12-2-93

MRID No. 415920-09

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: Mallard duck (*Anas platyrhynchos*).

4. **CITATION:** Hakin, B., A. Norman, A. Anderson, I.S. Dawe, and D.O. Chanter. 1990. The effect of dietary inclusion of acetochlor on reproduction in the mallard duck. Study performed by Huntingdon Research Centre Ltd., Huntingdon, Cambridgeshire, UK. HRC report No. ISN 189/891810. Submitted by ICI Americas Inc. EPA MRID No. 415920-09.

5. **REVIEWED BY:**

William S. Rabert — **Signature:** William S. Rabert
Biologist
Ecological Effects Branch — **Date:** November 12, 1993
Environmental Fate and Effects Division (7507C)

6. **APPROVED BY:**

Dan Rieder — **Signature:** Dan Rieder
Section Head
Ecological Effects Branch — **Date:** 11-15-93
Environmental Fate and Effects Division (7507C)

Henry T. Craven, M.S. — **Signature:** Henry T. Craven
Supervisor, EEB/EFED
USEPA — **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 mallards during the 22-week exposure period. The NOEC was 300 ppm. At 600 ppm, egg weights were low; and embryo viability and hatching were reduced.

[Eight birds died in controls and treated replicates prior to the beginning of egg laying. Five of eight dead birds were replaced. The replacement of dead birds is inappropriate because adverse effects on reproductive potential due to early deaths may be obfuscated. This study is not scientifically sound and does not fulfill the guideline requirement for an aquatic avian reproduction study.]

added and revised

8. **RECOMMENDATIONS:** N/A

9. **BACKGROUND:** N/A

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

11. **MATERIALS AND METHODS:**

A. **Test Animals:** Mallard ducks (*Anas platyrhynchos*) used in the study were purchased from the County Game Farms, Home Farm, Hothfield, Ashford, Kent. The birds were acclimated to the facilities for 7 days prior to initiation of the test. The birds were approximately 9 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 2, 13, and 22 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)	6	2	5
150 ppm	6	2	5
300 ppm	6	2	5
600 ppm	6	2	5

In addition, 6 or 7 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 galvanized steel. Pens measured 1.4 m x 0.7 m. The pens had solid sides and wire mesh floors. During egg production, the floors were covered with plastic "pillow" matting to minimize egg damage. The mean daily maximum and minimum temperatures in the adult study rooms were 23°C and 19°C, respectively. The mean relative humidity ranged from 74% to 86%.

The photoperiod during acclimation and during the first 8 weeks of the study was 7 hours of light per day. At the end of week 8, 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, 47, 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 14 to determine early embryonic death and on day 21 to determine late embryonic death. The eggs were placed in a hatcher at 37.5°C on incubation day 24. All eggs collected the first day of odd-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, ducklings were individually weighed and identified by leg bands. The hatchlings were housed in pens measuring 1.5 m x 1.2 m. The mean daily minimum and maximum temperatures were 26°C and 29°C, respectively. The mean relative humidity was 75%. 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 ducklings 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 21 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).

B. **Adult Mortality and Behavioral Reactions:** Adult mortality during the study was as follows: 3 control birds, 3 at 150 ppm, 1 at 300 ppm, and 1 at 600 ppm. Only one of the above mortalities occurred after the first day of week 11 (the beginning of the egg production period); that bird was not replaced. Four of the initial 7 mortalities were replaced by birds from the groups of spare birds maintained on the same diets as the replaced birds.

Abnormal behavioral observations were noted in only three birds. These consisted of limping in one bird (control) and wounds from pecking in two birds (one control, and one at 150 ppm).

Gross pathological examinations conducted on birds that died during the study revealed one bird with a fluid-filled body cavity (150 ppm), one with a white deposit on the heart (150 ppm), one thin bird (300 ppm), and four birds showing signs of pecking or missing feathers (two at 150 ppm, one at 300 ppm, and one at 600 ppm). Gross pathological examinations of birds surviving to terminal sacrifice revealed abnormalities in only 6 birds. These consisted of a decomposed egg in the oviduct of one bird, and red-colored intestines in 5 birds from the 600-ppm group.

C. **Adult Body Weight and Food Consumption:** There was no evidence of any treatment-related effect on body weight. However, at the end of the study, male bodyweights in all treatment groups were significantly greater than in controls (Table 5, attached). When compared to the control group, there were no significant differences in food consumption at any concentration tested (Tables 6 & 7, attached).

D. **Reproduction:** When compared to the control group, there were no significant differences in the following parameters at any concentration tested: egg production, damaged eggs, infertile eggs/eggs set, and 14-day survivors/eggs hatched (Tables 9-11, 15 & 18, attached).

Eggs from the 600-ppm group weighed significantly less than those from the controls (Table 12, attached).

The proportion of fertile eggs that showed early and late embryonic deaths were generally high at 600 ppm. Both early and late embryonic deaths were significantly higher in the 600-ppm group than in the control group (Table 15, attached).

The proportion of hatchlings of fertile eggs was significantly lower at 600 ppm than in the controls (Table 16, attached). No significant differences were found in the numbers of eggs hatching as a proportion of eggs set on day 21.

The ratio of 14-day surviving ducklings/eggs set was slightly lower at 600 ppm than in the control. The authors did not subject this parameter to any statistical analysis.

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

shell thickness at any concentration (Table 13, attached).

F. **Offspring Body Weight:** There were no significant differences in offspring bodyweights among groups for weight at hatch, nor for weight at 14 days (Table 17, attached). No abnormalities were detected in post-mortem examinations of ducklings that died during the 14-day observation period.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** "Following treatment of adult mallard ducks with acetochlor in diet at 600 ppm, egg weights were low, the proportions of early embryonic deaths and late embryonic deaths were increased, and the proportion of hatchlings of fertile eggs was reduced, relative to control values. At all dose concentrations, bodyweights of adult male birds were significantly higher than controls at the end of the study. At dose levels of 150 ppm and 300 ppm, there were no treatment related effects 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 one week; a two- to six-week period is recommended.

[The use of five replacement birds is in appropriate and may obfuscate the adverse effect of the early adult deaths on total reproductive potential.] 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 as early as week 2 in some groups. 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 ranged from 74% to 86%; the recommended relative humidity is 55%.

B. **Statistical Analysis:** Statistical analyses of reproductive parameters were performed by the 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 hatchling weight; although the authors reported no significant differences between groups, the reviewer's analysis showed that values in the 150-ppm group were significantly greater than in the controls, while values in the 600-ppm group were significantly less than in the controls.

The report stated that, at 600 ppm, the proportions of early embryonic deaths and late embryonic deaths were increased, and the proportion of hatchlings of fertile eggs was reduced, relative to control values. These parameters are not included in the Bigbird program, but analysis of a similar parameter (eggs hatched/eggs set) approached the 0.05 level of significance ($P = 0.073$) for the 600-ppm group.

The report stated that the ratio of 14-day surviving ducklings/eggs set was slightly lower at 600 ppm than in the control. The authors apparently did not subject this parameter to any statistical analysis. The reviewer's analysis showed that, at 600 ppm, the comparison between the 600-ppm group and the control approached the 0.05 level of significance ($P = 0.058$).

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 differences in hatchling weights were probably not treatment-related. The reviewer concurs with the authors' conclusion that there were no treatment related effects at 150- and 300-ppm.

The low ratio for 14-day survivors/eggs set at 600 ppm (35%) appears to be due to embryonic death and low hatching rather than an effect on survival of hatchlings. This is supported by the data on the ratio of 14-day survivors/eggs hatched. Mean values were 98% in both the control and 600-ppm groups (Table 18, attached).

At 600 ppm, egg weights were low. Additionally, embryo viability was reduced, with a resulting reduction in hatching success. The NOEC was 300 ppm.

[Use of replacement birds after treatment has begun is Inappropriate. Early deaths may have an adverse effect on reproduction capacity which may be obfuscated by using replacements. Also, the arbitrary replacement of only five out of the eight dead birds, results in dissimilarities between replicates. Any alteration of measurement of total reproductive potential due to the replacement of birds is unacceptable.] added

[The study is not scientifically sound and does not fulfill the guideline requirements for an avian reproduction study.] revised

D. **Adequacy of the Study:**

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

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

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

15. **COMPLETION OF ONE-LINER:** Yes; November 5, 1993.

DATA EVALUATION RECORD

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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: Mallard duck (*Anas platyrhynchos*).

4. **CITATION:** Hakin, B., A. Norman, A. Anderson, I.S. Dawe, and D.O. Chanter. 1990. The effect of dietary inclusion of acetochlor on reproduction in the mallard duck. Study performed by Huntingdon Research Centre Ltd., Huntingdon, Cambridgeshire, UK. HRC report No. ISN 189/891810. Submitted by ICI Americas Inc. EPA MRID No. 415920-09.

5. **REVIEWED BY:**

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7. **CONCLUSIONS:** Nominal dietary concentrations of acetochlor at 150 ppm and 300 ppm had no effects upon behavior, food consumption, or reproduction in adult mallards during the 22-week exposure period. The NOEC was 300 ppm. At 600 ppm, egg weights were low, while embryo viability and hatching were reduced. This study is scientifically sound and fulfills the guideline requirements for an avian reproduction study.

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

9. **BACKGROUND:**

ACETOCHLOR

Page_____ is not included in this copy.

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____ Identity of product inert ingredients.

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ACETOCHLOR/MALLARD
Sorted by Treatment Levels

TREATMENT LEVEL: Control

		PENNO	EL	EC	ES	VE	LE21	HAT	TWOWK
CASE	1	1	55	1	50	38	35	26	26
CASE	2	2	126	10	106	93	87	62	59
CASE	3	3	74	0	70	68	65	56	56
CASE	4	4	73	1	62	58	53	38	38
CASE	5	5	81	1	74	7	7	7	7
CASE	6	6	106	2	96	95	82	59	58
	Sums		515	15	458	359	329	248	244

TREATMENT LEVEL: 150 ppm

CASE	7	7	95	3	83	63	55	48	48
CASE	8	8	90	0	79	77	72	58	57
CASE	9	9	130	4	114	108	91	52	51
CASE	10	10	58	0	50	47	42	33	33
CASE	11	11	162	3	138	132	125	103	100
CASE	12	12	167	5	148	146	139	124	121
	Sums		702	15	612	573	524	418	410

TREATMENT LEVEL: 300 ppm

CASE	13	13	104	1	94	78	70	56	56
CASE	14	14	174	4	156	144	125	109	107
CASE	15	15	138	2	123	116	110	82	80
CASE	16	16	112	6	95	73	72	66	64
CASE	17	17	110	4	97	79	69	61	56
CASE	18	18	64	0	62	57	48	36	36
	Sums		702	17	627	547	494	410	399

TREATMENT LEVEL: 600 ppm

CASE	19	19	31	1	27	23	16	12	11
CASE	20	20	43	0	41	37	32	13	12
CASE	21	21	163	3	146	91	79	56	55
CASE	22	22	101	4	89	51	46	28	27
CASE	23	23	154	4	136	80	67	60	60
CASE	24	24	109	0	100	42	30	26	26
	Sums		601	12	539	324	270	195	191

ACETOCHLOR/MALLARD
Sorted by Treatment Levels

ANOVA on SQR(Eggs Laid)

DEP VAR: SEL N: 24 MULTIPLE R: 0.320 SQUARED MULTIPLE R: 0.103

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	10.289	3	3.430	0.762	0.528
ERROR	89.978	20	4.499		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	6.481	1	6.481	1.441	0.244
ERROR	89.978	20	4.499		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	6.938	1	6.938	1.542	0.229
ERROR	89.978	20	4.499		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.612	1	0.612	0.136	0.716
ERROR	89.978	20	4.499		

ANOVA on SQR(Eggs Cracked)

DEP VAR: SEC N: 24 MULTIPLE R: 0.141 SQUARED MULTIPLE R: 0.020

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	0.384	3	0.128	0.135	0.938
ERROR	18.903	20	0.945		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.001	1	0.001	0.001	0.971
ERROR	18.903	20	0.945		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.138	1	0.138	0.146	0.706
ERROR	18.903	20	0.945		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.059	1	0.059	0.063	0.805
ERROR	18.903	20	0.945		

ANOVA on SQR(Eggs Set)

DEP VAR: SES N: 24 MULTIPLE R: 0.315 SQUARED MULTIPLE R: 0.099

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	8.467	3	2.822	0.734	0.544
ERROR	76.877	20	3.844		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	4.879	1	4.879	1.269	0.273
ERROR	76.877	20	3.844		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	6.363	1	6.363	1.655	0.213
ERROR	76.877	20	3.844		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.640	1	0.640	0.166	0.688
ERROR	76.877	20	3.844		

ANOVA on SQR(Viable Embryos)

DEP VAR: SVE N: 24 MULTIPLE R: 0.526 SQUARED MULTIPLE R: 0.276

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	28.262	3	9.421	2.546	0.085
ERROR	73.996	20	3.700		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	12.071	1	12.071	3.263	0.086
ERROR	73.996	20	3.700		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	10.816	1	10.816	2.923	0.103
ERROR	73.996	20	3.700		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.472	1	0.472	0.128	0.725
ERROR	73.996	20	3.700		

ANOVA on SQR(21-day Live Embryos)

DEP VAR: SLE21 N: 24 MULTIPLE R: 0.532 SQUARED MULTIPLE R: 0.283

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	32.227	3	10.742	2.626	0.079
ERROR	81.812	20	4.091		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	13.240	1	13.240	3.237	0.087
ERROR	81.812	20	4.091		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	10.960	1	10.960	2.679	0.117
ERROR	81.812	20	4.091		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.906	1	0.906	0.221	0.643
ERROR	81.812	20	4.091		

ANOVA on SQR(Hatched)

DEP VAR: SHAT N: 24 MULTIPLE R: 0.574 SQUARED MULTIPLE R: 0.329

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	34.320	3	11.440	3.270	0.043
ERROR	69.979	20	3.499		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	11.675	1	11.675	3.337	0.083
ERROR	69.979	20	3.499		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	11.931	1	11.931	3.410	0.080
ERROR	69.979	20	3.499		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.511	1	1.511	0.432	0.519
ERROR	69.979	20	3.499		

ANOVA on SQR(Two week Survivors)

DEP VAR: STWOWK N: 24 MULTIPLE R: 0.574 SQUARED MULTIPLE R: 0.329

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	33.603	3	11.201	3.271	0.043
ERROR	68.495	20	3.425		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	11.358	1	11.358	3.316	0.084
ERROR	68.495	20	3.425		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	11.147	1	11.147	3.255	0.086
ERROR	68.495	20	3.425		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.651	1	1.651	0.482	0.495
ERROR	68.495	20	3.425		

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

DEP VAR: RESP1 N: 24 MULTIPLE R: 0.124 SQUARED MULTIPLE R: 0.015

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	7.916	3	2.639	0.105	0.956
ERROR	503.324	20	25.166		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	4.061	1	4.061	0.161	0.692
ERROR	503.324	20	25.166		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.023	1	0.023	0.001	0.976
ERROR	503.324	20	25.166		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	3.212	1	3.212	0.128	0.725
ERROR	503.324	20	25.166		

ANOVA on VE/ES

DEP VAR: RESP2 N: 24 MULTIPLE R: 0.537 SQUARED MULTIPLE R: 0.288

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1305.160	3	435.053	2.698	0.073
ERROR	3225.204	20	161.260		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	274.360	1	274.360	1.701	0.207
ERROR	3225.204	20	161.260		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	40.371	1	40.371	0.250	0.622
ERROR	3225.204	20	161.260		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	342.701	1	342.701	2.125	0.160
ERROR	3225.204	20	161.260		

ANOVA on LE21/VE

DEP VAR: RESP3 N: 24 MULTIPLE R: 0.392 SQUARED MULTIPLE R: 0.154

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	242.357	3	80.786	1.210	0.332
ERROR	1335.498	20	66.775		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	69.621	1	69.621	1.043	0.319
ERROR	1335.498	20	66.775		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	30.425	1	30.425	0.456	0.507
ERROR	1335.498	20	66.775		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	36.435	1	36.435	0.546	0.469
ERROR	1335.498	20	66.775		

ANOVA on HAT/LE21

DEP VAR: RESP4 N: 24 MULTIPLE R: 0.326 SQUARED MULTIPLE R: 0.106

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	230.778	3	76.926	0.790	0.514
ERROR	1947.354	20	97.368		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	9.472	1	9.472	0.097	0.758
ERROR	1947.354	20	97.368		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.566	1	1.566	0.016	0.900
ERROR	1947.354	20	97.368		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	155.426	1	155.426	1.596	0.221
ERROR	1947.354	20	97.368		

ANOVA on TWOWK/HAT

DEP VAR: RESP5 N: 24 MULTIPLE R: 0.331 SQUARED MULTIPLE R: 0.109

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	89.893	3	29.964	0.819	0.498
ERROR	731.463	20	36.573		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	16.562	1	16.562	0.453	0.509
ERROR	731.463	20	36.573		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	44.986	1	44.986	1.230	0.281
ERROR	731.463	20	36.573		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	81.397	1	81.397	2.226	0.151
ERROR	731.463	20	36.573		

ANOVA on HAT/ES

DEP VAR: RESP6 N: 24 MULTIPLE R: 0.655 SQUARED MULTIPLE R: 0.429

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1251.006	3	417.002	5.010	0.009
ERROR	1664.678	20	83.234		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	214.607	1	214.607	2.578	0.124
ERROR	1664.678	20	83.234		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	133.245	1	133.245	1.601	0.220
ERROR	1664.678	20	83.234		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	297.635	1	297.635	3.576	0.073
ERROR	1664.678	20	83.234		

ANOVA on TWOWK/ES

DEP VAR: RESP7 N: 24 MULTIPLE R: 0.660 SQUARED MULTIPLE R: 0.436

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1238.586	3	412.862	5.156	0.008
ERROR	1601.610	20	80.080		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	197.865	1	197.865	2.471	0.132
ERROR	1601.610	20	80.080		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	108.857	1	108.857	1.359	0.257
ERROR	1601.610	20	80.080		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	323.205	1	323.205	4.036	0.058
ERROR	1601.610	20	80.080		

REPRODUCTION/MALLARD
Sorted by Treatment Levels
ANOVA on thick

DEP VAR: THICK N: 101 MULTIPLE R: 0.043 SQUARED MULTIPLE R: 0.002

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	0.000	3	0.000	0.060	0.981
ERROR	0.057	97	0.001		

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	0.036	0.851
ERROR	0.057	97	0.001		

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	0.030	0.863
ERROR	0.057	97	0.001		

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	0.030	0.863
ERROR	0.057	97	0.001		

ANOVA on hatwt

DEP VAR: HATWT N: 184 MULTIPLE R: 0.326 SQUARED MULTIPLE R: 0.106

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	145.444	3	48.481	7.129	0.000
ERROR	1224.034	180	6.800		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	30.384	1	30.384	4.468	0.036
ERROR	1224.034	180	6.800		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.247	1	1.247	0.183	0.669
ERROR	1224.034	180	6.800		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	41.581	1	41.581	6.115	0.014
ERROR	1224.034	180	6.800		

ANOVA on survwt

DEP VAR: SURVWT N: 184 MULTIPLE R: 0.175 SQUARED MULTIPLE R: 0.031

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	6782.606	3	2260.869	1.891	0.133
ERROR	215179.345	180	1195.441		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1809.117	1	1809.117	1.513	0.220
ERROR	215179.345	180	1195.441		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.073	1	0.073	0.000	0.994
ERROR	215179.345	180	1195.441		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	4501.238	1	4501.238	3.765	0.054
ERROR	215179.345	180	1195.441		

2	14	.	36	233
2	15	.	35	250
2	16	.	39	273
2	17	.	37	231
2	18	.	36	242
3	19	.	.	.
3	20	.	.	.
3	21	.	36	239
3	22	.	.	.
3	23	.	36	258
3	24	.	.	.
0	1	.	.	.
0	2	.	36	225
0	3	.	34	240
0	4	.	36	281
0	5	.	.	.
0	6	.	32	193
1	7	.	.	.
1	8	.	39	128
1	9	.	44	215
1	10	.	39	183
1	11	.	39	211
1	12	.	37	200
2	13	.	.	.
2	14	.	37	232
2	15	.	35	249
2	16	.	37	276
2	17	.	37	233
2	18	.	36	249
3	19	.	.	.
3	20	.	.	.
3	21	.	.	.
3	22	.	.	.
3	23	.	.	.
3	24	.	.	.
0	1	.	.	.
0	2	.	.	.
0	3	.	.	.
0	4	.	.	.
0	5	.	.	.
0	6	.	37	235
1	7	.	.	.
1	8	.	.	.
1	9	.	37	238
1	10	.	.	.
1	11	.	40	278
1	12	.	36	261
2	13	.	.	.
2	14	.	39	253
2	15	.	.	.
2	16	.	.	.
2	17	.	38	226
2	18	.	.	.
3	19	.	.	.

3	20	.	44	240
3	21	.	.	.
3	22	.	.	.
3	23	.	.	.
3	24	.	.	.
0	1	.	.	.
0	2	.	38	274
0	3	.	.	.
0	4	.	.	.
0	5	.	.	.
0	6	.	37	231
1	7	.	.	.
1	8	.	.	.
1	9	.	36	240
1	10	.	.	.
1	11	.	37	292
1	12	.	42	239
2	13	.	.	.
2	14	.	39	222
2	15	.	35	302
2	16	.	.	.
2	17	.	.	.
2	18	.	.	.
3	19	.	.	.
3	20	.	.	.
3	21	.	.	.
3	22	.	.	.
3	23	.	.	.
3	24	.	.	.
0	1	.	.	.
0	2	.	36	267
0	3	.	.	.
0	4	.	.	.
0	5	.	.	.
0	6	.	36	207
1	7	.	.	.
1	8	.	.	.
1	9	.	.	.
1	10	.	.	.
1	11	.	38	240
1	12	.	.	.
2	13	.	.	.
2	14	.	.	.
2	15	.	.	.
2	16	.	.	.
2	17	.	.	.
2	18	.	.	.
3	19	.	.	.
3	20	.	.	.
3	21	.	.	.
3	22	.	.	.
3	23	.	.	.
3	24	.	.	.

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

ACETOCHLOR - REPRODUCTION - MALLARD

TRT LEVEL	PEN #	EGGSHELL THICKNESS	DAY 0 BODYWEIGHT	DAY 14 BODYWEIGHT
0	1	.	37	243
0	2	.	32	176
0	3	.	38	234
0	4	.32	35	237
0	5	.31	37	198
0	6	.29	39	224
1	7	.31	35	227
1	8	.30	37	213
1	9	.29	39	236
1	10	.32	40	236
1	11	.32	40	233
1	12	.29	38	189
2	13	.34	38	224
2	14	.30	42	205
2	15	.29	38	220
2	16	.32	39	246
2	17	.	36	198
2	18	.	36	235
3	19	.	38	140
3	20	.	46	224
3	21	.31	36	218
3	22	.32	38	209
3	23	.30	32	195
3	24	.30	35	192
0	1	.33	39	192
0	2	.30	34	145
0	3	.28	36	202
0	4	.33	36	187
0	5	.32	37	100
0	6	.30	38	203
1	7	.33	40	202
1	8	.32	37	162
1	9	.32	38	155
1	10	.32	39	190
1	11	.31	40	188
1	12	.30	36	201
2	13	.35	37	219
2	14	.33	36	164
2	15	.34	37	214
2	16	.32	36	174
2	17	.26	34	141
2	18	.	35	110
3	19	.31	37	160
3	20	.32	39	171
3	21	.32	36	163
3	22	.32	33	156
3	23	.32	32	159
3	24	.31	34	167
0	1	.35	38	217

0	2	.31	35	204
0	3	.3	36	211
0	4	.37	36	246
0	5	.	.	.
0	6	.31	39	230
1	7	.28	39	225
1	8	.31	38	228
1	9	.33	37	196
1	10	.33	38	225
1	11	.31	40	216
1	12	.32	35	200
2	13	.35	36	261
2	14	.31	35	219
2	15	.32	34	249
2	16	.33	38	233
2	17	.3	38	206
2	18	.	35	201
3	19	.	.	.
3	20	.	42	272
3	21	.34	35	212
3	22	.33	33	197
3	23	.30	32	247
3	24	.3	34	211
0	1	.39	36	206
0	2	.32	35	214
0	3	.29	35	234
0	4	.33	36	226
0	5	.34	.	.
0	6	.33	39	244
1	7	.31	37	241
1	8	.32	35	199
1	9	.36	32	228
1	10	.35	42	208
1	11	.33	39	241
1	12	.32	35	189
2	13	.36	36	248
2	14	.35	38	238
2	15	.33	35	219
2	16	.32	36	205
2	17	.32	34	180
2	18	.28	36	215
3	19	.	.	.
3	20	.	33	239
3	21	.33	35	204
3	22	.34	28	170
3	23	.3	32	172
3	24	.	32	190
0	1	.	41	227
0	2	.36	36	251
0	3	.	35	251
0	4	.34	37	276
0	5	.	39	305
0	6	.33	36	269
1	7	.34	39	246

1	8	.	34	236
1	9	.	39	225
1	10	.35	39	182
1	11	.33	39	258
1	12	.	37	197
2	13	.35	39	230
2	14	.38	45	209
2	15	.36	39	241
2	16	.	40	257
2	17	.3	36	202
2	18	.33	39	165
3	19	.34	32	244
3	20	.	42	223
3	21	.	37	251
3	22	.	38	255
3	23	.36	32	248
3	24	.35	31	279
0	1	.	.	.
0	2	.	39	182
0	3	.	35	197
0	4	.	34	251
0	5	.	.	.
0	6	.34	42	262
1	7	.	36	221
1	8	.	38	233
1	9	.37	38	169
1	10	.34	40	227
1	11	.37	40	213
1	12	.	37	178
2	13	.	36	228
2	14	.33	38	226
2	15	.	35	251
2	16	.	38	255
2	17	.	36	200
2	18	.	34	209
3	19	.	30	226
3	20	.	.	.
3	21	.37	36	223
3	22	.	38	209
3	23	.	30	171
3	24	.	33	176
0	1	.	.	.
0	2	.	37	209
0	3	.	.	.
0	4	.	.	.
0	5	.	.	.
0	6	.	40	216
1	7	.	35	257
1	8	.	34	175
1	9	.	37	176
1	10	.	36	261
1	11	.	36	216
1	12	.	36	191
2	13	.	35	247

2	14	.	36	233
2	15	.	35	250
2	16	.	39	273
2	17	.	37	231
2	18	.	36	242
3	19	.	.	.
3	20	.	.	.
3	21	.	36	239
3	22	.	.	.
3	23	.	36	258
3	24	.	.	.
0	1	.	.	.
0	2	.	36	225
0	3	.	34	240
0	4	.	36	281
0	5	.	.	.
0	6	.	32	193
1	7	.	.	.
1	8	.	39	128
1	9	.	44	215
1	10	.	39	183
1	11	.	39	211
1	12	.	37	200
2	13	.	.	.
2	14	.	37	232
2	15	.	35	249
2	16	.	37	276
2	17	.	37	233
2	18	.	36	249
3	19	.	.	.
3	20	.	.	.
3	21	.	.	.
3	22	.	.	.
3	23	.	.	.
3	24	.	.	.
0	1	.	.	.
0	2	.	.	.
0	3	.	.	.
0	4	.	.	.
0	5	.	.	.
0	6	.	37	235
1	7	.	.	.
1	8	.	.	.
1	9	.	37	238
1	10	.	.	.
1	11	.	40	278
1	12	.	36	261
2	13	.	.	.
2	14	.	39	253
2	15	.	.	.
2	16	.	.	.
2	17	.	38	226
2	18	.	.	.
3	19	.	.	.

3	20	.	44	240
3	21	.	.	.
3	22	.	.	.
3	23	.	.	.
3	24	.	.	.
0	1	.	.	.
0	2	.	38	274
0	3	.	.	.
0	4	.	.	.
0	5	.	.	.
0	6	.	37	231
1	7	.	.	.
1	8	.	.	.
1	9	.	36	240
1	10	.	.	.
1	11	.	37	292
1	12	.	42	239
2	13	.	.	.
2	14	.	39	222
2	15	.	35	302
2	16	.	.	.
2	17	.	.	.
2	18	.	.	.
3	19	.	.	.
3	20	.	.	.
3	21	.	.	.
3	22	.	.	.
3	23	.	.	.
3	24	.	.	.
0	1	.	.	.
0	2	.	36	267
0	3	.	.	.
0	4	.	.	.
0	5	.	.	.
0	6	.	36	207
1	7	.	.	.
1	8	.	.	.
1	9	.	.	.
1	10	.	.	.
1	11	.	38	240
1	12	.	.	.
2	13	.	.	.
2	14	.	.	.
2	15	.	.	.
2	16	.	.	.
2	17	.	.	.
2	18	.	.	.
3	19	.	.	.
3	20	.	.	.
3	21	.	.	.
3	22	.	.	.
3	23	.	.	.
3	24	.	.	.

ADULT FOOD CONSUMPTION
Acetochlor MRID 415920-04

Analysis of Variance File: AMADFOOD Date: 10-03-1991

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.
*	24	3573.7500	361.7108
1	6	3570.5000	297.5639
2	6	3340.8333	392.1640
3	6	3732.0000	190.0674
4	6	3651.6667	470.0292

Fmax for testing homogeneity of between subjects variances: 6.12
Number of variances= 4 df per variance= 5.
Analysis of Variance Dependent variable: FOOD

Source	df	SS (H)	MSS	F	P
Between Subjects	23	3009198.0000			
T (TREAT)	3	512248.8800	170749.6250	1.368	0.2793
Subj w Groups	20	2496949.0000	124847.4530		

Post-hoc tests for factor T (TREAT)

Level	Mean
1	3570.500
2	3340.833
3	3732.000
4	3651.667

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).

OVER 22 weeks

MALLARD REPRODUCTION

FOOD CONSUMPTION TOTAL

TRT	PEN NO.	TOTAL PER PEN
1	1	3732
1	2	3732
1	3	3191
1	4	3733
1	5	3190
1	6	3845
MEAN		
SD		
TOTAL (WK)		21423
2	1	3318
2	2	3076
2	3	2872
2	4	3339
2	5	4029
2	6	3411
MEAN		
SD		
TOTAL (WK)		20045
3	1	3784
3	2	3848
3	3	3471
3	4	3695
3	5	3589
3	6	4005
MEAN		
SD		
TOTAL (WK)		22392
4	1	2919
4	2	3552
4	3	3593
4	4	3530
4	5	4042
4	6	4274
MEAN		
SD		
TOTAL (WK)		21910

ANOVA

REPRODUCTION/MALLARD FEMALE ADULT BODY WEIGHTS

DEP VAR: POSTWT N: 120 MULTIPLE R: 0.515 SQUARED MULTIPLE R: 0.265

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	28275.841	3	9425.280	1.207	0.310
PREWT	298062.234	1	298062.234	38.175	0.000
ERROR	897891.066	115	7807.748		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	24518.032	1	24518.032	3.140	0.079
ERROR	897891.066	115	7807.748		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	9937.073	1	9937.073	1.273	0.262
ERROR	897891.066	115	7807.748		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1722.627	1	1722.627	0.221	0.639
ERROR	897891.066	115	7807.748		

TREATMENT LEVEL 600 ppm

CASE	91	1000	995
CASE	92	905	895
CASE	93	1050	1115
CASE	94	945	820
CASE	95	940	1000
CASE	96	1180	1005
CASE	97	950	1055
CASE	98	1025	1060
CASE	99	945	980
CASE	100	960	995
CASE	101	945	1105
CASE	102	1035	1000
CASE	103	870	945
CASE	104	965	1030
CASE	105	1140	1200
CASE	106	995	900
CASE	107	990	920
CASE	108	860	850
CASE	109	880	800
CASE	110	915	865
CASE	111	965	1065
CASE	112	965	1045
CASE	113	835	940
CASE	114	855	870
CASE	115	905	1035
CASE	116	920	995
CASE	117	870	995
CASE	118	900	1105
CASE	119	955	1035
CASE	120	950	920

REPRODUCTION/MALLARD ADULT FEMALE BODYWEIGHTS

TREATMENT LEVEL Control

		PREWT	POSTWT
CASE	1	920	895
CASE	2	1140	1040
CASE	3	850	810
CASE	4	885	925
CASE	5	985	925
CASE	6	1015	910
CASE	7	940	900
CASE	8	1050	1130
CASE	9	1095	1020
CASE	10	1040	970
CASE	11	1010	920
CASE	12	890	885
CASE	13	970	850
CASE	14	1090	995
CASE	15	955	870
CASE	16	1110	1225
CASE	17	955	955
CASE	18	910	955
CASE	19	1155	1065
CASE	20	1015	1025
CASE	21	945	855
CASE	22	1100	1210
CASE	23	1115	1205
CASE	24	980	1100
CASE	25	1045	1100
CASE	26	915	975
CASE	27	995	935
CASE	28	980	1250
CASE	29	1105	1235
CASE	30	1020	1050

TREATMENT LEVEL 150 ppm

CASE	31	1030	1055
CASE	32	765	865
CASE	33	1060	1125
CASE	34	895	1005
CASE	35	950	965
CASE	36	1020	995
CASE	37	980	956
CASE	38	1245	1055
CASE	39	975	845
CASE	40	980	925
CASE	41	995	1100
CASE	42	890	1015

CASE	43	1015	1000
CASE	44	930	940
CASE	45	1050	1045
CASE	46	980	910
CASE	47	1070	940
CASE	48	930	1075
CASE	49	1105	1200
CASE	50	920	965
CASE	51	940	1070
CASE	52	970	1185
CASE	53	1010	1090
CASE	54	965	1110
CASE	55	895	920
CASE	56	930	930
CASE	57	885	1100
CASE	58	940	1085
CASE	59	920	1205
CASE	60	945	1115

TREATMENT LEVEL 300 ppm

CASE	61	1100	1120
CASE	62	950	1105
CASE	63	840	870
CASE	64	775	1005
CASE	65	910	865
CASE	66	975	1080
CASE	67	1055	1020
CASE	68	970	1140
CASE	69	935	915
CASE	70	995	1170
CASE	71	1000	1040
CASE	72	1040	1075
CASE	73	950	1015
CASE	74	1010	1065
CASE	75	920	875
CASE	76	1025	1030
CASE	77	985	975
CASE	78	1120	995
CASE	79	1085	1005
CASE	80	970	985
CASE	81	935	975
CASE	82	925	1040
CASE	83	1030	1165
CASE	84	955	975
CASE	85	855	945
CASE	86	1045	995
CASE	87	890	905
CASE	88	920	970
CASE	89	1060	1060
CASE	90	860	905

ANOVA

MALLARD REPRODUCTION ADULT MALE BODY WEIGHTS

DEP VAR: POSTWT N: 44 MULTIPLE R: 0.669 SQUARED MULTIPLE R: 0.447

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	18019.958	3	6006.653	1.126	0.350
PREWT	156759.522	1	156759.522	29.385	0.000
ERROR	208054.114	39	5334.721		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	5375.462	1	5375.462	1.008	0.322
ERROR	208054.114	39	5334.721		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	13278.645	1	13278.645	2.489	0.123
ERROR	208054.114	39	5334.721		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT
TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	13757.792	1	13757.792	2.579	0.116
ERROR	208054.114	39	5334.721		

REPRODUCTION/MALLARD
ADULT BODY WEIGHTS - MALE

Sorted by Treatment Levels

TREATMENT LEVEL Control

		PREWT	POSTWT
CASE	1	775	765
CASE	2	915	985
CASE	3	1005	935
CASE	4	960	1030
CASE	5	1170	1090
CASE	6	1080	1060
CASE	7	1305	1220
CASE	8	1135	985
CASE	9	945	1000
CASE	10	1115	1120
CASE	11	1120	1195

TREATMENT LEVEL 150 ppm

CASE	12	1070	1115
CASE	13	1075	1000
CASE	14	1020	1075
CASE	15	1050	960
CASE	16	1050	1080
CASE	17	1185	1170
CASE	18	1070	1015
CASE	19	1060	1140
CASE	20	925	950
CASE	21	1085	1115
CASE	22	995	1145

TREATMENT LEVEL 300 ppm

CASE	23	1125	1110
CASE	24	1040	1020
CASE	25	1175	1120
CASE	26	1015	1040
CASE	27	965	1115
CASE	28	840	1000
CASE	29	1115	1190
CASE	30	940	1010
CASE	31	1065	1035
CASE	32	960	900
CASE	33	1040	1240

TREATMENT LEVEL 600 ppm

CASE	34	1235	1135
CASE	35	960	1180
CASE	36	1045	1060
CASE	37	935	1045
CASE	38	1155	1180
CASE	39	985	970
CASE	40	1055	980
CASE	41	1010	1065
CASE	42	965	1100
CASE	43	1065	1110
CASE	44	930	1000