and Race for Acne Relative to SEA Tour (Pre/Post-SEA and Post-SEA versus Pre-SEA and None)

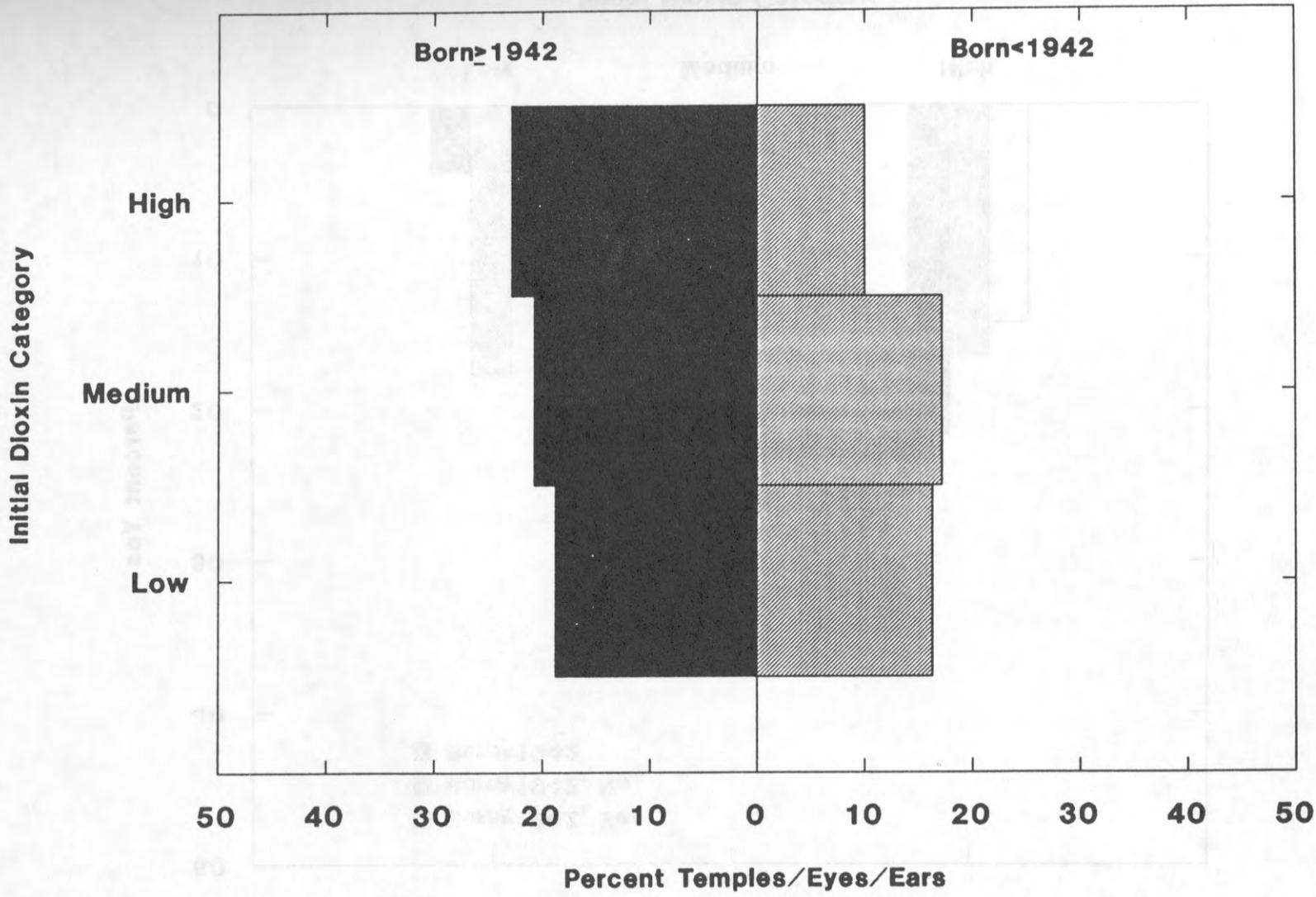


FIGURE J-2-4. Interaction of Initial Dioxin and Age for Location of Acne (Post-SEA) (Ranch Hands, Minimal Assumption)

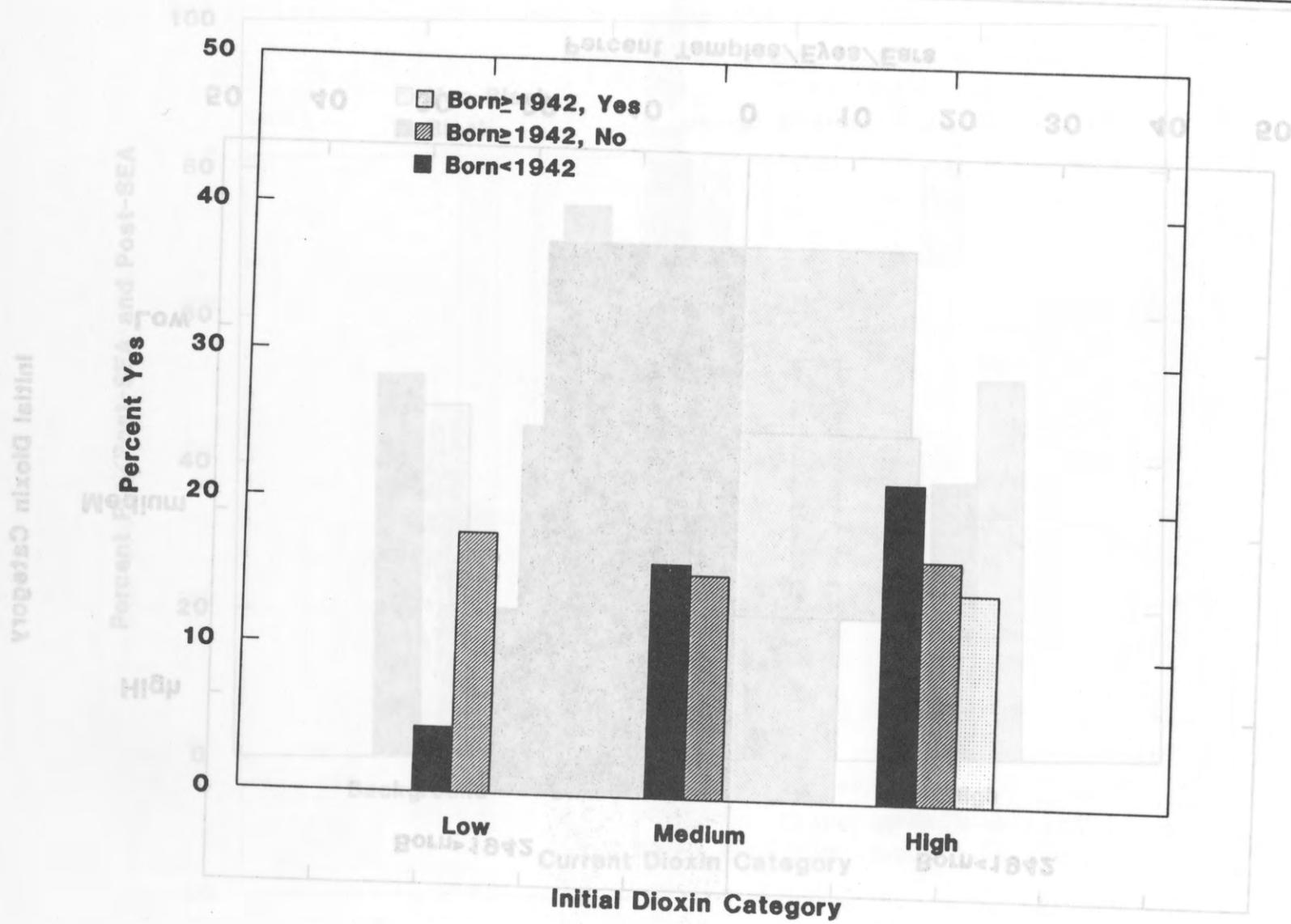


FIGURE J-2-5. Interaction of Initial Dioxin, Age, and Presence of Pre-SEA Acne for Hyperpigmentation (Ranch Hands, Maximal Assumption)