12/2/93

2

DATA EVALUATION RECORD

1. **CHEMICAL:** Acetochlor.
Shaughnessey Number: 121601.

2. **TEST MATERIAL:** Acetochlor; ICIA-5676; Batch No. A1016/9.P2; 89.4% purity; a dark brown liquid.

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

4. **CITATION:** Hakin, B., A.J. Norman, A. Anderson, I.S. Dawe, and D.O. Chanter. 1990. The effect of dietary inclusion of acetochlor on reproduction in the bobwhite quail. Study performed by Huntingdon Research Centre, Ltd., Huntingdon, Cambridgeshire, UK. HRC report No. ISN 188/891809. Submitted by ICI Americas Inc. EPA MRID No. 415920-10.

5. **REVIEWED BY:**

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Signature: William S. Rabert
Date: October 29, 1993

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Date: 11.9.93

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Signature: H T. Craven
Date: 12/2/93

7. **CONCLUSIONS:** Nominal dietary concentrations of acetochlor at 150 ppm and 300 ppm were reported to have had no effects upon behavior, food consumption, or reproduction in adult bobwhite quail during the 22-week exposure period. The NOEC was reported to be 300 ppm. At 600 ppm, adverse effects were reported to be reduced: adult food consumption, egg weight, eggshell thickness, chick body weights at hatch, chick body weights at 14 days of age, and the proportion of hatchlings surviving to 14 days of age. The proportion of cracked eggs was increased at 600 ppm.

added / revised

[Eight birds died in replicates prior to the beginning of egg laying and were replaced by 6 pairs of birds. Replacement of dead birds is inappropriate, because the adverse effects resulting from the early deaths on reproductive potential has been obfuscated by the replacements. Therefore, this study is not scientifically sound and does not fulfill the guideline requirements for an avian reproduction study.]

8. **RECOMMENDATIONS:** Repetition of this test is not necessary, since a second bobwhite reproduction test is Core.] added

9. **BACKGROUND:** N/A

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

11. **MATERIALS AND METHODS:**

A. **Test Animals:** Bobwhite quail (Colinus virginianus) were purchased from a supplier in Cambridgeshire, England. The birds were acclimated to the facilities for 7 days prior to initiation of the test. The birds were approximately 7 months of age at test initiation, and were identified by individual wing tags.

B. **Dose/Diet Preparation/Food Consumption:** Test diets were prepared by mixing acetochlor directly into the feed without the use of a vehicle. The control diet consisted of basal feed only. The control diet and three test concentrations (150, 300, and 600 ppm) were prepared weekly. After preparation, the diets were stored in closed paper sacks at room temperature until fed to the birds. Each of the four groups of adult birds was fed the appropriate diet for 22 weeks.

Basal diet for adult birds was quail layer diet manufactured by Special Diets Services, Witham, Essex. The composition of the diet was presented in the report. Food and water were supplied ad libitum during acclimation and during the test. Homogeneity and stability samples were taken from a trial mix of treatment diets (150 ppm and 600 ppm). Stability of the test chemical was determined in the trial mix by analyzing subsamples stored for 4, 9, and 14 days at room temperature in the animal room. Samples were taken from the test diets during weeks 1, 12, and 21 for confirmation of dietary concentrations of acetochlor. Analyses were performed by Huntingdon Research Centre (HRC) Department of Analytical Chemistry. Group food consumption was determined weekly throughout the study.

C. **Design:** The birds were distributed into four groups using a randomized block design as follows:

Acetochlor Nominal Concentration	Number of Pens	Birds Per Pen	
		Males	Females
Control (0 ppm)	20	1	1
150 ppm	20	1	1
300 ppm	20	1	1
600 ppm	20	1	1

In addition, 4 birds per group were maintained as replacements if needed prior to egg production.

D. **Pen Facilities:** Adult birds were housed indoors in pens constructed of polythene-coated steel wire. Pens measured approximately 30 cm x 40 cm x 25 cm. The mean daily maximum and minimum temperatures in the adult study rooms were 24°C and 21°C, respectively. The mean relative humidity was 76%.

The photoperiod during acclimation and during the first 6 weeks of the study was 7 hours of light per day. At the beginning of week 7, the lighting was increased to 16 hours per day, and was maintained at that level throughout the remainder of the study.

E. **Adult Observations/Gross Pathology:** Observations were made daily throughout the study for signs of toxicity or abnormal behavior. Gross pathological examinations were conducted on all birds that died during the study, as well as on all birds that survived until study termination. Adult birds were individually weighed on the following days: -7, 0, 15, 29, 43, 57, and 155.

F. **Eggs/Eggshell Thickness:** Eggs were collected daily during the 12-week production period, and stored at 16°C. Following each 7-day collection period, the eggs were candled and any cracked eggs were recorded and discarded. All normal eggs (except those used for eggshell thickness measurements) were then brought to room temperature (20°C) and placed in an incubator set to operate at 37.7°C and 55% relative humidity. Eggs were turned automatically every hour while in the incubator. Eggs were candled on day 11 to determine early embryonic death and on day 18 to determine late embryonic death. The eggs were placed in a hatcher at 37.5°C on incubation day 21. All eggs collected the first day of even-numbered weeks were used for egg shell thickness measurements. The thickness of the shells was measured at 4 points around the circumference using a micrometer calibrated to 0.01 mm.

G. **Hatchlings:** Upon removal from the hatcher, chicks were individually weighed and identified by leg bands. The hatchlings were housed in wooden pens with concrete

floors. The mean daily minimum and maximum temperatures were 25°C and 29°C, respectively. The mean relative humidity was 62%. Hatchlings were fed untreated diet (HRC chick meal), and were observed daily. Food and water were available ad libitum. At 14 days of age, individual body weights were measured. Gross pathological examinations were conducted on chicks that died during the 14-day observation period.

H. **Statistics:** Analysis of variance was used to evaluate adult food consumption, adult body weight, number of eggs laid, egg weight, % eggs damaged, egg shell thickness, infertile eggs/eggs set, early embryonic deaths/fertile eggs, late embryonic deaths/fertile eggs, eggs hatched/day 18 viable eggs, eggs hatched/fertile eggs, 14-day survivors/eggs hatched, and offspring body weight at hatching and 14 days later. Williams' test was used to compare individual treatment groups with the control.

12. **REPORTED RESULTS**

A. **Diet Analysis:** All mean measured concentrations of acetochlor taken from dietary samples were within 6% of nominal values (Addendum 1, Table 2, attached). Analyses of samples taken from the trial mix showed that acetochlor was homogeneously blended and was stable throughout the 14-day storage period (Addendum 1, Tables 3 & 4, attached).

revised

B. **Adult Mortality and Behavioral Reactions:** Eight birds died prior to the beginning of egg laying (i.e., 2 birds at 150 ppm, 1 at 300 ppm, and 5 at 600 ppm). Six of the 8 mortalities were replaced by birds from the group of spare birds maintained on the same diet as the replaced birds. The large number of mortalities at 600 ppm resulted in a reduced number of replicates (n=18) during the egg production period; these deaths "...may have been related to treatment." Another five deaths occurred after the beginning of the egg production; these deaths were as follows: 1 control bird, 2 at 150 ppm, 1 at 300 ppm, and 1 at 600 ppm, these birds were not replaced.

"In general, bird health was good throughout the study. Individual bird observations are given in Appendix 5" (attached).

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The results of gross pathological examinations conducted on birds that died or were sacrificed during the study were included in the report (attached). Most observations in the 600-ppm group consisted of "white deposits throughout the body cavity, especially thick around the heart" and were probably treatment-related.

Gross pathological examinations of birds surviving to terminal sacrifice revealed abnormalities in only 5 birds. These consisted of one thin bird (150 ppm) and cut feet in 4 birds (3 at 300 ppm, 1 at 600 ppm).

C. **Adult Body Weight and Food Consumption:** There was no evidence of any treatment-related effect on body weight. When compared to the control group, there were no significant differences in body weight at any concentration tested (Table 4, attached). Food consumption in the 600-ppm group was significantly lower than in the control group.

D. **Reproduction:** When compared to the control group, there were no significant differences in the following parameters at any concentration tested: egg production, cracked or broken eggs, infertile eggs/eggs set, early embryonic deaths/fertile eggs, late embryonic deaths/fertile eggs, eggs hatched/day 18 viable eggs, eggs hatched/fertile eggs, and 14-day survivors/eggs set (Tables 7, 9, 13, 14 & 16, attached).

The proportion of hatchlings surviving to 14 days of age was slightly low at 600 ppm (93%) compared to the controls (96%) (Table 16, attached). Analysis of the data found chick survival to be significantly lower at 600 ppm.

E. **Egg Shell Thickness:** Eggs in the 600-ppm group weighed significantly less, and had significantly thinner eggshells, than those in the controls (Tables 10-11, attached).

F. **Offspring Body Weight:** Chick body weights at hatch and at 14 days of age were slightly lower at 600 ppm than in the control group (Table 15, attached). Values at 600 ppm were significantly less than controls initially and 14 days later. Post-mortem examinations of chicks that died during the 14-day observation period revealed abnormalities in only one chick. That bird (from the 600-ppm group) was "very small with withered left leg."

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** "Following treatment of adult bobwhite quail with acetochlor in diet at 600 ppm, adult food consumption, mean egg weights, egg shell thickness and the number of chicks surviving to 14 days were reduced, and chicks were lighter in weight at time of hatch and at 14 days relative to controls. At dose levels of 150 ppm and 300 ppm, there were no treatment-related effects on adult birds or on any of the measured reproductive parameters."

The report stated that study was conducted in conformance with Good Laboratory Practice regulations. The GLP statement was signed by the Study Director. Quality assurance audits were conducted during the study and the final report was signed by the Systems Compliance Auditor of Huntingdon Research Centre 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:

The acclimation period was only one week; while a two- to six-week period is recommended.

[Extra birds were used to replace some birds that died during treatment. The use of replacement birds is not recommended and is inappropriate.] added

A solvent (test vehicle) was not used in the preparation of the test diets.

The SEP states that the test chemical should be administered for at least 10 weeks prior to the onset of egg laying. In this study, egg production began during week 9. However, no eggs were selected for hatching until after the birds had been on test feed for 10 weeks.

The mean relative humidity in the adult study rooms was 76%; the recommended relative humidity is 55%.

B. **Statistical Analysis:** Statistical analyses of reproductive parameters were performed by the KBN reviewer (attached) using analysis of variance (ANOVA) following square-root transformation of the count data and arcsine square-root transformation of the ratio data. The comparisons between the control and each treatment group were 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.

Analyses of reproductive parameters generally supported the results reported by the authors. An exception was the analysis of adult food consumption; the authors reported that this value was significantly lower in the 600-ppm group than in the controls, while the KBN reviewer's analysis revealed no significant difference. Egg weights were not subjected to statistical analysis by the reviewer.

C. **Discussion/Results:** Chemical analyses of food samples taken during weeks 2, 13, and 22 show that measured concentrations of acetochlor were very similar to nominal concentrations; all measured values were within 6% of nominal values. Homogeneity and stability was measured on a trial mix of treatment diets. Therefore, homogeneity and stability of the actual treatment diets were not measured. However, judging from the data using the trial mix, acetochlor was extremely stable in the diet, and the method of preparation achieved a homogeneous mix.

The percentages of cracked eggs in the control group (12%) and in all treatment groups are unusually high (Table 9, attached). Typically, 0.5% to 2.0% may be expected for the bobwhite quail (Technical Support Document to Subdivision E - Hazard Evaluation: Wildlife and Aquatic Organisms). The authors provided no explanation for these high values. Statistical analysis of this parameter showed no significant differences between groups. However, the high values in the control group may have confounded the analysis. Only one treatment group (600 ppm) had a higher proportion of cracked eggs than the control. A conservative approach is to assume that the value at 600 ppm (16% of the eggs were cracked) was a treatment effect.

The authors' conclusion of reduced egg weight, eggshell thickness, and adult food consumption at in the 600-ppm group is accepted. Therefore, the following parameters were reduced at 600 ppm: adult food consumption, egg weight, eggshell thickness, chick body weights at hatch, chick body weights at 14 days of age, and the proportion of hatchlings surviving to 14 days of age. The proportion of cracked eggs was increased at 600 ppm. The NOEC was 300 ppm.

The study is not scientifically sound and does not fulfill the guideline requirements for an avian reproduction study, because replacement birds were used after treatments began. The use of replacement birds obfuscates the measurement of adverse effects of the chemical on total reproductive potential.

revised

D. **Adequacy of the Study:**

(1) **Classification:** [Supplemental.] revised

added [(2) **Rationale:** The use of replacement birds confounds the measurement of reproductive effects resulting from adverse effects including those resulting from early adult deaths.]

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

15. **COMPLETION OF ONE-LINER:** Yes; [October 29, 1993.] revised

DATA EVALUATION RECORD

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Date: 12/2/93

7. **CONCLUSIONS:** Nominal dietary concentrations of acetochlor at 150 ppm and 300 ppm had no effects upon behavior, food consumption, or reproduction in adult bobwhite quail during the 22-week exposure period. The NOEC was 300 ppm. At 600 ppm, the following parameters were reduced: adult food consumption, egg weight, eggshell thickness, chick bodyweights at hatch, chick bodyweights at 14 days of age, and the proportion of hatchlings surviving to 14 days of age. The proportion of cracked eggs was increased at 600 ppm. This study is scientifically sound and fulfills the guideline requirements for an avian reproduction study.

ACETOCHLOR

Page_____ is not included in this copy.

Pages 10 through 22 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.

____ Identity of the source of product ingredients.

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____ A draft product label.

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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/QUAIL

TREATMENT LEVEL: Control

		PENNO	EL	EC	ES	VE	LE21	HAT	TWOWK
CASE	1	1	26	2	21	20	20	18	18
CASE	2	2	61	12	46	46	46	45	45
CASE	3	3	0	0	0	0	0	0	0
CASE	4	4	36	1	31	30	30	25	25
CASE	5	5	69	8	57	57	56	55	54
CASE	6	6	21	4	16	16	16	13	11
CASE	7	7	72	2	64	62	62	60	60
CASE	8	8	34	5	26	25	24	19	19
CASE	9	9	37	5	28	27	24	23	22
CASE	10	10	52	13	36	36	35	34	33
CASE	11	11	65	1	60	58	57	57	46
CASE	12	12	20	3	14	10	10	9	9
CASE	13	13	9	3	5	0	0	0	0
CASE	14	14	40	3	35	34	34	34	34
CASE	15	15	47	5	37	36	34	26	26
CASE	16	16	45	13	30	30	30	26	24
CASE	17	17	59	10	44	15	15	15	14
CASE	18	18	42	8	30	30	29	26	26
CASE	19	19	53	1	47	43	42	39	35
CASE	20	20	55	1	48	45	45	43	43
	Sums		843	100	675	620	609	567	544

TREATMENT LEVEL: 150 ppm

CASE	21	1	64	13	44	29	28	24	22
CASE	22	2	24	0	21	21	21	21	14
CASE	23	3	58	4	48	36	36	25	25
CASE	24	4	34	3	28	27	26	25	23
CASE	25	5	72	10	57	51	40	24	23
CASE	26	6	47	2	40	38	38	33	33
CASE	27	7	35	4	27	24	24	16	14
CASE	28	8	35	2	28	26	26	26	26
CASE	29	9	79	9	64	63	61	60	60
CASE	30	10	28	3	21	18	19	15	14
CASE	31	11	46	2	38	29	26	25	25
CASE	32	12	13	2	10	10	10	9	9
CASE	33	13	74	5	63	59	59	57	56
CASE	34	14	25	3	20	20	20	20	20
CASE	35	15	0	0	0	0	0	0	0
CASE	36	16	34	6	26	22	18	10	9
CASE	37	17	61	1	55	55	55	53	51
CASE	38	18	0	0	0	0	0	0	0
CASE	39	19	9	4	5	3	2	0	0
CASE	40	20	40	10	27	25	24	21	21
	Sums		778	83	622	556	533	464	445

TREATMENT LEVEL: 300 ppm

		PENNO	EL	EC	ES	VE	LE21	HAT	TWOWK
CASE	41	1	59	2	52	47	46	43	42
CASE	42	2	56	5	46	46	46	44	44
CASE	43	3	63	15	44	39	38	29	28
CASE	44	4	62	5	52	51	51	51	46
CASE	45	5	53	2	47	45	45	43	35
CASE	46	6	35	2	30	22	21	19	19
CASE	47	7	32	2	29	27	26	22	22
CASE	48	8	55	2	49	48	48	45	45
CASE	49	9	39	0	35	34	34	33	33
CASE	50	10	27	3	21	21	21	21	21
CASE	51	11	9	0	7	4	4	4	4
CASE	52	12	52	6	41	38	38	38	37
CASE	53	13	51	3	43	43	43	42	41
CASE	54	14	57	1	50	28	28	28	28
CASE	55	15	71	6	62	59	57	54	52
CASE	56	16	36	3	28	27	27	24	23
CASE	57	17	65	2	57	55	54	51	46
CASE	58	18	63	17	43	43	42	40	37
CASE	59	19	63	10	47	47	46	45	42
CASE	60	20	50	2	46	38	37	36	33
	Sums		998	88	829	762	752	712	678

TREATMENT LEVEL: 600 ppm

CASE	61	1	66	2	59	53	53	51	51
CASE	62	2	13	10	3	0	0	0	0
CASE	63	3	68	9	55	54	54	52	48
CASE	64	4	60	3	52	52	50	45	44
CASE	65	5	1	0	1	1	1	1	1
CASE	66	6	59	6	50	50	50	49	47
CASE	67	7	53	1	47	33	33	31	29
CASE	68	8	61	4	51	48	47	34	31
CASE	69	9	1	0	1	1	1	1	0
CASE	70	10	35	9	24	19	18	15	13
CASE	71	11	57	52	4	1	1	1	1
CASE	72	12	38	6	27	27	26	25	24
CASE	73	13	68	3	59	58	57	49	47
CASE	74	14	59	13	41	17	15	15	6
CASE	75	15	66	12	50	49	48	45	41
CASE	76	16	63	5	53	52	52	37	36
CASE	77	17	53	2	45	43	43	42	39
CASE	78	18	33	3	26	24	22	22	20
	Sums		854	140	648	582	571	515	478

ANOVA on SQR(Eggs Laid)
ACETOCHLOR/QUAIL
Sorted by Treatment Levels

DEP VAR: SEL N: 78 MULTIPLE R: 0.216 SQUARED MULTIPLE R: 0.047

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	15.835	3	5.278	1.213	0.311
ERROR	322.119	74	4.353		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	2.041	1	2.041	0.469	0.496
ERROR	322.119	74	4.353		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	5.877	1	5.877	1.350	0.249
ERROR	322.119	74	4.353		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.989	1	0.989	0.227	0.635
ERROR	322.119	74	4.353		

ANOVA on SQR(Eggs Cracked)

DEP VAR: SEC N: 78 MULTIPLE R: 0.175 SQUARED MULTIPLE R: 0.031

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	3.287	3	1.096	0.780	0.509
ERROR	103.963	74	1.405		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.566	1	0.566	0.403	0.528
ERROR	103.963	74	1.405		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.324	1	0.324	0.231	0.632
ERROR	103.963	74	1.405		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.852	1	0.852	0.607	0.439
ERROR	103.963	74	1.405		

ANOVA on SQR(Eggs Set)

DEP VAR: SES N: 78 MULTIPLE R: 0.226 SQUARED MULTIPLE R: 0.051

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	15.943	3	5.314	1.323	0.273
ERROR	297.172	74	4.016		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.562	1	1.562	0.389	0.535
ERROR	297.172	74	4.016		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	6.952	1	6.952	1.731	0.192
ERROR	297.172	74	4.016		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.007	1	0.007	0.002	0.968
ERROR	297.172	74	4.016		

ANOVA on SQR(Viable Embryos)

DEP VAR: SVE N: 78 MULTIPLE R: 0.221 SQUARED MULTIPLE R: 0.049

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	17.053	3	5.684	1.272	0.290
ERROR	330.638	74	4.468		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.179	1	1.179	0.264	0.609
ERROR	330.638	74	4.468		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	7.913	1	7.913	1.771	0.187
ERROR	330.638	74	4.468		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.042	1	0.042	0.009	0.923
ERROR	330.638	74	4.468		

ANOVA on SQR(Hatched)

DEP VAR: SHAT N: 78 MULTIPLE R: 0.270 SQUARED MULTIPLE R: 0.073

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	24.805	3	8.268	1.944	0.130
ERROR	314.740	74	4.253		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	3.701	1	3.701	0.870	0.354
ERROR	314.740	74	4.253		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	8.705	1	8.705	2.047	0.157
ERROR	314.740	74	4.253		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.127	1	0.127	0.030	0.863
ERROR	314.740	74	4.253		

ANOVA on SQR(21-day Live Embryos)

DEP VAR: SLE21 N: 78 MULTIPLE R: 0.232 SQUARED MULTIPLE R: 0.054

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	18.564	3	6.188	1.405	0.248
ERROR	325.907	74	4.404		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.634	1	1.634	0.371	0.544
ERROR	325.907	74	4.404		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	8.059	1	8.059	1.830	0.180
ERROR	325.907	74	4.404		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.055	1	0.055	0.012	0.912
ERROR	325.907	74	4.404		

ANOVA on SQR(Two week Survivors)

DEP VAR: STWOWK N: 78 MULTIPLE R: 0.272 SQUARED MULTIPLE R: 0.074

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	25.140	3	8.380	1.978	0.125
ERROR	313.493	74	4.236		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	3.785	1	3.785	0.894	0.348
ERROR	313.493	74	4.236		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	8.084	1	8.084	1.908	0.171
ERROR	313.493	74	4.236		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.740	1	0.740	0.175	0.677
ERROR	313.493	74	4.236		

ACETOCHLOR/QUAIL
Sorted by Treatment Levels
ANOVA on EC/EL

DEP VAR: RESP1 N: 75 MULTIPLE R: 0.212 SQUARED MULTIPLE R: 0.045

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	467.020	3	155.673	1.116	0.348
ERROR	9901.283	71	139.455		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	11.407	1	11.407	0.082	0.776
ERROR	9901.283	71	139.455		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	266.811	1	266.811	1.913	0.171
ERROR	9901.283	71	139.455		

Post-hoc contrast of treatment 3 with control.

FOR EFFECT CALLED: TRT

OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
OTHESIS	16.490	1	16.490	0.118	0.732
ERROR	9901.283	71	139.455		

03

ANOVA on LE21/VE

DEP VAR: RESP3 N: 72 MULTIPLE R: 0.227 SQUARED MULTIPLE R: 0.051

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	217.650	3	72.550	1.228	0.306
ERROR	4017.857	68	59.086		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	134.802	1	134.802	2.281	0.136
ERROR	4017.857	68	59.086		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	3.802	1	3.802	0.064	0.801
ERROR	4017.857	68	59.086		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	4.958	1	4.958	0.084	0.773
ERROR	4017.857	68	59.086		

ANOVA on HAT/LE21

DEP VAR: RESP4 N: 73 MULTIPLE R: 0.321 SQUARED MULTIPLE R: 0.103

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1420.177	3	473.392	2.642	0.056
ERROR	12364.788	69	179.200		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	565.247	1	565.247	3.154	0.080
ERROR	12364.788	69	179.200		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	109.991	1	109.991	0.614	0.436
ERROR	12364.788	69	179.200		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	39.846	1	39.846	0.222	0.639
ERROR	12364.788	69	179.200		

ANOVA on TWOWK/HAT

DEP VAR: RESP5 N: 72 MULTIPLE R: 0.323 SQUARED MULTIPLE R: 0.104

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1390.415	3	463.472	2.640	0.056
ERROR	11939.608	68	175.582		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	30.477	1	30.477	0.174	0.678
ERROR	11939.608	68	175.582		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	17.769	1	17.769	0.101	0.751
ERROR	11939.608	68	175.582		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1116.029	1	1116.029	6.356	0.014
ERROR	11939.608	68	175.582		

ANOVA on HAT/ES

DEP VAR: RESP6 N: 75 MULTIPLE R: 0.179 SQUARED MULTIPLE R: 0.032

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	842.063	3	280.688	0.787	0.505
ERROR	25330.494	71	356.768		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	104.521	1	104.521	0.293	0.590
ERROR	25330.494	71	356.768		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	284.529	1	284.529	0.798	0.375
ERROR	25330.494	71	356.768		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	29.592	1	29.592	0.083	0.774
ERROR	25330.494	71	356.768		

ACETOCHLOR/QUAIL
Sorted by Treatment Levels
ANOVA on TWOWK/ES

DEP VAR: RESP7 N: 75 MULTIPLE R: 0.248 SQUARED MULTIPLE R: 0.062

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1699.959	3	566.653	1.555	0.208
ERROR	25865.352	71	364.301		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	175.077	1	175.077	0.481	0.490
ERROR	25865.352	71	364.301		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	199.864	1	199.864	0.549	0.461
ERROR	25865.352	71	364.301		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	610.152	1	610.152	1.675	0.200
ERROR	25865.352	71	364.301		

QUAIL ACETOCHLOR

ANOVA on hatwt

DEP VAR: HATWT N: 674 MULTIPLE R: 0.353 SQUARED MULTIPLE R: 0.124

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	41.473	3	13.824	31.728	0.000
ERROR	291.927	670	0.436		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.290	1	0.290	0.666	0.415
ERROR	291.927	670	0.436		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.205	1	0.205	0.471	0.493
ERROR	291.927	670	0.436		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	28.160	1	28.160	64.630	0.000
ERROR	291.927	670	0.436		

ANOVA on survwt

DEP VAR: SURVWT N: 663 MULTIPLE R: 0.331 SQUARED MULTIPLE R: 0.109

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	916.308	3	305.436	26.971	0.000
ERROR	7462.971	659	11.325		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.040	1	0.040	0.003	0.953
ERROR	7462.971	659	11.325		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	12.159	1	12.159	1.074	0.300
ERROR	7462.971	659	11.325		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	571.955	1	571.955	50.505	0.000
ERROR	7462.971	659	11.325		

REPRODUCTION/QUAIL
Sorted by Treatment Levels
ANOVA on thick

DEP VAR: THICK N: 312 MULTIPLE R: 0.201 SQUARED MULTIPLE R: 0.040

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	0.005	3	0.002	4.307	0.005
ERROR	0.114	308	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	0.153	0.696
ERROR	0.114	308	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	0.172	0.679
ERROR	0.114	308	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	0.004	1	0.004	10.190	0.002
ERROR	0.114	308	0.000		

QUAIL (1)

TRT	PENNO	THICK (eggshell thickness)	HATWT (Day-0 weight)	SURWT (weight at 14 days of age)
1	1			
1	2	0.22		
1	3			
1	4			
1	5		7.2	29
1	6	0.21		
1	7	0.22	6.4	29
1	8	0.18	7.22	29
1	9			
1	10			
1	11	0.21	6.5	27
1	12			
1	13			
1	14		5.8	25
1	15	0.22	6.4	27
1	16	0.2	6.1	29
1	17	0.2	6.3	25
1	18			
1	19		6.3	26
1	20	0.15		
2	1		6.2	23
2	2			
2	3	0.21	6	28
2	4			
2	5	0.18		
2	6	0.18	7.3	31
2	7			
2	8	0.19		
2	9	0.19	6	21
2	10	0.18		
2	11	0.2	6.1	27
2	12			
2	13	0.19		
2	14	0.21	7.4	30
2	15			
2	16			
2	17		6	24
2	18			
2	19			
2	20			
3	1			
3	2			
3	3			
3	4	0.21	5.7	25
3	5			
3	6	0.19		
3	7	0.19	6.8	29
3	8	0.22	6.6	32
3	9			
3	10	0.18	7.2	26
3	11	0.17		
3	12			
3	13			
3	14	0.2		
3	15	0.21	6.2	26
3	16	0.18		
3	17	0.19	6.8	27
3	18			
3	19	0.2	7.5	33
3	20			
4	1	0.21		
4	2	0.12		

(2)

4	3		5.9	19
4	4	0.19	5.5	24
4	5			
4	6	0.19	5.8	23
4	7	0.2	5	23
4	8	0.23	6.2	22
4	9			
4	10			
4	11	0.17		
4	12			
4	13	0.2	6	24
4	14	0.16	6	19
4	15	0.19	6.4	26
4	16	0.22	6.5	25
4	17	0.21		
4	18			
1	1			
1	2	0.2	7.2	25
1	3			
1	4			
1	5	0.18	8	29
1	6		5.8	23
1	7	0.22	7.4	28
1	8	0.19	8.5	25
1	9	0.22		
1	10		6	27
1	11		6.9	22
1	12			
1	13			
1	14	0.23	6.7	26
1	15	0.23	7.3	30
1	16	0.22	6.8	28
1	17	0.22	6.5	25
1	18			
1	19	0.19	6.3	26
1	20	0.16	7.3	23
2	1	0.18	6.9	34
2	2	0.18		
2	3	0.21	7	28
2	4	0.21		
2	5		7.5	29
2	6		7.8	33
2	7	0.18	7.2	21
2	8	0.2	7.2	28
2	9	0.21	6.5	19
2	10	0.21		
2	11	0.18		
2	12		7.2	23
2	13	0.2	7.4	31
2	14	0.21	8.4	32
2	15			
2	16	0.19		
2	17	0.22	6.5	25
2	18			
2	19			
2	20	0.19	7	33
3	1	0.21		
3	2	0.18	7.6	29
3	3	0.2	6	26
3	4	0.22	6.2	28

3	5	0.21	6.3	24
3	6		8.2	31
3	7	0.18	7.7	27
3	8		7.6	31
3	9	0.2	6.7	25
3	10	0.18	8.3	21
3	11	0.18		
3	12	0.19		
3	13	0.21	5.8	31
3	14	0.21	7.5	27
3	15		6.7	23
3	16	0.2	7.6	32
3	17	0.2	7.1	30
3	18	0.21	6.9	28
3	19	0.22	7.6	27
3	20			
4	1	0.21		
4	2			
4	3	0.19	5.3	19
4	4	0.19	6.6	23
4	5			
4	6		6.5	24
4	7	0.18	6	21
4	8		6.7	22
4	9			
4	10		6.1	22
4	11			
4	12	0.17		
4	13	0.22	6.4	29
4	14		5.9	
4	15		7.1	27
4	16	0.22	6.7	22
4	17	0.21	6.7	19
4	18	0.2		
1	1		6.8	25
1	2	0.2	7.1	27
1	3			
1	4	0.19		
1	5	0.18	7.9	29
1	6		7	27
1	7	0.22	7.5	32
1	8		8.1	31
1	9	0.2	5.6	21
1	10	0.2	6.3	25
1	11	0.23	7.1	20
1	12			
1	13	0.18		
1	14		7	25
1	15	0.22	8.1	27
1	16	0.22	7.4	28
1	17	0.22	6.7	29
1	18	0.22	8.6	32
1	19	0.2	6.8	25
1	20	0.18	7.5	24
2	1	0.22	7	27
2	2			
2	3	0.22	7	34
2	4	0.21	6.8	27
2	5	0.21	8	26
2	6	0.2	8.4	28
2	7		6.6	26
2	8	0.19	7.2	26
2	9	0.19	6.5	19
2	10	0.19	6.9	28
2	11	0.21	6.6	28

2	12	0.17	7.8	32
2	13	0.2	7	25
2	14	0.23	7.9	29
2	15			
2	16	0.21		
2	17	0.23	7	21
2	18			
2	19			
2	20	0.19	7.3	25
3	1	0.2	6.6	28
3	2	0.18	7.3	26
3	3	0.19	6.9	24
3	4	0.22	6.4	26
3	5	0.21	6.7	23
3	6	0.21	7.8	29
3	7		7.6	25
3	8	0.22	7.6	26
3	9	0.22	6.7	19
3	10	0.18	8.4	27
3	11		6.3	20
3	12	0.19	7.5	27
3	13	0.19	6.3	22
3	14	0.21	7.6	28
3	15	0.22	7	26
3	16	0.22	8	29
3	17	0.21	7.4	26
3	18	0.2	8	26
3	19	0.21	8.1	29
3	20	0.19	6	24
4	1	0.21	6.4	22
4	2			
4	3	0.19	5.9	21
4	4	0.2	7.2	25
4	5			
4	6	0.19	6.7	25
4	7	0.18	6.2	23
4	8	0.2	7.7	27
4	9			
4	10			
4	11	0.14		
4	12	0.18	7.4	22
4	13	0.2	6.7	24
4	14	0.17	5.8	
4	15	0.18	7.4	28
4	16	0.25	7.1	23
4	17	0.21	7.7	23
4	18	0.2	6.8	10
1	1	0.23	6.9	22
1	2	0.22	7.3	25
1	3			
1	4	0.19	7	24
1	5	0.18	8	26
1	6		6.5	26
1	7	0.23	7.5	30
1	8	0.22		
1	9		6.7	28
1	10		7.5	31
1	11	0.18	7.3	25
1	12	0.21	6.4	21
1	13			
1	14	0.22	7.3	23

1	15		7.6	20
1	16		7.3	23
1	17	0.22	6.6	20
1	18	0.19	8.5	22
1	19	0.21	7.4	27
1	20	0.17	8.1	25
2	1	0.23	7.3	28
2	2	0.22	6.3	
2	3	0.22	7.3	32
2	4		7.5	26
2	5	0.18	8	25
2	6	0.2	8.4	23
2	7	0.21	7.6	22
2	8	0.23	7.6	30
2	9	0.21	6.9	19
2	10	0.22	7.6	25
2	11	0.21	6.8	27
2	12		7.1	18
2	13	0.19	7.2	25
2	14		7.9	27
2	15			
2	16		6.6	17
2	17	0.22	7.6	24
2	18			
2	19			
2	20		6.7	27
3	1	0.22	7.4	26
3	2	0.17	7.8	25
3	3	0.2	6.6	26
3	4	0.21	6.7	23
3	5		7.1	26
3	6		8.2	25
3	7		8.1	28
3	8		7.4	27
3	9	0.22	7.7	21
3	10		7.9	24
3	11		5.8	19
3	12	0.19	7.6	26
3	13	0.19	6.2	24
3	14	0.22	7.7	25
3	15		7	23
3	16	0.22	8	28
3	17	0.2	7.3	24
3	18	0.2	8.2	28
3	19	0.222	8.4	27
3	20	0.19	6.9	22
4	1	0.21	6.7	22
4	2			
4	3	0.19	6	23
4	4	0.21	6.9	23
4	5			
4	6	0.19	6.8	25
4	7	0.2		
4	8	0.22		
4	9			
4	10	0.2	6.7	23
4	11	0.16		
4	12	0.18	7.6	21
4	13	0.21	6.7	24
4	14	0.18		

4	15	0.19	7.2	22
4	16	0.23	6.8	21
4	17	0.22	7.5	26
4	18	0.19	6.9	
1	1	0.22	7.7	28
1	2	0.21	7.2	25
1	3			
1	4	0.18		
1	5	0.17	7.8	25
1	6		6.4	27
1	7	0.23	7.5	32
1	8	0.22	8.2	27
1	9	0.21	7.2	22
1	10	0.21	7.4	27
1	11	0.2	7.2	26
1	12	0.18	6.4	25
1	13	0.19		
1	14	0.22	7.1	25
1	15	0.24	7.7	14
1	16		7.1	23
1	17	0.21	6.8	22
1	18	0.23	8.7	31
1	19	0.21	7.1	28
1	20	0.18	8.1	25
2	1	0.19	7.5	29
2	2	0.22	6.8	22
2	3	0.22	7.2	31
2	4		7.8	26
2	5	0.19	8	26
2	6	0.22	8.5	25
2	7	0.2	6.9	26
2	8	0.19	7.2	24
2	9	0.21	7	18
2	10			
2	11	0.22	6.7	27
2	12		7.2	27
2	13	0.2	7.2	25
2	14		7.9	27
2	15			
2	16	0.21		
2	17	0.22	7.8	25
2	18			
2	19			
2	20	0.19	7.2	31
3	1	0.21	7.5	28
3	2	0.18	6.9	23
3	3	0.19	6.6	23
3	4	0.22	7.1	26
3	5	0.22	6.9	22
3	6	0.21	8	29
3	7		8	27
3	8	0.23	7.7	30
3	9	0.23	7.4	23
3	10		8	25
3	11		6.3	22
3	12	0.2	7.2	26
3	13	0.19	6.3	20
3	14	0.23	8	26
3	15	0.21	7.2	25
3	16	0.2	8.1	30
3	17	0.21	7.6	26
3	18	0.2	7.8	25
3	19	0.23	8	30
3	20	0.19	6.6	23
4	1	0.22	6.8	21
4	2	0.12		

(7)

4	3		5.4	21
4	4		6.9	23
4	5			
4	6	0.19	6.9	26
4	7	0.21	6.1	20
4	8	0.23	6.6	22
4	9			
4	10	0.12		
4	11	0.16		
4	12	0.19	7.6	20
4	13	0.21	6.7	24
4	14	0.18	6.4	18
4	15	0.2	7.1	24
4	16	0.23	6.9	26
4	17		7.6	26
4	18	0.19	7.6	16
1	1	0.23	7.6	27
1	2	0.19	7.7	23
1	3		3	
1	4	0.18	7.1	25
1	5	0.17	7.9	26
1	6		6.2	28
1	7	0.22	7.5	32
1	8		8.2	26
1	9	0.2	6.9	23
1	10	0.2	7.4	30
1	11	0.23	7.3	23
1	12	0.21		
1	13			
1	14		6.9	24
1	15	0.23	7.2	24
1	16		7.5	27
1	17	0.19	6.9	23
1	18	0.22	8.2	28
1	19	0.17	7.3	27
1	20	0.17	8.4	24
2	1		7.2	28
2	2		7.2	25
2	3	0.22	7.3	31
2	4	0.19	7	27
2	5	0.19	8.1	26
2	6	0.18	8.8	28
2	7	0.2	6.3	18
2	8		7.2	20
2	9	0.21	7	20
2	10		6.5	17
2	11	0.23	6.3	29
2	12			
2	13	0.19	6.6	27
2	14		7.6	28
2	15			
2	16	0.19		
2	17	0.22	7.7	25
2	18			
2	19			
2	20		7.1	31
3	1	0.21	7.8	26
3	2	0.17	7.7	23
3	3	0.19	6.6	23
3	4	0.2	6.9	24

3	5	0.21	7.4	27
3	6		8	34
3	7			
3	8	0.21	7.2	30
3	9		7.2	22
3	10		8.5	24
3	11			
3	12	0.21	7.7	26
3	13	0.19	6.5	23
3	14	0.22	7.5	22
3	15	0.21	7	25
3	16		8	28
3	17	0.2	7.8	26
3	18	0.2	7.6	28
3	19	0.22	8.1	31
3	20		7.1	20
4	1	0.2	6.5	21
4	2			
4	3	0.19	5.7	23
4	4	0.19	6.8	25
4	5			
4	6		6.4	24
4	7			
4	8	0.23	6.9	25
4	9			
4	10	0.2		
4	11			
4	12	0.17	7.3	26
4	13	0.19	6.3	21
4	14	0.19	6.1	20
4	15	0.19	7.2	23
4	16		7	24
4	17	0.21	7.7	25
4	18		7.8	25
1	1		7.4	28

1	2		7	27
1	3			
1	4		7.1	25
1	5		7.9	25
1	6		6.7	24
1	7		7.6	28
1	8		8.4	30
1	9			
1	10		7	26
1	11		7	22
1	12		6.1	26
1	13			
1	14		6.5	24
1	15		6.9	21
1	16		7.6	26
1	17		6.7	16
1	18		7.8	28
1	19		6.8	23
1	20		7.9	22
2	1		7.6	24
2	2		6.7	21
2	3		7.1	28
2	4		7	28
2	5		7.4	22
2	6		8.1	25

2	7	5.1	
2	8	7.2	28
2	9	6.8	19
2	10	7.5	26
2	11	7	29
2	12	7.1	26
2	13	6.7	27
2	14	7.8	30
2	15		
2	16		
2	17	7.8	26
2	18		
2	19		
2	20	6.7	29
3	1	7.3	25
3	2	7.8	27
3	3	6.4	25
3	4	6.8	25
3	5	7.3	23
3	6	7.8	29
3	7	8	31
3	8	7.1	27
3	9	7.2	24
3	10	7.9	22
3	11		
3	12	7.8	25
3	13	6.5	22
3	14	7.5	26
3	15	7.6	24
3	16	8.1	27
3	17	7.2	23
3	18	7.6	29
3	19	8.1	31
3	20	7	21
4	1	6.4	18
4	2		
4	3	5.5	22
4	4	6.6	25
4	5	5.4	12
4	6	6.6	24
4	7	6.1	20
4	8	6.7	22
4	9	5.3	
4	10	6.4	25
4	11	7.3	21
4	12	7	25
4	13	6.6	26
4	14	6.3	18
4	15	6.9	24
4	16	3.8	24
4	17	7.4	24
4	18	7.4	23
1	1	7.8	26
1	2	7	23
1	3		
1	4	8	28
1	5	7.6	25
1	6	6.5	25
1	7	7.7	32
1	8	8.1	32
1	9		
1	10	7.5	28
1	11	7.6	22
1	12		
1	13		
1	14	7.2	24

1	15	8	25
1	16		
1	17		
1	18	8.9	26
1	19	6.7	23
1	20	7.8	25
2	1	7.1	25
2	2	6.8	28
2	3	7.5	28
2	4	7.3	24
2	5	7.7	25
2	6	8.6	30
2	7		
2	8	7.5	30
2	9	6.9	16
2	10	7.3	24
2	11	7	30
2	12	6.5	22
2	13	6.9	31
2	14		
2	15		
2	16	5.8	23
2	17	8.2	27
2	18		
2	19		
2	20	7.1	24
3	1	7.5	26
3	2	7.8	26
3	3	7	28
3	4	6.9	23
3	5	7.4	25
3	6	7.7	29
3	7		
3	8	7.5	31
3	9	6.9	24
3	10		
3	11		
3	12	8.4	25
3	13	6.8	24
3	14	7.9	27
3	15	7.3	25
3	16	7.8	27
3	17	7.3	28
3	18	7.5	28
3	19	7.7	30
3	20	6.7	25
4	1	6.8	19
4	2		
4	3	6	24
4	4	6.9	25
4	5		
4	6	6.8	26
4	7	6.6	21
4	8	7	26
4	9		
4	10	7.5	17
4	11		
4	12	8.1	25
4	13	7.2	24
4	14	6.7	

4	15	7	21
4	16	6.7	22
4	17	7.6	26
4	18	7.1	18
1	1	7.2	28
1	2	6.9	27
1	3		
1	4	7.7	27
1	5	7.8	28
1	6		
1	7	7.6	35
1	8		
1	9	5.5	20
1	10	7.2	29
1	11	6.6	17
1	12	6.9	20
1	13		
1	14	7.1	26
1	15	7.4	25
1	16		
1	17		
1	18	8	32
1	19	7.3	31
1	20	8.4	25
2	1	7	26
2	2	6.8	29
2	3	7.4	35
2	4	7.6	30
2	5		
2	6	8.3	26
2	7	6.6	22
2	8	6.9	27
2	9	7.6	20
2	10		
2	11	6.7	29
2	12		
2	13	7.1	26
2	14		
2	15		
2	16	5.7	23
2	17	8.1	26
2	18		
2	19		
2	20	7.2	32
3	1	6.4	29
3	2	7.1	27
3	3	6.8	28
3	4	6.6	25
3	5	7.4	30
3	6	7.7	31
3	7	6	25
3	8	7.1	29
3	9	7.7	24
3	10		
3	11		
3	12	7.2	25
3	13	6.4	26
3	14	7.4	25
3	15	7.2	25
3	16	7.7	27

3	17	7.3	26
3	18	7.8	29
3	19	7.7	27
3	20	6.9	25
4	1	6.6	20
4	2		
4	3	5.7	24
4	4	6.5	30
4	5		
4	6	6.7	27
4	7	5.7	21
4	8	6.6	25
4	9		
4	10		
4	11		
4	12	7.4	26
4	13	6.6	25
4	14	6.5	
4	15	7.3	25
4	16	6.9	30
4	17	7.3	26
4	18	7.7	30
1	1	7.5	29
1	2	7.5	27
1	3		
1	4	6.8	25
1	5	7.8	26
1	6		
1	7	7.6	33
1	8	8.4	31
1	9	6.3	21
1	10	7.5	29
1	11	6.7	21
1	12	6.4	28
1	13		
1	14	6.9	24
1	15	8	25
1	16		
1	17		
1	18	8	29
1	19	7.2	23
1	20	8.3	23
2	1	6.8	22
2	2	7.5	26
2	3		
2	4		
2	5		
2	6	8.2	26
2	7		
2	8	7.3	26
2	9	7	20
2	10	6.9	26
2	11		
2	12		
2	13	7.2	25
2	14		
2	15		
2	16	7	25
2	17	8.2	22
2	18		
2	19		
2	20	7.3	31
3	1	7.7	28
3	2	7.8	27
3	3	7.1	29
3	4	6.6	24

(12)

(13)

3	5	7.5	21
3	6		
3	7		
3	8	7.6	28
3	9	7.5	23
3	10		
3	11		
3	12	8.5	28
3	13	6.8	25
3	14		
3	15	7.3	25
3	16	7.9	29
3	17	7.7	25
3	18	8.4	26
3	19	7.7	25
3	20	7.1	26
4	1	6.2	18
4	2		
4	3	5.3	21
4	4	6.6	22
4	5		
4	6	7	24
4	7	6.4	26
4	8	6.9	23
4	9		
4	10	6.8	28
4	11		
4	12	8	27
4	13	6.4	23
4	14	5.5	20
4	15	6.6	23
4	16	6.9	26
4	17	6.8	25
4	18	7.3	25
1	1	7.8	33
1	2	6.8	24
1	3		
1	4		
1	5	7.3	25
1	6		
1	7	7.7	32
1	8	7.9	22
1	9	6.8	23
1	10	7.4	27
1	11	6.7	21
1	12	6.9	26
1	13		
1	14	6.5	24
1	15	7.1	25
1	16		
1	17		
1	18	7.8	28
1	19	7.4	28
1	20	7.7	27
2	1		
2	2	6.8	30
2	3	7	29
2	4	6.4	27
2	5		
2	6		

2	7	7	26
2	8		
2	9	7.1	22
2	10		
2	11		
2	12		
2	13	7	29
2	14		
2	15		
2	16	6	15
2	17	7.8	27
2	18		
2	19		
2	20	7.1	27
3	1	7.2	28
3	2	7.4	30
3	3	6.8	29
3	4	6.2	27
3	5	7	28
3	6		
3	7		
3	8	7.1	32
3	9	7.2	24
3	10		
3	11		
3	12	6.6	30
3	13	6.6	26
3	14		
3	15	7	23
3	16		
3	17	7.6	31
3	18	7.5	30
3	19	7.6	25
3	20	6.9	25
4	1	6.3	21
4	2		
4	3	5.4	22
4	4	6.5	29
4	5		
4	6		
4	7	5.9	24
4	8	6.3	24
4	9		
4	10	6.4	24
4	11		
4	12	7.8	16
4	13	6.7	24
4	14		
4	15	7.1	23
4	16	6.7	20
4	17	7.6	28
4	18		
1	1	8.2	28
1	2	7.1	26
1	3		
1	4	7.5	28
1	5	7.8	29
1	6		
1	7	8.1	33
1	8	8.7	23

1	9	5.8	17
1	10	7.3	24
1	11	6.6	23
1	12		
1	13		
1	14	7.2	26
1	15	7.3	24
1	16		
1	17		
1	18		
1	19		
1	20	7.1	21
2	1		
2	2		
2	3	6.8	25
2	4	6.8	26
2	5	8.1	17
2	6	8.8	21
2	7	7.5	26
2	8		
2	9	6.4	20
2	10		
2	11		
2	12		
2	13	7.1	29
2	14		
2	15		
2	16	6.4	19
2	17	8.1	25
2	18		
2	19		
2	20		
3	1	7.7	25
3	2	7.7	28
3	3	6.9	26
3	4	6.1	23
3	5	7.3	28
3	6		
3	7		
3	8	7.4	33
3	9		
3	10		
3	11		
3	12	8.3	31
3	13	6.5	27
3	14		
3	15	7.4	20
3	16		
3	17	7.7	25
3	18	7.7	27
3	19	7.4	23
3	20	6.2	
4	1	6.3	22
4	2		
4	3	5.4	22
4	4	6.8	20
4	5		
4	6		
4	7	6.3	26
4	8	7.1	22
4	9		
4	10	7.2	28
4	11		
4	12	7.3	20
4	13	7	26
4	14		

4	15	6.7	
4	16		
4	17	7.4	24
4	18		

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ANOVA on postwt FEMALES
REPRODUCTION/~~MALLARD~~ QUAIL
Sorted by Treatment Levels

DEP VAR: POSTWT N: 75 MULTIPLE R: 0.537 SQUARED MULTIPLE R: 0.289

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1952.001	3	650.667	1.246	0.300
PREWT	13665.225	1	13665.225	26.162	0.000
ERROR	36563.255	70	522.332		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	777.491	1	777.491	1.488	0.227
ERROR	36563.255	70	522.332		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1375.832	1	1375.832	2.634	0.109
ERROR	36563.255	70	522.332		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1535.118	1	1535.118	2.939	0.091
ERROR	36563.255	70	522.332		

ACETOCHLOR - REPRODUCTION - BOBWHITE QUAIL
ADULT FEMALE BODYWEIGHHTS

TRT LEVEL	PREWEIGHT	POSTWEIGHT
1	174	174
1	195	236
1	171	203
1	185	202
1	203	244
1	184	190
1	186	237
1	175	179
1	185	205
1	183	174
1	173	216
1	162	170
1	163	179
1	169	196
1	179	200
1	175	214
1	215	247
1	176	196
1	168	205
2	204	229
2	173	180
2	211	255
2	202	240
2	202	223
2	195	228
2	177	199
2	181	182
2	188	210
2	186	193
2	186	222
2	198	237
2	192	140
2	160	136
2	189	181
2	181	235
2	180	174
2	178	175
2	198	221
3	174	216
3	196	198
3	180	214
3	174	184
3	213	225
3	197	197
3	195	183
3	189	193
3	189	216
3	178	130

3	189	210
3	155	190
3	180	196
3	196	224
3	198	178
3	171	207
3	207	209
3	192	215
3	174	183
4	176	209
4	162	160
4	176	206
4	167	198
4	188	150
4	183	143
4	173	175
4	176	207
4	189	164
4	201	201
4	192	208
4	196	222
4	197	199
4	197	233
4	180	210
4	187	216
4	161	195
4	194	192

ANOVA on postwt
REPRODUCTION/MALLARD
Sorted by Treatment Levels

MALES

DEP VAR: POSTWT N: 77 MULTIPLE R: 0.737 SQUARED MULTIPLE R: 0.543

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	107.741	3	35.914	0.245	0.864
PREWT	12249.018	1	12249.018	83.673	0.000
ERROR	10540.241	72	146.392		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.876	1	1.876	0.013	0.910
ERROR	10540.241	72	146.392		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	62.730	1	62.730	0.429	0.515
ERROR	10540.241	72	146.392		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	64.597	1	64.597	0.441	0.509
ERROR	10540.241	72	146.392		

2	408
2	338
2	404
2	331
2	329
2	338
3	402
3	316
3	381
3	330
3	331
3	358
3	426
3	343
3	267
3	347
3	360
3	357
3	357
3	379
3	340
3	388
3	308
3	296

ACETOCHLOR - REPRODUCTION - BOBWHITE QUAIL
ADULT MALE BODYWEIGHHTS

TRT LEVEL	PREWEIGHT	POSTWEIGHT
1	195	200
1	200	201
1	190	190
1	183	204
1	199	211
1	195	197
1	196	223
1	210	216
1	190	193
1	172	165
1	171	182
1	202	190
1	168	187
1	185	189
1	173	174
1	203	216
1	179	164
1	199	199
1	197	196
1	208	221
2	191	203
2	188	189
2	196	182
2	171	158
2	191	197
2	178	185
2	191	204
2	180	171
2	206	198
2	189	197
2	167	170
2	181	187
2	188	198
2	195	212
2	207	233
2	173	167
2	203	205
2	175	193
2	196	207
3	207	211
3	183	202
3	211	219
3	198	204
3	169	171
3	216	159
3	183	195
3	204	204
3	181	173
3	212	214

3	196	215
3	175	165
3	194	213
3	190	190
3	194	198
3	191	203
3	174	172
3	165	173
3	176	191
3	185	185
4	200	193
4	192	199
4	209	213
4	175	169
4	206	210
4	178	179
4	185	184
4	192	197
4	186	188
4	187	180
4	186	184
4	187	204
4	206	223
4	199	214
4	164	176
4	182	174
4	166	158
4	185	186

Acetochlor
Bobwhite Quail - Food Consumption

Analysis of Variance File: ACE Date: 10-08-1991

FILTER: None

N's, means and standard deviations based on dependent variable: FOOD

* Indicates statistics are collapsed over this factor

Factors: T	N	Mean	S.D.
*	78	352.4231	36.0092
1	20	352.2500	29.2770
2	20	350.1500	40.5843
3	20	357.7500	36.8394
4	18	349.2222	38.8217

Fmax for testing homogeneity of between subjects variances: 1.92
Number of variances= 4 df per variance= 18.

Analysis of Variance Dependent variable: FOOD

Source	df	SS (H)	MSS	F	P
Between Subjects	77	99843.0310			
T (TRT)	3	855.8769	285.2923	0.213	0.8879
Subj w Groups	74	98987.1560	1337.6643		

Post-hoc tests for factor T (TRT)

Level	Mean
1	352.250
2	350.150
3	357.750
4	349.222

Comparison	Bon-ferroni T-test	Dunnett
1 > 2		
1 < 3		
1 > 4		
2 < 3		N.A.
2 > 4		N.A.
3 > 4		N.A.

For Dunnett's test only the P-values .05 and .01 are possible and only for comparisons with the control mean (level 1).

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

g/bird over the entire 22 weeks

TRT	
0	348
0	343
0	366
0	331
0	376
0	326
0	383
0	378
0	339
0	362
0	339
0	306
0	320
0	358
0	364
0	442
0	355
0	342
0	331
0	336
1	327
1	338
1	383
1	341
1	375
1	325
1	319
1	354
1	354
1	360
1	354
1	284
1	448
1	364
1	302
1	436
1	362
1	319
1	304
1	354
2	398
2	345
2	369
2	305
2	340
2	397
2	330
2	333
2	313
2	357
2	363
2	346
2	360
2	451