Data Evaluation Report on the Reproductive Effects of AE 0317309 Technical (Pyrasulfotole) on Mallard Duck (*Anas platyrhynchos*)

PMRA Submission Number 2006-2445 EPA MRID Number 468017-33

Data Requirement:	PMRA Data Code	9.6.3.2
	EPA DP Barcode	D328639
	OECD Data Point	IIA 8.1.4
	EPA MRID	468017-33
	EPA Guideline	850.2300

Test material: AE 0317309 Technical **Purity:** 95.7% ai
Common name Pyrasulfotole
Chemical name: IUPAC: (5-Hydroxy-1,3-dimethylpyrazol-4-yl)(α,α,α-trifluoro-2-mesyl-*p*-tolyl)methanone
CAS name: (5-Hydroxy-1,3-dimethyl-1*H*-pyrazol-4-yl)[2-(methylsulfonyl)-4-(trifluoromethyl)phenyl]methanone
CAS No.: 365400-11-9
Synonyms: None reported

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Australian Government Department of the Environment and Heritage (DEH).

Reference/Submission No.: {.....}

Company Code	BCZ
Active Code	PSA
Use Site Category:	13, 14
EPA PC Code	000692

Date Evaluation Completed: 11-28-2006

CITATION: Sabbert, T.J. 2005. Effect of Technical AE 0317309 on Mallard Reproduction. Unpublished study performed by Bayer CropScience, Stilwell, KS. Laboratory Study No. EBAIX017. Study submitted by Bayer CropScience, Research Triangle Park, NC. Study initiated January 10, 2005 and submitted February 28, 2006.

DISCLAIMER: This document provides guidance for EPA and PMRA reviewers on how to complete a data evaluation record after reviewing a scientific study concerning the reproductive effects of a pesticide on avian species. It is not intended to prescribe conditions to any external party for conducting this study nor to establish absolute criteria regarding the assessment of whether the study is scientifically sound and whether the study satisfies any applicable data requirements. Reviewers are expected to review and to determine for each study, on a case-by-case basis, whether it is scientifically sound and provides sufficient information to satisfy applicable data requirements. Studies that fail to meet any of the conditions may be accepted, if appropriate; similarly, studies that

meet all of the conditions may be rejected, if appropriate. In sum, the reviewer is to take into account the totality of factors related to the test methodology and results in determining the acceptability of the study.

EXECUTIVE SUMMARY

The one-generation reproductive toxicity of AE 0317309 Technical to groups (15 pen/level) pairs of 19-week old mallard duck (*Anas platyrhynchos*) was assessed over approximately 20 weeks. AE 0317309 Technical was administered to the birds in the diet at nominal concentrations of 0 (negative control), 67, 200, or 600 mg ai/kg diet. Mean-measured concentrations were <30 (<LOQ, control), 56, 167, and 557 mg ai/kg diet, respectively (84-93% of nominal).

There was a significant adverse effect on male body weight gain, with a 115% reduction at the highest treatment level. There were no other effects on any adult or offspring parameter. The NOAEC and LOAEC levels were 167 and 557 mg ai/kg diet, respectively.

This toxicity study is classified as **ACCEPTABLE**, scientifically sound, and does satisfy the guideline requirement for a mallard duck reproductive toxicity study

Results Synopsis

Test Organism Size/Age(mean Weight): 19 weeks old; 860-1452 g (combined sexes)

NOAEC: 167 mg a.i./kg diet
LOAEC: 557 mg a.i./kg diet

Endpoint(s) Affected: male body weight gain

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: The study protocol was based on procedures outlined in the U.S. EPA Pesticide Assessment Guidelines, Series 71-4. Deviations from OPPTS Guideline No. 850.2300 included:

1. Cage size was significantly smaller than recommended. OPPTS recommends at least 10,000 cm^2 per bird. In this study, the floor space was only 2410 cm^2 per bird. Cage sizes smaller than recommended should be shown to not adversely affect the health or reproduction of the ducks.

2. The maximum labeled field residue was not reported, so it is unknown if the highest level tested was an appropriate level to approximate field exposure. However, the proposed use rate for AE0317309 SE 06 A2 (Sub. No. 2006-2446), allows a single application at a maximum rate of 50 g a.i./ha per year. Based on this use rate, the predicted concentration in mallard field diet is 1.69 mg a.i./kg diet.

3. Measured concentrations of AE 0317309 Technical in the avian diet were relatively variable, with reviewer-calculated coefficients of variation (CVs) of 12.3-17% for all treatment levels.

4. Unpublished reports confirming the homogeneity and stability (freezer and ambient) were referenced, but not provided for review. In the concurrently-submitted bobwhite quail reproduction study (MRID 468017-32, which was not included as one of the stability/homogeneity references), freezer storage stability was established for up to 5 months, but ambient stability was not determined.

5. The duration of both the pre-egg-laying and egg-laying phases were not clearly reported. Based on body weight recordings, the pre-egg laying phase was at least 9 weeks long.

These deviations do not affect the acceptability of this study.

COMPLIANCE: Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided. This study was conducted in compliance with 40 CFR Part 160 with the exception of feed analysis.

A. MATERIALS:

1. Test Material AE 0317309 Technical

Description: Light brown crystalline powder

Lot No./Batch No. : OP 1-4

Purity: 95.7%

Stability of compound under test conditions: It was reported that historical data confirmed the freezer (Sabbert, T.J., 2006) and ambient (Langand-Lerche, C., 2003) stability in treated feed. However, actual data were not provided for review. Data verifying stability of AE 0317309 Technical in treated feed stored frozen (temperature not reported) for 5 weeks was provided in the concurrently-submitted bobwhite quail study (83% of nominal concentrations; MRID 468017-32). However, as diets were replaced weekly, the stability of AE 0317309 Technical in treated feed under ambient conditions needs to be verified.

(OECD recommends water solubility, stability in water and light, pKa, Pow, and vapor pressure of test compound)

Storage conditions of test chemicals: Ambient conditions (approx. 23°C)

Physicochemical properties of AE 0317309 Technical.

Parameter	Value	Comment
Molecular weight	362.3 g/mol	
Water Solubility (g/L) at 20°C	4.2 at pH 4 69.1 at pH 7 49.0 at pH 9	Very soluble
Vapor Pressure/Volatility	2.7×10^{-7} Pa at 20°C 6.8×10^{-7} Pa at 25°C	Non-volatile
UV Absorption	water $\lambda_{max} = 264$ 0.1M HCl $\lambda_{max} = 241$ 0.1M NaOH $\lambda_{max} = 216$	Not likely to undergo photolysis.
Pka	4.2 ± 0.15	
log K_{ow} at 23°C	0.276 at pH 4 -1.362 at pH 7 -1.58 at pH 9	Not likely to bioaccumulate
Stability of compound at room temperature, if provided		No significant degradation over 12 months at ambient temperatures.

Data obtained from pyrasulfatole chemistry review of Submission 2006-2445.

2. Test organism:

Table 1: Test organism.

Parameter	Details	Remarks *Criteria*
Species (common and scientific names):	Mallard duck (*Anas platyrhynchos*)	*Recommended species include a wild waterfowl species, preferably the mallard (Anas platyrhynchos) or an upland game species, preferably the northern bobwhite (Colinus virginianus)*

Parameter	Details	Remarks *Criteria*
Age at Study Initiation:	Approximately 19 weeks old and approaching their first breeding season.	*Birds approaching their first breeding season should be used.*
Body Weight: (mean and range)	Males: Overall range (n=60) 901-1452 g, with group means of 1109-1183 g. Females: Overall range (n=60) 860-1132 g, with group means of 988-992 g.	Individual body weights were recorded at Weeks 1 (test initiation), 3, 5, 7, 9, and 22 (test termination). *Body weights should be recorded at test initiation and at biweekly intervals up to week eight or up to the onset of egg laying and at termination.*
Source:	Whistling Wings Inc. Hanover, IL	Birds were from the same hatch, and were phenotypically indistinguishable from wild birds. *All birds should be from the same source.*

B. STUDY DESIGN:

1. Experimental Conditions

a. Range-finding study – None reported.

b. Definitive Study

Table 2: Experimental Parameters.

Parameter	Details	Remarks *Criteria*

Parameter	Details	Remarks *Criteria*
Acclimation period: Conditions (same as test or not): Feeding: Health (any mortality observed):	Approximately 5 weeks Same as test Teklad Bayer Game Bird ration (batch no. 12-01051) and local tap water were provided *ad libitum*. Good health (mortality not reported)	Upon arrival, five birds/sex were sacrificed and necropsied. Swab samples for microbiological examination were also performed. No remarkable findings were noted on the gross necropsy and the microbiological tests. Any birds that were injured or did not appear healthy were excluded from the study. During the acclimation and study periods, the ducks were lightly misted with water at least three times per week. *Recommended observation period includes a 2-3 week health observation period prior to selection of birds for treatment. Generally, birds should be healthy without excess mortality. Feeding should be ad libitum, and sickness, injuries or mortality should be noted.*

Parameter	Details	Remarks *Criteria*
Test duration pre-laying exposure: egg-laying exposure: withdrawal period, if used:	9-10 weeks 10-11 weeks N/A	***Recommended pre-laying exposure duration:*** *At least 10 weeks prior to the onset of egg-laying.* ***Recommended exposure duration with egg-laying:*** *At least 10 weeks.* ***Recommended withdrawal period:*** *If reduced reproduction is evident, a withdrawal period of up to 3 weeks should be added to the test phase.*
Pen (for parental and offspring) size: construction materials: number:	Parents (one pair) were housed in cages measuring 79 x 61 x 55 cm (with sloping floors). Offspring (by set and group) were housed in 91 x 81 x 25 cm brooding cages. Parental pens were constructed of stainless steel wire grid, stainless steel sheeting, and plastic-coated steel wire (floors). Offspring pens were constructed of galvanized wire mesh and galvanized sheeting. 15 parental pens/treatment level. Hatchlings were group-housed according to the appropriate parental concentration and hatch day.	Cage size was significantly smaller than recommended. OPPTS recommends at least 10,000 cm^2 per bird. In this study, the floor space was only 2410 cm^2 per bird. Cage sizes smaller than recommended should be shown to not adversely affect the health or reproduction of the quail. *Pens* *Pens should have adequate room and be arranged to prevent cross-contamination.* *Materials* *Recommended materials include nontoxic material and nonbinding material, such as galvanized steel.* *Number* *At least 5 replicate pens should be used for mallards housed in groups of 7. For other arrangements, at least 12 pens should be used, but considerably more may be used if birds are kept in pairs. Chicks should be housed according to parental grouping.*
Number of birds per pen (male:female)	2 birds/pen (1 male:1 female)	*One male and one female per pen should be used. For quail, one male and two females should be used. For ducks, two males and five females should be used.*

Parameter	Details	Remarks *Criteria*
Number of pens per group/treatment negative control: solvent control: treated:	15 15/level	*At least 12-16 pens should be used, but considerably more if birds are kept in pairs.*
Test concentrations (mg ai/kg diet) nominal: measured:	0 (negative control), 67, 200, and 600 mg ai/kg diet <30 (<LOQ, control), 56, 167, and 557 mg ai/kg diet	Mean-measured concentrations were determined from treated feed from Weeks 1, 5, 10, 15, and 20. *Recommended test concentrations include at least two concentrations other than the control; three or more will provide a better statistical analysis. The highest test concentrations should show a significant effect or be at or above the actual or expected field residue level.*
Maximum labeled field residue anticipated and source of information:	Not specified	*The highest test concentrations should show a significant effect or be at or above the actual or expected field residue level. The source (i.e., maximum label rate in lb ai/A and ppm), label registration no., label date, and site should be cited]*
Solvent/vehicle, if used type: amount:	N/A	*Recommended solvents include corn oil or other appropriate vehicle not more than 2% of diet by weight*

Parameter	Details	Remarks *Criteria*
Was detailed description and nutrient analysis of the basal diet provided (Yes/No)	Yes. Basal diets contained 28.3% protein, 4.3% fat, 3.1% crude fiber, and 29,800 ppm calcium.	Offspring received Teklad Bayer Starter ration (batch no. 12-10041) without the addition of test substance. *A commercial breeder feed or an equivalent that is appropriate for the test species is recommended.*
Preparation of test diet	The appropriate amount of test chemical was mixed with approx. 1 kg of basal diet for at least 5 minutes with a Kitchen Aid mixer. This premix was then quantitatively transferred to a Hobart mixer which contained approximately half of the basal diet, and mixed for at least 10 minutes. The remaining half of basal diet was added, and mixed again for at least 10 minutes. Treated diets were prepared weekly, and were stored in a walk-in freezer (-10°C) until needed.	The amount of AE 0317309 Technical was adjusted to reflect 100% ai. Fresh treated feed was added to feed pans on Thursday of each week. *A premixed diet containing the test substance should be mechanically mixed with basal diet. If an evaporative vehicle is used, it should be completely evaporated prior to feeding.*
Indicate whether stability and homogeneity of test material in diet determined (Yes/No)	Yes	
Were concentrations in diet verified by chemical analysis?	Yes; however, nearly half (7/15) of the sample recoveries indicated <80% of nominal concentrations had been obtained. Samples from all treatment levels and control were collected from feed prepared on Weeks 1, 5, 10, 15, and 20. Samples were stored frozen for up to 5 weeks prior to analysis (reviewer-derived from raw data table).	Measured concentrations of AE 0317309 Technical in the avian diet were relatively variable, with reviewer-calculated coefficients of variation (CV's) of 12.3-17% for all treatment levels (SD ÷ Mean x 100).

Parameter	Details	Remarks *Criteria*
Did chemical analysis confirm that diet was stable and homogeneous?	No. It was reported that historical data confirmed homogeneity and freezer stability in treated feed (Sabbert, T.J., 2006; not provided for review), and also the stability under ambient room temperature was confirmed by historical data (Langand-Lerche, C., 2003; not provided for review).	
Feeding and husbandry	Feeding and husbandry conditions appeared to be adequate, given guideline recommendations.	
Test conditions (pre-laying) temperature: relative humidity: photoperiod:	Average of 21°C Average of 53% 7 hours light/day up through Week 8. The photoperiod was then increased to 17 hours light/day thereafter. A 30-minute dawn/dusk cycle was used for transition.	An average light intensity of 4.4-11.9 foot-candles was maintained; a low light intensity was utilized to calm the birds and reduce stress. Average air change in the adult room was 12.14 air changes per hour. *Recommended temperature: about 21EC (70EF)* *Recommended relative humidity: about 55%* *Recommended lighting* *First 8 weeks: 7 h per day.* *Thereafter: 16-17 h per day.* *At least 6 foot-candles are recommended at bird level.*

Parameter	Details	Remarks *Criteria*
Egg Collection and Incubation		
Egg collection and storage collection interval: storage temperature: storage humidity:	Twice daily Average of 14°C Average of 86%	To prevent pathogen contamination, eggs were washed with warm water (approx. 110°F) and a chlorine-based detergent, and then dipped into a solution of germicidal soap and warm water prior to storage. *Eggs should be collected daily; recommended egg storage temperature is approximately 16EC (61EF); recommended humidity is approximately 65%.* *Recommended collection interval: daily*
Were eggs candled for cracks prior to setting for incubation?	Yes	*Eggs should be candled on day 0*
Were eggs set weekly?	Yes	
When candling was done for fertility?	Day 14	*Quail: approx. day 11* *Ducks: approx. day 14*
When the eggs were transferred to the hatcher?	Day 23	*Bobwhite: usually day 21* *Mallard: usually day 23*
Hatching conditions temperature: humidity: photoperiod:	Averaged 37°C Averaged 68% 14-hours light/day (hatchlings)	*Recommended temperature is 39EC (102EF)* *Recommended humidity is 70%*
Day the hatched eggs were removed and counted	Days 27 and 28	*Eggs for bobwhite should be removed on day 24; for mallard on day 27*
Were egg shells washed and dried for at least 48 hrs before measuring?	Yes	

Parameter	Details	Remarks *Criteria*
Egg shell thickness no. of eggs used: intervals: mode of measurement:	All eggs laid in 1 day Every other week Three points around the equatorial circumference were measured to the nearest 0.001 mm.	*Newly hatched eggs should be collected at least once every two weeks. Thickness of the shell plus membrane should be measured to the nearest 0.01 mm* with 3 - *4 measurements per shell.*
Reference chemical, if used	None used	

2. Observations:

Table 3: Observations.

Parameter	Details	Remarks
Parameters measured		
Parental (mortality, body weight, mean feed consumption) Egg collection and subsequent development (no. of eggs laid, no. of eggs cracked, shell thickness, no. of eggs set, no. of viable embryos, no. of live 3 week embryos, no. hatched, no. of 14-day survivors, average weight of 14-d old survivors, mortality, gross pathology, others)	- mortality - signs of toxicity, injury, or illness - body weight - food consumption - necropsy - eggs laid - eggs broken, cracked, small, and soft shelled, etc. - egg shell thickness - egg shell strength - eggs set - fertile 14-day embryos - live 21-day embryos - shell pipping - number of hatchlings - hatchling body weight - signs of toxicity and physical defects of hatchlings - number of 14-day-old survivors - 14-day-old survivor body weight	In addition to egg shell thickness, egg shell strength (the force needed to penetrate the shell and membrane) was measured at one point on the waist to the nearest 0.01 kg. The unhatched eggs were observed for embryo attempts to hatch (pipping), and discarded on day 28. *Recommended endpoints measured include:* • *Eggs laid/pen* • *Eggs cracked/pen* • *Eggs set/pen* • *Viable embryos/pen* • *Live 3-week embryos/pen* • *Normal hatchlings/pen* • *14-day-old survivors/pen* • *14-day-old survivors/pen* • *Weights of 14-day-old* • *survivors (mean per pen)* • *Egg shell thickness* • *Food consumption (mean per pen)* • *Initial and final body weight (mean per pen)*

Parameter	Details	Remarks
Indicate if the test material was regurgitated	No indications of dietary regurgitation.	
Observation intervals (for various parameters)	Mortality and signs of toxicity were observed at least once daily for adults and hatchlings. Parental body weights were recorded at Weeks 1 (test initiation), 3, 5, 7, 9, and 20 (test termination), and food consumption was determined weekly.	*Body weights and food consumption should be measured at least biweekly*
Were raw data included?	Yes, sufficient	

II. RESULTS AND DISCUSSION:

A. MORTALITY:

No treatment-related mortalities were observed. One male from the 56 mg ai/kg diet group was found dead on day 7 of the study. Necropsy revealed lesions of the feet, liver, heart, and spleen, and regressed testes. Necropsy of the pen-mate revealed regressed ovaries, but was otherwise unremarkable. One female from the 56 mg ai/kg diet group was found dead on day 11. Necropsy indicated regressed ovaries, and yellow liquid in body cavity. Necropsy of the pen-mate revealed regressed testes but was otherwise unremarkable. These deaths were considered unrelated to treatment. The NOAEC for adult mortality was 557 mg ai/kg diet.

Table 4: Effect of AE 0317309 Technical on Mortality of Mallard Duck.

Treatment (mg a.i./kg diet) [record measured and nominal conc. used]	Observation Period					
	Week 7		Week 14		Week 20	
	No. Dead		No. Dead		No. Dead	
	Male	Female	Male	Female	Male	Female
Control	0	0	0	0	0	0
56 (67)	1	1	1	1	1	1
167 (200)	0	0	0	0	0	0
557 (600)	0	0	0	0	0	0

B. REPRODUCTIVE AND OTHER ENDPOINTS:

Abnormal Effects/Behavior: No treatment-related signs of toxicity were apparent. Effects such as feather loss, bumblefoot, and skin abrasion were associated with normal laboratory cage housing, and were observed at comparable levels among all groups. The NOAEC for adult clinical signs of toxicity was 557 mg ai/kg diet.

Food Consumption: No statistically-significant differences on overall food consumption were observed between the treatment and control groups. Overall feed consumption averaged 111-120 g/bird/day for all levels. The NOAEC for adult food consumption was 557 mg ai/kg diet.

Body Weight: No statistically-significant differences in overall adult female body weight changes were observed between the treatment and control groups (by non-parametric analysis). The mean weight gain in the females was 224, 258, 251, and 191 g for the control, 56, 167, and 557 mg ai/kg diet levels, respectively. In males, the William's test indicated a statistical difference in body weight changes at the 557 mg ai/kg level (-9 g) compared to the control (54 g); however, the study author indicated that the difference was not considered biologically significant because the percent reduction in body weights did not indicate a dose-related response. Therefore, the reported NOAEC for body weight effects was 557 mg ai/kg diet.

Necropsy: No treatment-related findings were observed at necropsy. The NOAEC for post-mortem findings was 557 mg ai/kg diet.

Reproductive Effects: No treatment-related effects on egg production or quality, fertility, embryonic development, hatchability, or chick survival were observed at any test level. In addition, no treatment-related clinical signs of toxicity or effects on hatchling or 14-day survivor body weights were observed. There were two hatchlings in the control group that were observed to have a loss of righting reflex, but both chicks recovered. Also, a total of 8 hatchlings were found dead: 3 from the control group, 3 from the 56 mg ai/kg group, and 1 each from the 167 and 557 mg ai/kg groups. None of these deaths were compound-related. The NOAEC for all reproductive parameters was 557 mg ai/kg diet.

Table 5: Reproductive and Other Parameters (nominal concentrations; study author-reported).

Parameter	Control	56 mg ai/kg	167 mg ai/kg	557 mg ai/kg	NOAEC/ LOAEC
Eggs laid/pen	42.9	46.1	48.2	47.2	557mg ai/kg >557 mg ai/kg
Eggs laid/hen/day	Not reported	Not reported	Not reported	Not reported	N/A
Eggs cracked	8	7	4	4	N/A
Eggs set	568	631	646	647	N/A
Shell thickness (mm ∀ SD)	0.341 ± 0.02	0.358 ± 0.02	0.358 ± 0.03	0.357 ± 0.01	557 mg ai/kg >557 mg ai/kg
Viable 14-day embryos	432	534	417	572	N/A
Live 21-day embryos	423	529	405	560	N/A
No. of hatchling/hen	32.3	36.3	28.2	30.6	557 mg ai/kg >557 mg ai/kg
No. of normal hatchlings	355	436	310	401	N/A
Hatchling weight (g ± SD)	36.0 ± 4.56	37.2 ± 3.81	36.2 ± 4.38	36.0 ± 3.81	557 mg ai/kg >557 mg ai/kg
14-day old survivors	352	433	309	400	N/A

Parameter	Control	56 mg ai/kg	167 mg ai/kg	557 mg ai/kg	NOAEC/ LOAEC
14-day old survivors weight (g ± SD)	257.7 ± 25.95	256.8 ± 23.64	252.2 ± 25.22	260.2 ± 24.17	557 mg ai/kg >557 mg ai/kg
Mean food consumption	120	111	114	112	557 mg ai/kg >557 mg ai/kg
Weight of females (parent) at test initiation: at onset of egg laying: at test termination:	 992 969 1216	 988 967 1246	 990 998 1240	 991 990 1182	 557 mg ai/kg >557 mg ai/kg
Weight of males (parent) at test initiation: at onset of egg laying: at test termination:	 1137 1118 1191	 1129 1097 1159	 1109 1089 1141	 1183 1135 1174	 557 mg ai/kg >557 mg ai/kg
Gross pathology	No treatment-related abnormalities observed.				557 mg ai/kg >557 mg ai/kg
Eggshell strength (kg ± SD)	2.56 ± 0.27	2.77 ± 0.34	2.75 ± 0.41	2.83 ± 0.37	557 mg ai/kg >557 mg ai/kg

N/A = Not statistically analyzed.

C. REPORTED STATISTICS:

The following variables were statistically analyzed: adult body weight change from initiation to termination, overall mean feed consumption, eggs laid/hen, eggs cracked/hen, eggs set/hen, viable (14-day) embryos/hen, live (21-day) embryos/hen, eggs not cracked/laid (%), eggs set/laid (%), viable embryos/eggs set (%), live embryos/viable embryos (%), hatchlings/hen, 14-day old survivors/hen, hatchlings/eggs laid (%), hatchlings/eggs set (%), hatchlings/live embryos (%), 14-day old survivors/eggs set (%), 14-day old survivors/hatchlings (%), hatchling body weights, 14-day old survivors body weights, egg shell strength, and egg shell thickness.

Data were assessed for normality using the Shapiro-Wilk's test and for homogeneity of variance using Levene's test. If the data set passed the tests for normality and homogeneity, an analysis of variance (ANOVA) was performed to determine statistically-significant differences between groups, followed by Dunnett's or William's tests. If the data set did not pass the tests for normality and homogeneity, the data were analyzed by the Jonckheere or Mann-Whitney non-parametric test.

All variables were analyzed using SAS statistical software. Mean-measured concentrations were used for all estimations.

D. VERIFICATION OF STATISTICAL RESULTS:

Statistical Method: Analysis was conducted using "chicks.sas" (Ver. 3; March 2002), a SAS program provided by EFED/OPP/USEPA. Data for all endpoints were examined graphically using box plots to determine if they exhibited a dose-dependent response, which was ultimately used to select the multiple comparison test to detect LOAEC and NOAEC. Data for each endpoint were tested to determine if their distributions were normal and if their variances were homogeneous using Shapiro-Wilk's and Levene's tests, respectively. Data that satisfied these assumptions were subjected to Dunnett's and William's tests and data that did not satisfy these assumptions

were subjected to the non-parametric MannWhitney-U (with a Bonferroni adjustment) and Jonckheere's tests. Data for dead birds were excluded from the analyses. See Appendix I for output of reviewer's statistical verification and graphs for affected endpoints to support any reviewer-generated conclusions that may differ from those reported in the study.

NOAEC: 167 mg ai/kg
LOAEC: 557 mg ai/kg
Most Sensitive Endpoint(s): male body weight gain

Table 6: Reproductive and Other Parameters (mean-measured concentrations; reviewer-reported).

Parameter	Control	56 mg ai/kg	167 mg ai/kg	557 mg ai/kg	NOAEC/ LOAEC
Eggs laid/pen	42.9	43.1	48.2	47.2	557 mg ai/kg >557 mg ai/kg
Eggs cracked/pen	0.53	0.47	0.27	0.27	557 mg ai/kg >557 mg ai/kg
Eggs not cracked/eggs laid (%)	98.8	99.0	99.3	99.5	557 mg ai/kg >557 mg ai/kg
Eggs set/pen	37.9	42.1	43.1	43.1	557 mg ai/kg >557 mg ai/kg
Shell thickness	0.34	0.36	0.36	0.36	557 mg ai/kg >557 mg ai/kg
Eggs set/eggs laid (%)	82.1	91.2	89.4	91.1	557 mg ai/kg >557 mg ai/kg
Viable embryos/pen	28.8	35.6	27.8	38.1	557 mg ai/kg >557 mg ai/kg
Viable embryos/eggs set (%)	74.1	83.7	65.1	88.6	557 mg ai/kg >557 mg ai/kg
Live embryos/pen	28.2	35.3	27.0	37.3	557 mg ai/kg >557 mg ai/kg
Live embryos/viable embryos (%)	98.1	98.9	96.9	98.2	557 mg ai/kg >557 mg ai/kg
No. of hatchlings/pen	23.7	29.1	20.7	26.7	557 mg ai/kg >557 mg ai/kg
No. of hatchlings/eggs laid (%)	50.1	60.9	43.7	57.6	557 mg ai/kg >557 mg ai/kg
No. of hatchlings/eggs set (%)	61.3	66.9	48.4	63.3	557 mg ai/kg >557 mg ai/kg
No. of hatchlings/live embryos (%)	85.6	80.6	77.8	75.5	557 mg ai/kg >557 mg ai/kg

Hatchling survival/pen	23.5	28.9	20.6	26.7	557 mg ai/kg >557 mg ai/kg
Hatchling survival/eggs set (%)	60.6	66.3	48.3	63.1	557 mg ai/kg >557 mg ai/kg
Hatchling survival/no. of hatchlings (%)	99.0	99.2	99.8	99.8	557 mg ai/kg >557 mg ai/kg
Hatchling weight (g)	36.1	37.3	36.0	36.7	557 mg ai/kg >557 mg ai/kg
Survivor weight (g)	256.0	256.2	253.4	262.0	557 mg ai/kg >557 mg ai/kg
Mean food consumption (g/bird/day)	120.3	110.9	113.7	111.6	557 mg ai/kg >557 mg ai/kg
Male weight gain (g)	54.5	29.5	32.9	-8.6*	167 mg ai/kg 557 mg ai/kg
Female weight gain (g)	224.4	257.9	250.8	190.9	557 mg ai/kg >557 mg ai/kg

*Statistically significant at $p<0.05$.

E. STUDY DEFICIENCIES:

The stability of AE 0317309 Technical for 7 days in treated feed maintained under open-trough, ambient conditions (representing actual use) was referenced, but actual data were not provided for review. Furthermore, relatively high variability was observed in the results obtained during concentration verification, with reviewer-calculated CV's of 12.3-17.0%.

F. REVIEWERS' COMMENTS:

Results of the reviewers' statistical verification were similar to the study author's; however, the conclusions drawn from them differed. Both the reviewers and study author detected a significant adverse effect on adult male body weight change at the highest treatment level. The study author dismissed this effect, stating that it was biologically irrelevant because the means did not decrease in a linear pattern, and, therefore, it was not regarded as a dose-dependent response. The reviewers could not dismiss this effect, because it was a 115% reduction from control and because the median values decreased in a linear fashion and the overall pattern of response indicated dose-dependency. The DEH reviewer noted that there was no statistically significant difference between all bodyweights or mean feed consumption, and, thus, believed that the effect on adult male body weight change was unlikely to be biologically significant. However, because it is a statistically significant effect and using it would give more conservative endpoints, the DEH reviewer accepted the other DER reviewers' interpretation.

The composition and contaminant analysis of the Teklad Game Bird Ration and Teklad Bayer Starter Ration were reportedly provided in Appendix 1; however, the compositions of the two diets were remarkably similar, and it appeared that they both represented the adult feed (primarily based on calcium content).

The mean test article intake was calculated to be 5, 17, and 55 mg ai/kg bw/day for the 64, 205, and 557 mg ai/kg diet levels, respectively.

A method validation study was conducted on June 16, 2003 (Study No. A9720801). Control feed (presumably Teklad Bayer Game Bird Ration) was spiked with AE 0317309 Technical at 0 (control), 30.0, 300, 2503, and 5005 mg ai/kg. Recoveries ranged from 78-96%, and averaged 90 ± 7% of nominal concentrations.

In-life dates for the definitive study were January 11 – July 12, 2005.

G. CONCLUSIONS:

This study is classified as **ACCEPTABLE**, is scientifically sound, and does satisfy the guideline requirements for an avian reproduction study using mallard duck. Male body weight gain was adversely affected at the highest treatment level. Otherwise, there were no other treatment-related effects on any adult, reproductive, or offspring parameter.

NOAEC: 167 mg a.i./kg diet
LOAEC: 557 mg ai/kg diet
Endpoint(s) Affected: Male body weight gain

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APPENDIX I. OUTPUT OF REVIEWER=S STATISTICAL VERIFICATION:

Mallard repro, Pyrasulfotole, MRID 468017-33
PRINTOUT OF RAW DATA

Obs	TRT	EL	EC	ENC_EL	ES	ES_EL	VE	VE_ES	LE	LE_VE	NH	NH_EL	NH_ES
1	Ctrl	53	1	98.11	47	88.68	41	87.23	38	92.68	32	60.38	68.09
2	Ctrl	48	0	100.00	42	87.50	41	97.62	39	95.12	27	56.25	64.29
3	Ctrl	5	0	100.00	0	0.00	0	.	0	.	0	0.00	.
4	Ctrl	66	1	98.48	61	92.42	60	98.36	59	98.33	52	78.79	85.25
5	Ctrl	51	0	100.00	46	90.20	0	0.00	0	.	0	0.00	0.00
6	Ctrl	41	3	92.68	30	73.17	29	96.67	29	100.00	28	68.29	93.33
7	Ctrl	44	0	100.00	39	88.64	35	89.74	35	100.00	26	59.09	66.67
8	Ctrl	36	0	100.00	32	88.89	31	96.88	31	100.00	30	83.33	93.75
9	Ctrl	50	2	96.00	43	86.00	43	100.00	42	97.67	33	66.00	76.74
10	Ctrl	57	0	100.00	52	91.23	51	98.08	51	100.00	47	82.46	90.38
11	Ctrl	61	0	100.00	57	93.44	54	94.74	54	100.00	43	70.49	75.44
12	Ctrl	0	0	.	0	.	0	.	0	.	0	.	.
13	Ctrl	49	0	100.00	46	93.88	46	100.00	44	95.65	36	73.47	78.26
14	Ctrl	29	0	100.00	25	86.21	1	4.00	1	100.00	1	3.45	4.00
15	Ctrl	54	1	98.15	48	88.89	0	0.00	0	.	0	0.00	0.00
16	Dose1	36	0	100.00	32	88.89	32	100.00	29	90.63	24	66.67	75.00
17	Dose1	74	1	98.65	68	91.89	67	98.53	67	100.00	59	79.73	86.76
18	Dose1	66	3	95.45	58	87.88	58	100.00	58	100.00	56	84.85	96.55
19	Dose1	49	0	100.00	45	91.84	40	88.89	40	100.00	29	59.18	64.44
20	Dose1	51	0	100.00	45	88.24	40	88.89	40	100.00	26	50.98	57.78
21	Dose1	0	0	.	0	.	0	.	0	.	0	.	.
22	Dose1	34	0	100.00	32	94.12	30	93.75	30	100.00	21	61.76	65.63
23	Dose1	31	1	96.77	28	90.32	23	82.14	23	100.00	16	51.61	57.14
24	Dose1	69	0	100.00	64	92.75	47	73.44	46	97.87	38	55.07	59.38
25	Dose1	44	0	100.00	40	90.91	0	0.00	0	.	0	0.00	0.00
26	Dose1	56	2	96.43	50	89.29	48	96.00	48	100.00	40	71.43	80.00
27	Dose1	66	0	100.00	61	92.42	47	77.05	47	100.00	39	59.09	63.93

28	Dose1	55	0	100.00	52	94.55	49	94.23	48	97.96	40	72.73
76.92												
29	Dose1	61	0	100.00	56	91.80	53	94.64	53	100.00	48	78.69
85.71												
30	Dose1	0	0	.	0	.	0	.	0	.	0	.
.												
31	Dose2	47	0	100.00	43	91.49	43	100.00	42	97.67	37	78.72
86.05												
32	Dose2	46	0	100.00	42	91.30	17	40.48	17	100.00	16	34.78
38.10												
33	Dose2	48	0	100.00	44	91.67	0	0.00	0	.	0	0.00
0.00												
34	Dose2	63	0	100.00	57	90.48	12	21.05	11	91.67	10	15.87
17.54												
35	Dose2	68	0	100.00	63	92.65	58	92.06	58	100.00	38	55.88
60.32												
36	Dose2	45	0	100.00	41	91.11	38	92.68	37	97.37	36	80.00
87.80												
37	Dose2	55	0	100.00	49	89.09	48	97.96	42	87.50	10	18.18
20.41												
38	Dose2	33	0	100.00	31	93.94	0	0.00	0	.	0	0.00
0.00												
39	Dose2	59	0	100.00	54	91.53	52	96.30	52	100.00	49	83.05
90.74												
40	Dose2	50	3	94.00	32	64.00	29	90.63	27	93.10	11	22.00
34.38												
41	Dose2	56	0	100.00	52	92.86	50	96.15	50	100.00	47	83.93
90.38												
42	Dose2	0	0	.	0	.	0	.	0	.	0	.
.												
43	Dose2	72	0	100.00	64	88.89	0	0.00	0	.	0	0.00
0.00												
44	Dose2	57	0	100.00	52	91.23	51	98.08	50	98.04	39	68.42
75.00												
45	Dose2	24	1	95.83	22	91.67	19	86.36	19	100.00	17	70.83
77.27												
46	Dose3	0	0	.	0	.	0	.	0	.	0	.
.												
47	Dose3	45	0	100.00	41	91.11	33	80.49	33	100.00	32	71.11
78.05												
48	Dose3	46	0	100.00	42	91.30	41	97.62	41	100.00	40	86.96
95.24												
49	Dose3	37	0	100.00	32	86.49	24	75.00	24	100.00	22	59.46
68.75												
50	Dose3	74	2	97.30	69	93.24	69	100.00	67	97.10	34	45.95
49.28												
51	Dose3	69	0	100.00	65	94.20	61	93.85	60	98.36	55	79.71
84.62												
52	Dose3	50	1	98.00	44	88.00	44	100.00	43	97.73	27	54.00
61.36												
53	Dose3	57	0	100.00	52	91.23	49	94.23	48	97.96	41	71.93
78.85												
54	Dose3	51	0	100.00	46	90.20	46	100.00	45	97.83	34	66.67
73.91												
55	Dose3	67	1	98.51	61	91.04	58	95.08	57	98.28	32	47.76
52.46												
56	Dose3	0	0	.	0	.	0	.	0	.	0	.
.												
57	Dose3	51	0	100.00	46	90.20	46	100.00	45	97.83	31	60.78
67.39												

58 Dose3 50 0 100.00 47 94.00 47 100.00 47 100.00 12 24.00
25.53
59 Dose3 62 0 100.00 57 91.94 9 15.79 9 100.00 9 14.52
15.79
60 Dose3 49 0 100.00 45 91.84 45 100.00 41 91.11 32 65.31
71.11
Mallard repro, Pyrasulfotole, MRID 468017-33
PRINTOUT OF RAW DATA (continued)

Obs	TRT	NH_LE	HS	HS_ES	HS_NH	THICK	HATWT	SURVWT	FOOD	WTGAINM	WTGAINF
1	Ctrl	84.21	32	68.09	100.00	0.33	38	239	114	-178	240
2	Ctrl	69.23	26	61.90	96.30	0.34	39	252	109	-155	331
3	Ctrl	.	0	.	.	.	.	.	119	64	228
4	Ctrl	88.14	52	85.25	100.00	0.35	39	265	132	205	158
5	Ctrl	.	0	0.00	.	0.36	.	.	105	210	357
6	Ctrl	96.55	27	90.00	96.43	0.33	33	252	98	53	225
7	Ctrl	74.29	26	66.67	100.00	0.36	39	253	101	-9	151
8	Ctrl	96.77	29	90.63	96.67	0.33	30	271	102	98	325
9	Ctrl	78.57	33	76.74	100.00	0.35	36	269	168	69	193
10	Ctrl	92.16	47	90.38	100.00	0.34	33	255	128	16	191
11	Ctrl	79.63	43	75.44	100.00	0.36	34	250	122	94	185
12	Ctrl	.	0	.	.	.	.	.	184	33	148
13	Ctrl	81.82	36	78.26	100.00	0.37	40	268	98	50	81
14	Ctrl	100.00	1	4.00	100.00	0.29	37	242	107	150	193
15	Ctrl	.	0	0.00	.	0.34	.	.	117	117	360
16	Dose1	82.76	23	71.88	95.83	0.36	39	276	84	-165	348
17	Dose1	88.06	59	86.76	100.00	0.33	38	254	108	93	310
18	Dose1	96.55	56	96.55	100.00	0.32	39	263	109	82	348
19	Dose1	72.50	28	62.22	96.55	0.33	34	229	103	157	28
20	Dose1	65.00	26	57.78	100.00	0.38	38	243	126	154	197
21	Dose1	.	0	.	.	.	.	.	65	.	.
22	Dose1	70.00	21	65.63	100.00	0.34	41	269	147	19	98
23	Dose1	69.57	16	57.14	100.00	0.36	37	243	114	-36	255
24	Dose1	82.61	38	59.38	100.00	0.37	38	265	142	12	185
25	Dose1	.	0	0.00	.	0.38	.	.	137	-72	345
26	Dose1	83.33	40	80.00	100.00	0.35	33	258	83	-43	197
27	Dose1	82.98	39	63.93	100.00	0.39	37	259	102	44	454
28	Dose1	83.33	40	76.92	100.00	0.39	39	266	168	92	316
29	Dose1	90.57	47	83.93	97.92	0.35	35	251	123	47	272
30	Dose1	.	0	.	.	.	.	.	53	.	.
31	Dose2	88.10	37	86.05	100.00	0.35	37	242	104	4	299
32	Dose2	94.12	16	38.10	100.00	0.37	35	261	92	-13	135
33	Dose2	.	0	0.00	.	0.37	.	.	110	23	316
34	Dose2	90.91	10	17.54	100.00	0.37	40	270	127	37	382
35	Dose2	65.52	38	60.32	100.00	0.37	41	262	96	3	375
36	Dose2	97.30	36	87.80	100.00	0.35	33	242	97	116	257
37	Dose2	23.81	10	20.41	100.00	0.36	38	279	102	71	283
38	Dose2	.	0	0.00	.	0.36	.	.	120	88	105
39	Dose2	94.23	49	90.74	100.00	0.34	36	258	143	-87	406
40	Dose2	40.74	11	34.38	100.00	0.27	28	220	110	152	252
41	Dose2	94.00	46	88.46	97.87	0.38	34	250	145	-22	169
42	Dose2	.	0	.	.	.	.	.	137	27	232
43	Dose2	.	0	0.00	.	0.35	.	.	114	69	295
44	Dose2	78.00	39	75.00	100.00	0.38	36	251	117	30	206
45	Dose2	89.47	17	77.27	100.00	0.40	38	254	91	-5	50
46	Dose3	.	0	.	.	.	.	.	100	-45	140
47	Dose3	96.97	32	78.05	100.00	0.34	37	250	123	-112	262
48	Dose3	97.56	39	92.86	97.50	0.37	38	262	131	-120	309
49	Dose3	91.67	22	68.75	100.00	0.37	36	269	84	89	-324
50	Dose3	50.75	34	49.28	100.00	0.35	35	262	146	-45	199

51	Dose3	91.67	55	84.62	100.00	0.34	32	240	115	126	174
52	Dose3	62.79	27	61.36	100.00	0.34	35	261	104	-74	365
53	Dose3	85.42	41	78.85	100.00	0.36	34	264	112	-75	317
54	Dose3	75.56	34	73.91	100.00	0.35	39	267	111	-36	305
55	Dose3	56.14	32	52.46	100.00	0.36	38	259	135	47	139
56	Dose3	.	0	.	.	.	.	.	84	18	224
57	Dose3	68.89	31	67.39	100.00	0.34	36	271	101	-5	260
58	Dose3	25.53	12	25.53	100.00	0.38	40	281	139	-3	-145
59	Dose3	100.00	9	15.79	100.00	0.37	40	252	100	50	297
60	Dose3	78.05	32	71.11	100.00	0.36	37	269	89	56	341

Mallard repro, Pyrasulfotole, MRID 468017-33
ANALYSIS RESULTS FOR VARIABLE EL (Eggs Laid)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.870	<.001	0.364	0.779	USE NON-PARAMETRIC TESTS

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**
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	15	42.93	18.87	4.87	43.96	32.48,	53.39
Dose1	15	46.13	22.77	5.88	49.35	33.52,	58.74
Dose2	15	48.20	18.20	4.70	37.76	38.12,	58.28
Dose3	15	47.20	21.57	5.57	45.70	35.25,	59.15

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	49.00	0.00	66.00	.	.
Dose1	51.00	0.00	74.00	107.45	-7.45
Dose2	50.00	0.00	72.00	112.27	-12.27
Dose3	50.00	0.00	74.00	109.94	-9.94

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	0.93	0.817

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	49.00	.	.
Dose1	51.00	1.000	0.760
Dose2	50.00	1.000	0.780
Dose3	50.00	1.000	0.796

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
ANALYSIS RESULTS FOR VARIABLE NEG_EC (Eggs Cracked)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.647	<.001	1.087	0.362	USE NON-PARAMETRIC TESTS

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**
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval	
Ctrl	15	0.53	0.92	0.24	171.65	0.03,	1.04
Dose1	15	0.47	0.92	0.24	196.17	0.00,	0.97
Dose2	15	0.27	0.80	0.21	299.55	0.00,	0.71
Dose3	15	0.27	0.59	0.15	222.61	0.00,	0.60

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	0.00	0.00	3.00	.	.
Dose1	0.00	0.00	3.00	87.50	12.50
Dose2	0.00	0.00	3.00	50.00	50.00
Dose3	0.00	0.00	2.00	50.00	50.00

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	1.75	0.626

MannWhit(Bon) - testing each trt median signif. greater than control
Jonckheere - test assumes dose-response relationship, testing positive trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	0.00	.	.
Dose1	0.00	1.000	0.631
Dose2	0.00	1.000	0.880
Dose3	0.00	1.000	0.862

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
ANALYSIS RESULTS FOR VARIABLE ENC_EL ((EL-EC)/EL (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.686	<.001	1.193	0.322	USE NON-PARAMETRIC TESTS

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**
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	14	98.82	2.13	0.57	2.16	97.58, 100.00
Dose1	13	99.02	1.66	0.46	1.68	98.02, 100.00
Dose2	14	99.27	1.88	0.50	1.89	98.19, 100.00
Dose3	13	99.52	0.94	0.26	0.94	98.96, 100.00

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	100.00	92.68	100.00	.	.
Dose1	100.00	95.45	100.00	100.21	-0.21
Dose2	100.00	94.00	100.00	100.46	-0.46
Dose3	100.00	97.30	100.00	100.72	-0.72

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	1.52	0.678

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	100.00	.	.
Dose1	100.00	1.000	0.603
Dose2	100.00	1.000	0.855
Dose3	100.00	1.000	0.852

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
ANALYSIS RESULTS FOR VARIABLE ES (Eggs Set)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.884	<.001	0.267	0.849	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	15	37.87	18.11	4.68	47.84	27.84,	47.90
Dose1	15	42.07	20.84	5.38	49.55	30.52,	53.61
Dose2	15	43.07	16.73	4.32	38.84	33.80,	52.33
Dose3	15	43.13	20.04	5.17	46.47	32.03,	54.23

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	43.00	0.00	61.00	.	.
Dose1	45.00	0.00	68.00	111.09	-11.09
Dose2	44.00	0.00	64.00	113.73	-13.73
Dose3	46.00	0.00	69.00	113.91	-13.91

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	1.17	0.761

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	43.00	.	.
Dose1	45.00	1.000	0.791
Dose2	44.00	1.000	0.774
Dose3	46.00	1.000	0.819

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
ANALYSIS RESULTS FOR VARIABLE ES_EL (EggsSet/EggsLaid (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.440	<.001	3.497	0.022	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	14	82.08	24.15	6.45	29.42	68.14,	96.03
Dose1	13	91.15	2.13	0.59	2.34	89.86,	92.43
Dose2	14	89.42	7.44	1.99	8.32	85.13,	93.71
Dose3	13	91.14	2.17	0.60	2.38	89.83,	92.45

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	88.78	0.00	93.88	.	.
Dose1	91.80	87.88	94.55	111.04	-11.04
Dose2	91.40	64.00	93.94	108.94	-8.94
Dose3	91.23	86.49	94.20	111.03	-11.03

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	6.08	0.108

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	88.78	.	.
Dose1	91.80	1.000	0.975
Dose2	91.40	1.000	0.968
Dose3	91.23	1.000	0.965

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
ANALYSIS RESULTS FOR VARIABLE VE (Viable Embryo(d14))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.916	<.001	0.252	0.859	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	15	28.80	22.41	5.79	77.81	16.39,	41.21
Dose1	15	35.60	21.43	5.53	60.19	23.73,	47.47
Dose2	15	27.80	22.05	5.69	79.33	15.59,	40.01
Dose3	15	38.13	21.15	5.46	55.47	26.42,	49.85

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	35.00	0.00	60.00	.	.
Dose1	40.00	0.00	67.00	123.61	-23.61
Dose2	29.00	0.00	58.00	96.53	3.47
Dose3	45.00	0.00	69.00	132.41	-32.41

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	2.00	0.572

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	35.00	.	.
Dose1	40.00	1.000	0.768
Dose2	29.00	1.000	0.467
Dose3	45.00	1.000	0.779

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE VE_ES (ViableEmbryo/EggsSet (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.774	<.001	5.101	0.004	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	13	74.10	41.66	11.55	56.22	48.93,	99.27
Dose1	13	83.66	26.53	7.36	31.71	67.63,	99.69
Dose2	14	65.13	42.22	11.28	64.83	40.75,	89.50
Dose3	13	88.62	23.30	6.46	26.29	74.54,	100.00

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	96.67	0.00	100.00	.	.
Dose1	93.75	0.00	100.00	112.90	-12.90
Dose2	91.34	0.00	100.00	87.89	12.11
Dose3	97.62	15.79	100.00	119.59	-19.59

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	4.56	0.207

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	96.67	.	.
Dose1	93.75	0.918	0.295
Dose2	91.34	0.474	0.129
Dose3	97.62	1.000	0.756

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE LE (Live Embryo(d21))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.921	<.001	0.219	0.883	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	15	28.20	21.98	5.67	77.94	16.03,	40.37
Dose1	15	35.27	21.40	5.52	60.67	23.42,	47.12
Dose2	15	27.00	21.60	5.58	79.99	15.04,	38.96
Dose3	15	37.33	20.62	5.32	55.23	25.92,	48.75

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	35.00	0.00	59.00	.	.
Dose1	40.00	0.00	67.00	125.06	-25.06
Dose2	27.00	0.00	58.00	95.74	4.26
Dose3	43.00	0.00	67.00	132.39	-32.39

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	2.35	0.504

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	35.00	.	.
Dose1	40.00	1.000	0.798
Dose2	27.00	1.000	0.446
Dose3	43.00	1.000	0.779

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE LE_VE (LiveEmbryo/ViableEmbryo (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.802	<.001	2.071	0.118	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	11	98.13	2.57	0.78	2.62	96.41, 99.86
Dose1	12	98.87	2.72	0.78	2.75	97.14, 100.00
Dose2	11	96.85	4.25	1.28	4.38	94.00, 99.70
Dose3	13	98.17	2.38	0.66	2.43	96.73, 99.61

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	100.00	92.68	100.00	.	.
Dose1	100.00	90.63	100.00	100.75	-0.75
Dose2	98.04	87.50	100.00	98.69	1.31
Dose3	98.28	91.11	100.00	100.04	-0.04

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	3.11	0.376

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	100.00	.	.
Dose1	100.00	1.000	0.844
Dose2	98.04	0.836	0.279
Dose3	98.28	1.000	0.205

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE NH (Number Hatched)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.949	0.015	0.642	0.591	USE PARAMETRIC TESTS

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**
BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	15	23.67	18.63	4.81	78.72	13.35,	33.98
Dose1	15	29.07	19.28	4.98	66.32	18.39,	39.74
Dose2	15	20.67	18.32	4.73	88.65	10.52,	30.81
Dose3	15	26.73	15.51	4.01	58.03	18.14,	35.32

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	28.00	0.00	52.00	.	.
Dose1	29.00	0.00	59.00	122.82	-22.82
Dose2	16.00	0.00	49.00	87.32	12.68
Dose3	32.00	0.00	55.00	112.96	-12.96

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PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	56	0.62	0.606

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	23.67	.	26.37	.	0.844	0.968	0.966	.	.
Dose1	29.07	0.946	26.37	0.746	.	0.580	0.984	.	.
Dose2	20.67	0.562	23.70	0.620	.	.	0.792	.	.
Dose3	26.73	0.886	23.70	0.639	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE NH_EL (NumberHatched/EggsLaid (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.927	0.003	4.995	0.004	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	14	50.14	33.34	8.91	66.49	30.89,	69.39
Dose1	13	60.91	21.34	5.92	35.03	48.01,	73.80
Dose2	14	43.69	33.87	9.05	77.52	24.14,	63.25
Dose3	13	57.55	20.66	5.73	35.91	45.06,	70.04

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	63.19	0.00	83.33	.	.
Dose1	61.76	0.00	84.85	121.47	-21.47
Dose2	45.33	0.00	83.93	87.13	12.87
Dose3	60.78	14.52	86.96	114.77	-14.77

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	0.84	0.839

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	63.19	.	.
Dose1	61.76	1.000	0.615
Dose2	45.33	1.000	0.342
Dose3	60.78	1.000	0.451

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE NH_ES (NumberHatched/EggsSet (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.922	0.002	3.370	0.026	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	13	61.25	35.48	9.84	57.93	39.80, 82.69
Dose1	13	66.87	23.62	6.55	35.32	52.59, 81.14
Dose2	14	48.43	36.45	9.74	75.27	27.38, 69.48
Dose3	13	63.26	22.65	6.28	35.80	49.57, 76.94

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	75.44	0.00	93.75	.	.
Dose1	65.63	0.00	96.55	109.18	-9.18
Dose2	49.21	0.00	90.74	79.07	20.93
Dose3	68.75	15.79	95.24	103.28	-3.28

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	1.22	0.747

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	75.44	.	.
Dose1	65.63	1.000	0.350
Dose2	49.21	0.623	0.143
Dose3	68.75	1.000	0.242

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE NH_LE (NumberHatched/LiveEmbryo (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.903	<.001	3.806	0.017	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval	
Ctrl	11	85.58	9.99	3.01	11.68	78.86,	92.29
Dose1	12	80.60	9.45	2.73	11.72	74.60,	86.61
Dose2	11	77.84	24.56	7.41	31.55	61.34,	94.34
Dose3	13	75.46	22.11	6.13	29.30	62.10,	88.82

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	84.21	69.23	100.00	.	.
Dose1	82.87	65.00	96.55	94.19	5.81
Dose2	89.47	23.81	97.30	90.95	9.05
Dose3	78.05	25.53	100.00	88.18	11.82

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	1.42	0.701

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	84.21	.	.
Dose1	82.87	0.503	0.155
Dose2	89.47	1.000	0.425
Dose3	78.05	0.523	0.288

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE HS (Hatching Survival(d14))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.951	0.017	0.642	0.591	USE PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	15	23.47	18.58	4.80	79.18	13.18,	33.76
Dose1	15	28.87	19.23	4.97	66.62	18.22,	39.52
Dose2	15	20.60	18.22	4.70	88.45	10.51,	30.69
Dose3	15	26.67	15.45	3.99	57.95	18.11,	35.22

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	27.00	0.00	52.00	.	.
Dose1	28.00	0.00	59.00	123.01	-23.01
Dose2	16.00	0.00	49.00	87.78	12.22
Dose3	32.00	0.00	55.00	113.64	-13.64

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PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	56	0.61	0.610

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	23.47	.	26.17	.	0.842	0.972	0.961	.	.
Dose1	28.87	0.947	26.17	0.747	.	0.590	0.987	.	.
Dose2	20.60	0.570	23.63	0.629	.	.	0.791	.	.
Dose3	26.67	0.891	23.63	0.648	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE HS_ES (HatchingSurvival/EggsSet (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.919	0.002	3.452	0.023	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	13	60.57	35.00	9.71	57.78	39.42, 81.71
Dose1	13	66.32	23.45	6.50	35.36	52.15, 80.49
Dose2	14	48.29	36.29	9.70	75.14	27.34, 69.24
Dose3	13	63.07	22.38	6.21	35.48	49.55, 76.59

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	75.44	0.00	90.63	.	.
Dose1	65.63	0.00	96.55	109.50	-9.50
Dose2	49.21	0.00	90.74	79.73	20.27
Dose3	68.75	15.79	92.86	104.14	-4.14

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	1.10	0.776

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	75.44	.	.
Dose1	65.63	1.000	0.350
Dose2	49.21	0.686	0.154
Dose3	68.75	1.000	0.262

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
66
13:56
Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE HS_NH (HatchingSurvival/NumberHatched (%))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.699	<.001	7.478	<.001	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	11	99.04	1.65	0.50	1.67	97.92, 100.00
Dose1	12	99.19	1.53	0.44	1.54	98.22, 100.00
Dose2	11	99.81	0.64	0.19	0.64	99.38, 100.00
Dose3	13	99.81	0.69	0.19	0.69	99.39, 100.00

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	100.00	96.30	100.00	.	.
Dose1	100.00	95.83	100.00	100.16	-0.16
Dose2	100.00	97.87	100.00	100.78	-0.78
Dose3	100.00	97.50	100.00	100.78	-0.78

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	3.02	0.389

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	100.00	.	.
Dose1	100.00	1.000	0.563
Dose2	100.00	1.000	0.873
Dose3	100.00	1.000	0.947

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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13:56
Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE THICK (Eggshell thickness)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.905	<.001	0.780	0.511	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	13	0.34	0.02	0.01	6.06	0.33,	0.35
Dose1	13	0.36	0.02	0.01	6.23	0.34,	0.37
Dose2	14	0.36	0.03	0.01	8.73	0.34,	0.38
Dose3	13	0.36	0.01	0.00	3.87	0.35,	0.37

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	0.34	0.29	0.37	.	.
Dose1	0.36	0.32	0.39	105.06	-5.06
Dose2	0.36	0.27	0.40	105.06	-5.06
Dose3	0.36	0.34	0.38	104.88	-4.88

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

Degrees of Freedom	TestStat	P-value
3	7.47	0.058

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	0.34	.	.
Dose1	0.36	1.000	0.964
Dose2	0.36	1.000	0.989
Dose3	0.36	1.000	0.966

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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13:56
Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE HATWT (Hatchling Weight)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.964	0.153	0.911	0.444	USE PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.	Interval
Ctrl	11	36.05	3.27	0.99	9.07	33.86,	38.25
Dose1	12	37.28	2.24	0.65	6.02	35.86,	38.71
Dose2	11	36.03	3.68	1.11	10.22	33.55,	38.50
Dose3	13	36.67	2.46	0.68	6.71	35.18,	38.16

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	36.50	29.80	39.60	.	.
Dose1	37.75	33.10	40.60	103.41	-3.41
Dose2	36.20	27.50	41.30	99.92	0.08
Dose3	36.50	32.00	40.30	101.70	-1.70

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PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	43	0.48	0.700

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	36.05	.	36.70	.	0.749	1.000	0.956	.	.
Dose1	37.28	0.963	36.70	0.784	.	0.736	0.953	.	.
Dose2	36.03	0.736	36.38	0.723	.	.	0.950	.	.
Dose3	36.67	0.891	36.38	0.746	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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13:56
Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE SURVWT (Survivor Wt (d14))

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.980	0.601	0.643	0.591	USE PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	11	256.01	10.79	3.25	4.22	248.76, 263.26
Dose1	12	256.18	13.09	3.78	5.11	247.87, 264.50
Dose2	11	253.44	15.79	4.76	6.23	242.83, 264.04
Dose3	13	261.98	10.37	2.88	3.96	255.71, 268.25

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	253.00	239.00	270.70	.	.
Dose1	258.40	228.70	275.70	100.07	-0.07
Dose2	254.40	219.50	278.60	99.00	1.00
Dose3	261.90	239.70	281.10	102.33	-2.33

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PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	43	1.01	0.399

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	256.01	.	257.10	.	1.000	0.963	0.658	.	.
Dose1	256.18	0.756	257.10	0.669	.	0.953	0.662	.	.
Dose2	253.44	0.546	257.10	0.703	.	.	0.360	.	.
Dose3	261.98	0.975	257.10	0.725	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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13:56
Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE FOOD (Food Consumption)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.972	0.188	1.255	0.299	USE PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	120.27	25.11	6.48	20.88	106.36, 134.17
Dose1	15	110.93	31.29	8.08	28.21	93.60, 128.26
Dose2	15	113.67	17.82	4.60	15.68	103.80, 123.53
Dose3	15	111.60	19.77	5.11	17.72	100.65, 122.55

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	114.00	98.00	184.00	.	.
Dose1	109.00	53.00	168.00	92.24	7.76
Dose2	110.00	91.00	145.00	94.51	5.49
Dose3	111.00	84.00	146.00	92.79	7.21

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PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	56	0.47	0.704

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	120.27	.	120.27	.	0.714	0.876	0.758	.	.
Dose1	110.93	0.301	112.30	0.220	.	0.989	1.000	.	.
Dose2	113.67	0.430	112.30	0.236	.	.	0.995	.	.
Dose3	111.60	0.331	111.60	0.217	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	Dose3	>highest dose

Mallard repro, Pyrasulfotole, MRID 468017-33
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13:56
Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE WTGAINM (Male wt gain)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.969	0.143	0.990	0.405	USE PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	54.47	109.40	28.25	200.86	-6.12, 115.05
Dose1	13	29.54	91.77	25.45	310.68	-25.92, 85.00
Dose2	15	32.87	59.58	15.38	181.29	-0.13, 65.86
Dose3	15	-8.60	72.84	18.81	-846.99	-48.94, 31.74

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	64.00	-178.00	210.00	.	.
Dose1	44.00	-165.00	157.00	54.23	45.77
Dose2	27.00	-87.00	152.00	60.34	39.66
Dose3	-5.00	-120.00	126.00	-15.79	115.79

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PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Analysis of Variance (ANOVA) - overall F-test

Numerator df	Denominator df	F-stat	P-value
3	54	1.42	0.248

Dunnett - testing each trt mean signif. less than control
Williams - test assumes dose-response relationship, testing negative trend
Tukey - two-sided tests, all possible comparisons, not used for NOEC or LOEC

Level	Mean	Dunnett p-value	Isotonic mean	Williams p-value	Tukey p-values Dose1	Dose2	Dose3	Dose4	Dose5
Ctrl	54.47	.	54.47	.	0.867	0.899	0.191	.	.
Dose1	29.54	0.424	31.32	0.285	.	1.000	0.642	.	.
Dose2	32.87	0.458	31.32	0.294	.	.	0.547	.	.
Dose3	-8.60	0.060	-8.60	0.029	.	.	.	.	.

SUMMARY	NOEC	LOEC
Dunnett	Dose3	>highest dose
Williams	**Dose2**	**Dose3**

Mallard repro, Pyrasulfotole, MRID 468017-33
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13:56
Thursday, May 25, 2006
ANALYSIS RESULTS FOR VARIABLE WTGAINF (Female wt gain)

TESTS OF ASSUMPTIONS FOR PARAMETRIC ANALYSIS
Shapiro-Wilks test for Normality of Residuals -- alpha-level=0.01
Levenes test for homogeneity of variance(absolute residuals) -- alpha-level=0.05
Use parametric analyses if neither test rejected, otherwise non-parametric analyses.

Shapiro-Wilks Test Stat	Shapiro-Wilks P-value	Levenes Test Stat	Levenes P-value	Conclusion
0.900	<.001	1.523	0.219	USE NON-PARAMETRIC TESTS

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BASIC SUMMARY STATISTICS

Level	N	Mean	StdDev	StdErr	Coef of Var	95% Conf.Interval
Ctrl	15	224.40	83.90	21.66	37.39	177.94, 270.86
Dose1	13	257.92	115.37	32.00	44.73	188.20, 327.64
Dose2	15	250.80	103.64	26.76	41.32	193.41, 308.19
Dose3	15	190.87	189.26	48.87	99.16	86.06, 295.68

Level	Median	Min	Max	%of Control(means)	%Reduction(means)
Ctrl	193.00	81.00	360.00	.	.
Dose1	272.00	28.00	454.00	114.94	-14.94
Dose2	257.00	50.00	406.00	111.76	-11.76
Dose3	260.00	-324.00	365.00	85.06	14.94

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NON-PARAMETRIC ANALYSES - use alpha-level=0.05 for all tests
Kruskal-Wallis test - equality among treatment groups

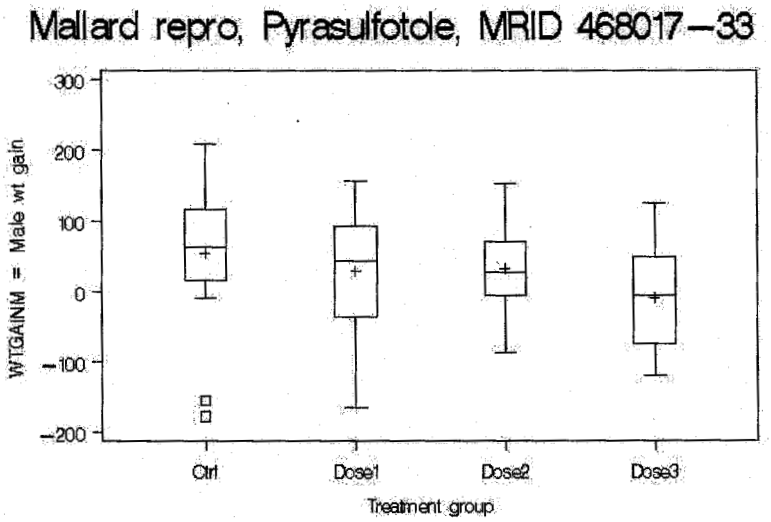
Degrees of Freedom	TestStat	P-value
3	1.40	0.706

MannWhit(Bon) - testing each trt median signif. less than control
Jonckheere - test assumes dose-response relationship, testing negative trend

Level	Median	MannWhit(Bon adjust)p-value	Jonckheere p-value
Ctrl	193.00	.	.
Dose1	272.00	1.000	0.845
Dose2	257.00	1.000	0.817
Dose3	260.00	1.000	0.588

SUMMARY	NOEC	LOEC
MannWhit (Bonf adjust)	Dose3	>highest dose
Jonckheere	Dose3	>highest dose

Box Plots:



TRT	EL	EC	ES	VE	LE	NH	
HS	THICK	HATWT	SURVWT	FOOD	PREM	POSTM	PREF
POSTF							
A	53	1	47	41	38	32	
32	0.330	37.9	239.0	114	1278	1100	982
1222							
A	48	0	42	41	39	27	
26	0.343	38.8	252.4	109	1147	992	1036
1367							
A	5	0	0	0	0	0	
0	.	.	.	119	1292	1356	988
1216							
A	66	1	61	60	59	52	
52	0.349	39.2	265.1	132	1047	1252	920
1078							
A	51	0	46	0	0	0	
0	0.360	.	.	105	988	1198	932
1289							
A	41	3	30	29	29	28	
27	0.325	33.0	251.7	98	1164	1217	978
1203							
A	44	0	39	35	35	26	
26	0.355	39.3	253.0	101	1066	1057	1125
1276							
A	36	0	32	31	31	30	
29	0.332	29.8	270.7	102	1173	1271	959
1284							
A	50	2	43	43	42	33	
33	0.348	35.6	268.5	168	1206	1275	1076
1269							
A	57	0	52	51	51	47	
47	0.341	32.9	255.3	128	1159	1175	888
1079							
A	61	0	57	54	54	43	
43	0.355	34.0	249.6	122	1164	1258	945
1130							
A	0	0	0	0	0	0	
0	.	.	.	184	1098	1131	904
1052							
A	49	0	46	46	44	36	
36	0.368	39.6	268.4	98	1113	1163	1029
1110							
A	29	0	25	1	1	1	
1	0.286	36.5	242.4	107	1060	1210	1078
1271							
A	54	1	48	0	0	0	
0	0.336	.	.	117	1097	1214	1038
1398							
B	36	0	32	32	29	24	
23	0.363	39.0	275.7	84	1232	1067	983
1331							
B	74	1	68	67	67	59	
59	0.327	37.9	253.9	108	1194	1287	890
1200							

B	66	3	58	58	58	56	56	0.322	39.1	262.7	109	1040	1122	920	1268
B	49	0	45	40	40	29	28	0.333	34.1	228.7	103	1031	1188	1059	1087
B	51	0	45	40	40	26	26	0.380	37.7	243.4	126	1017	1171	918	1115
B	0	0	0	0	0	0	0	.	.	.	65	1094	.	1093	.
B	34	0	32	30	30	21	21	0.343	40.6	268.5	147	1108	1127	1130	1228
B	31	1	28	23	23	16	16	0.364	37.3	242.6	114	1373	1337	1000	1255
B	69	0	64	47	46	38	38	0.366	37.8	264.6	142	1115	1127	1046	1231
B	44	0	40	0	0	0	0	0.376	.	.	137	1266	1194	1029	1374
B	56	2	50	48	48	40	40	0.351	33.1	257.8	83	1074	1031	995	1192
B	66	0	61	47	47	39	39	0.385	36.7	259.0	102	1035	1079	972	1426
B	55	0	52	49	48	40	40	0.391	39.2	266.0	168	1001	1093	933	1249
B	61	0	56	53	53	48	47	0.351	34.9	251.3	123	1194	1241	970	1242
B	0	0	0	0	0	0	0	.	.	.	53	1135	.	950	.
C	47	0	43	43	42	37	37	0.348	37.3	241.8	104	1175	1179	986	1285
C	46	0	42	17	17	16	16	0.373	35.0	260.8	92	1234	1221	1030	1165
C	48	0	44	0	0	0	0	0.365	.	.	110	1252	1275	1050	1366
C	63	0	57	12	11	10	10	0.373	39.6	269.9	127	1048	1085	860	1242
C	68	0	63	58	58	38	38	0.368	41.3	262.4	96	934	937	972	1347

C	45	0	41	38	37	36	36	0.352	33.2	242.3	97	994	1110	900	1157
C	55	0	49	48	42	10	10	0.357	38.3	278.6	102	970	1041	984	1267
C	33	0	31	0	0	0	0	0.361	.	.	120	1133	1221	972	1077
C	59	0	54	52	52	49	49	0.339	36.2	257.8	143	1189	1102	936	1342
C	50	3	32	29	27	11	11	0.265	27.5	219.5	110	1045	1197	957	1209
C	56	0	52	50	50	47	46	0.380	34.2	249.5	145	1051	1029	1132	1301
C	0	0	0	0	0	0	0	.	.	.	137	1174	1201	925	1157
C	72	0	64	0	0	0	0	0.347	.	.	114	1210	1279	1076	1371
C	57	0	52	51	50	39	39	0.382	35.9	250.8	117	1000	1030	1003	1209
C	24	1	22	19	19	17	17	0.400	37.8	254.4	91	1219	1214	1060	1110
D	0	0	0	0	0	0	0	.	.	.	100	1138	1093	979	1119
D	45	0	41	33	33	32	32	0.342	36.5	250.2	123	1381	1269	973	1235
D	46	0	42	41	41	40	39	0.371	38.2	261.8	131	1326	1206	1050	1359
D	37	0	32	24	24	22	22	0.373	36.3	268.5	84	1084	1173	1078	754
D	74	2	69	69	67	34	34	0.350	34.9	261.9	146	1452	1407	1013	1212
D	69	0	65	61	60	55	55	0.343	32.0	239.7	115	1241	1367	942	1116
D	50	1	44	44	43	27	27	0.342	34.7	261.0	104	1265	1191	944	1309
D	57	0	52	49	48	41	41	0.359	33.7	263.7	112	1164	1089	904	1221

D	51	0	46	46	45	34	34	0.352	39.3	266.5	111	1142	1106	926	1231
D	67	1	61	58	57	32	32	0.364	38.0	259.4	135	901	948	1064	1203
D	0	0	0	0	0	0	0	.	.	.	84	1097	1115	987	1211
D	51	0	46	46	45	31	31	0.338	35.7	270.6	101	1185	1180	972	1232
D	50	0	47	47	47	12	12	0.381	39.7	281.1	139	1168	1165	1035	890
D	62	0	57	9	9	9	9	0.368	40.3	252.3	100	1072	1122	882	1179
D	49	0	45	45	41	32	32	0.361	37.4	269.0	89	1123	1179	1115	1456

TRT	EL	EC	ES	VE	LE	NH
A	53	1	47	41	38	32
A	48	0	42	41	39	27
A	5	0	0	0	0	0
A	66	1	61	60	59	52
A	51	0	46	0	0	0
A	41	3	30	29	29	28
A	44	0	39	35	35	26
A	36	0	32	31	31	30
A	50	2	43	43	42	33
A	57	0	52	51	51	47
A	61	0	57	54	54	43
A	0	0	0	0	0	0
A	49	0	46	46	44	36
A	29	0	25	1	1	1
A	54	1	48	0	0	0
	644	**8**	**568**	**432**	**423**	**355**
B	36	0	32	32	29	24
B	74	1	68	67	67	59
B	66	3	58	58	58	56
B	49	0	45	40	40	29
B	51	0	45	40	40	26
B	0	0	0	0	0	0
B	34	0	32	30	30	21
B	31	1	28	23	23	16
B	69	0	64	47	46	38
B	44	0	40	0	0	0
B	56	2	50	48	48	40
B	66	0	61	47	47	39
B	55	0	52	49	48	40
B	61	0	56	53	53	48
B	0	0	0	0	0	0
	692	**7**	**631**	**534**	**529**	**436**
C	47	0	43	43	42	37
C	46	0	42	17	17	16
C	48	0	44	0	0	0
C	63	0	57	12	11	10
C	68	0	63	58	58	38
C	45	0	41	38	37	36
C	55	0	49	48	42	10
C	33	0	31	0	0	0
C	59	0	54	52	52	49
C	50	3	32	29	27	11
C	56	0	52	50	50	47
C	0	0	0	0	0	0
C	72	0	64	0	0	0
C	57	0	52	51	50	39
C	24	1	22	19	19	17
	723	**4**	**646**	**417**	**405**	**310**
D	0	0	0	0	0	0
D	45	0	41	33	33	32

D	46	0	42	41	41	40
D	37	0	32	24	24	22
D	74	2	69	69	67	34
D	69	0	65	61	60	55
D	50	1	44	44	43	27
D	57	0	52	49	48	41
D	51	0	46	46	45	34
D	67	1	61	58	57	32
D	0	0	0	0	0	0
D	51	0	46	46	45	31
D	50	0	47	47	47	12
D	62	0	57	9	9	9
D	49	0	45	45	41	32
	708	**4**	**647**	**572**	**560**	**401**

HS	THICK	HATWT	SURVWT	FOOD	PREM	POSTM
32	0.330	37.9	239.0	114	1278	1100
26	0.343	38.8	252.4	109	1147	992
0	.	.	.	119	1292	1356
52	0.349	39.2	265.1	132	1047	1252
0	0.360	.	.	105	988	1198
27	0.325	33.0	251.7	98	1164	1217
26	0.355	39.3	253.0	101	1066	1057
29	0.332	29.8	270.7	102	1173	1271
33	0.348	35.6	268.5	168	1206	1275
47	0.341	32.9	255.3	128	1159	1175
43	0.355	34.0	249.6	122	1164	1258
0		.	.	184	1098	1131
36	0.368	39.6	268.4	98	1113	1163
1	0.286	36.5	242.4	107	1060	1210
0	0.336	.	.	117	1097	1214
352	**0.341**	**36.1**	**256.0**	**120**	**1137**	**1191**
23	0.363	39.0	275.7	84	1232	1067
59	0.327	37.9	253.9	108	1194	1287
56	0.322	39.1	262.7	109	1040	1122
28	0.333	34.1	228.7	103	1031	1188
26	0.380	37.7	243.4	126	1017	1171
0	.	.	.	65	1094	.
21	0.343	40.6	268.5	147	1108	1127
16	0.364	37.3	242.6	114	1373	1337
38	0.366	37.8	264.6	142	1115	1127
0	0.376	.	.	137	1266	1194
40	0.351	33.1	257.8	83	1074	1031
39	0.385	36.7	259.0	102	1035	1079
40	0.391	39.2	266.0	168	1001	1093
47	0.351	34.9	251.3	123	1194	1241
0	.	.	.	53	1135	.
433	**0.358**	**37.3**	**256.2**	**111**	**1127**	**1159**
37	0.348	37.3	241.8	104	1175	1179
16	0.373	35.0	260.8	92	1234	1221
0	0.365	.	.	110	1252	1275
10	0.373	39.6	269.9	127	1048	1085
38	0.368	41.3	262.4	96	934	937
36	0.352	33.2	242.3	97	994	1110
10	0.357	38.3	278.6	102	970	1041
0	0.361	.	.	120	1133	1221
49	0.339	36.2	257.8	143	1189	1102
11	0.265	27.5	219.5	110	1045	1197
46	0.380	34.2	249.5	145	1051	1029
0	.	.	.	137	1174	1201
0	0.347	.	.	114	1210	1279
39	0.382	35.9	250.8	117	1000	1030
17	0.400	37.8	254.4	91	1219	1214
309	**0.358**	**36.0**	**253.4**	**114**	**1109**	**1141**
0	.	.	.	100	1138	1093
32	0.342	36.5	250.2	123	1381	1269

39	0.371	38.2	261.8	131	1326	1206
22	0.373	36.3	268.5	84	1084	1173
34	0.350	34.9	261.9	146	1452	1407
55	0.343	32.0	239.7	115	1241	1367
27	0.342	34.7	261.0	104	1265	1191
41	0.359	33.7	263.7	112	1164	1089
34	0.352	39.3	266.5	111	1142	1106
32	0.364	38.0	259.4	135	901	948
0	.	.	.	84	1097	1115
31	0.338	35.7	270.6	101	1185	1180
12	0.381	39.7	281.1	139	1168	1165
9	0.368	40.3	252.3	100	1072	1122
32	0.361	37.4	269.0	89	1123	1179
	0.357	**36.7**	**262.0**	**112**	**1183**	**1174**

PREF	POSTF
982	1222
1036	1367
988	1216
920	1078
932	1289
978	1203
1125	1276
959	1284
1076	1269
888	1079
945	1130
904	1052
1029	1110
1078	1271
1038	1398
992	**1216**
983	1331
890	1200
920	1268
1059	1087
918	1115
1093	.
1130	1228
1000	1255
1046	1231
1029	1374
995	1192
972	1426
933	1249
970	1242
950	.
993	**1246**
986	1285
1030	1165
1050	1366
860	1242
972	1347
900	1157
984	1267
972	1077
936	1342
957	1209
1132	1301
925	1157
1076	1371
1003	1209
1060	1110
990	**1240**
979	1119
973	1235

1050	1359
1078	754
1013	1212
942	1116
944	1309
904	1221
926	1231
1064	1203
987	1211
972	1232
1035	890
882	1179
1115	1456
991	**1182**