

9-12-94 EEB 2/16

DATA EVALUATION RECORD
§ 71-4 Avian Reproduction Study
Mallard

1. CHEMICAL: TPTH
2. TEST MATERIAL: TPTH (Batch No. GFRAM 911K; 97.9%; CAS No. 76-87-9) was a fine, white powder with a characteristic odor.

3. CITATION:

Author: Carol A. Pederson,
Connie L. Lesar
Title: Toxicity and Reproduction
Study in Mallard Ducks
Date: January 24, 1994
Laboratory Report #: BLAL No. 106-010-08
Any Other Study #: N/A
Sponsor: Elf Atochem North America,
Inc., Philadelphia, PA
Laboratory: Bio-life Associates, Ltd
MRID No.: 43178502

4. REVIEWED BY:

Dennis J. McLane, Wildlife Biologist
Ecological Effects Branch
Environmental Fate and Effects Division (7507 C)

Dennis J. McLane
9-12-94

5. APPROVED BY:

Les Touart, Section Head
Ecological Effects Branch
Environmental Fate and Effects Division (7507 C)

LT
9-12-94

6. CONCLUSION: This study is scientifically sound but does not fulfill the guideline requirements pertinent items need more explanation and information. (see 7. Major Guideline Deviations). TPTH at 30 and 90 ppm cause many reproductive effects. The no-effect-level and the lowest effect level are 3 ppm and 30 ppm, respectively. Statistically significant items are listed below under the appropriate dose level. (see following table)

Table 1
Listing of Affected Parameters for 90 and 30 ppm Dose Levels

@ 90 ppm	@ 30 ppm
Eggs Laid/Pen	Live Embryos
Eggs Set/Pen	Normal Hatchlings
Viable Embryos/Pen	Hatchling Survivors

Live Embryos/Pen	14-Day-Old Survivors
Normal Hatchlings/Pen	Eggshell Thickness
Hatchlings Survivors/Pen	
Egg Shell Thickness/Pen	
14 Day Old Survivors/Pen	
Eggs Set/Eggs Laid	
Viable Embryos/Eggs Set	
Live Embryos/Viable Embryos	
Normal Hatchlings/Eggs Laid	
Eggs Cracked/ Eggs Laid	
Normal Hatchlings/Eggs Set	
Hatchling Survivor/Eggs Set	
Male Body Weight	

The no-effect-level and the lowest effect level are 3 ppm and 30 ppm, respectively. Also as shown in Table 3 below several of the reproductive effects were still detectable after the 5 week recovery period. In addition, the ovary weights were not effected. On the other hand, testes weight were statistically different at the 30 ppm level but not the 90. EEB was unable to determine if this effect was due to TPTH.

7. MAJOR GUIDELINE DEVIATIONS:

A. The report omitted the scientific explanation for removing the small eggs.

B. It was reported that the birds were treated with an antibiotic but the illness was not reported.

C. The dosage levels were separated by a factor of three rather than five.

D. The rational for using more than 2% total vehicle was not included. The guidelines indicate only 2% total vehicle, in this study 2% corn oil was used and 1% acetone or a total of 3%.

E. Food consumption weight per pen (replicate) was not submitted.

8. Background: Submitted as result of the Reregistration Standard.

9. MATERIALS AND METHODS:A. Test Organisms:

Guideline Requirements	Result Results
1. Species: a. Supplier: b. Same hatch: c. Same source: d. Approaching the first breeding season: e. Indistinguishable from wild birds: f. Age: g. Pen reared:	a. Whistling Wings, inc. Hanover, IL 61041 b. No other source reported c. Yes d. Yes e. Yes f. Approx. 15 week old g. Not reported
2. <u>Health:</u> a. Weight loss: b. Sickness: c. Mortality: d. History:	a. Not reported b. Given P.A. Bacterin at 7 and 14 days c. Not reported d. Only the treatment reported above
3. <u>Acclimation period:</u>	Yes 3 weeks
B. <u>Test System:</u> 1. Test design: a. No. of dose levels (including number of controls and vehicle controls): b. Factor used to separate dosage levels: c. No. of pens per level: d. Male to female ratio per pen:	1. a. 4 b. 10 c. 16 d. 1 to 1

2. Pen Facilities a. Parents 1. Temperature 2. Relative humidity 3. Minimize cross contamination: 4. Pen materials: 5. Ventilation: b. Chicks 1. Temperature: 2. Relative Humidity: 3. Pen materials: 4. Ventilation: 5. Photoperiod:	1. 20°C 2. 70% 3. Not reported 4. "61 x 121.9 x 61 cm wire pens constructed of 1" wire mesh... over concrete..." 5. "Adequate ventilation was maintained throughout the study" 1. 36.6°C 2. 37.9% 3. Not reported 4. Not reported 5. Not reported
3. Photoperiod: a. Parent- 1st 8 wks 7 L increased to 16-17 L; 6 footcandles or 65 lux b. Chick or Duckling-hour of light per day	a. 7 hours of light until week 9 then 17-hour L - 7-hour D; @ 6 footcandles b. 24-hour L
4. Bodyweight a. Parent- Day 1 and biweekly through test week 10 but not during egg laying period b. Chick- Day 1 and day 14	Day 1 and biweekly through test week 10 but not during egg laying period Days 1 and 14
5. Food consumption (Twice a week)	Twice weekly and calculated on a weekly basis.

6. Dose preparation- a. Rational as why or how the dosage level were selected for the preliminary study. The levels for the main study were the same as the preliminary study. b. Vehicle: 2% of the diet c. Evaporative vehicle should be allowed to evaporate stored to maintain stability	a. Not reported b. 2% corn oil and 1% acetone c. 20 minutes of mixing after acetone was added. No additional evaporative period was mentioned before freezing.
7. Feeding and Husbandry a. Appropriate diet b. Water c. Test diet for at least 10 wks d. Commercial game bird breeder ration e. Store to maintain stability (prepare weekly and freeze)	a. Purina Custom Game Bird Layena b. Automatic waterer and a small bowl c. Through week 20 d. see a. e. "...prepared fresh weekly and frozen prior to feeding"
8. Egg collection, Storage, and Incubation a. collected daily b. stored at 16° C and 65% relative humidity c. set at weekly intervals d. candled day 0 cracks, day 11 for bobwhite, and day 14 for mallard for fertility day 18 for bobwhite and day 21 for mallards e. Temp for hatching 39°C and relative humidity 70%	a. Yes b. 19°C-15°C Temp. & 60% RH c. Yes d. Yes e. Temp 37.5-37.6°C HR 61 - 64%

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9. Observations a. Bobwhite chicks hatch day (day 2) b. On control diet for 14 days c. Mallard Ducklings hatch day (day 27) d. F₁ on control diet for 14 days	a. N/A b. N/A c. Day 27 d. Yes
10. Eggshell Thickness a. One day every two weeks newly laid eggs should be collected. weeks 1,3,5,7,9, b. Air dry for 48 hours c. Measure 3 to 4 points in 0.01 mm	a. Yes b. Yes c. 3/egg to 0.01 mm
11. Withdrawal if reduced reproduction is evident add withdrawal period not to exceed 3 wks.	F₀ 5 week recovery period

10. REPORTED RESULTS: (see part 12. Statistical Analysis below)

11. STUDY AUTHORS'S CONCLUSIONS / QUALITY ASSURANCE MEASURES:
The author signed a quality assurance statement on page 4.

"TPTH was administered for 20 consecutive weeks in the diet to four groups of approximately 18-week-old mallard ducks as follows: Vehicle Control (0ppm). T-I (3 ppm), T-II (30 ppm), and T-III (90 ppm). A five-week recovery period followed the 20-week test period.

"Survival of mallard ducks at dietary levels used in this study was excellent. Clinical signs appearing to be neurological in nature were seen in two females and one male in the high level (90 ppm) group and their possible effect as a compound-related finding cannot be excluded. At the high dietary level, 90 ppm, there appeared to be initial but reversible decreases in body weight and feed consumption.

"The ingestion of TPTH at levels of 3, 30, or 90 ppm by the parental generation also appeared to adversely affect eggshell thickness in the 30 and 90 ppm test groups, as well as the reproductive success of the 30 (viable embryos of eggs set and live 21-day embryos of viable embryos) and 90 (mean eggs laid per hen, viable embryos, and normal hatchlings of live 21-day embryos of viable embryos, and normal hatchlings of live 21-day embryos) ppm test groups. With the exception of the percentages of normal hatchlings of 21-day embryos in the 90 ppm test group, all other adverse reproductive effects were readily reversible during the five-week recovery period. The mid-level (30 ppm) and high level (90 ppm) were considered to be adverse effect levels. The no-observed-effect level (NOEL) was determined to be the low level (3 ppm)."

Report provided a Quality Assurance Statement and Good Laboratory Practice Exception statement.

12. Statistical Analysis:

The following is the reported procedure for statistical analysis: "First a Levene's test (Milliken & Johnson, Analysis of Messy Data, Vol. 1, 1984, pg 22, Lifetime Learning Publications, Belmont, Calif.) is conducted to determine whether the variances across the treatment groups are homogeneous (at the 0.01 level of significance). If there is not a significant difference in the group variances, a parametric one-way analysis of variances, a parametric one-way analysis of variance is conducted along with a Dunnett's test, comparing each treatment group to the control group. A one-tailed test is performed since the concern is with the detrimental (not both detrimental and beneficial) effects of

the overall F test is not of interest, since the Dunnett's comparison to control (which involves the only comparisons in which there is interest) already controls for an overall controls Type I error rate of 0.05."

The following lists of parameters were found to be statistically significant by Bio-life Associates, Ltd:

Table 2
Results of Biolife's Statistical Analysis

Parameter	Vehicle Control	3 ppm	30 ppm	90 ppm
Mean Eggs Laid per Hen in 11 Weeks	40	43	31	11*
Eggs Cracked or Broken eggs of Eggs Laid (%)	3	6	8	24
Viable Embryos of Set (%)	92	90	71	26*
Day-21 Live Embryos of Set (%)	94	85	74	3*
Normal Hatchlings of Live 21-Day Embryos (%)	91	85	82	0*
Day-14 Survivors of Normal Hatchlings (%)	96	95	94	-
Mean 14-Day-Old Survivors/Hen	26	26	13	0

Eggshell Thickness	0.387	0.388	0.363*	0.312*
Ovarian Weight	8.98	6.91	8.51	6.85*
Body Weight Female @ 4 Weeks	216.7	215.3	216.6	207.0*
Body Weight Female @ 20 Weeks	263.2	255.9	261.8	242.4*

Statistical different from controls .

It does not appear that Biolife did a statistical analysis for eggs cracked/pen, eggs set per pen, viable embryos/pen, live 21-day embryos/pen, normal hatchlings/pen, and 14-day old survivors per pen. EEB has provided these in Table 3 below.

In order to review the statistical results EEB used SAS program Birdrepr.sas which an ANOVA (reproductive parameters) and ANCOVA (body weight) with Dunnett's and Bonferroni's Tests. Based on this, the following items EEB found statistically significant.

Table 3
Means for TPTH Mallard Reproduction Study Parameters

Parameter	Vehicle Control	3 ppm	30 ppm	90 ppm
Eggs Laid/Pen	39.56	43.25	31.25	11.0*
Eggs set /Pen	35.5	38.188	27.375	8.313*
Viable Embryos/ Pen	32.75	34.875	20.0*	2.063*
Live Embryos/ Pen	29.75	30.5	15.688*	0.063*
Normal Hatchlings/ Pen	27.375	27.25	12.875*	0.00*
Hatchling Survivors/ Pen	27.8	26.062	12.563*	0.00*
Eggshell Thickness	0.3782	0.3882	0.3635	0.316*
14-Day Survivor Weight	275.715	262.956	298.808*	---
Eggs Set/ Eggs Laid ¹	71.53	70.38	69.66	62.17
Live Embryos/ Viable Embryos ¹	75.34	73.43	64.85	3.63
Normal Hatchlings/ Eggs Laid ¹	56.56	52.46	38.7	0.0

Eggs Cracked/ Eggs Laid ¹	7.62	10.15	11.15	23.65
Viable Embryos/ Eggs Set ¹	73.78	74.6	60.19	28.73
Normal Hatchlings/ Eggs Set ¹	62.27	58.76	42.46	0.00
Hatchlings Survivors/ Eggs Set ¹	59.62	56.36	41.78	0.00
Male Body Weight ¹	1252.75	1298.81	1218.69	1275.19

¹ Although the ANOVA and ANCOVA show significant Dunnett's and Bonferroni's tests did not show which dosage levels were statistically significant. However, for all these variables the 90 ppm level was biologically significant.

In addition to these parameters ovary and testes weights were also analyzed. The ovary data did not show any statistical or biological significance. The testes data shows a statistical difference between the 30 ppm level and the other levels (see attached printout c:\chem\tpth\testmal.out). The variation was so great, and the 90 ppm level nearly identical to the control EEB does not believe this is related to the dosage.

Both the EEB and Biolife analysis agree that the embryo, hatchling, and 14 day old survivors were affected at 30 ppm and 90 ppm.

Table 3

Based on Biolife's Analysis Comparison of Test Period, Recovery Period, and Combination of Both

Parameter	Test Period	Recovery Period	Both
Egg Laid per Hen	90 ppm	none	90 ppm
Normal Eggs per Hen	90 ppm	none	90 ppm
Normal Eggs of Eggs Laid (%)	90 ppm	None	90 ppm
Abnormal/Reduced of Eggs Laid (%)	None	None	None

Cracked/ Broken of Eggs Laid (%)	None	None	None
Defective of Eggs Laid (%)	None	None	None
Infertile Eggs of Set (%)	None	None	None
Viable Embryos of Set (%)	30 ppm, 90 ppm	30 ppm	30 ppm, 90 ppm
Embryo Mortalities @ 1 week of Set (%)	None	None	None
Embryo Mortalities @ Midterm of Set (%)	None	None	None
Day-21 Live Embryos of Set (%)	30 ppm, 90 ppm	30 ppm	30 ppm, 90 ppm
Embryo Mortalities @ Fullterm of Set (%)	None	None	None
Pipped Not Liberated of Set (%)	None	None	None
Normal Hatchlings of Set (%)	30 ppm, 90 ppm	30 ppm	30 ppm, 90 ppm
Day-14 Survivors of Set (%)	30 ppm, 90 ppm	30 ppm	30 ppm, 90 ppm
Day-21 Live Embryos of Viable Embryos (%)	30 ppm, 90 ppm	None	30 ppm, 90 ppm
Normal Hatchlings of Viable Embryos (%)	30 ppm, 90 ppm	None	30 ppm, 90 ppm

Normal Hatchlings of Day-21 Live Embryos (%)	90 ppm	90 ppm	90 ppm
Day-14 Survivors of Normal Hatchlings (%)	--	None	None

The above table shows reproductive effects which persisted throughout the recovery.

12. ADEQUACY OF THE STUDY:

A. Category-Supplemental

B. Rational-The following items ~~were~~ not addressed: the illness the antibiotic was ~~used~~ to treat, the scientific basis for removing the small eggs, and the total food consumption ~~per~~ pen.

C. Reparability-The following items ~~are~~ should be reported: The illness the antibiotic was ~~used~~ to treat and number of birds infected. The scientific basis for removing the small eggs. The rational as why ~~the~~ dosage levels were not separated by a factor of five was not used. The total food consumption per pen.

14. COMPLETION OF ONE-LINER FOR STUDY: 8/17/94

File:C:\CHEM\TPTH\WALLREPR.OUT Page 3

PREF	16	877.9000000	1189.00	1016.44
POSTF	16	1037.00	1392.00	1191.06

N Obs	Variable	Minimum	Maximum	Std Dev
16	EL	14.7806179		
	EC	1.7308476		
	ES	14.1431668		
	VE	14.8093439		
	LE	16.5085836		
	NH	16.0187390		
	HS	15.8175799		
	THICK	0.0236488		
	HATWT	2.6369174		
	SURVWT	34.6848280		
	FOOD			
	PREM	128.3562101		
	POSTM	167.8984688		
	PREF	88.9186660		
	POSTF	96.4209305		

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TRT=C

N Obs	Variable	N	Minimum	Maximum	Mean
16	EL	16	0	70.0000000	31.2500000
	EC	16	0	6.0000000	1.5625000
	ES	16	0	63.0000000	27.3750000
	VE	16	0	56.0000000	20.0000000
	LE	16	0	50.0000000	15.6875000
	NH	16	0	43.0000000	12.9375000
	HS	16	0	41.0000000	12.5625000
	THICK	12	0.3280000	0.4000000	0.3635000
	HATWT	13	27.0000000	40.2000000	34.3615385
	SURVWT	13	263.0000000	326.0000000	298.8076923
	FOOD	0			
	PREM	16	1009.00	1260.00	1144.69
	POSTM	16	875.0000000	1490.00	1218.69
	PREF	16	879.0000000	1155.00	1008.62
	POSTF	16	901.0000000	1384.00	1170.75

N Obs	Variable	Std Dev
16	EL	21.8220072
	EC	1.5041609
	ES	19.9194210
	VE	16.1575576
	LE	14.5863806
	NH	12.8138922
	HS	12.5058320
	THICK	0.0251523
	HATWT	3.6153696
	SURVWT	16.8597875
	FOOD	
	PREM	72.1745281
	POSTM	159.8748339
	PREF	84.6182604
	POSTF	150.7061158

TRT=D

File:C:\CHEM\TPTH\WALLREPR.OUT Page 4

N Obs	Variable	N	Minimum	Maximum	Mean
16	EL	16	0	35.0000000	11.0000000
	EC	16	0	7.0000000	2.0625000
	ES	16	0	30.0000000	8.3125000
	VE	16	0	8.0000000	2.0625000
	LE	16	0	1.0000000	0.0625000
	NH	16	0	0	0
	HS	16	0	0	0
	THICK	7	0.2930000	0.3300000	0.3115714
	HATWT	0			
	SURVWT	0			
	FOOD	0			
	PREM	16	1005.00	1355.00	1200.31
	POSTM	16	1088.00	1554.00	1275.19
	PREF	16	892.0000000	1150.00	1046.19
	POSTF	15	937.0000000	1726.00	1195.53

N Obs	Variable	Std Dev
16	EL	11.2427755
	EC	2.1746647
	ES	9.4496473
	VE	2.6949026
	LE	0.2500000
	NH	0
	HS	0
	THICK	0.0154041
	HATWT	
	SURVWT	
	FOOD	
	PREM	102.0083126
	POSTM	119.1286245
	PREF	93.0650086
	POSTF	189.1646549

1. ANALYSIS OF EL DATA

14:30 Tuesday, August 9, 1994

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General Linear Models Procedure

Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

1. ANALYSIS OF EL DATA

14:30 Tuesday, August 9, 1994

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General Linear Models Procedure

Dependent Variable: RESP

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	9970.54687500	9.31	0.0001
Error	60	21425.93750000		

Corrected Total 63 31396.48437500

	R-Square	C.V.	RESP Mean
	0.317569	60.44038	31.26562500

Source	DF	Type I SS	F Value	Pr > F
TRT	3	9970.54687500	9.31	0.0001
Source	DF	Type III SS	F Value	Pr > F
TRT	3	9970.54687500	9.31	0.0001

1. ANALYSIS OF EL DATA ***** 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 60 MSB= 357.099
Critical Value of Dunnnett's T= 2.410
Minimum Significant Difference= 16.101

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Limit	Difference Between Means	Upper Limit
B - A	-12.414	3.688	19.789
C - A	-24.414	-8.313	7.789
D - A	-44.664	-28.562	-12.461 ***

1. ANALYSIS OF EL DATA ***** 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESP

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 60 MSB= 357.099
Critical Value of T= 2.73
Minimum Significant Difference= 18.23

Means with the same letter are not significantly different.

Bon Grouping	Mean	N	TRT
A	43.250	16	B
A			
A	39.563	16	A
A			

	A	31.250	16	C
B	11.000	16	D	

2. ANALYSIS OF EC DATA ***** 14:30 Tuesday, August 9, 1994

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

2. ANALYSIS OF EC DATA ***** 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESP

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	9.68750000	1.13	0.3423
Error	60	170.75000000		
Corrected Total	63	180.43750000		
		R-Square	C.V.	RESP Mean
		0.053689	101.8542	1.65625000

Source	DF	Type I SS	F Value	Pr > F
TRT	3	9.68750000	1.13	0.3423
Source	DF	Type III SS	F Value	Pr > F
TRT	3	9.68750000	1.13	0.3423

2. ANALYSIS OF EC DATA ***** 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 60 MSB= 2.845833
Critical Value of Dunnnett's T= 2.410
Minimum Significant Difference= 1.4374

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
D - A	-0.437	1.000	2.437
B - A	-0.562	0.875	2.312
C - A	-0.937	0.500	1.937

2. ANALYSIS OF EC DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESP

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 60 MSE= 2.845833
Critical Value of T= 2.73
Minimum Significant Difference= 1.6274

Means with the same letter are not significantly different.

Bon Grouping	Mean	N	TRT
A	2.063	16	D
A	1.937	16	B
A	1.562	16	C
A	1.062	16	A

3. ANALYSIS OF ES DATA

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General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

3. ANALYSIS OF ES DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESP

Source DF Sum of Squares F Value Pr > F

Model	3	8740.81250000	9.86	0.0001
Error	60	17737.62500000		
Corrected Total	63	26478.43750000		

R-Square	C.V.	RESP Mean
0.330111	62.88022	27.34375000

Source	DF	Type I SS	F Value	Pr > F
TRT	3	8740.81250000	9.86	0.0001
Source	DF	Type III SS	F Value	Pr > F
TRT	3	8740.81250000	9.86	0.0001

3. ANALYSIS OF ES DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESP

NOTE: This test controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 60 MSE= 295.6271
Critical Value of Dunnnett's T= 2.410
Minimum Significant Difference= 14.65

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
B - A	-11.963	2.688	17.337
C - A	-28.778	-8.135	4.585
D - A	-41.837	-27.187	-12.528

3. ANALYSIS OF ES DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESP

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 60 MSE= 295.6271
Critical Value of T= 2.73
Minimum Significant Difference= 16.587

Means with the same letter are not significantly different.

Bon Grouping	Mean	N	TRT
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A	38.188	16	B
A	35.500	16	A
A	27.375	16	C
B	8.313	16	D

4. ANALYSIS OF VE DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

4. ANALYSIS OF VE DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESP

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	10791.6718750	16.19	0.0001
Error	60	13332.4375000		
Corrected Total	63	24124.1093750		
R-Square		C.V.	RESP Mean	
0.447340		66.76162	22.32812500	

Source	DF	Type I SS	F Value	Pr > F
TRT	3	10791.6718750	16.19	0.0001
Source	DF	Type III SS	F Value	Pr > F
TRT	3	10791.6718750	16.19	0.0001

4. ANALYSIS OF VE DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnett's T tests for variable: RESP

NOTE: This test controls the type I error rate for

comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 60 MSB= 222.2073
Critical Value of Dunnett's T= 2.10
Minimum Significant Difference= 12.701

Comparisons significant at the 0.05 level are indicated by '***'.

TRT	Comparison	Simultaneous		Simultaneous	
		Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	
B	- A	-10.201	2.500	15.201	
C	- A	-25.076	-12.375	0.326	
D	- A	-43.014	-30.312	-17.611	***

4. ANALYSIS OF VE DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESP

NOTE: This test controls the type I experimentwise error rate,
but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 60 MSB= 222.2073
Critical Value of T= 2.73
Minimum Significant Difference= 14.38

Means with the same letter are not significantly different.

Bon Grouping	Mean	N	TRT
A	34.875	16	B
A			
A	32.375	16	A
B			
B			
B	20.000	16	C
C	2.063	16	D

5. ANALYSIS OF LE DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

5. ANALYSIS OF LE DATA

14:30 Tuesday, August 9, 1994

Dependent Variable: RESP

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	9878.62500000	15.97	0.0001
Error	60	12369.37500000		
Corrected Total	63	22248.00000000		
R-Square		C.V.	RESP Mean	
0.444023		75.56917	19.00000000	

Source	DF	Type I SS	F Value	Pr > F
TRT	3	9878.62500000	15.97	0.0001
Source	DF	Type III SS	F Value	Pr > F
TRT	3	9878.62500000	15.97	0.0001

5. ANALYSIS OF LR DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 60 MSE= 206.1563
Critical Value of Dunnnett's T= 2.410
Minimum Significant Difference= 12.334

Comparisons significant at the 0.05 level are indicated by '***'.

TRT	Comparison	Simultaneous		
		Lower Limit	Difference Between Means	Upper Confidence Limit
B - A		-11.484	0.750	12.984
C - A		-26.296	-14.063	-1.829 ***
D - A		-41.921	-29.887	-17.454 ***

5. ANALYSIS OF LR DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESP

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 60 MSE= 206.1563
Critical Value of T= 2.73

Means with the same letter are not significantly different.

Bon Grouping	Mean	N	TRT
A	30.500	16	B
A	29.750	16	A
B	15.688	16	C
C	0.063	16	D

6. ANALYSIS OF NH DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

6. ANALYSIS OF NH DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESP

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	8290.54687500	15.63	0.0001
Error	60	10607.68750000		
Corrected Total	63	18898.23437500		

R-Square	C.V.	RESP Mean
0.438694	78.72071	16.89062500

Source	DF	Type I SS	F Value	Pr > F
TRT	3	8290.54687500	15.63	0.0001
Source	DF	Type III SS	F Value	Pr > F
TRT	3	8290.54687500	15.63	0.0001

6. ANALYSIS OF NH DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 60 MSE= 176.7948
Critical Value of Dunnnett's T= 2.410
Minimum Significant Difference= 11.329

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Limit	Difference Between Means	Upper Confidence Limit
B - A	-11.454	-0.125	11.204
C - A	-25.767	-14.438	-3.108 ***
D - A	-38.704	-27.375	-16.046 ***

6. ANALYSIS OF NH DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESP

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWO.

Alpha= 0.05 df= 60 MSE= 176.7948
Critical Value of T= 2.73
Minimum Significant Difference= 12.827

Means with the same letter are not significantly different.

Bon Grouping	Mean	N	TRT
A	27.375	16	A
A			
A	27.250	16	B
B	12.938	16	C
C	0.000	16	D

7. ANALYSIS OF HS DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure
Class Level Information

Class Levels Values

TRT 4 A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 63 observations can be used in this analysis.

7. ANALYSIS OF HS DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESP

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	7982.15357143	17.18	0.0001
Error	59	9137.27500000		
Corrected Total	62	17119.42857143		
		R-Square	C.V.	RESP Mean
		0.466263	75.74998	16.42857143

Source	DF	Type I SS	F Value	Pr > F
TRT	3	7982.15357143	17.18	0.0001
Source	DF	Type III SS	F Value	Pr > F
TRT	3	7982.15357143	17.18	0.0001

7. ANALYSIS OF HS DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 154.8691
Critical Value of Dunnnett's T= 2.408

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Limit	Difference Between Means	Upper Confidence Limit
B - A	-12.506	-1.738	9.031
C - A	-26.006	-15.238	-4.469 ***
D - A	-38.568	-27.800	-17.032 ***

7. ANALYSIS OF HS DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESP

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 154.8691
Critical Value of T= 2.73013

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit

A - B	-10.473	1.738	13.948
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A - C	3.027	15.238	27.448
-------	-------	--------	--------

A - D	15.589	27.800	40.011
-------	--------	--------	--------

B - A	-13.948	-1.738	10.473
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B - C	1.488	13.500	25.512
-------	-------	--------	--------

B - D	14.050	26.062	38.075
-------	--------	--------	--------

C - A	-27.448	-15.238	-3.027
-------	---------	---------	--------

C - B	-25.512	-13.500	-1.488
-------	---------	---------	--------

C - D	0.550	12.563	24.575
-------	-------	--------	--------

D - A	-40.011	-27.800	-15.589
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D - B	-38.075	-26.062	-14.050
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D - C	-24.575	-12.563	-0.550
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8. ANALYSIS OF EGG SHELL THICKNESS DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure
Class Level Information

Class	Levels	Values
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TRT	4	A B C D
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Number of observations in data set = 64

NOTE: Due to missing values, only 47 observations can be used in this analysis.

8. ANALYSIS OF EGG SHELL THICKNESS DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESP

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	0.03035395	15.71	0.0001
Error	43	0.02769396		
Corrected Total	46	0.05804791		

R-Square C.V.

0.522912 6.897008
RESP Mean
0.36795745

Source	DF	Type I SS	F Value	Pr > F
TRT	3	0.03035395	15.71	0.0001
Source	DF	Type III SS	F Value	Pr > F
TRT	3	0.03035395	15.71	0.0001

8. ANALYSIS OF EGG SHELL THICKNESS DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESP

NOTE: This test controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 43 MSE= 0.000644
Critical Value of Dunnnett's T= 2.442

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit

B - A	-0.01366	0.01000	0.03366
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C - A	-0.04005	-0.01475	0.01055
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D - A	-0.09615	-0.06668	-0.03721
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8. ANALYSIS OF EGG SHELL THICKNESS DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESP

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 43 MSE= 0.000644
Critical Value of T= 2.76584

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit

B - A	-0.01680	0.01000	0.03680
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B - C	-0.00205	0.02475	0.05155
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B - D	0.04487	0.07668	0.10849
-------	---------	---------	---------

Dependent Variable: RESP
 Source DF Sum of Squares F Value Pr > F
 Model 2 2.35525641 0.15 0.8619
 Error 39 307.84307692
 Corrected Total 41 310.19833333

R-Square C.V. RESP Mean
 0.007593 8.243095 34.08333333

Source DF Type I SS F Value Pr > F
 TRT 2 2.35525641 0.15 0.8619
 Source DF Type III SS F Value Pr > F
 TRT 2 2.35525641 0.15 0.8619

9. ANALYSIS OF HATCHLING WEIGHT DATA

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure
 Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 42 observations can be used in this analysis.

9. ANALYSIS OF HATCHLING WEIGHT DATA

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESP

Source DF Sum of Squares F Value Pr > F
 Model 2 2.35525641 0.15 0.8619
 Error 39 307.84307692
 Corrected Total 41 310.19833333

R-Square C.V. RESP Mean
 0.007593 8.243095 34.08333333

Source DF Type I SS F Value Pr > F
 TRT 2 2.35525641 0.15 0.8619
 Source DF Type III SS F Value Pr > F
 TRT 2 2.35525641 0.15 0.8619

9. ANALYSIS OF HATCHLING WEIGHT DATA

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnett's T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 39 MSE= 7.893412
 Critical Value of Dunnett's T= 2.292

Comparisons significant at the 0.05 level are indicated by '****'.

TRT Comparison	Simultaneous		Difference Between Means		Simultaneous	
	Lower Confidence Limit	Upper Confidence Limit	Lower Confidence Limit	Upper Confidence Limit		
C - A	-2.318	0.208	0.208	2.733		
B - A	-2.758	-0.354	-0.354	2.050		

9. ANALYSIS OF HATCHLING WEIGHT DATA

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESP

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 39 MSE= 7.893412
 Critical Value of T= 2.50166

Comparisons significant at the 0.05 level are indicated by '****'.

TRT Comparison	Simultaneous		Difference Between Means		Simultaneous	
	Lower Confidence Limit	Upper Confidence Limit	Lower Confidence Limit	Upper Confidence Limit		
C - A	-2.549	0.208	0.208	2.964		
C - B	-2.063	0.562	0.562	3.186		
A - C	-2.964	-0.208	-0.208	2.549		
A - B	-2.271	0.354	0.354	2.978		
B - C	-3.186	-0.562	-0.562	2.063		
B - A	-2.978	-0.354	-0.354	2.271		

10. ANALYSIS OF 14-DAY SURVIVOR WEIGHT DATA

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure
 Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 42 observations can be used in this analysis.

10. ANALYSIS OF 14-DAY SURVIVOR WEIGHT DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESP

Source	DF	Sum of Squares	F Value	Pr > F
Model	2	9317.36423306	7.09	0.0024
Error	39	25624.34552885		
Corrected Total	41	34941.70976190		
R-Square		C.V.		RESP Mean
	0.266655	9.220311		278.00238095

Source	DF	Type I SS	F Value	Pr > F
TRT	2	9317.36423306	7.09	0.0024
Source	DF	Type III SS	F Value	Pr > F
TRT	2	9317.36423306	7.09	0.0024

10. ANALYSIS OF 14-DAY SURVIVOR WEIGHT DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnett's T tests for variable: RESP

NOTE: This test controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 39 MSE= 657.0345
Critical Value of Dunnett's T= 2.292

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
C - A	0.053	23.092	46.131 ***
B - A	-34.692	-12.759	9.173

10. ANALYSIS OF 14-DAY SURVIVOR WEIGHT DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESP

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 39 MSE= 657.0345
Critical Value of T= 2.50166

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
C - A	-2.059	23.092	48.244
C - B	11.303	35.841	59.795 ***
A - C	-48.244	-23.092	2.059
A - B	-11.184	12.759	36.703
B - C	-59.795	-35.851	-11.908 ***
B - A	-36.703	-12.759	11.184

12. ANALYSIS OF ES/EL DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 53 observations can be used in this analysis.

12. ANALYSIS OF ES/EL DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESPONSE
Weight:

Source	Model	DF	Sum of Squares	F Value	Pr > F
		3	12396.8255482	3.65	0.0187
Error		49	55433.5613452		
Corrected Total		52	67830.3868934		
R-Square			C.V.		RESPONSE Mean
		0.182762	48.15659		69.84456233

Source	DF	Type I SS	F Value	Pr > F
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TRT		3	12396.8255482	3.65	0.0187
Source	DF	Type III SS	F Value	Pr > F	
TRT	3	12396.8255482	3.65	0.0187	

12. ANALYSIS OF ES/EL DATA

46

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESPONSE

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 49 MSE= 1131.297
Critical Value of Dunnnett's T= 2.425

Comparisons significant at the 0.05 level are indicated by '****'.

TRT Comparison	Simultaneous			Simultaneous		
	Lower Limit	Difference Between Means	Confidence Limit	Upper Limit	Confidence Limit	
B - A	-31.600	-1.148		29.303		
C - A	-33.280	-1.868		29.544		
D - A	-43.670	-9.366		24.937		

12. ANALYSIS OF ES/EL DATA

47

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 49 MSE= 1131.297
Critical Value of T= 2.74961

Comparisons significant at the 0.05 level are indicated by '****'.

TRT Comparison	Simultaneous			Simultaneous		
	Lower Limit	Difference Between Means	Confidence Limit	Upper Limit	Confidence Limit	
A - B	-33.384	1.148		35.681		
A - C	-33.753	1.868		37.489		
A - D	-29.534	9.366		48.266		
B - A	-35.681	-1.148		33.384		
B - C	-33.126	0.720		34.565		
B - D	-29.063	8.218		45.498		
C - A	-37.489	-1.868		33.753		
C - B	-34.565	-0.720		33.126		

C - D	-30.794	7.498	45.789
D - A	-48.266	-9.366	29.534
D - B	-45.498	-8.218	29.063
D - C	-45.789	-7.498	30.794

13. ANALYSIS OF VE/ES DATA

48

14:30 Tuesday, August 9, 1994

General Linear Models Procedure Class Level Information

Class Levels Values

TRT 4 A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 53 observations can be used in this analysis.

13. ANALYSIS OF VE/ES DATA

49

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESPONSE

Weight:

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	277121.660350	30.02	0.0001
Error	49	150792.042189		
Corrected Total	52	427913.702539		
R-Square		C.V.	RESPONSE Mean	
0.647611		82.46138	67.27296644	

Source	DF	Type I SS	F Value	Pr > F
TRT	3	277121.660350	30.02	0.0001
Source	DF	Type III SS	F Value	Pr > F
TRT	3	277121.660350	30.02	0.0001

13. ANALYSIS OF VE/ES DATA

50

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESPONSE

NOTE: This tests controls the type I experimentwise error for

Alpha= 0.05 Confidence= 0.95 df= 49 MSE= 3077.389
 Critical Value of Dunnett's T= 2.425

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
B - A	-49.49	0.73	50.95
C - A	-65.49	-13.68	38.13
D - A	-101.72	-45.14	11.43

13 ANALYSIS OF VE/ES DATA

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error rate
 but generally has a higher type II error rate than
 Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 49 MSE= 3077.389
 Critical Value of T= 2.74961

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
B - A	-56.23	0.73	57.68
B - C	-41.41	14.41	70.23
B - D	-15.61	45.87	107.36
A - B	-57.68	-0.73	56.23
A - C	-45.07	13.68	72.43
A - D	-19.01	45.14	109.30
C - B	-70.23	-14.41	41.41
C - A	-72.43	-13.68	45.07
C - D	-31.69	31.46	94.62
D - B	-107.36	-45.87	15.61
D - A	-109.30	-45.14	19.01
D - C	-94.62	-31.46	31.69

14. ANALYSIS OF LB/VE DATA

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 52 observations can be used in
 this analysis.

14. ANALYSIS OF LE/VE DATA

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESPONSE

Weight:

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	186598.923818	9.42	0.0001
Error	48	316859.847338		
Corrected Total	51	503458.771155		

R-Square	C.V.	RESPONSE Mean
0.370634	113.8604	71.35761218

Source	DF	Type I SS	F Value	Pr > F
TRT	3	186598.923818	9.42	0.0001
Source	DF	Type III SS	F Value	Pr > F
TRT	3	186598.923818	9.42	0.0001

14. ANALYSIS OF LB/VE DATA

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnett's T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error for
 comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 48 MSE= 6601.247
 Critical Value of Dunnett's T= 2.429

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
B - A	-77.71	-4.03	69.65
C - A	-88.61	-12.61	63.39
D - A	-159.39	-73.82	11.74

14. ANALYSIS OF LB/VE DATA

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 48 MSB= 6601.247
 Critical Value of T= 2.75202

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
A - B	-79.46	4.03	87.52
A - C	-73.51	12.61	98.73
A - D	-23.13	73.82	170.78
B - A	-87.52	-4.03	79.46
B - C	-73.24	8.58	90.41
B - D	-23.37	69.80	162.96
C - A	-98.73	-12.61	73.51
C - B	-34.32	8.58	73.24
C - D	-170.78	-73.82	23.13
D - A	-162.96	-69.80	23.37
D - B	-156.74	-61.21	34.32

15. ANALYSIS OF NH/LE DATA
 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Class Level Information

Class Levels	Values
TRT	4 A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 43 observations can be used in this analysis.

15. ANALYSIS OF NH/LE DATA
 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESPONSE
 Weight: WT

Source	DF	Sum of Squares	F Value	Pr > F
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Error	39	117593.2833528
Corrected Total	42	140178.9782024

R-Square	C.V.	RESPONSE Mean
0.161120	75.12594	73.09186698

Source	DF	Type I SS	F Value	Pr > F
TRT	3	22585.6948496	2.50	0.0739
Source	DF	Type III SS	F Value	Pr > F
TRT	3	22585.6948496	2.50	0.0739

15. ANALYSIS OF NH/LE DATA
 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnett's T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 39 MSB= 3015.212
 Critical Value of Dunnett's T= 2.486

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
B - A	-53.87	-2.91	48.05
C - A	-63.74	-10.21	43.32
D - A	-218.06	-76.43	65.21

15. ANALYSIS OF NH/LE DATA
 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 39 MSB= 3015.212
 Critical Value of T= 2.77957

Comparisons significant at the 0.05 level are indicated by '***'.

TRT	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit

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16. ANALYSIS OF NH/EL DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESPONSE

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 49 MSR= 5980.668
Critical Value of Dunnnett's T= 2.425

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		Difference Between Means	Simultaneous	
	Lower Confidence Limit	Upper Confidence Limit		Lower Confidence Limit	Upper Confidence Limit
B - A	-74.11	-4.10			65.92
C - A	-89.96	-17.74			54.49
D - A	-135.43	-56.56			22.31

16. ANALYSIS OF NH/EL DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 49 MSE= 5980.668
Critical Value of T= 2.74961

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		Difference Between Means	Simultaneous	
	Lower Confidence Limit	Upper Confidence Limit		Lower Confidence Limit	Upper Confidence Limit
A - B	-75.30	4.10			83.50
A - C	-64.16	17.74			99.64
A - D	-32.88	56.56			146.00
B - A	-83.50	-4.10			75.30
B - C	-64.16	13.64			91.46
B - D	-33.25	52.46			138.18
C - A	-99.64	-17.74			64.16
C - B	-91.46	-13.64			64.18
C - D	-49.22	38.82			126.87
D - A	-146.00	-56.56			32.88
D - B	-138.18	-52.46			33.25
D - C	-126.87	-38.82			49.22

Comparison	Limit	Means	Limit
A - B	-54.08	2.91	59.90
A - C	-49.66	10.21	70.07
A - D	-81.96	76.43	234.82
B - A	-59.90	-2.91	54.08
B - C	-49.69	7.30	64.29
B - D	-83.81	73.52	230.85
C - A	-70.07	-10.21	49.66
C - B	-64.29	-7.30	49.69
C - D	-92.17	66.22	224.61
D - A	-234.82	-76.43	81.96
D - B	-230.85	-73.52	83.81
D - C	-224.61	-66.22	92.17

16. ANALYSIS OF NH/EL DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 53 observations can be used in this analysis.

16. ANALYSIS OF NH/EL DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESPONSE
WT

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	497556.552860	27.73	0.0001
Error	49	293052.721009		
Corrected Total	52	790609.273869		

R-Square
0.629223
C.V.
169.0825
RESPONSE Mean
45.73790367

Source	DF	Type I SS	F Value	Pr > F
TRT	3	497556.552860	27.73	0.0001
Source	DF	Type III SS	F Value	Pr > F
TRT	3	497556.552860	27.73	0.0001

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17. ANALYSIS OF HS/NH DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 42 observations can be used in this analysis.

17. ANALYSIS OF HS/NH DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESPONSE

Weight:

Source	DF	Sum of Squares	F Value	Pr > F
Model	2	1868.86151157	0.44	0.6489
Error	39	83345.95845918		
Corrected Total	41	85214.81997075		
R-Square		C.V.	RESPONSE Mean	
	0.021931	56.60373	81.67043749	

Source	DF	Type I SS	F Value	Pr > F
TRT	2	1868.86151157	0.44	0.6489
Error	39	83345.95845918		
TRT	2	1868.86151157	0.44	0.6489

17. ANALYSIS OF HS/NH DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESPONSE

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 39 MSE= 2137.076
Critical Value of Dunnnett's T= 2.292

Comparisons significant at the 0.05 level are indicated by '***'.

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TRT	Comparison	Simultaneous		Difference Between Means	Upper Confidence Limit
		Lower Limit	Upper Limit		
C	- A	-37.990	3.560		45.111
B	- A	-37.835	1.721		41.276

17. ANALYSIS OF HS/NH DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 39 MSE= 2137.076
Critical Value of T= 2.50166

Comparisons significant at the 0.05 level are indicated by '***'.

TRT	Comparison	Simultaneous		Difference Between Means	Upper Confidence Limit
		Lower Limit	Upper Limit		
C	- B	-41.342	1.840		45.022
C	- A	-41.800	3.560		48.921
B	- C	-45.022	-1.840		41.342
B	- A	-41.462	1.721		44.903
A	- C	-48.921	-3.560		41.800
A	- B	-44.903	-1.721		41.462

18. ANALYSIS OF EC/SL DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 53 observations can be used in this analysis.

18. ANALYSIS OF EC/SL DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure
Dependent Variable: RESPONSE

Weight:

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	35827.3838251	5.83	0.0017
Error	49	100319.1663309		
Corrected Total	52	136146.5501560		
R-Square C.V. RESPONSE Mean				
	0.263153	419.4413		10.78754872
Source	DF	Type I SS	F Value	Pr > F
TRT	3	35827.3838251	5.83	0.0017
Source	DF	Type III SS	F Value	Pr > F
TRT	3	35827.3838251	5.83	0.0017

18. ANALYSIS OF EC/EL DATA

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14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 49 MSE= 2047.33
Critical Value of Dunnnett's T= 2.425

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
D - A	-30.11	16.03	62.18
C - A	-38.73	3.53	45.78
B - A	-38.43	2.53	43.50

18. ANALYSIS OF EC/EL DATA

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14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 49 MSE= 2047.33
Critical Value of T= 2.74961

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		Simultaneous	
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	
D - C	-39.00	12.51	64.02	
D - B	-36.65	13.50	63.65	
D - A	-36.30	16.03	68.36	
C - D	-64.02	-12.51	39.00	
C - B	-44.54	0.99	46.52	
C - A	-44.39	3.53	51.45	
B - D	-63.65	-13.50	36.65	
B - C	-46.52	-0.99	44.54	
B - A	-43.92	2.53	48.99	
A - D	-68.36	-16.03	36.30	
A - C	-51.45	-3.53	44.39	
A - B	-48.99	-2.53	43.92	

19. ANALYSIS OF NH/BS DATA

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14:30 Tuesday, August 9, 1994General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 53 observations can be used in this analysis.

19. ANALYSIS OF NH/BS DATA

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14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESPONSE

Weight:

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	485437.073479	24.07	0.0001
Error	49	329365.419835		
Corrected Total	52	814803.493314		
R-Square C.V. RESPONSE Mean				
	0.595772	159.5340		51.39115882

Source	DF	Type I SS	F Value	Pr > F
TRT	3	485437.073479	24.07	0.0001

Source	DF	Type III SS	F Value	Pr > F
D	3	485437.073479	24.07	0.0001

19. ANALYSIS OF NH/RS DATA

74

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESPONSE

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 49 MSE= 6721.764
Critical Value of Dunnnett's T= 2.425

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous			Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
B - A	-77.73	-3.50	70.73	-77.73	-3.50	70.73
C - A	-96.23	-19.66	56.91	-96.23	-19.66	56.91
D - A	-145.88	-62.27	21.35	-145.88	-62.27	21.35

19. ANALYSIS OF NH/RS DATA

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14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 49 MSE= 6721.764
Critical Value of T= 2.74961

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous			Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
A - B	-80.67	3.50	87.68	-80.67	3.50	87.68
A - C	-67.17	19.66	106.49	-67.17	19.66	106.49
A - D	-32.55	62.27	157.09	-32.55	62.27	157.09
B - A	-87.68	-3.50	80.67	-87.68	-3.50	80.67
B - C	-66.34	16.16	98.65	-66.34	16.16	98.65
B - D	-32.11	58.76	149.64	-32.11	58.76	149.64
C - A	-106.49	-19.66	67.17	-106.49	-19.66	67.17
C - B	-98.65	-16.16	66.34	-98.65	-16.16	66.34
C - D	-50.73	42.61	135.95	-50.73	42.61	135.95
D - A	-157.09	-62.27	32.55	-157.09	-62.27	32.55

Source	DF	Type III SS	F Value	Pr > F
D	3	485437.073479	24.07	0.0001

20. ANALYSIS OF HS/RS DATA

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14:30 Tuesday, August 9, 1994

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 53 observations can be used in this analysis.

20. ANALYSIS OF HS/RS DATA

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14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESPONSE

Weight: WT

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	438940.545433	22.94	0.0001
Error	49	312544.620151		
Corrected Total	52	751485.165584		

R-Square	C.V.	RESPONSE Mean
0.584097	161.3882	49.48644329

Source	DF	Type I SS	F Value	Pr > F
TRT	3	438940.545433	22.94	0.0001

20. ANALYSIS OF HS/RS DATA

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14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnnett's T tests for variable: RESPONSE

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 49 MSE= 6378.462

Critical Value of Dunnett's T= 2.425

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous			Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
B - A	-75.57	-3.26	69.04			
C - A	-92.43	-17.84	56.74			
D - A	-141.08	-59.62	21.83			

20. ANALYSIS OF HS/ES DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 49 MSR= 6378.462
Critical Value of T= 2.74961

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous			Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
A - B	-78.73	3.26	85.26			
A - C	-66.74	17.84	102.42			
A - D	-32.74	59.62	151.99			
B - A	-85.26	-3.26	78.73			
B - C	-65.79	14.58	94.94			
B - D	-32.16	56.36	144.88			
C - A	-102.42	-17.84	66.74			
C - B	-94.94	-14.58	65.79			
C - D	-49.14	41.78	132.70			
D - A	-151.99	-59.62	32.74			
D - B	-144.88	-56.36	32.16			
D - C	-132.70	-41.78	49.14			

21. ANALYSIS OF LE/ES DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Class Level Information

Class Levels Values

TRT 4 A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 53 observations can be used in this analysis.

21. ANALYSIS OF LE/ES DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: RESPONSE

Weight:

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	535619.419479	28.20	0.0001
Error	49	310213.203691		
Corrected Total	52	845832.623170		

R-Square C.V. RESPONSE Mean

0.633245 139.6373 56.98107071

Source	DF	Type I SS	F Value	Pr > F
TRT	3	535619.419479	28.20	0.0001
Source	DF	Type III SS	F Value	Pr > F
TRT	3	535619.419479	28.20	0.0001

21. ANALYSIS OF LE/ES DATA

14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnett's T tests for variable: RESPONSE

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 49 MSR= 6330.882
Critical Value of Dunnett's T= 2.425

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous			Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
B - A	-74.42	-2.39	69.65			
C - A	-92.34	-18.03	56.28			
D - A	-147.03	-65.88	15.26			

21. ANALYSIS OF LE/ES DATA

14:30 Tuesday, August 9, 1994

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Bonferroni (Dunn) T tests for variable: RESPONSE

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 49 MSB= 6330.882
Critical Value of T= 2.74961

Comparisons significant at the 0.05 level are indicated by '***'.

TRT	Comparison	Simultaneous		
		Lower Limit	Difference Between Means	Upper Confidence Limit
A	- B	-79.30	2.39	84.08
	- C	-66.23	18.03	102.30
	- D	-26.14	65.88	157.91
B	- A	-84.08	-2.39	79.30
	- C	-64.42	15.65	95.71
	- D	-24.70	63.50	151.69
C	- A	-102.30	-18.03	66.23
	- B	-95.71	-15.65	64.42
	- D	-42.73	47.85	138.43
D	- A	-157.91	-65.88	26.14
	- B	-151.69	-63.50	24.70
	- C	-138.43	-47.85	42.73

22. COVARIATE ANALYSIS OF MALE BODY WEIGHT DATA

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

22. COVARIATE ANALYSIS OF MALE BODY WEIGHT DATA

General Linear Models Procedure

Dependent Variable: POSTM

Source	DF	Sum of Squares	F Value	Pr > F
Model	4	204049.132150	2.78	0.0349
Error	59	1083359.602225		
Corrected Total	63	1287408.734375		

R-Square C.V. POSTM Mean

0.158496 10.74290 1261.3593750

Source	DF	Type I SS	F Value	Pr > F
TRT	3	55823.421875	1.01	0.3933
PREM	1	148225.710275	8.07	0.0062

Source	DF	Type III SS	F Value	Pr > F
TRT	3	35616.230778	0.65	0.5882
PREM	1	148225.710275	8.07	0.0062

Parameter	Estimate	Parameter=0	T for H0: Pr > T	Std Error of Estimate
INTERCEPT	689.0952311	B	3.30	0.0017
TRT	-15.5405017	B	-0.32	0.7471
	34.2146390	B	0.71	0.4793
	-29.3392544	B	-0.60	0.5504
	0.0000000	B		
PREM	0.4882831		2.84	0.0062
				0.17185818

NOTE: The X'X matrix has been found to be singular and a generalized inverse was used to solve the normal equations. Estimates followed by the letter 'B' are biased, and are not unique estimators of the parameters.

22. COVARIATE ANALYSIS OF MALE BODY WEIGHT DATA

General Linear Models Procedure
Least Squares Means
Coefficients for the Least Square Means

Effect	Coefficients	A	B	C
INTERCEPT	1	1	1	1
TRT	A	1	0	0
	B	0	1	0
	C	0	0	1
	D	0	0	0
PREM		1177.453125	1177.453125	1177.453125
TRT	D			
Effect	Coefficients			
INTERCEPT	1	1	1	1
TRT	A	1	0	0
	B	0	1	0
	C	0	0	1
	D	0	0	0
PREM		1177.453125	1177.453125	1177.453125

22. COVARIATE ANALYSIS OF MALE BODY WEIGHT DATA 87

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure
 Least Squares Means

TRT	POSTM LSMEAN	Std Err LSMEAN	Pr > T HO:LSMEAN=0	LSMEAN Number
A	1248.48515	33.90988	0.0001	1
B	1298.24029	33.87724	0.0001	2
C	1234.68640	34.34145	0.0001	3
D	1264.02565	34.10367	0.0001	4

Pr > |T| HO: LSMEAN(i)=LSMEAN(j)

i/j	1	2	3	4
1		0.3034	0.7767	0.7471
2	0.3034		0.1930	0.4793
3	0.7767	0.1930		0.5504
4	0.7471	0.4793	0.5504	

NOTE: To ensure overall protection level, only probabilities associated with pre-planned comparisons should be used.

22. COVARIATE ANALYSIS OF MALE BODY WEIGHT DATA 88

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dunnett's T tests for variable: POSTM

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 59 MSB= 18362.03
 Critical Value of Dunnett's T= 2.411
 Minimum Significant Differences= 115.51

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		Simultaneous	
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	
B - A	-69.45	46.06	161.57	
D - A	-93.07	22.44	137.95	
C - A	-149.57	-34.06	81.45	

22. COVARIATE ANALYSIS OF MALE BODY WEIGHT DATA 89

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: POSTM

NOTE: This test controls the type I experimentwise error rate, but generally has a higher type II error rate than REGWQ.

Alpha= 0.05 df= 59 MSB= 18362.03
 Critical Value of T= 2.73
 Minimum Significant Differences= 130.8

Means with the same letter are not significantly different.

Bon Grouping	Mean	N	TRT
A	1298.81	16	B 3
A	1275.19	16	D 90
A	1252.75	16	A C
A	1218.69	16	C 30

23. COVARIATE ANALYSIS OF FEMALE BODY WEIGHT DATA 90

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure
 Class Level Information

Class	Levels	Values
TRT	4	A B C D

Number of observations in data set = 64

NOTE: Due to missing values, only 63 observations can be used in this analysis.

23. COVARIATE ANALYSIS OF FEMALE BODY WEIGHT DATA 91

 14:30 Tuesday, August 9, 1994

General Linear Models Procedure

Dependent Variable: POSTF

Source	DF	Sum of Squares	F Value	Pr > F
Model	4	158506.155164	1.98	0.1089
Error	58	1158317.559121		
Corrected Total	62	1316823.714286		
R-Square		C.V.	POSTF Mean	
0.120370		11.91367	1186.1904762	

Source	DF	Type I SS	F Value	Pr > F
TRT	3	5556.043452	0.09	0.9638
PREF	1	152950.111712	7.66	0.0076

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TRT	DF	Type III SS	F Value	Pr > F
3	2	2175.312551	0.04	0.9906
1	1	152950.111712	7.66	0.0076

Parameter	Estimate	T for H0: Parameter=0	Pr > T	Std Error of Estimate
INTERCEPT	573.6472322	B	2.52	0.0145
TRT	5.0445025	B	0.10	0.9215
	9.2289106	B	0.18	0.8571
	-6.4089725	B	-0.13	0.9009
	0.0000000	B		
PRBF	0.5983510		2.77	0.0076

NOTE: The X'X matrix has been found to be singular and a generalized inverse was used to solve the normal equations. Estimates followed by the letter 'B' are biased, and are not unique estimators of the parameters.

23. COVARIATE ANALYSIS OF FEMALE BODY WEIGHT DATA

General Linear Models Procedure
Least Squares Means
Coefficients for TRT Least Square Means

TRT	A	B	C
INTERCEPT	1	1	1
TRT	1	0	0
	0	1	0
	0	0	1
	0	0	0

Parameter	Estimate	Standard Error	DF	Pr > T	Pr > F
INTERCEPT	1009.3809524	1009.3809524	1009.3809524	1009.3809524	1009.3809524
TRT					

TRT	A	B	C
INTERCEPT	1	1	1
TRT	0	0	0
	0	1	0
	0	0	1
	0	0	0

General Linear Models Procedure
Least Squares Means

23. COVARIATE ANALYSIS OF FEMALE BODY WEIGHT DATA

General Linear Models Procedure
Least Squares Means

TRT	POSTF	LSMEAN	Std Err	Pr > T	LSMEAN	Number
A	1189.23765	35.33252	0.0001	0.0001	1	
B	1193.42207	35.33998	0.0001	0.0001	2	
C	1177.78419	35.42101	0.0001	0.0001	3	
D	1184.19316	36.71772	0.0001	0.0001	4	

Pr > |T| H0: LSMEAN(i) = LSMEAN(j)

i/j	1	2	3	4
1		0.9335	0.8196	0.9215
2	0.9335		0.7556	0.8571
3	0.8196	0.7556		0.9009
4	0.9215	0.8571	0.9009	

NOTE: To ensure overall protection level, only probabilities associated with pre-planned comparisons should be used.

23. COVARIATE ANALYSIS OF FEMALE BODY WEIGHT DATA

General Linear Models Procedure

Dunnett's T tests for variable: POSTF

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 58 MSB= 19970.99
Critical Value of Dunnett's T= 2.413

Comparisons significant at the 0.05 level are indicated by '***'.

TRT	Simultaneous	Simultaneous	Simultaneous	Simultaneous
D	-113.03	7.53	130.09	
B	-117.50	3.06	123.63	
C	-137.82	-17.25	103.32	

23. COVARIATE ANALYSIS OF FEMALE BODY WEIGHT DATA

General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: POSTF

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 58 MSB= 19970.99
Critical Value of T= 2.73177

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		Difference Between Means	Simultaneous	
	Lower Confidence Limit	Upper Confidence Limit		Lower Confidence Limit	Upper Confidence Limit
D - B	-134.27	4.47		143.22	
D - A	-131.21	7.53		146.28	
D - C	-113.96	24.78		163.53	
B - D	-143.22	-4.47		134.27	
B - A	-133.43	3.06		139.55	
B - C	-116.18	20.31		156.80	
A - D	-146.28	-7.53		131.21	
A - B	-139.55	-3.06		133.43	
A - C	-119.24	17.25		153.74	
C - D	-163.53	-24.78		113.96	
C - B	-156.80	-20.31		116.18	
C - A	-153.74	-17.25		119.24	

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OBS	TRT	RESP
1	a	25.38
2	a	43.94
3	a	4.16
4	a	16.21
5	a	1.12
6	a	2.90
7	a	12.33
8	a	31.02
9	a	29.43
10	a	13.36
11	a	14.88
12	a	18.26
13	a	43.24
14	a	7.80
15	a	55.48
16	a	26.15
17	b	41.38
18	b	23.67
19	b	18.13
20	b	1.03
21	b	29.24
22	b	6.75
23	b	20.98
24	b	27.75
25	b	6.87
26	b	23.57
27	b	34.58
28	b	29.21
29	b	25.72
30	b	32.71
31	b	29.71
32	b	37.44
33	c	7.06
34	c	17.05
35	c	0.30
36	c	8.76
37	c	31.55
38	c	9.62
39	c	29.38
40	c	1.31
41	c	0.90
42	c	3.46
43	c	0.62
44	c	23.54
45	c	27.60
46	c	13.21
47	c	3.40
48	c	1.69
49	d	33.44
50	d	32.06
51	d	10.40
52	d	26.90
53	d	1.76
54	d	22.15
55	d	22.06
56	d	39.71
57	d	0.65
58	d	37.23
59	d	5.21
60	d	30.13
61	d	27.38
62	d	22.29
63	d	14.89

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General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	4	a b c d

Number of observations in data set = 64

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General Linear Models Procedure

Dependent Variable: RESP

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	1614.64805469	3.28	0.0269
Error	60	9842.94074375		
Corrected Total	63	11457.58879844		

R-Square	C.V.	RESP Mean
0.140924	64.96607	19.71515625

Source	DF	Type I SS	F Value	Pr > F
TRT	3	1614.64805469	3.28	0.0269
Source	DF	Type III SS	F Value	Pr > F
TRT	3	1614.64805469	3.28	0.0269

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General Linear Models Procedure

Duncan's Multiple Range Test for variable: RESP

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 60 MSE= 164.049

Number of Means 2 3 4
Critical Range 9.064 9.531 9.838

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	TRT
A	24.296	16	b
A			

21.745 16 d
 A A
 21.604 16 a
 A
 11.216 16 c
 B

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General Linear Models Procedure

Dunnnett's T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 60 MSB= 164.049
 Critical Value of Dunnnett's T= 2.410
 Minimum Significant Difference= 10.913

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
b - a	-8.221	2.692	13.606
d - a	-10.772	0.141	11.054
c - a	-21.301	-10.388	0.525

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General Linear Models Procedure

Dunnnett's One-tailed T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 60 MSB= 164.049
 Critical Value of Dunnnett's T= 2.104
 Minimum Significant Difference= 9.5273

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
b - a	-6.835	2.692	12.220
d - a	-9.386	0.141	9.669
c - a	-19.915	-10.388	-0.861 ***

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General Linear Models Procedure

Dunnnett's One-tailed T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 60 MSB= 164.049
 Critical Value of Dunnnett's T= 2.104
 Minimum Significant Difference= 9.5273

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
b - a	-6.835	2.692	12.220
d - a	-9.386	0.141	9.669
c - a	-19.915	-10.388	-0.861

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RESP

TRT

OBS

1	a	3.17
2	a	0.73
3	a	0.77
4	a	1.20
5	a	0.71
6	a	0.42
7	a	0.88
8	a	43.46
9	a	0.78
10	a	57.50
11	a	0.86
12	a	0.53
13	a	45.95
14	a	0.99
15	a	43.88
16	a	46.22
17	b	75.56
18	b	48.09
19	b	0.51
20	b	1.43
21	b	48.54
22	b	1.05
23	b	37.47
24	b	39.73
25	b	42.65
26	b	1.92
27	b	45.47
28	b	4.18
29	b	37.86
30	b	0.60
31	b	50.13
32	b	32.66
33	c	0.93
34	c	0.85
35	c	2.38
36	c	0.75
37	c	0.35
38	c	0.93
39	c	100.51
40	c	53.58
41	c	26.76
42	c	0.60
43	c	0.51
44	c	52.32
45	c	40.63
46	c	43.44
47	c	0.62
48	c	1.11
49	d	12.81
50	d	3.28
51	d	1.62
52	d	67.38
53	d	
54	d	59.48
55	d	3.81
56	d	0.61
57	d	1.91
58	d	1.54
59	d	2.77
60	d	4.02
61	d	305.11
62	d	6.52
63	d	5.35

64 d 49.90

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General Linear Models Procedure
Class Level Information

Class Levels Values

TRT 4 a b c d

Number of observations in data set = 64

NOTE: Due to missing values, only 63 observations can be used in this analysis.

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General Linear Models Procedure

Dependent Variable: RESP

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	3592.09895875	0.61	0.6083
Error	59	114966.97384125		
Corrected Total	62	118559.07280000		

R-Square	C.V.	RESP Mean
0.030298	177.3281	24.89333333

Source	DF	Type I SS	F Value	Pr > F
TRT	3	3592.09895875	0.61	0.6083
Source	DF	Type III SS	F Value	Pr > F
TRT	3	3592.09895875	0.61	0.6083

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General Linear Models Procedure

Duncan's Multiple Range Test for variable: RESP

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 59 MSE= 1948.593
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377

Number of Means 2 3 4
Critical Range 31.51 33.13 34.20

Means with the same letter are not significantly different.

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Duncan Grouping	Mean	N	TRT
A	35.07	15	d
A	29.24	16	b
A	20.39	16	c
A	15.50	16	a

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General Linear Models Procedure

Dunnnett's T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 1948.593
Critical Value of Dunnnett's T= 2.412

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		Simultaneous	
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	
d - a	-18.70	19.57	57.84	
b - a	-23.91	13.74	51.38	
c - a	-32.75	4.89	42.53	

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General Linear Models Procedure

Dunnnett's One-tailed T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 1948.593
Critical Value of Dunnnett's T= 2.106

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		Simultaneous	
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	
d - a	-13.84	19.57	52.98	
b - a	-19.13	13.74	46.61	
c - a	-27.98	4.89	37.76	

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General Linear Models Procedure

Dunnnett's One-tailed T tests for variable: RESP

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 1948.593
Critical Value of Dunnnett's T= 2.106

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous		Simultaneous	
	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	
d - a	-13.84	19.57	52.98	
b - a	-19.13	13.74	46.61	
c - a	-27.98	4.89	37.76	

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