12-2-93

MRID No. 419633-05

DATA EVALUATION RECORD

1. **CHEMICAL:** Acetochlor. Shaughnessey No. 121601.

2. **TEST MATERIAL:** Acetochlor; ICIA 5676; 2-chloro-N-(ethoxymethyl)-N-(2-ethyl-6-methylphenyl) acetamide; $C_{14}H_{20}NO_2Cl$; Ref A1016/9; 90.1% purity; a dark amber liquid.

3. **STUDY TYPE:** Avian Reproduction Study. Species Tested: Bobwhite quail (*Colinus virginianus*).

4. **CITATION:** Beavers, J.B., P. Winter, G.J. Smith, and M. Jaber. 1991. Acetochlor: A One-Generation Reproduction Study with the Northern Bobwhite (*Colinus virginianus*). Laboratory Project No. 123-157. Prepared by Wildlife International Ltd., Easton, MD. Submitted by ICI Agrochemicals, Surrey, UK. MRID No. 419633-05.

5. **REVIEWED BY:**

Michael L. Whitten, M.S.
Wildlife Toxicologist
KBN Engineering and
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Signature: Michael L. Whitten
Date: 11/27/91

6. **APPROVED BY:**

Pim Kosalwat, Ph.D.
Senior Toxicologist
KBN Engineering and
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Signature: P. Kosalwat
Date: 11/27/91

Henry T. Craven, M.S.
Supervisor, EEB/EFED
USEPA

Signature: William Kabert 11/5/93
Date: H. T. Craven 12/2/93

7. **CONCLUSIONS:** Nominal dietary concentrations of acetochlor at 150 ppm a.i. and 300 ppm a.i. had no effects upon behavior, food consumption, or reproduction in adult bobwhite quail during the 20-week exposure period. The NOEC was 300 ppm a.i., based upon reduced embryo viability, hatchability, offspring body weight and offspring survivability at 600 ppm a.i. This study is scientifically sound and fulfills the guideline requirements for an avian reproduction study.

8. **RECOMMENDATIONS:** N/A.

9. **BACKGROUND:**

10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A.

11. **MATERIALS AND METHODS:**

A. **Test Animals:** The birds used in the test were pen-reared, unmated bobwhite quail (*Colinus virginianus*) obtained from Fritt's Quail Farm, Phillipsburg, New Jersey. The birds were acclimated to the facilities for 10 weeks prior to initiation of the test. At test initiation, all birds were examined for physical injuries and general health. The birds were 25 weeks of age at test initiation.

B. **Dose/Diet Preparation/Food Consumption:** Test diets were prepared by mixing acetochlor into a pre-mix which was used for weekly preparation of the final diet. The control diet and three test concentrations (150, 300, and 600 ppm) were prepared weekly and presented to the birds on Wednesday of each week. When necessary, additional feed was prepared. Each of the four groups of adult birds was fed the appropriate diet from test initiation until terminal sacrifice. Dietary concentrations were not adjusted for purity of the test substance, and are presented as ppm of the test substance as received. The control diet contained an amount of the solvent (acetone) and carrier (corn oil) equal to that in the treated diets.

Basal diet for adult birds and their offspring was formulated by Agway, Inc. The composition of the diet was presented in the report. The test substance was not mixed into the diet of the offspring. Food and water were supplied *ad libitum* during acclimation and during the test. Six samples from each treatment concentration were collected on day 0 of week 1 to determine the homogeneity of the test material in the diet and verify the initial concentrations of the test substance. Verification samples were also taken on day 0 of weeks 2, 3, 4, 8, 12, 16, and 20. Three samples from each concentration were collected on day 7 of week 1 to evaluate the stability of the test material in the diet. All samples were frozen immediately after collection, and remained frozen until analyzed by Wildlife International Ltd.

Food consumption in each pen was determined once each week throughout the study.

C. **Design**: The birds were randomly distributed into four groups as follows:

Acetochlor Nominal Concentration	Number of Pens	Birds Per Pen	
		Males	Females
Control (0 ppm)	16	1	1
150 ppm	16	1	1
300 ppm	16	1	1
600 ppm	16	1	1

Treatment levels were based "upon known toxicity data." Adult birds were identified by individual leg bands. The primary phases of the study and their approximate durations were as follows:

1. Acclimation - 10 weeks.
2. Pre-photostimulation - 7 weeks.
3. Pre-egg laying (with photostimulation) - 4 weeks.
4. Egg laying - 9 weeks.
5. Post-adult sacrifice (final incubation, hatching, 14-day offspring rearing period) - 5 weeks.

D. **Pen Facilities**: Adult birds were housed indoors in pens constructed of wire grid and sheeting. Pens measured approximately 30 cm x 51 cm. The pens had sloping floors which resulted in a ceiling height ranging from 21 to 26 cm. The average temperature in the adult study room was 20.5°C ± 3.1°C (SD) with an average relative humidity of 47% ± 17% (SD).

The photoperiod during acclimation and during the first 7 weeks of the study was 8 hours of light per day. The photoperiod was then increased to 17 hours of light per day and maintained at that level until sacrifice of adult birds. The birds were exposed to approximately 130 lux of illumination throughout the study.

E. **Adult Observations/Gross Pathology**: All adult birds were observed at least once daily throughout the study for signs of toxicity or abnormal behavior. The single bird that died during the study was necropsied. As soon as practical after the death of the bird, its penmate was sacrificed and necropsied. At study termination, all surviving birds were sacrificed and necropsied. Adult birds were weighed at test initiation, at the end of weeks 2, 4, 6, 8, and at study termination.

F. **Eggs/Eggshell Thickness**: Eggs were collected daily from all pens, marked according to pen of origin, and fumigated to prevent pathogen contamination. The eggs were then stored at 12.7°C ± 0.7°C (SD) and 56% relative humidity until incubated. Eggs were removed from the storage room weekly and candled. Cracked or abnormal eggs were discarded. All eggs that were not cracked, abnormal or used for egg shell thickness measurements were placed in an incubator at 37.5°C ± 0.0°C (SD) and 56% relative humidity. Eggs were candled again on day 11 of incubation to determine embryo viability and on day 21 to determine embryo survival. All eggs were turned automatically while in the incubator. The eggs were placed in a hatcher on incubation day 21. Temperature in the hatcher was 37.3°C ± 0.1°C (SD) with a relative humidity of 70%.

Weekly throughout the egg laying period, one egg was collected, when available, from each of the odd numbered pens during the odd numbered weeks, and from each of the even numbered pens during the even numbered weeks. These eggs were used for egg shell thickness measurements. The average thickness of the dried shell plus membrane was determined by measuring (to the nearest 0.005 mm) five points around the waist of the egg using a micrometer.

G. **Hatchlings**: All hatchlings and unhatched eggs were removed from the hatcher on day 25 or 26 of incubation. The average body weight of the hatchlings by pen was then determined. Hatchlings were leg-banded for identification by pen of origin and then placed in brooding pens until 14 days of age. Each brooding pen measured 72 cm x 90 cm x 23 cm high, and was constructed of galvanized wire mesh and sheeting. Brooder temperatures were maintained at approximately 38°C. The photoperiod was maintained at 16 hours of light per day. Hatchlings were fed untreated diet. At 14 days of age, the average body weight by parental pen of all survivors was determined.

H. **Statistics**: Upon completion of the study, Dunnett's test was used to determine statistically significant differences between the control group and each of the treatment groups. Sample units were the individual pens within each experimental group. Percentage data were examined using Dunnett's test following arcsine transformation. The pens in which mortality occurred were not used in statistical comparisons of the data.

Each of the following parameters was analyzed statistically:

Adult Body Weight
Adult Feed Consumption
Eggs Laid of Maximum Laid
Eggs Cracked of Eggs Laid
Viable Embryos of Eggs Set
Live 3-Week Embryos of Viable Embryos
Hatchlings of 3-Week Embryos
Hatchlings of Eggs Set
Offspring's Body Weight
Hatchlings of Maximum Set
14-Day Old Survivors of Maximum Set
14-Day Old Survivors of Eggs Set
14-Day Old Survivors of of Hatchlings
Egg Shell Thickness

12. **REPORTED RESULTS**

A. **Diet Analysis**: The results of the diet analyses showed that homogeneity and stability were within acceptable limits. Mean measured concentrations of verification samples were 153 ppm, 313 ppm, and 666 ppm. These values correspond to 102%, 104%, and 111% of the nominal concentrations of 150, 300, and 600 ppm, respectively. Detailed results of diet analyses are presented in Table 6 (attached) and Appendix XII.

B. **Mortality and Behavioral Reactions**: There were no treatment related mortalities at any concentration tested.

One incidental mortality (a female) occurred in the 150-ppm group during week 16. Necropsy results of the mortality and sacrificed birds were included in the report. Due to the nature of the lesions observed at necropsy, the mortality was considered to be incidental to treatment. Two females in the 600-ppm group were noted with lesions of old or resolved egg yolk peritonitis. It could not be determined if these findings were treatment related. All other findings observed in sacrificed birds were considered to be unrelated to treatment.

No overt signs of toxicity were observed at any concentration.

C. **Adult Body Weight and Food Consumption**: No significant differences in body weights between the control and any treatment group were noted at any body weight interval.

There were no apparent treatment related effects upon feed consumption among birds at test concentrations of

150 ppm or 300 ppm throughout the study. There was a slight, but significant increase in feed consumption at 150 ppm during week 4, and a slight, but significant decrease during week 20. There was a slight, but significant increase in feed consumption at 300 ppm during week 1, and a slight, but significant decrease during week 20. These differences were considered to be unrelated to treatment.

At 600 ppm, there was a slight and possibly treatment related increase in feed consumption that occurred intermittently throughout the study (weeks 1, 4, 8, and 17). A significant decrease in feed consumption was observed at 600 ppm during week 20 (Table 2, attached).

D. **Reproduction**: When compared to the control group, there were no significant differences in reproductive parameters in the 150- and 300-ppm groups. While not statistically significant, at 600 ppm there was a slight reduction in viable embryos, hatchability, and survival of offspring. In combination, the reductions resulted in statistically significant reductions in hatchlings as a percentage of eggs set, and 14-day old survivors as a percentage of eggs set (Tables 3 & 3A, attached).

E. **Egg Shell Thickness**: When compared to the control group, there were no significant differences in egg shell thickness at any concentration.

F. **Offspring Body Weight**: There were no significant differences between the control and any treatment group in body weights of offspring at hatching or at 14 days of age.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES**:
"Bobwhite were exposed to technical grade acetochlor at dietary concentrations of 0 ppm, 150 ppm, 300 ppm and 600 ppm for 20 weeks. Those concentrations did not result in treatment related mortalities, overt signs of toxicity or treatment related effects upon adult body weight.

While there were no effects upon feed consumption or reproductive parameters at the 150 ppm and 300 ppm test concentrations, there may have been a slight intermittent increase in feed consumption at the 600 ppm test concentration accompanied by effects upon a number of reproductive parameters. Reproductive parameters affected at the 600 ppm test concentration included reductions in viable embryos, hatchability and offspring survivability. Those reductions resulted in statistically significant

reductions in hatchlings and 14-day old survivors as percentages of eggs set. Based upon effect upon reproductive performance at 600 ppm, the no observed effect concentration in this study for bobwhite exposed to technical grade acetochlor was 300 ppm."

The report stated that study was conducted in conformance with Good Laboratory Practice regulations. Quality assurance audits were conducted during the study and the final report was signed by the Quality Assurance Auditor of Wildlife International Ltd.

14. **Reviewer's Discussion and Interpretation of the Study**:

A. **Test Procedure**: The test procedures were in accordance with Subdivision E - Hazard Evaluation: Wildlife and Aquatic Organisms, ASTM, and SEP guidelines except for the following deviations:

A recovery period was not added to the test phase.

Eggs were stored at a temperature of approximately 13°C and a relative humidity of 56%; 16°C and 65% are recommended.

Eggs were candled on day 21 to determine embryo survival; day 18 is recommended.

Behavioral observations of offspring were not reported.

Observations on food palatability were not reported.

B. **Statistical Analysis**: Statistical procedures differed from recommended methods. Specifically, there is no basis for transforming the number of eggs laid and the number of hatchlings to percentile values of the maximum number of eggs laid or set in any test group.

Statistical analyses of reproductive parameters were performed by the reviewer using analysis of variance (ANOVA) following square-root transformation of the count data and arcsine square-root transformation of the ratio data. The comparison between control data and data from each treatment level was made using multiple comparison tests. The computer program used is based on the EEB Bigbird program, with an exception that the count data were square-root transformed before the ANOVA. The significance level was $p \leq 0.05$.

Results of the reviewer's analyses confirmed the authors' findings of statistically significant reductions at 600 ppm for hatchlings/eggs set, and 14-day old survivors/eggs set. Additionally, the reviewer's analyses showed statistically significant reductions at 600 ppm for hatchlings/21 day live embryos, and body weight of 14-day old survivors. Food consumption of adult birds at 600 ppm was significantly higher than control values.

C. **Discussion/Results**: The authors reported (p. 21) that analyses of feed samples collected during the study showed mean measured concentrations of 153 ppm, 313 ppm, and 666 ppm. On page 14, however, mean measured concentrations of 153 ppm, 295 ppm and 591 ppm are presented. The derivation of either series of values is unclear. Using data provided in Table 6 and Appendix XII, the reviewer obtained even different values. Perhaps the most valid calculation of mean concentrations is to use all day 0 values from Table 6. These values result in mean measured concentrations of 153 ppm, 316 ppm, and 671 ppm.

The detection limit for analysis of test substance in the diet was reported in Table 6 and Appendix XII as 16.6 ppm. This seems high, i.e., contamination in the control diet could have been present but not detected. In this case, however, the results of the study were probably not affected.

Food consumption of adult birds at 600 ppm was significantly higher than control values. This was probably not a treatment-effect.

Reproductive parameters affected at 600 ppm consisted of reduced embryo viability, hatchability, offspring body weight and offspring survivability. The NOEC, therefore, was 300 ppm.

This study is scientifically sound and fulfills the guideline requirements for an avian reproduction study.

D. **Adequacy of the Study:**

(1) **Classification:** Core.

(2) **Rationale:** Deviations from protocols were minor and probably did not affect the validity of the study.

(3) **Repairability:** N/A.

15. **COMPLETION OF ONE-LINER:** Yes; November 25, 1991.

ACETOCHLOR

Page_____ is not included in this copy.

Pages 10 through 12 are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

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____ Sales or other commercial/financial information.

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The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

Acetochlor
Bob White Quail MRID # 419633-05

ACETOCHLOR/QUAIL
Sorted by Treatment Levels

TREATMENT LEVEL: 0 ppm

			EL	EC	ES	VE	LE21	HAT	TWOWK
CASE	1		40	1	34	32	32	30	28
CASE	2		49	8	37	35	35	28	25
CASE	3		31	0	26	26	26	25	25
CASE	4		31	1	24	23	23	22	22
CASE	5		41	4	33	32	32	31	26
CASE	6		48	0	44	38	38	38	36
CASE	7		33	0	30	25	25	25	23
CASE	8		49	0	45	45	45	42	41
CASE	9		48	4	40	37	36	36	36
CASE	10		25	0	22	21	21	20	18
CASE	11		46	0	42	28	28	28	26
CASE	12		53	1	47	46	46	44	42
CASE	13		36	0	32	32	32	27	27
CASE	14		43	5	34	33	33	33	31
CASE	15		56	1	51	49	49	49	48
CASE	16		44	2	38	37	37	34	34
		Totals	673	27	579	539	538	512	488

TREATMENT LEVEL: 150 ppm

CASE	17		37	2	32	31	31	30	28
CASE	18		16	0	14	11	11	11	11
CASE	19		46	3	39	38	38	37	36
CASE	20		18	0	15	9	9	9	9
CASE	21		50	1	45	44	44	37	33
CASE	22		18	1	14	13	13	13	13
CASE	23		.	.	.	.	.	.	.
CASE	24		66	11	50	45	45	44	41
CASE	25		31	2	26	23	23	21	21
CASE	26		31	0	27	24	23	20	19
CASE	27		51	1	46	46	45	41	39
CASE	28		2	0	0	0	0	0	0
CASE	29		54	3	44	43	43	41	38
CASE	30		52	0	48	46	45	45	44
CASE	31		36	0	32	32	31	31	23
CASE	32		50	11	35	32	32	27	26
		Totals	558	35	467	437	433	407	381

ACETOCHLOR/QUAIL
Sorted by Treatment Levels

TREATMENT LEVEL: 300 ppm

		EL	EC	ES	VE	LE21	HAT	TWOWK
CASE	33	46	2	40	36	36	35	34
CASE	34	42	0	36	23	23	22	22
CASE	35	33	0	29	21	20	20	19
CASE	36	11	0	9	4	4	4	4
CASE	37	45	2	39	39	38	37	36
CASE	38	46	0	42	39	38	38	36
CASE	39	46	0	42	32	32	30	30
CASE	40	45	1	40	39	39	30	27
CASE	41	26	4	19	19	19	19	19
CASE	42	46	0	42	40	40	36	28
CASE	43	42	0	39	38	38	38	35
CASE	44	37	0	33	28	28	28	28
CASE	45	39	0	35	35	35	34	34
CASE	46	44	0	40	40	40	38	37
CASE	47	47	1	41	41	41	40	36
CASE	48	37	3	29	26	26	24	22
	Totals	632	13	555	500	497	473	447

TREATMENT LEVEL: 600 ppm

CASE	49	31	1	27	27	27	26	26
CASE	50	20	0	16	11	11	8	2
CASE	51	46	0	43	39	39	35	33
CASE	52	48	0	44	44	44	41	27
CASE	53	31	1	27	20	20	20	17
CASE	54	48	0	44	31	31	28	27
CASE	55	56	0	52	50	50	44	42
CASE	56	50	0	46	43	43	42	42
CASE	57	47	3	40	26	26	26	26
CASE	58	47	1	42	14	14	13	13
CASE	59	41	2	34	28	26	22	22
CASE	60	46	4	38	38	38	32	28
CASE	61	50	1	45	41	41	32	32
CASE	62	46	0	42	40	40	38	35
CASE	63	25	1	22	17	17	15	9
CASE	64	42	1	37	37	36	35	32
	Totals	674	15	599	506	503	457	413

ANOVA on SQR(Eggs Laid)

DEP VAR: SEL N: 63 MULTIPLE R: 0.214 SQUARED MULTIPLE R: 0.046

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	3.533	3	1.178	0.944	0.425
ERROR	73.574	59	1.247		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	2.715	1	2.715	2.177	0.145
ERROR	73.574	59	1.247		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.413	1	0.413	0.331	0.567
ERROR	73.574	59	1.247		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.001	1	0.001	0.001	0.979
ERROR	73.574	59	1.247		

ANOVA on SQR(Eggs Cracked)

DEP VAR: SEC N: 63 MULTIPLE R: 0.223 SQUARED MULTIPLE R: 0.050

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	2.497	3	0.832	1.031	0.386
ERROR	47.644	59	0.808		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.190	1	0.190	0.236	0.629
ERROR	47.644	59	0.808		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.095	1	1.095	1.355	0.249
ERROR	47.644	59	0.808		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.347	1	0.347	0.430	0.515
ERROR	47.644	59	0.808		

ANOVA on SQR(Eggs Set)

DEP VAR: SES N: 63 MULTIPLE R: 0.255 SQUARED MULTIPLE R: 0.065

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	5.592	3	1.864	1.368	0.261
ERROR	80.413	59	1.363		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	3.718	1	3.718	2.728	0.104
ERROR	80.413	59	1.363		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.199	1	0.199	0.146	0.704
ERROR	80.413	59	1.363		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.057	1	0.057	0.042	0.838
ERROR	80.413	59	1.363		

ANOVA on SQR(Viable Embryos)

DEP VAR: SVE N: 63 MULTIPLE R: 0.193 SQUARED MULTIPLE R: 0.037

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	3.757	3	1.252	0.764	0.519
ERROR	96.737	59	1.640		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	3.672	1	3.672	2.240	0.140
ERROR	96.737	59	1.640		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.652	1	0.652	0.398	0.531
ERROR	96.737	59	1.640		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.483	1	0.483	0.295	0.589
ERROR	96.737	59	1.640		

ANOVA on SQR(21-day Live Embryos)

DEP VAR: SLE21 N: 63 MULTIPLE R: 0.198 SQUARED MULTIPLE R: 0.039

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	3.939	3	1.313	0.806	0.496
ERROR	96.143	59	1.630		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	3.861	1	3.861	2.370	0.129
ERROR	96.143	59	1.630		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.707	1	0.707	0.434	0.513
ERROR	96.143	59	1.630		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.531	1	0.531	0.326	0.570
ERROR	96.143	59	1.630		

ANOVA on SQR(Hatched)

DEP VAR: SHAT N: 63 MULTIPLE R: 0.206 SQUARED MULTIPLE R: 0.042

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	4.011	3	1.337	0.872	0.461
ERROR	90.420	59	1.533		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	3.935	1	3.935	2.568	0.114
ERROR	90.420	59	1.533		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.640	1	0.640	0.418	0.521
ERROR	90.420	59	1.533		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.145	1	1.145	0.747	0.391
ERROR	90.420	59	1.533		

ANOVA on SQR(Two week Survivors)

DEP VAR: STWOWK N: 63 MULTIPLE R: 0.220 SQUARED MULTIPLE R: 0.049

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	4.773	3	1.591	1.005	0.397
ERROR	93.417	59	1.583		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	4.094	1	4.094	2.586	0.113
ERROR	93.417	59	1.583		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.664	1	0.664	0.419	0.520
ERROR	93.417	59	1.583		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	2.517	1	2.517	1.590	0.212
ERROR	93.417	59	1.583		

ANOVA on EC/EL

DEP VAR: RESP1 N: 63 MULTIPLE R: 0.200 SQUARED MULTIPLE R: 0.040

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	153.126	3	51.042	0.822	0.487
ERROR	3664.987	59	62.118		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	14.124	1	14.124	0.227	0.635
ERROR	3664.987	59	62.118		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	64.005	1	64.005	1.030	0.314
ERROR	3664.987	59	62.118		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	17.850	1	17.850	0.287	0.594
ERROR	3664.987	59	62.118		

ANOVA on VE/ES

DEP VAR: RESP2 N: 62 MULTIPLE R: 0.210 SQUARED MULTIPLE R: 0.044

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	453.888	3	151.296	0.895	0.449
ERROR	9806.553	58	169.079		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	40.624	1	40.624	0.240	0.626
ERROR	9806.553	58	169.079		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	94.454	1	94.454	0.559	0.458
ERROR	9806.553	58	169.079		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	435.647	1	435.647	2.577	0.114
ERROR	9806.553	58	169.079		

ANOVA on LE21/VE

DEP VAR: RESP3 N: 62 MULTIPLE R: 0.197 SQUARED MULTIPLE R: 0.039

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	37.173	3	12.391	0.781	0.510
ERROR	920.558	58	15.872		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	35.731	1	35.731	2.251	0.139
ERROR	920.558	58	15.872		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	14.529	1	14.529	0.915	0.343
ERROR	920.558	58	15.872		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	7.503	1	7.503	0.473	0.494
ERROR	920.558	58	15.872		

ANOVA on HAT/LE21

DEP VAR: RESP4 N: 62 MULTIPLE R: 0.321 SQUARED MULTIPLE R: 0.103

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	516.365	3	172.122	2.224	0.095
ERROR	4488.409	58	77.386		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	2.698	1	2.698	0.035	0.853
ERROR	4488.409	58	77.386		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	5.837	1	5.837	0.075	0.785
ERROR	4488.409	58	77.386		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	325.359	1	325.359	4.204	0.045
ERROR	4488.409	58	77.386		

ANOVA on TWOWK/HAT

DEP VAR: RESP5 N: 62 MULTIPLE R: 0.210 SQUARED MULTIPLE R: 0.044

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	353.786	3	117.929	0.893	0.450
ERROR	7655.806	58	131.997		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.339	1	1.339	0.010	0.920
ERROR	7655.806	58	131.997		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	4.665	1	4.665	0.035	0.852
ERROR	7655.806	58	131.997		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	219.415	1	219.415	1.662	0.202
ERROR	7655.806	58	131.997		

ANOVA on HAT/ES

DEP VAR: RESP6 N: 62 MULTIPLE R: 0.337 SQUARED MULTIPLE R: 0.113

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	807.465	3	269.155	2.474	0.071
ERROR	6310.786	58	108.807		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	46.605	1	46.605	0.428	0.515
ERROR	6310.786	58	108.807		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	58.088	1	58.088	0.534	0.468
ERROR	6310.786	58	108.807		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	733.317	1	733.317	6.740	0.012
ERROR	6310.786	58	108.807		

ANOVA on TWOWK/ES

DEP VAR: RESP7 N: 62 MULTIPLE R: 0.403 SQUARED MULTIPLE R: 0.163

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1338.883	3	446.294	3.758	0.016
ERROR	6888.561	58	118.768		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	68.515	1	68.515	0.577	0.451
ERROR	6888.561	58	118.768		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	55.985	1	55.985	0.471	0.495
ERROR	6888.561	58	118.768		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1175.581	1	1175.581	9.898	0.003
ERROR	6888.561	58	118.768		

MALE BODY WEIGHT; PREWEIGHT AND POSTWEIGHT

		PREWT	POSTWT
TREATMENT LEVEL: Control			
CASE	1	215	236
CASE	2	199	194
CASE	3	196	195
CASE	4	234	218
CASE	5	199	201
CASE	6	191	196
CASE	7	206	207
CASE	8	217	215
CASE	9	203	202
CASE	10	189	191
CASE	11	229	207
CASE	12	198	193
CASE	13	204	208
CASE	14	204	187
CASE	15	245	216
CASE	16	198	199
TREATMENT LEVEL: 150 ppm			
CASE	17	203	192
CASE	18	207	219
CASE	19	234	220
CASE	20	222	181
CASE	21	205	230
CASE	22	201	187
CASE	23	196	.
CASE	24	212	199
CASE	25	241	231
CASE	26	199	192
CASE	27	203	199
CASE	28	226	214
CASE	29	213	207
CASE	30	189	194
CASE	31	181	187
CASE	32	194	175
TREATMENT LEVEL: 300 ppm			
CASE	33	198	200
CASE	34	225	204
CASE	35	221	206
CASE	36	220	214
CASE	37	205	208
CASE	38	216	205
CASE	39	219	213
CASE	40	190	187
CASE	41	192	187
CASE	42	203	223
CASE	43	186	195
CASE	44	191	188
CASE	45	191	187
CASE	46	198	204
CASE	47	206	223
CASE	48	197	200
TREATMENT LEVEL: 600 ppm			
CASE	49	201	203
CASE	50	218	221
CASE	51	208	189
CASE	52	217	199
CASE	53	205	204
CASE	54	200	220
CASE	55	196	201
CASE	56	205	215
CASE	57	221	214
CASE	58	207	186
CASE	59	221	202
CASE	60	208	195
CASE	61	216	209
CASE	62	209	197
CASE	63	211	194
CASE	64	195	197

ANOVA on male body weight

DEP VAR: POSTWT N: 63 MULTIPLE R: 0.572 SQUARED MULTIPLE R: 0.327

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	125.422	3	41.807	0.343	0.794
PREWT	3394.451	1	3394.451	27.856	0.000
ERROR	7067.637	58	121.856		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	54.963	1	54.963	0.451	0.505
ERROR	7067.637	58	121.856		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	9.002	1	9.002	0.074	0.787
ERROR	7067.637	58	121.856		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	19.637	1	19.637	0.161	0.690
ERROR	7067.637	58	121.856		

FEMALE BODY WEIGHT; PREWEIGHT AND POSTWEIGHT

		PREWT	POSTWT
TREATMENT LEVEL: Control			
CASE	1	215	232
CASE	2	189	211
CASE	3	206	224
CASE	4	229	237
CASE	5	201	226
CASE	6	194	216
CASE	7	211	232
CASE	8	202	248
CASE	9	183	222
CASE	10	192	206
CASE	11	195	226
CASE	12	215	244
CASE	13	183	221
CASE	14	194	230
CASE	15	201	218
CASE	16	187	223
TREATMENT LEVEL: 150 ppm			
CASE	17	200	223
CASE	18	194	205
CASE	19	198	215
CASE	20	213	216
CASE	21	205	229
CASE	22	199	229
CASE	23	179	.
CASE	24	208	267
CASE	25	191	208
CASE	26	210	217
CASE	27	211	243
CASE	28	205	214
CASE	29	199	226
CASE	30	175	189
CASE	31	180	205
CASE	32	193	197
TREATMENT LEVEL: 300 ppm			
CASE	33	216	243
CASE	34	218	252
CASE	35	214	216
CASE	36	205	168
CASE	37	216	239
CASE	38	215	254
CASE	39	226	272
CASE	40	195	215
CASE	41	194	221
CASE	42	180	203
CASE	43	215	239
CASE	44	216	252
CASE	45	177	203
CASE	46	194	209
CASE	47	191	211
CASE	48	196	212
TREATMENT LEVEL: 600 ppm			
CASE	49	181	149
CASE	50	207	185
CASE	51	184	204
CASE	52	185	216
CASE	53	209	215
CASE	54	190	225
CASE	55	217	231
CASE	56	211	224
CASE	57	223	251
CASE	58	242	242
CASE	59	201	216
CASE	60	197	237
CASE	61	196	224
CASE	62	193	205
CASE	63	199	203
CASE	64	181	221

ANOVA on female body weight

DEP VAR: POSTWT N: 63 MULTIPLE R: 0.641 SQUARED MULTIPLE R: 0.411

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1083.300	3	361.100	1.308	0.280
PREWT	10140.935	1	10140.935	36.747	0.000
ERROR	16006.258	58	275.970		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	182.776	1	182.776	0.662	0.419
ERROR	16006.258	58	275.970		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	258.755	1	258.755	0.938	0.337
ERROR	16006.258	58	275.970		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1076.367	1	1076.367	3.900	0.053
ERROR	16006.258	58	275.970		

TRT	THICK	HATWT	SURVWT
0	0.196	6	23
0	0.212	6	24
0	0.222	5	22
0	0.224	7	24
0	0.21	6	22
0	0.223	6	20
0	0.199	5	22
0	0.22	7	26
0	0.199	6	23
0	0.195	6	25
0	0.211	6	21
0	0.227	7	24
0	0.228	6	25
0	0.176	6	28
0	0.218	6	22
0	0.212	6	24
1	0.247	6	25
1	0.229	6	21
1	0.203	6	22
1	0.236	6	26
1	0.209	5	21
1	0.194	5	19
1	.	.	.
1	0.207	6	24
1	0.193	6	26
1	0.217	6	24
1	0.219	6	23
1	0.189	.	.
1	0.208	6	22
1	0.212	6	24
1	0.192	5	25
1	0.196	6	22
2	0.207	7	24
2	0.21	6	20
2	0.217	6	22
2	0.188	6	27
2	0.224	6	21
2	0.202	6	24
2	0.219	6	20
2	0.212	6	20
2	0.225	6	19
2	0.2	6	21
2	0.212	6	21
2	0.204	6	23
2	0.21	6	23
2	0.213	6	20
2	0.217	6	24
2	0.2	5	21
3	0.191	6	16
3	0.23	5	13
3	0.216	5	22
3	0.204	5	18
3	0.201	5	20
3	0.204	5	22
3	0.198	6	19

Control

150 ppm

300 ppm

600 ppm

Eggshell thickness (mm) by pen
Hatchling wt (g) by pen
Wt (g) of 14-day surviving chicks by pen

3	0.194	7	23
3	0.222	7	23
3	0.205	6	21
3	0.195	7	26
3	0.202	5	20
3	0.229	6	23
3	0.232	6	20
3	0.228	5	15
3	0.205	5	22

Adult food consumption per pen

TRT 0 = control
1 = 150 ppm
2 = 300 ppm
3 = 600 ppm

SUM = Total food consumed (g)

TRT	SUM
0	590
0	450
0	598
0	538
0	434
0	497
0	531
0	367
0	550
0	500
0	568
0	465
0	483
0	498
0	656
0	415
1	547
1	540
1	722
1	450
1	626
1	551
1	403
1	483
1	471
1	462
1	483
1	487
1	633
1	373
1	519
1	519
2	432
2	550
2	436
2	614
2	531
2	603
2	557
2	553
2	469
2	622
2	552
2	503
2	508
2	610
2	560
2	411
3	458
3	661
3	627
3	496
3	675
3	503
3	555
3	617
3	563
3	641
3	572
3	492
3	568
3	527
3	522
3	530

ANOVA on eggshell thickness

DEP VAR: THICK N: 63 MULTIPLE R: 0.027 SQUARED MULTIPLE R: 0.001

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	0.000	3	0.000	0.015	0.998
ERROR	0.012	59	0.000		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.000	1	0.000	0.018	0.893
ERROR	0.012	59	0.000		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.000	1	0.000	0.023	0.880
ERROR	0.012	59	0.000		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.000	1	0.000	0.041	0.841
ERROR	0.012	59	0.000		

ANOVA on hatwt

DEP VAR: HATWT N: 62 MULTIPLE R: 0.270 SQUARED MULTIPLE R: 0.073

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1.478	3	0.493	1.525	0.218
ERROR	18.732	58	0.323		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.572	1	0.572	1.771	0.188
ERROR	18.732	58	0.323		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.031	1	0.031	0.097	0.757
ERROR	18.732	58	0.323		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.125	1	1.125	3.483	0.067
ERROR	18.732	58	0.323		

ANOVA on survwt

DEP VAR: SURVWT N: 62 MULTIPLE R: 0.475 SQUARED MULTIPLE R: 0.226

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	103.128	3	34.376	5.635	0.002
ERROR	353.839	58	6.101		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.648	1	0.648	0.106	0.746
ERROR	353.839	58	6.101		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	19.531	1	19.531	3.201	0.079
ERROR	353.839	58	6.101		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	84.500	1	84.500	13.851	0.000
ERROR	353.839	58	6.101		

ANOVA on food

DEP VAR: FOOD N: 64 MULTIPLE R: 0.276 SQUARED MULTIPLE R: 0.076

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	27424.922	3	9141.641	1.654	0.186
ERROR	331571.313	60	5526.189		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	520.031	1	520.031	0.094	0.760
ERROR	331571.313	60	5526.189		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	4301.281	1	4301.281	0.778	0.381
ERROR	331571.313	60	5526.189		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	23490.281	1	23490.281	4.251	0.044
ERROR	331571.313	60	5526.189		

Significantly higher than in controls

Results of SAS Birdall Statistical Analyses of Bowhite Quail Reproduction Test - Acetochlor

OBS	TRT	EL	EC	ES	VE	LE	NH	HS	THICK	HATW	SURVWT	FOOD	PREM	POSTM	PREF	POSTF
1	a	40	1	34	32	32	30	28	0.196	6	23	590	215	236	215	232
2	a	49	8	37	35	35	28	25	0.212	6	24	450	199	194	189	211
3	a	31	0	26	26	26	25	25	0.222	5	22	598	196	195	206	224
4	a	31	1	24	23	23	22	22	0.224	7	24	538	234	218	229	237
5	a	41	4	33	32	32	31	26	0.210	6	22	434	199	201	201	226
6	a	48	0	44	38	38	38	36	0.223	6	20	497	191	196	194	216
7	a	33	0	30	25	25	25	23	0.199	5	22	531	206	207	211	232
8	a	49	0	45	45	45	42	41	0.220	7	26	367	217	215	202	248
9	a	48	4	40	37	36	36	36	0.199	6	23	550	203	202	183	222
10	a	25	0	22	21	21	20	18	0.195	6	25	500	189	191	192	206
11	a	46	0	42	28	28	28	26	0.211	6	21	568	229	207	195	226
12	a	53	1	47	46	46	44	42	0.227	7	24	465	198	193	215	244
13	a	36	0	32	32	32	27	27	0.228	6	25	483	204	208	183	221
14	a	43	5	34	33	33	33	31	0.176	6	28	498	204	187	194	230
15	a	56	1	51	49	49	49	48	0.218	6	22	656	245	216	201	218
16	a	44	2	38	37	37	34	34	0.212	6	24	415	198	199	187	223
17	b	37	2	32	31	31	30	28	0.247	6	25	547	203	192	200	223
18	b	16	0	14	11	11	11	11	0.229	6	21	540	207	219	194	205
19	b	46	3	39	38	38	37	36	0.203	6	22	722	234	220	198	215
20	b	18	0	15	9	9	9	9	0.236	6	26	450	222	181	213	216
21	b	50	1	45	44	44	37	33	0.209	5	21	626	205	230	205	229
22	b	18	1	14	13	13	13	13	0.194	5	19	551	201	187	199	229
23	b	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
24	b	66	11	50	45	45	44	41	0.207	6	24	483	212	199	208	267
25	b	31	2	26	23	23	21	21	0.193	6	26	471	241	231	191	208
26	b	31	0	27	24	23	20	19	0.217	6	24	462	199	192	210	217
27	b	51	1	46	46	45	41	39	0.219	6	23	483	203	199	211	243
28	b	2	0	0	0	0	0	0	0.189	0	0	487	226	214	205	214
29	b	54	3	44	43	43	41	38	0.208	6	22	633	213	207	199	226
30	b	52	0	48	46	45	45	44	0.212	6	24	373	189	194	175	189
31	b	36	0	32	32	31	31	23	0.192	5	25	519	181	187	180	205
32	b	50	11	35	32	32	27	26	0.196	6	22	519	194	175	193	197
33	c	46	2	40	36	36	35	34	0.207	7	24	432	198	200	216	243
34	c	42	0	36	23	23	22	22	0.210	6	20	550	225	204	218	252
35	c	33	0	49	29	20	20	19	0.217	6	22	436	221	206	214	216
36	c	11	0	9	4	4	4	4	0.188	6	27	614	220	214	205	168
37	c	45	2	39	39	38	37	36	0.224	6	21	531	205	208	216	239
38	c	46	0	42	39	38	38	36	0.202	6	24	603	216	205	215	254
39	c	46	0	42	32	32	30	30	0.219	6	20	557	219	213	226	272
40	c	45	1	40	39	39	30	27	0.212	6	20	553	190	187	195	215
41	c	26	4	19	19	19	19	19	0.225	6	19	469	192	187	194	221
42	c	46	0	42	40	40	36	28	0.200	6	21	622	203	223	180	203
43	c	42	0	39	38	38	38	35	0.212	6	21	552	186	195	215	239
44	c	37	0	33	28	28	28	28	0.204	6	23	503	191	188	216	252

45	c	39	0	35	35	35	34	34	0.210	6	23	508	191	187	177	203
46	c	44	0	40	40	40	38	37	0.213	6	20	610	198	204	194	209
47	c	47	1	41	41	41	40	36	0.217	6	24	560	206	223	191	211
48	c	37	3	29	26	26	24	22	0.200	5	21	411	197	200	196	212
49	d	31	1	27	27	27	26	26	0.191	6	16	458	201	203	181	149
50	d	20	0	16	11	11	8	2	0.230	5	13	661	218	221	207	185
51	d	46	0	43	39	39	35	33	0.216	5	22	627	208	189	184	204
52	d	48	0	44	44	44	41	27	0.204	5	18	496	217	199	185	216
53	d	31	1	27	20	20	20	17	0.201	5	20	675	205	204	209	215
54	d	48	0	44	31	31	28	27	0.204	5	22	503	200	220	190	225
55	d	56	0	52	50	50	44	42	0.198	6	19	555	196	201	217	231
56	d	50	0	46	43	43	42	42	0.194	7	23	617	205	215	211	224
57	d	47	3	40	26	26	26	26	0.222	7	23	563	221	214	223	251
58	d	47	1	42	14	14	13	13	0.205	6	21	641	207	186	242	242
59	d	41	2	34	28	26	22	22	0.195	7	26	572	221	202	201	216
60	d	46	4	38	38	38	32	28	0.202	5	20	492	208	195	197	237
61	d	50	1	45	41	41	32	32	0.229	6	23	568	216	209	196	224
62	d	46	0	42	40	40	38	35	0.232	6	20	527	209	197	193	205
63	d	25	1	22	17	17	15	9	0.228	5	15	522	211	194	199	203
64	d	42	1	37	37	36	35	32	0.205	5	22	530	195	197	181	221

---------- TRT=a ----------

N Obs	Variable	N	Minimum	Maximum	Mean
16	EL	16	25.0000000	56.0000000	42.0625000
	EC	16	0	8.0000000	1.6875000
	ES	16	22.0000000	51.0000000	36.1875000
	VE	16	21.0000000	49.0000000	33.6875000
	LE	16	21.0000000	49.0000000	33.6250000
	NH	16	20.0000000	49.0000000	32.0000000
	HS	16	18.0000000	48.0000000	30.5000000
	THICK	16	0.1760000	0.2280000	0.2107500
	HATWT	16	5.0000000	7.0000000	6.0625000
	SURVWT	16	20.0000000	28.0000000	23.4375000
	FOOD	16	367.0000000	656.0000000	508.7500000
	PREM	16	189.0000000	245.0000000	207.9375000
	POSTM	16	187.0000000	236.0000000	204.0625000
	PREF	16	183.0000000	229.0000000	199.8125000
	POSTF	16	206.0000000	248.0000000	226.0000000

N Obs	Variable	Std Dev
16	EL	8.7974902
	EC	2.3584953
	ES	8.3922087
	VE	8.1952730
	LE	8.1721070
	NH	8.1404341
	HS	8.2704293
	THICK	0.0143875
	HATWT	0.5737305
	SURVWT	1.9989581
	FOOD	74.6730652
	PREM	15.9852797
	POSTM	12.5987764
	PREF	12.8645184
	POSTF	11.1355287

---------- TRT=b ----------

N Obs	Variable	N	Minimum	Maximum	Mean
16	EL	15	2.0000000	66.0000000	37.2000000
	EC	15	0	11.0000000	2.3333333
	ES	15	0	50.0000000	31.1333333
	VE	15	0	46.0000000	29.1333333
	LE	15	0	45.0000000	28.8666667
	NH	15	0	45.0000000	27.1333333
	HS	15	0	44.0000000	25.4000000
	THICK	15	0.1890000	0.2470000	0.2100667
	HATWT	15	0	6.0000000	5.4000000
	SURVWT	15	0	26.0000000	21.6000000
	FOOD	15	373.0000000	722.0000000	524.4000000
	PREM	15	181.0000000	241.0000000	208.6666667
	POSTM	15	175.0000000	231.0000000	201.8000000
	PREF	15	175.0000000	213.0000000	198.7333333
	POSTF	15	189.0000000	267.0000000	218.8666667

N Obs	Variable	Std Dev
16	EL	17.7892423
	EC	3.6774733
	ES	15.0184014
	VE	15.2121505
	LE	15.0706274
	NH	14.1918823
	HS	13.2330754
	THICK	0.0171317
	HATWT	1.5491933
	SURVWT	6.2996599
	FOOD	85.6536214
	PREM	16.4649700
	POSTM	17.5426012
	PREF	10.9444485
	POSTF	19.0782848

---------- TRT=c ----------

N Obs	Variable	N	Minimum	Maximum	Mean
16	EL	16	11.0000000	47.0000000	39.5000000
	EC	16	0	4.0000000	0.8125000
	ES	16	9.0000000	49.0000000	35.9375000
	VE	16	4.0000000	41.0000000	31.7500000
	LE	16	4.0000000	41.0000000	31.0625000
	NH	16	4.0000000	40.0000000	29.5625000
	HS	16	4.0000000	37.0000000	27.9375000
	THICK	16	0.1880000	0.2250000	0.2100000
	HATWT	16	5.0000000	7.0000000	6.0000000
	SURVWT	16	19.0000000	27.0000000	21.8750000
	FOOD	16	411.0000000	622.0000000	531.9375000
	PREM	16	186.0000000	225.0000000	203.6250000
	POSTM	16	187.0000000	223.0000000	202.7500000
	PREF	16	177.0000000	226.0000000	204.2500000
	POSTF	16	168.0000000	272.0000000	225.5625000

N Obs	Variable	Std Dev
16	EL	9.5498691
	EC	1.2763881
	ES	9.8147423
	VE	10.0365997
	LE	10.3503221
	NH	9.7157518
	HS	8.9775182
	THICK	0.0096954
	HATWT	0.3651484
	SURVWT	2.1252451
	FOOD	67.2145508
	PREM	12.8627369
	POSTM	11.9303534
	PREF	14.7715944
	POSTF	26.1456657

---------- TRT=d ----------

N Obs	Variable	N	Minimum	Maximum	Mean
16	EL	16	20.0000000	56.0000000	42.1250000
	EC	16	0	4.0000000	0.9375000
	ES	16	16.0000000	52.0000000	37.4375000
	VE	16	11.0000000	50.0000000	31.6250000
	LE	16	11.0000000	50.0000000	31.4375000
	NH	16	8.0000000	44.0000000	28.5625000
	HS	16	2.0000000	42.0000000	25.8125000
	THICK	16	0.1910000	0.2320000	0.2097500
	HATWT	16	5.0000000	7.0000000	5.6875000
	SURVWT	16	13.0000000	26.0000000	20.1875000
	FOOD	16	458.0000000	675.0000000	562.9375000
	PREM	16	195.0000000	221.0000000	208.6250000
	POSTM	16	186.0000000	221.0000000	202.8750000
	PREF	16	181.0000000	242.0000000	201.0000000
	POSTF	16	149.0000000	251.0000000	215.5000000

N Obs	Variable	Std Dev
16	EL	10.0324474
	EC	1.1814539
	ES	9.7841283
	VE	11.7011395
	LE	11.7244403
	NH	10.7948676
	HS	11.1068672
	THICK	0.0141445
	HATWT	0.7932003
	SURVWT	3.3708308
	FOOD	65.1331649
	PREM	8.2935718
	POSTM	10.4490829
	PREF	16.7252304
	POSTF	24.0582626

Dependent Variable: Eggs Laid

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.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	257.32519841	0.60	0.6191
Error	59	8469.08750000		
Corrected Total	62	8726.41269841		

R-Square	C.V.	RESP Mean
0.029488	29.75174	40.26984127

Source	DF	Type I SS	F Value	Pr > F
TRT	3	257.32519841	0.60	0.6191

Source	DF	Type III SS	F Value	Pr > F
TRT	3	257.32519841	0.60	0.6191

Duncan's Multiple Range Test for variable: Eegs Laid

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

Alpha= 0.05 df= 59 MSE= 143.5439
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377

Number of Means	2	3	4
Critical Range	8.552	8.992	9.282

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	TRT
A	42.125	16	d
A	42.063	16	a
A	39.500	16	c
A	37.200	15	b

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= 59 MSE= 143.5439
Critical Value of Dunnett's T= 2.412
Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
d - a	-10.155	0.063	10.280
c - a	-12.780	-2.563	7.655
b - a	-15.248	-4.862	5.523

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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= 143.5439
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	Simultaneous Upper Confidence Limit
d - a	-11.502	0.063	11.627
d - c	-8.940	2.625	14.190
d - b	-6.831	4.925	16.681
a - d	-11.627	-0.063	11.502
a - c	-9.002	2.563	14.127
a - b	-6.893	4.862	16.618
c - d	-14.190	-2.625	8.940
c - a	-14.127	-2.563	9.002
c - b	-9.456	2.300	14.056
b - d	-16.681	-4.925	6.831
b - a	-16.618	-4.862	6.893
b - c	-14.056	-2.300	9.456

Dependent Variable: Cracked eggs

Number of observations in data set = 64. NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	23.28273810	1.44	0.2405
Error	59	318.14583333		
Corrected Total	62	341.42857143		

R-Square	C.V.	RESP Mean
0.068192	162.5493	1.42857143

Source	DF	Type I SS	F Value	Pr > F
TRT	3	23.28273810	1.44	0.2405

Source	DF	Type III SS	F Value	Pr > F
TRT	3	23.28273810	1.44	0.2405

Duncan's Multiple Range Test for variable: Cracked eggs

Alpha= 0.05 df= 59 MSE= 5.392302
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377

Number of Means	2	3	4
Critical Range	1.658	1.743	1.799

Duncan Grouping	Mean	N	TRT
A	2.333	15	b
A	1.687	16	a
A	0.937	16	d
A	0.812	16	c

Dunnett's T tests for variable: Cracked eggs

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 5.392302
Critical Value of Dunnett's T= 2.412

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
b - a	-1.367	0.646	2.659
d - a	-2.730	-0.750	1.230
c - a	-2.855	-0.875	1.105

Bonferroni (Dunn) T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 5.392302
Critical Value of T= 2.73013

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - b	-2.924	-0.646	1.633
a - d	-1.491	0.750	2.991
a - c	-1.366	0.875	3.116

Dependent Variable: Eggs Set

Number of observations in data set = 64. NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	352.38273810	0.98	0.4099
Error	59	7095.04583333		
Corrected Total	62	7447.42857143		

R-Square	C.V.	RESP Mean
0.047316	31.11997	35.23809524

Source	DF	Type I SS	F Value	Pr > F
TRT	3	352.38273810	0.98	0.4099

Source	DF	Type III SS	F Value	Pr > F
TRT	3	352.38273810	0.98	0.4099

Duncan's Multiple Range Test for variable: RESP

Alpha= 0.05 df= 59 MSE= 120.255
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377
Number of Means 2 3 4
Critical Range 7.828 8.230 8.496

Duncan Grouping	Mean	N	TRT
A	37.438	16	d
A	36.188	16	a
A	35.938	16	c
A	31.133	15	b

Dunnett's T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 120.255
Critical Value of Dunnett's T= 2.412

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
d - a	-8.102	1.250	10.602
c - a	-9.602	-0.250	9.102
b - a	-14.560	-5.054	4.452

Bonferroni (Dunn) T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 120.255
Critical Value of T= 2.73013

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - d	-11.835	-1.250	9.335
a - c	-10.335	0.250	10.835
a - b	-5.706	5.054	15.814

Dependent Variable: Viable Embryos

Number of observations in data set = 64. NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	161.34900794	0.41	0.7491
Error	59	7811.92083333		
Corrected Total	62	7973.26984127		

R-Square	C.V.	RESP Mean
0.020236	36.42842	31.58730159

Source	DF	Type I SS	F Value	Pr > F
TRT	3	161.34900794	0.41	0.7491

Source	DF	Type III SS	F Value	Pr > F
TRT	3	161.34900794	0.41	0.7491

Duncan's Multiple Range Test for variable: RESP

Alpha= 0.05 df= 59 MSE= 132.4054
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377

Number of Means	2	3	4
Critical Range	8.213	8.636	8.915

Duncan Grouping	Mean	N	TRT
A	33.688	16	a
A	31.750	16	c
A	31.625	16	d
A	29.133	15	b

Dunnett's T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 132.4054
Critical Value of Dunnett's T= 2.412

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
c - a	-11.750	-1.937	7.875
d - a	-11.875	-2.063	7.750
b - a	-14.529	-4.554 ?	5.421

Bonferroni (Dunn) T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 132.4054
Critical Value of T= 2.73013

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - c	-9.169	1.937	13.044
a - d	-9.044	2.063	13.169
a - b	-6.736	4.554 ?	15.845

Dependent Variable: Live 3-Week Embryos

Number of observations in data set = 64. NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	176.49880952	0.44	0.7237
Error	59	7850.35833333		
Corrected Total	62	8026.85714286		

R-Square	C.V.	RESP Mean
0.021989	36.86996	31.28571429

Source	DF	Type I SS	F Value	Pr > F
TRT	3	176.49880952	0.44	0.7237

Source	DF	Type III SS	F Value	Pr > F
TRT	3	176.49880952	0.44	0.7237

Duncan's Multiple Range Test for variable: RESP

Alpha= 0.05 df= 59 MSE= 133.0569
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377

Number of Means	2	3	4
Critical Range	8.234	8.657	8.937

Duncan Grouping	Mean	N	TRT
A	33.625	16	a
A	31.437	16	d
A	31.062	16	c
A	28.867	15	b

Dunnett's T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 133.0569
Critical Value of Dunnett's T= 2.412

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
d - a	-12.024	-2.188	7.649
c - a	-12.399	-2.563	7.274
b - a	-14.758	-4.758	5.241

Bonferroni (Dunn) T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 133.0569
Critical Value of T= 2.73013

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - d	-8.947	2.188	13.322
a - c	-8.572	2.563	13.697
a - b	-6.560	4.758	16.077

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Dependent Variable: Number of Hatchlings

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	196.70912698	0.55	0.6472
Error	59	6977.60833333		
Corrected Total	62	7174.31746032		

R-Square	C.V.	RESP Mean
0.027419	37.05364	29.34920635

Source	DF	Type I SS	F Value	Pr > F
TRT	3	196.70912698	0.55	0.6472

Source	DF	Type III SS	F Value	Pr > F
TRT	3	196.70912698	0.55	0.6472

Duncan's Multiple Range Test for variable: RESP

Alpha= 0.05 df= 59 MSE= 118.2645
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377

Number of Means	2	3	4
Critical Range	7.762	8.162	8.425

Duncan Grouping	Mean	N	TRT
A	32.000	16	a
A	29.562	16	c
A	28.562	16	d
A	27.133	15	b

Dunnett's T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 118.2645
Critical Value of Dunnett's T= 2.412

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
c - a	-11.711	-2.438	6.836
d - a	-12.711	-3.438	5.836
b - a	-14.294	-4.867	4.560

Bonferroni (Dunn) T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 118.2645
Critical Value of T= 2.73013

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - c	-8.060	2.438	12.935
a - d	-7.060	3.438	13.935
a - b	-5.804	4.867	15.537

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Dependent Variable: 14-Day Hatchling Survivors

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	258.58055556	0.78	0.5110
Error	59	6536.97500000		
Corrected Total	62	6795.55555556		

R-Square	C.V.	RESP Mean
0.038051	38.35376	27.44444444

Source	DF	Type I SS	F Value	Pr > F
TRT	3	258.58055556	0.78	0.5110

Source	DF	Type III SS	F Value	Pr > F
TRT	3	258.58055556	0.78	0.5110

Duncan's Multiple Range Test for variable: RESP

Alpha= 0.05 df= 59 MSE= 110.7962
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377
Number of Means 2 3 4
Critical Range 7.513 7.900 8.155

Duncan Grouping	Mean	N	TRT
A	30.500	16	a
A	27.937	16	c
A	25.812	16	d
A	25.400	15	b

Dunnett's T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 110.7962
Critical Value of Dunnett's T= 2.412

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
c - a	-11.539	-2.563	6.414
d - a	-13.664	-4.687	4.289
b - a	-14.225	-5.100	4.025

Bonferroni (Dunn) T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 110.7962
Critical Value of T= 2.73013

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - c	-7.598	2.563	12.723
a - d	-5.473	4.687	14.848
a - b	-5.228	5.100	15.428

Dependent Variable: Eggshell Thickness (mm)

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	0.00000878	0.01	0.9975
Error	59	0.01162493		
Corrected Total	62	0.01163371		

R-Square	C.V.	RESP Mean
0.000755	6.679664	0.21014286

Source	DF	Type I SS	F Value	Pr > F
TRT	3	0.00000878	0.01	0.9975

Source	DF	Type III SS	F Value	Pr > F
TRT	3	0.00000878	0.01	0.9975

Duncan's Multiple Range Test for variable: RESP

Alpha= 0.05 df= 59 MSE= 0.000197
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377

Number of Means	2	3	4
Critical Range	.0100	.0105	.0109

Duncan Grouping	Mean	N	TRT
A	0.21075	16	a
A	0.21007	15	b
A	0.21000	16	c
A	0.20975	16	d

Dunnett's T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 0.000197
Critical Value of Dunnett's T= 2.412

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
b - a	-0.01285	-0.00068	0.01148
c - a	-0.01272	-0.00075	0.01122
d - a	-0.01297	-0.00100	0.01097

Bonferroni (Dunn) T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 0.000197
Critical Value of T= 2.73013

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - b	-0.01309	0.00068	0.01446
a - c	-0.01280	0.00075	0.01430
a - d	-0.01255	0.00100	0.01455

Dependent Variable: Hatchling Weights (grams)

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	4.34246032	1.71	0.1750
Error	59	49.97500000		
Corrected Total	62	54.31746032		

R-Square	C.V.	RESP Mean
0.079946	15.88540	5.79365079

Source	DF	Type I SS	F Value	Pr > F
TRT	3	4.34246032	1.71	0.1750

Source	DF	Type III SS	F Value	Pr > F
TRT	3	4.34246032	1.71	0.1750

Duncan's Multiple Range Test for variable: RESP

Alpha= 0.05 df= 59 MSE= 0.847034
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377

Number of Means	2	3	4
Critical Range	0.657	0.691	0.713

Duncan Grouping	Mean	N	TRT
A	6.062	16	a
A	6.000	16	c
A	5.687	16	d
A	5.400	15	b

Dunnett's T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 0.847034
Critical Value of Dunnett's T= 2.412

TRT Comparison		Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
c	- a	-0.847	-0.063	0.722
d	- a	-1.160	-0.375	0.410
b	- a	-1.460	-0.662	0.135

Bonferroni (Dunn) T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 0.847034
Critical Value of T= 2.73013

TRT Comparison		Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a	- c	-0.826	0.063	0.951
a	- d	-0.513	0.375	1.263
a	- b	-0.241	0.662	1.566

Dependent Variable: 14-Day Hatchling Survivor Weights (grams)

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	85.16388889	1.96	0.1295
Error	59	853.72500000		
Corrected Total	62	938.88888889		

R-Square	C.V.	RESP Mean
0.090707	17.46704	21.77777778

Source	DF	Type I SS	F Value	Pr > F
TRT	3	85.16388889	1.96	0.1295

Source	DF	Type III SS	F Value	Pr > F
TRT	3	85.16388889	1.96	0.1295

Duncan's Multiple Range Test for variable: RESP

Alpha= 0.05 df= 59 MSE= 14.46992
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377
Number of Means 2 3 4
Critical Range 2.715 2.855 2.947

Duncan Grouping		Mean	N	TRT
	A	23.437	16	a
B	A	21.875	16	c
B	A	21.600	15	b
B		20.187 ***	16	d

Dunnett's T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 14.46992
Critical Value of Dunnett's T= 2.412

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit	
c - a	-4.806	-1.562	1.681	
b - a	-5.135	-1.837	1.460	
d - a	-6.494	-3.250	-0.006	***

Bonferroni (Dunn) T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 14.46992
Critical Value of T= 2.73013

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - c	-2.109	1.562	5.234
a - b	-1.895	1.837	5.570
a - d	-0.422	3.250	6.922

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Dependent Variable: Total Food Consumption per Bird (grams)

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	24828.5091270	1.54	0.2144
Error	59	317754.4750000		
Corrected Total	62	342582.9841270		

R-Square	C.V.	RESP Mean
0.072474	13.79128	532.12698413

Source	DF	Type I SS	F Value	Pr > F
TRT	3	24828.5091270	1.54	0.2144

Source	DF	Type III SS	F Value	Pr > F
TRT	3	24828.5091270	1.54	0.2144

Duncan's Multiple Range Test for variable: RESP

Alpha= 0.05 df= 59 MSE= 5385.669
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377

Number of Means	2	3	4
Critical Range	52.38	55.08	56.86

Duncan Grouping	Mean	N	TRT
A	562.94	16	d
A	531.94	16	c
A	524.40	15	b
A	508.75	16	a

Dunnett's T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 5385.669
Critical Value of Dunnett's T= 2.412

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
d - a	-8.39	54.19	116.77
c - a	-39.39	23.19	85.77
b - a	-47.97	15.65	79.27

Bonferroni (Dunn) T tests for variable: RESP

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 5385.669
Critical Value of T= 2.73013

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - d	-125.02	-54.19	16.65
a - c	-94.02	-23.19	47.65
a - b	-87.66	-15.65	56.36

Dependent Variable: Number of Eggs Set per Eggs Laid

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	5976.59366742	2.25	0.0921
Error	58	51362.78169183		
Corrected Total	61	57339.37535925		

R-Square	C.V.	RESPONSE Mean
0.104232	43.16550	68.94035660

Source	DF	Type I SS	F Value	Pr > F
TRT	3	5976.59366742	2.25	0.0921

Source	DF	Type III SS	F Value	Pr > F
TRT	3	5976.59366742	2.25	0.0921

Duncan's Multiple Range Test for variable: RESPONSE

Alpha= 0.05 df= 58 MSE= 885.5652
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.48387
Number of Means 2 3 4
Critical Range 21.42 22.52 23.25

Duncan Grouping	Mean	N	TRT
A	70.72	16	d
A	69.81	15	c
A	68.36	16	a
A	66.56	15	b

Dunnett's T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 885.5652
Critical Value of Dunnett's T= 2.414

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
d - a	-23.048	2.354	27.756
c - a	-24.369	1.452	27.274
b - a	-27.626	-1.805	24.017

Bonferroni (Dunn) T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 885.5652
Critical Value of T= 2.73177

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - d	-31.095	-2.354	26.387
a - c	-30.669	-1.452	27.764
a - b	-27.412	1.805	31.021

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Dependent Variable: Viable Embryos per Eggs Set

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	16180.0048280	0.94	0.4296
Error	58	334459.7639737		
Corrected Total	61	350639.7688017		

R-Square	C.V.	RESPONSE Mean
0.046144	101.3199	74.94852954

Source	DF	Type I SS	F Value	Pr > F
TRT	3	16180.0048280	0.94	0.4296

Source	DF	Type III SS	F Value	Pr > F
TRT	3	16180.0048280	0.94	0.4296

Duncan's Multiple Range Test for variable: RESPONSE

Alpha= 0.05 df= 58 MSE= 5766.548
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.44828
Number of Means 2 3 4
Critical Range 54.73 57.54 59.40

Duncan Grouping	Mean	N	TRT
A	77.62	14	b
A	77.33	16	a
A	74.53	16	c
A	70.97	16	d

Dunnett's T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 5766.548
Critical Value of Dunnett's T= 2.414

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
b - a	-66.808	0.288	67.384
c - a	-67.617	-2.795	62.026
d - a	-71.179	-6.358	58.464

Bonferroni (Dunn) T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 5766.548
Critical Value of T= 2.73177

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - b	-76.205	-0.288	75.629
a - c	-70.547	2.795	76.138
a - d	-66.985	6.358	79.700

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Dependent Variable: Live 3-Three Week Embryos per Viable Egg

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	2581.94021363	0.91	0.4421
Error	58	54883.68035846		
Corrected Total	61	57465.62057209		

R-Square	C.V.	RESPONSE Mean
0.044930	35.01898	87.84238505

Source	DF	Type I SS	F Value	Pr > F
TRT	3	2581.94021363	0.91	0.4421

Source	DF	Type III SS	F Value	Pr > F
TRT	3	2581.94021363	0.91	0.4421

Duncan's Multiple Range Test for variable: RESPONSE

Alpha= 0.05 df= 58 MSE= 946.2704
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.44828
Number of Means 2 3 4
Critical Range 22.17 23.31 24.06

Duncan Grouping	Mean	N	TRT
A	89.31	16	a
A	88.41	16	d
A	86.79	14	b
A	86.62	16	c

Dunnett's T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 946.2704
Critical Value of Dunnett's T= 2.414

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
d - a	-27.158	-0.900	25.358
b - a	-29.707	-2.527	24.653
c - a	-28.955	-2.697	23.561

Bonferroni (Dunn) T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 946.2704
Critical Value of T= 2.73177

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - d	-28.810	0.900	30.610
a - b	-28.226	2.527	33.280
a - c	-27.013	2.697	32.407

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Dependent Variable: Number of Hatchlings per Live 3-Week Embryos

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	13308.9742997	1.93	0.1349
Error	58	133368.4666569		
Corrected Total	61	146677.4409566		

R-Square	C.V.	RESPONSE Mean
0.090736	61.30921	78.21443105

Source	DF	Type I SS	F Value	Pr > F
TRT	3	13308.9742997	1.93	0.1349

Source	DF	Type III SS	F Value	Pr > F
TRT	3	13308.9742997	1.93	0.1349

Duncan's Multiple Range Test for variable: RESPONSE

Alpha= 0.05 df= 58 MSE= 2299.456
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.44828

Number of Means	2	3	4
Critical Range	34.56	36.34	37.51

Duncan Grouping	Mean	N	TRT
A	80.42	16	a
A	80.02	16	c
A	78.33	14	b
A	73.97	16	d

Dunnett's T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 2299.456
Critical Value of Dunnett's T= 2.414

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
c - a	-41.325	-0.392	40.541
b - a	-44.453	-2.083	40.286
d - a	-47.380	-6.447	34.485

Bonferroni (Dunn) T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 2299.456
Critical Value of T= 2.73177

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - c	-45.922	0.392	46.706
a - b	-45.856	2.083	50.023
a - d	-39.867	6.447	52.761

Dependent Variable: Number of Hatchlings per Eggs Laid

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	10239.0535522	1.27	0.2915
Error	59	157999.0057679		
Corrected Total	62	168238.0593202		

R-Square	C.V.	RESPONSE Mean
0.060861	87.61552	59.06362836

Source	DF	Type I SS	F Value	Pr > F
TRT	3	10239.0535522	1.27	0.2915

Source	DF	Type III SS	F Value	Pr > F
TRT	3	10239.0535522	1.27	0.2915

Duncan's Multiple Range Test for variable: RESPONSE

Alpha= 0.05 df= 59 MSE= 2677.949
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377

Number of Means	2	3	4
Critical Range	36.94	38.84	40.09

Duncan Grouping	Mean	N	TRT
A	60.99	16	a
A	60.43	16	c
A	58.97	15	b
A	55.94	16	d

Dunnett's T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 2677.949
Critical Value of Dunnett's T= 2.412

TRT Comparison		Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
c	- a	-44.687	-0.557	43.573
b	- a	-46.881	-2.021	42.838
d	- a	-49.174	-5.044	39.086

Bonferroni (Dunn) T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 2677.949
Critical Value of T= 2.73013

TRT Comparison		Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a	- c	-49.394	0.557	50.507
a	- b	-48.755	2.021	52.797
a	- d	-44.906	5.044	54.995

Dependent Variable: 14-Day Survivors per Number of Hatchlings

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	3608.32293156	0.42	0.7367
Error	58	164629.19786435		
Corrected Total	61	168237.52079591		

R-Square	C.V.	RESPONSE Mean
0.021448	68.14218	78.18499137

Source	DF	Type I SS	F Value	Pr > F
TRT	3	3608.32293156	0.42	0.7367

Source	DF	Type III SS	F Value	Pr > F
TRT	3	3608.32293156	0.42	0.7367

Duncan's Multiple Range Test for variable: RESPONSE

Alpha= 0.05 df= 58 MSE= 2838.434
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.44828
Number of Means 2 3 4
Critical Range 38.40 40.37 41.68

Duncan Grouping	Mean	N	TRT
A	79.77	16	a
A	79.11	16	c
A	77.11	14	b
A	76.40	16	d

Dunnett's T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 2838.434
Critical Value of Dunnett's T= 2.414

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
c - a	-46.130	-0.653	44.825
b - a	-49.728	-2.654	44.420
d - a	-48.841	-3.364	42.114

Bonferroni (Dunn) T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 2838.434
Critical Value of T= 2.73177

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - c	-50.804	0.653	52.109
a - b	-50.608	2.654	55.916
a - d	-48.092	3.364	54.820

Dependent Variable: Cracked Eggs per Eggs Laid

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	15103.4527494	2.04	0.1174
Error	59	145309.2381824		
Corrected Total	62	160412.6909318		

R-Square	C.V.	RESPONSE Mean
0.094154	653.6231	7.59264724

Source	DF	Type I SS	F Value	Pr > F
TRT	3	15103.4527494	2.04	0.1174

Source	DF	Type III SS	F Value	Pr > F
TRT	3	15103.4527494	2.04	0.1174

Duncan's Multiple Range Test for variable: RESPONSE

Alpha= 0.05 df= 59 MSE= 2462.868
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377

Number of Means	2	3	4
Critical Range	35.42	37.25	38.45

Duncan Grouping	Mean	N	TRT
A	11.50	15	b
A	8.39	16	a
A	6.09	16	d
A	4.89	16	c

Dunnett's T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 2462.868
Critical Value of Dunnett's T= 2.412

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
b - a	-39.911	3.110	46.130
d - a	-44.629	-2.309	40.012
c - a	-45.821	-3.501	38.820

Bonferroni (Dunn) T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 59 MSE= 2462.868
Critical Value of T= 2.73013

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - b	-51.804	-3.110	45.585
a - d	-45.594	2.309	50.211
a - c	-44.402	3.501	51.403

Dependent Variable: Number of Hatchlings per Eggs Set

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	26784.3615095	2.25	0.0922
Error	58	230214.1419514		
Corrected Total	61	256998.5034609		

R-Square	C.V.	RESPONSE Mean
0.104220	93.34778	67.49133018

Source	DF	Type I SS	F Value	Pr > F
TRT	3	26784.3615095	2.25	0.0922

Source	DF	Type III SS	F Value	Pr > F
TRT	3	26784.3615095	2.25	0.0922

Duncan's Multiple Range Test for variable: RESPONSE

Alpha= 0.05 df= 58 MSE= 3969.209
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.44828
Number of Means 2 3 4
Critical Range 45.40 47.74 49.28

Duncan Grouping	Mean	N	TRT
A	71.03	16	a
A	69.90	14	b
A	67.50	16	c
A	62.19	16	d

Dunnett's T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 3969.209
Critical Value of Dunnett's T= 2.414

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
b - a	-56.800	-1.134	54.533
c - a	-57.310	-3.531	50.247
d - a	-62.618	-8.840	44.939

Bonferroni (Dunn) T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 3969.209
Critical Value of T= 2.73177

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - b	-61.851	1.134	64.118
a - c	-57.317	3.531	64.380
a - d	-52.009	8.840	69.688

Dependent Variable: 14-Day Hatchling Survivors per Eggs Set

Number of observations in data set = 64. NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	3	35610.1907915	3.08	0.0343
Error	58	223429.4155896		
Corrected Total	61	259039.6063811		

R-Square	C.V.	RESPONSE Mean
0.137470	98.34469	63.11102826

Source	DF	Type I SS	F Value	Pr > F
TRT	3	35610.1907915	3.08	0.0343

Source	DF	Type III SS	F Value	Pr > F
TRT	3	35610.1907915	3.08	0.0343

Duncan's Multiple Range Test for variable: RESPONSE

Alpha= 0.05 df= 58 MSE= 3852.231
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.44828

Number of Means	2	3	4
Critical Range	44.73	47.03	48.55

Duncan Grouping	Mean	N	TRT
A	67.44	16	a
A	65.11	14	b
A	63.54	16	c
A	56.95	16	d

Dunnett's T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 3852.231
Critical Value of Dunnett's T= 2.414

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
b - a	-57.17	-2.33	52.51
c - a	-56.88	-3.90	49.08
d - a	-63.48	-10.50	42.48

Bonferroni (Dunn) T tests for variable: RESPONSE

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 3852.231
Critical Value of T= 2.73177

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - b	-59.72	2.33	64.38
a - c	-56.04	3.90	63.85
a - d	-49.45	10.50	70.44

Dependent Variable: Male Body Weight (grams)

Number of observations in data set = 64; NOTE: Due to missing values, only 63 observations can be used in this analysis.

Source	DF	Sum of Squares	F Value	Pr > F
Model	4	3434.58560000	7.05	0.0001
Error	58	7067.63662223		
Corrected Total	62	10502.22222222		

R-Square	C.V.	POSTM Mean
0.327034	5.440826	202.88888889

Source	DF	Type I SS	F Value	Pr > F
TRT	3	40.13472222	0.11	0.9540
PREM	1	3394.45087777	27.86	0.0001

Source	DF	Type III SS	F Value	Pr > F
TRT	3	125.42162569	0.34	0.7942
PREM	1	3394.45087777	27.86	0.0001

Parameter		Estimate	T for H0: Parameter=0	Pr > |T|	Std Error of Estimate
INTERCEPT		87.72233244 B	3.99	0.0002	21.99171290
TRT	a	1.56697254 B	0.40	0.6896	3.90347856
	b	-1.09799834 B	-0.28	0.7829	3.96733248
	c	2.63480030 B	0.67	0.5061	3.93768924
	d	0.00000000 B	.	.	.
PREM		0.55196006	5.28	0.0001	0.10457936

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.

Least Squares Means
Coefficients for TRT Least Square Means

TRT		a	b	c
Effect		Coefficients		
INTERCEPT		1	1	1
TRT	a	1	0	0
	b	0	1	0
	c	0	0	1
	d	0	0	0
PREM		207.19047619	207.19047619	207.19047619

TRT		d
Effect		Coefficients
INTERCEPT		1
TRT	a	0
	b	0
	c	0
	d	1
PREM		207.19047619

Least Squares Means

TRT	POSTM LSMEAN	Std Err LSMEAN	Pr > |T| H0:LSMEAN=0	LSMEAN Number
a	203.650173	2.760813	0.0001	1
b	200.985202	2.854392	0.0001	2
c	204.718000	2.784784	0.0001	3
d	202.083200	2.763783	0.0001	4

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

i/j	1	2	3	4
1	.	0.5045	0.7867	0.6896
2	0.5045	.	0.3548	0.7829
3	0.7867	0.3548	.	0.5061
4	0.6896	0.7829	0.5061	.

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

Dependent Variable: Male Body Weight (grams) (cont.)

Number of observations in data set = 64. NOTE: Due to missing values, only 63 observations can be used in this analysis.

Duncan's Multiple Range Test for variable: Male Weights

Alpha= 0.05 df= 58 MSE= 121.8558
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377

Number of Means	2	3	4
Critical Range	7.882	8.288	8.555

Duncan Grouping	Mean	N	TRT
A	204.062	16	a
A	202.875	16	d
A	202.750	16	c
A	201.800	15	b

Dunnett's T tests for variable: Male Weights

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 121.8558
Critical Value of Dunnett's T= 2.413

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
d - a	-10.605	-1.187	8.230
c - a	-10.730	-1.312	8.105
b - a	-11.836	-2.262	7.311

Bonferroni (Dunn) T tests for variable: Male Weights

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 121.8558
Critical Value of T= 2.73177

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - d	-9.474	1.187	11.849
a - c	-9.349	1.312	11.974
a - b	-8.575	2.262	13.100

Dependent Variable: Female Body Weight (grams)

Source	DF	Sum of Squares	F Value	Pr > F
Model	4	11169.4777430	10.13	0.0001
Error	58	15990.2365427		
Corrected Total	62	27159.7142857		

R-Square	C.V.	POSTF Mean
0.411252	7.495369	221.52380952

Source	DF	Type I SS	F Value	Pr > F
TRT	3	1268.04345238	1.53	0.2155
PREF	1	9901.43429065	35.91	0.0001

Source	DF	Type III SS	F Value	Pr > F
TRT	3	1099.32129111	1.33	0.2737
PREF	1	9901.43429065	35.91	0.0001

Parameter		Estimate	T for H0: Parameter=0	Pr > |T|	Std Error of Estimate
INTERCEPT		30.02487361 B	0.96	0.3403	31.22637771
TRT	a	11.59577966 B	1.97	0.0531	5.87325716
	b	5.45826013 B	0.91	0.3650	5.97764592
	c	7.06352408 B	1.20	0.2354	5.89170094
	d	0.00000000 B	.	.	.
PREF		0.92276182	5.99	0.0001	0.15397635

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.

Least Squares Means
Coefficients for TRT Least Square Means

TRT		a	b	c
Effect		Coefficients		
INTERCEPT		1	1	1
TRT	a	1	0	0
	b	0	1	0
	c	0	0	1
	d	0	0	0
PREF		200.98412698	200.98412698	200.98412698

TRT		d
Effect		Coefficients
INTERCEPT		1
TRT	a	0
	b	0
	c	0
	d	1
PREF		200.98412698

Least Squares Means

TRT	POSTF	Std Err	Pr > |T|	LSMEAN

	LSMEAN	LSMEAN	H0:LSMEAN=0	Number
a	227.081133	4.154925	0.0001	1
b	220.943613	4.301127	0.0001	2
c	222.548877	4.181355	0.0001	3
d	215.485353	4.151008	0.0001	4

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

i/j	1	2	3	4
1	.	0.3082	0.4463	0.0531
2	0.3082	.	0.7909	0.3650
3	0.4463	0.7909	.	0.2354
4	0.0531	0.3650	0.2354	.

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

Dependent Variable: Female Body Weight (grams) (cont.)

Dunnett's T tests for variable: Female Body Weight

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 275.6937
Critical Value of Dunnett's T= 2.413

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
c - a	-14.603	-0.438	13.728
b - a	-21.533	-7.133	7.267
d - a	-24.666	-10.500	3.666

Duncan's Multiple Range Test for variable: Female Weight

Alpha= 0.05 df= 58 MSE= 275.6937
WARNING: Cell sizes are not equal.
Harmonic Mean of cell sizes= 15.7377
Number of Means 2 3 4
Critical Range 11.86 12.47 12.87

Duncan Grouping	Mean	N	TRT
A	226.000	16	a
A	225.562	16	c
A	218.867	15	b
A	215.500	16	d

Bonferroni (Dunn) T tests for variable: Female Weight

Alpha= 0.05 Confidence= 0.95 df= 58 MSE= 275.6937
Critical Value of T= 2.73177

TRT Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
a - c	-15.599	0.438	16.474
a - b	-9.168	7.133	23.435
a - d	-5.537	10.500	26.537

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