MRID NO. 442032-01

DATA EVALUATION RECORD
FISH LIFE-CYCLE TOXICITY TEST
GUIDELINE 72-5

1. **CHEMICAL:** Fonofos   PC Code No.: 041701

2. **TEST MATERIAL:** Fonofos   **Purity:** 95.2% w/w
^{14}C Fonofos   **Radiopurity:** ≥97.6%

3. **CITATION:**

Authors: S.J. Kent and N. Shillabeer
Title: FONOFOS: Determination of Chronic Toxicity to Fathead Minnow (*Pimephales promelas*) Full Lifecycle
Study Completion Date: September 14, 1996
Laboratory: Brixham Environmental Laboratory, ZENECA Limited, Brixham, Devon, UK
Laboratory Report ID: BL5728/B
Sponsor: ZENECA Inc., Wilmington, DE
MRID No.: 442032-01
DP Barcode: D233223

4. **REVIEWED BY:** Rosemary Graham Mora, M.S., Environmental Scientist, KBN Engineering and Applied Sciences, Inc.

fn RGM

Signature: _[signature]_   **Date:** 5/8/97

APPROVED BY: Pim Kosalwat, Ph.D., Senior Scientist, KBN Engineering and Applied Sciences, Inc.

Signature: P. Kosalwat   **Date:** 5/8/97

5. **APPROVED BY:**

Signature: _[signature]_   **Date:** 10/27/97

6. **Study Parameters:**
Test Species: *Pimephales promelas*
Age of Test Organism: <24 hours old embryos
Test Duration: 300 days
Study Method: Flow-Through
Type of Concentrations: Mean measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for a fish full life-cycle toxicity test using fathead minnows.

Results Synopsis:
NOEC: 2.5 µg/L
LOEC: 4.9 µg/L

2043373

MATC: 3.5 μg/L

LOEC's for specific effects:
Length of F_0 fish at 28 and 56 days posthatch and survival of
F_1 fish (ELS I) at 56 days posthatch
= 4.9 μg/L.

Length of male F_0 fish at test termination
= 9.6 μg/L.

Length of all F_0 fish at test termination; male weight of F_0
fish at test termination; length of F_1 fish at 56 days
posthatch (ELS I and II)
= 19 μg/L.

The remaining biological parameters = $\geq$19 μg/L.

8. **ADEQUACY OF THE STUDY:**

   A. **Classification:** Core

   B. **Rationale:** Fulfills requirement.

   C. **Repairability:** N/A

9. **GUIDELINE DEVIATIONS:**

   1. The dissolved oxygen concentrations fell below the
      recommended level (75% of saturation). However, the mean
      DO concentration was $\geq$83% of saturation and DO
      concentrations were at or above 48% of saturation
      throughout the study period. These DO levels probably
      did not affect the outcome of the study.

   2. Hardness, alkalinity, and conductivity were measured at
      least twice weekly in the dilution water only. The
      guidelines recommend these parameters be measured in a
      control and one treatment weekly.

   3. Dechlorinated tap water was used to prepare the dilution
      water. However, free residual chlorine was measured 228
      times during the study and were less than 4 μg/L.

10. **SUBMISSION PURPOSE:**

11. **MATERIALS AND METHODS:**

A. **Biological System:**

Guideline Criteria	Reported Information
Species: Prefer sheepshead minnow (*Cyprinodon variegatus*) or fathead minnow (*Pimephales promelas*).	*Pimephales promelas*
Source and acclimation	Embryos were obtained from the brood stock held in dilution water for at least 3 weeks prior to test initiation. The brood stock fish were obtained from Osage Catfisheries, Osage Beach, Missouri and Aquatic Research Organisms, Hampton, New Hampshire.
Age at beginning of test: Embryos 2 to 24 hours old	<24-hour old, naturally fertilized eggs.
Feeding: Fish should be fed at least twice daily and should not be fed for at least 24 hours prior to test termination.	After hatching until 5 days post hatch, larvae were fed live freshwater rotifers at least twice daily. From day 5 to day 56, fish were fed live brine shrimp one to three times daily. Frozen brine shrimp were provided *ad libitum* from day 57 to test termination. Fish were also fed Promin *ad libitum* from day 16 on. Fish were not fed for 24 hours prior to test termination.

Guideline Criteria	Reported Information
Embryo Exposure (Four-Five Days): Embryos (≤24 hours old) from at least 3 separate spawns should be randomly distributed to embryo cups. A minimum of 50 embryos (≤24 hrs old) per replicate cup, 4 cups per treatment should be used. Parameters measured: · Survival of embryos · Time required to hatch · Hatching success · Survival of fry for 4 weeks Dead and fungused embryos should be counted and removed daily.	Embryos (<24 hours old) were collected from 11 brood tanks each containing approximately two males and six females. 25 embryos per cup; 2 cups per larval tank; 2 larval tanks per replicate test chamber; 2 replicate chambers per treatment and control. All parameters listed at left were measured. Dead embryos were recorded and removed daily until hatching was complete.
Larval-Juvenile Exposure (From Hatch to 8 Weeks): After hatching, each group of larvae is randomly reduced to a minimum of 25 fish and released in replicate larval growth chambers. The random selection must include any fish that are lethargic or deformed. Parameters measured: · Fish survival (determined by counting the number of live fish in each replicate growth chamber weekly). · Total lengths (mm) of all fish at 4 and 8 weeks after hatching.	After hatching, larvae in the two incubation cups were impartially reduced to 25 and released into each larval tank (i.e., 25 per larval tank, 2 larval tanks per replicate chamber). On Day 60, fish in the two larval tanks were impartially reduced to 25 and transferred to the respective adult/spawning tank (i.e., 25 per replicate adult tank, 2 adult tanks per treatment level). Both parameters at left were measured.

Guideline Criteria	Reported Information
Juvenile-Adult Exposure (From 8 wks posthatch to the end of the spawning phase [32-40 wks]): At 20-24 weeks after hatching, mature fish are placed in a spawning tank of the same concentration (4 males and 4 females randomly chosen and assigned). The spawning tank is divided into 4 individual spawning chambers with appropriate spawning substrates.	When adults reached sexual maturity, each replicate adult/spawning tank was divided into four compartments, with substrate for spawning. One male and one female were distributed to each spawning compartment. The remaining fish were held in an extra adult tank designated for each replicate.
The substrates are examined daily and embryos removed, counted, and recorded separately for each pair.	Substrates were examined, and embryos were removed and counted daily.
For fathead minnow, adult exposure should be terminated when no spawning occurs for one week.	Adult exposure was terminated on exposure day 300. Egg production continued to the day of test termination.
For sheepshead minnow, testing should be terminated after spawning is observed for 2 weeks.	

Guideline Criteria	Reported Information
Second Generation Embryo Exposure (4-5 days): 50 embryos from each conc. level are randomly selected and transferred to incubation cups for hatch. Use the same test procedures as those for parental generation. Embryos not selected are discarded.	Two early life stage studies of F1 generation were conducted and performed consecutively (ELS I and ELS II). For each study, approximately 50 embryos pooled from different spawning groups within each treatment were placed in incubation cups (25 embryos per cup; 2 cups per replicate; 2 replicates per treatment). Embryos not selected were discarded or used for residue analysis.
Second Generation Larval-Juvenile Exposure (From Hatch to 4-8 wks): After hatching, 25 larvae are released in each growth chambers (2 chambers per treatment). Each group of 2nd generation fish is terminated 8 wks after hatching. Fish are blotted, weighed, and measured before being discarded.	25 larvae per chamber, 2 replicate chambers per treatment. Each of the two early life stage studies was terminated after 8 weeks of exposure. Fish were measured for standard length and weight.

Comments: Egg production continued until test termination. The guidelines recommend the test continue until no egg production occurs for one day.

B. Physical System:

Guideline Criteria	Reported Information
Test Water: Sheepshead Minnow 1. Natural seawater (sterilized and filtered) or a commercial mixture. 2. Natural seawater with a salinity of $\geq$15 parts per thousand (weekly range of salinity <6% and monthly pH range <0.8 pH units). Fathead Minnow 1. Reconstituted water or water from unpolluted well or spring (sterilized and tested for pollutants). 2. Hardness of 40 to 48 mg/L as $CaCO_3$ and pH of 7.2 to 7.6.	N/A 1. Reconstituted dechlorinated tap water (residual chlorine measured 228 times during the test was below the limit of detection of 4 μg/L). 2. The hardness ranged from 22 to 73 mg/L as $CaCO_3$. The pH ranged from 6.99-8.08.
Test Temperature: Fathead: 25°C and should not remain outside the range of 24 to 26°C for more than 48 hours. Sheepshead: 30°C.	Range: 23.8-25.9°C Mean: 25.1°C
Photoperiod: 16-hour light/8-hour dark. Light intensity of 10-100 lumens at water surface.	Range of 10.5-15.75 hours of light per day. 420-690 lux (39-64 lumens) at the water surface.

Guideline Criteria	Reported Information
Dosing Apparatus: 1. Intermittent flow proportional diluters or continuous flow serial diluters. 2. A minimum of 5 toxicant concentrations with a dilution factor $\leq$0.5. 3. One control should be used.	1. Continuous flow diluter. 2. Five with a dilution factor of 0.5. 3. A dilution water control and a solvent control.
Toxicant Mixing: 1. Mixing chamber recommended but not required. 2. Test solution completely mixed before introduction into the test system (aeration should not be used for mixing). 3. Flow splitting accuracy must be within 10% and periodically checked.	1. Mixing chambers were used, one for each test level. 2. Test solutions were mixed by magnetic stirrers. Test concentrations were confirmed by chemical analysis. 3. Flow splitting accuracy checked three times weekly.
Exposure System/Test Vessels: Exposure tanks should be all glass or glass with a plastic or stainless steel frame (30.5 x 30.5 x 91.4 cm or 30.5 x 30.5 x 61 cm for fathead, and 45 x 90 x 26 cm for sheephead). Larval chambers should have glass bottoms and drains that allow water to be drawn down to 3 cm. Test water depth in adult tanks and larval chambers should be a minimum of 15 cm.	Adult tanks were 54-L glass aquaria (61 X 30.5 X 31 cm) filled with 45 L (depth of 26 cm). Four spawning chambers in each of two adult tanks were created by inserting perforated vertical screens. Larval tanks were 12-L glass aquaria (30.5 X 20.5 X 21 cm) filled with 9.5 L of test solution (depth of 16.5 cm).

Guideline Criteria	Reported Information
Embryo and Fry Chambers: 120 ml glass jars with bottoms replaced with 40 mesh stainless steel or nylon screen. Chambers can be oscillated vertically using rocker arm apparatus (2 rpm motor) or placed in separate chambers with self-starting siphons.	Incubation cups were glass tubing (5 cm diameter) with 0.47 mm^2 nylon mesh screen bottoms, gently oscillated.
Flow Rate: Flow rates to larval cups should provide 90% replacement in 8-12 hours, and maintain DO at above 75% of saturation. The toxicant level cannot drop below 20% with fish in the tank.	Flow rate provided approximately 7 (adult tanks) to 7.5 (progeny tanks) volume additions per 24 hours. Mean DO levels ranging from 7.0-7.4 mg/L (83-88% saturation). Individual measurements ranged from 4.0-8.4 mg/L (48-100% saturation)
Aeration: Dilution water should be aerated to insure DO concentration at or near 100% saturation. Test tanks and embryo chambers should not be aerated.	Test vessels were not aerated.

C. **Chemical System:**

Guideline Criteria	Reported Information
Concentrations: Minimum of 5 concentrations and a control, all replicated; plus solvent control if appropriate. Toxicant conc. must be measured in one tank at each toxicant level every week.	A dilution water control; a solvent control; and 2.5, 5.0, 10, 20, and 40 μg/L of fonofos. Samples collected from all replicates were analyzed daily from Day -21 to Day 2 and once weekly for the remainder of the study.

Guideline Criteria	Reported Information
Other Variables: 1. DO must be measured at each conc. at least once a week. 2. Test water temp. must be recorded continuously. 2. <u>Freshwater</u>: A control and one conc. must be analyzed weekly for pH, alkalinity, hardness, and conductance. 3. <u>Natural seawater</u>: must maintain a constant salinity and not fluctuate more than 6% weekly; monthly pH range <0.8 pH units.	1. DO was measured twice weekly in each test vessel throughout the test period. 2. Temperature was measured twice weekly in each test vessel throughout the test period and continuously in one dilution water control replicate and one solvent control replicate. 3. pH was measured twice weekly in each test vessel throughout the test period. The dilution water was analyzed daily for conductivity and total hardness and twice weekly for alkalinity.
Solvents: Should not exceed 0.1 ml/L in a flow-through system. Acceptable solvents are: dimethylformamide, triethylene glycol, methanol, acetone, ethanol.	Solvent conc.: 71 µl/L Solvent: triethylene glycol

12. REPORTED RESULTS:

Guideline Criteria	Reported Information
Data Endpoints must include: · survival of F_0 and F_1 embryos, time required to hatch, and hatching success; · survival and total length of F_0 fish at 4 and 8 weeks after hatching; · weights and lengths of F_1 fish at 8 weeks; · incidence of pathological or histological effects; and · observations of other effects or clinical signs.	All biological parameters listed at left and the following additional parameters: · Embryo production · Residue analysis of F_0 adult tissue and F_1 bulk embryo samples

F_0 Results:

Nominal Conc. (μg/L)	Mean Meas. Conc. (μg/L)	% Hatch	Day 28 % Survival	Day 56 % Survival	Day 296 % Survival	# Eggs/♀/ Reprod. Day (Rep A/ Rep B)[a]
Control	<0.50	92	88	88	100	4.10/9.45
Solvent Control	<0.50	86	92	88	78	7.62/11.92
2.5	2.5	90	88	88	88	3.41/10.80
5.0	4.9	88	92	88	88	8.21/8.53
10	9.6	88	92	92	78	3.33/7.77
20	19	88	96	92	100	4.76/3.62
40	37	88	84	80	78	0/0.08

Hatch

Mean Meas. Conc. (μg/L)	Day 28 Length (mm)	Day 56 Length (mm)	Length at Test Termination (mm) all fish	Female Wt. (mg) at Termination	Male Wt. (mg) at Termination
Control	19±2	31±3	60±12	2280±560	8340±876
Solvent Control	19±2	31±3	60±11	2840±1060	7570±1640
2.5	19±2	30±3	64±9	3470±1610	8300±1570
4.9	19±2	29±4	60±9	2720±171	7910±945
9.6	18±2	29±4	57±10	1900±274	7200±927
19	16±2	25±5	51±6	2470±1340	5160±1720
37	14±2	24±5	45±7	1290±346	3610±833

F_1 Results:

Mean Meas. Conc. (μg/L)	% Hatch	Day 56 % Survival (ELS I/II)	Day 56 Length (mm) (ELS I/II)	Day 56 Wt. (mg) (ELS I/II)
Control	93	92/96	27.9±1.9 26.4±1.3	321.2±64.4 275.4±49.4
Solvent Control	95	92/88	27.8±1.1 26.9±3.4	310.4±37.4 313.3±93.5
2.5	89	98/96	28.9±1.8 26.8±1.8	352.5±65.8 275.7±59.5
4.9	88	96/96	28.1±1.7 26.9±1.5	350.3±72.4 275.9±38.9
9.6	98	85/88	26.9±4.0 25.8±2.2	325.4±110.7 274.4±69.3
19	70	86/80	25.1±3.7 24.9±2.8	333.9±121.4 301.0±81.1

Notes for all tables:
1) All days reported are as number of days posthatch.
2) Growth reported are mean values ± standard deviations.
[a] Estimated by reviewer.
[b] Treatment-related difference from pooled controls

Reported Statistical Results for Biological Endpoints:

Growth and Survival of F_0 and F_1 Generations on Days 28, 56, 140 and at termination of spawning				
Generation	Days (post hatch)	NOEC/LOEC for Survival (μg/L)	NOEC/LOEC for Length (μg/L)	NOEC/LOEC for Weight (μg/L)
F_0	28	$\geq$37/>37	2.5/4.9	N/A
	56	$\geq$37/>37	2.5/4.9	N/A
	296 (All Fish)	$\geq$37/>37	9.6/19	19/37
	296 (Female)	N/A	19/37	19/37
	296 (Male)	N/A	4.9/9.6	9.6/19
F_1	56 (ELS I)	2.5/4.9	9.6/19	$\geq$19/>19
	56 (ELS II)	$\geq$19/>19	9.6/19	$\geq$19/>19

Reproduction	NOEC/LOEC (μg/L)
Egg hatchability F_0	$\geq$37/>37
Egg production	19/37
Egg hatchability F_1	9.6/19

Morphological and Behavioral Observations

F_0 Generation: The only clinical observation noted was on day 107 posthatch, several fish in the two highest test concentrations (9.6 and 37 μg/L) showed spinal deformities.

Other Observations:

F_0 Generation: Residue analysis was performed on a male and a female from both replicates of each treatment and control. In general, mean residue levels increased with increasing test concentrations in both male and female fish. Residue levels in control fish were below the limit of detection.

F_1 **Generation:** Residue analysis was performed on batch samples of eggs from each treatment (except the highest test concentration [37 μg/L] for which no eggs were available) and control. In general, mean residue levels in the eggs increased with increasing test concentrations. Residue levels in control fish were below the limit of detection.

Raw data included?: Yes.

Statistical Results:

Statistical Method:

Discrete-variable data: Contingency tables.
Continuous-variable data: Analysis of variance F-test and a means comparison test (Bonferroni's t-test), or non-parametric methods (Wilcoxon's Rank Sum test).

NOEC: 2.5 μg/L
LOEC: 4.9 μg/L
MATC: 3.5 μg/L

Most sensitive endpoints: F_0 length at 28 and 56 days posthatch, and F_1 survival at 56 days posthatch (ELS I).

Comments: None.

13. **REVIEWER'S STATISTICAL ANALYSIS:**

Statistical Method: Analysis of variance and means comparison tests (i.e., Dunnett's and Bonferroni's tests) or non-parametric methods (i.e., Kruskal Wallis). Results are similar to the authors'.

NOEC: 2.5 μg/L
LOEC: 4.9 μg/L
MATC: 3.5 μg/L

Most sensitive endpoints: Length of F_0 generation fish at 28 and 56 days posthatch.

14. **REVIEWER'S DISCUSSION:** This study is scientifically sound and fulfills the guideline requirements for a fish full life-cycle toxicity test using fathead minnows. The MATC for fathead minnow exposed to fonofos was between 2.5 and 4.9 μg/L. The geometric-mean MATC was 3.5 μg/L.

fonofos:Egg Hatchablity of Po Generation
File: 442032p0.hat   Transform: NO TRANSFORM

          t-test of Solvent and Blank Controls   Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN =   0.8700   CALCULATED t VALUE =   -2.0426
GRP2 (BLANK CRTL) MEAN   =   0.9250   DEGREES OF FREEDOM =   6
DIFFERENCE IN MEANS   =   -0.0550

TABLE t VALUE (0.05 (2), 6) = 2.447   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) = 3.707   NO significant difference at alpha=0.01

Chi-square test for normality: actual and expected frequencies
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INTERVAL   <-1.5   -1.5 to <-0.5   -0.5 to 0.5   >0.5 to 1.5   >1.5
             ___   _____   _____   _____   ___

EXPECTED   1.876   6.776   10.696   6.776   1.876
OBSERVED   1   6   11   10   0

Calculated Chi-Square goodness of fit test statistic = 3.9165
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Hartley's test for homogeneity of variance

Calculated H statistic (max Var/min Var) =   5.57
Closest, conservative, Table H statistic =   69.0 (alpha = 0.01)

Used for Table H ==>   R (# groups) =   6,   df (# reps-1) =   4
Actual values   ==>   R (# groups) =   6,   df (# avg reps-1) = 3.67
                                               (average df used)

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal
      but do not differ greatly, Hartley's test may still be used
      as an approximate test (average df are used).

Bartlett's test for homogeneity of variance
Calculated B1 statistic =   3.18

Bartlett's test using average degrees of freedom
Calculated B2 statistic =   3.40
   Based on average replicate size of   3.67

Table Chi-square value =   15.09 (alpha = 0.01, df =   5)
Table Chi-square value =   11.07 (alpha = 0.05, df =   5)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.
Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

TITLE: fonofos:Egg Hatchablity of Po Generation
FILE: 442032p0.hat
TRANSFORM: NO TRANSFORMATION   NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	GRPS 1&2 POOLED	1	0.8200	0.8200
1	GRPS 1&2 POOLED	2	0.8600	0.8600
1	GRPS 1&2 POOLED	3	0.9200	0.9200
1	GRPS 1&2 POOLED	4	0.8800	0.8800
1	GRPS 1&2 POOLED	5	0.8800	0.8800
1	GRPS 1&2 POOLED	6	0.9400	0.9400
1	GRPS 1&2 POOLED	7	0.9600	0.9600
1	GRPS 1&2 POOLED	8	0.9200	0.9200
2	2.5 ug/l	1	0.9000	0.9000
2	2.5 ug/l	2	0.9600	0.9600
2	2.5 ug/l	3	0.8400	0.8400
2	2.5 ug/l	4	0.9400	0.9400
3	5.0 ug/l	1	0.8600	0.8600
3	5.0 ug/l	2	0.9600	0.9600
3	5.0 ug/l	3	0.8800	0.8800
3	5.0 ug/l	4	0.8200	0.8200
4	10 ug/l	1	0.8800	0.8800
4	10 ug/l	2	0.7600	0.7600
4	10 ug/l	3	0.9400	0.9400
4	10 ug/l	4	0.9200	0.9200
5	20 ug/l	1	0.9400	0.9400
5	20 ug/l	2	0.7600	0.7600
5	20 ug/l	3	0.8800	0.8800
5	20 ug/l	4	0.9200	0.9200
6	40 ug/l	1	0.8800	0.8800
6	40 ug/l	2	0.8600	0.8600
6	40 ug/l	3	0.9200	0.9200
6	40 ug/l	4	0.8400	0.8400

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fonofos:Egg Hatchablity of Po Generation
File: 442032p0.hat   Transform: NO TRANSFORMATION

          SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	GRPS 1&2 POOLED	8	0.820	0.960	0.898
2	2.5 ug/l	4	0.840	0.960	0.910
3	5.0 ug/l	4	0.820	0.960	0.880
4	10 ug/l	4	0.760	0.940	0.875
5	20 ug/l	4	0.760	0.940	0.875
6	40 ug/l	4	0.840	0.920	0.875

          SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	GRPS 1&2 POOLED	0.002	0.046	0.016	5.11
2	2.5 ug/l	0.003	0.053	0.026	5.81
3	5.0 ug/l	0.003	0.059	0.029	6.69
4	10 ug/l	0.006	0.081	0.040	9.21
5	20 ug/l	0.006	0.081	0.040	9.21
6	40 ug/l	0.001	0.034	0.017	3.90

```
fonofos:Egg Hatchablity of Po Generation
File: 442032p0.hat       Transform: NO TRANSFORMATION

                          ANOVA TABLE
     --------------------------------------------------------------------

SOURCE          DF            SS            MS            F
     --------------------------------------------------------------------
Between         5            0.005         0.001         0.285

Within (Error)  22           0.076         0.003
     --------------------------------------------------------------------
Total           27           0.081
     --------------------------------------------------------------------

   Critical F value =   2.66  (0.05,5,22)
   Since  F < Critical F  FAIL TO REJECT  Ho: All equal

             TUKEY method of multiple comparisons
     --------------------------------------------------------------------
                                           GROUP
                      TRANSFORMED  ORIGINAL 0 0 0 0 0
GROUP  IDENTIFICATION    MEAN       MEAN    6 5 4 3 1 2
-----  --------------- -----------  ------- - - - - - -
  6          40 ug/l      0.875      0.875  \
  5          20 ug/l      0.875      0.875  . \
  4          10 ug/l      0.875      0.875  . . \
  3         5.0 ug/l      0.880      0.880  . . . \
  1    GRPS 1&2 POOLED    0.898      0.898  . . . . \
  2         2.5 ug/l      0.910      0.910  . . . . . \
     --------------------------------------------------------------------
* = significant difference (p=0.05)       . = no significant difference
Tukey value (6,22) =   4.45               s =    0.003


        WILLIAMS TEST  (Isotonic regression model)    TABLE 1 OF 2
     --------------------------------------------------------------------
GROUP                          ORIGINAL   TRANSFORMED   ISOTONIZED
        IDENTIFICATION      N    MEAN        MEAN         MEAN
------  -----------------  ---  --------  -----------   ----------
  1     GRPS 1&2 POOLED    8    0.898       0.898         0.902
  2            2.5 ug/l    4    0.910       0.910         0.902
  3            5.0 ug/l    4    0.880       0.880         0.880
  4             10 ug/l    4    0.875       0.875         0.875
  5             20 ug/l    4    0.875       0.875         0.875
  6             40 ug/l    4    0.875       0.875         0.875
     --------------------------------------------------------------------


        WILLIAMS TEST  (Isotonic regression model)    TABLE 2 OF 2
     --------------------------------------------------------------------
                    ISOTONIZED  CALC.    SIG     TABLE    DEGREES OF
     IDENTIFICATION    MEAN     WILLIAMS P=.05   WILLIAMS  FREEDOM
     --------------  ---------- -------- -----   --------  --------
     GRPS 1&2 POOLED   0.902
            2.5 ug/l   0.902    0.116            1.72      k= 1, v=22
            5.0 ug/l   0.880    0.486            1.80      k= 2, v=22
             10 ug/l   0.875    0.625            1.83      k= 3, v=22
             20 ug/l   0.875    0.625            1.84      k= 4, v=22
             40 ug/l   0.875    0.625            1.85      k= 5, v=22
     --------------------------------------------------------------------
s =    0.059
Note: df used for table values are approximate when v > 20.
```

fonofos:Survival to 28 Days of Po Generation
File: 442032p0.28s   Transform: NO TRANSFORM

          t-test of Solvent and Blank Controls   Ho:GRP1 MEAN = GRP2 MEAN

  GRP1 (SOLVENT CRTL) MEAN =   0.9100   CALCULATED t VALUE =   0.5023
  GRP2 (BLANK CRTL) MEAN   =   0.8800   DEGREES OF FREEDOM =   6
  DIFFERENCE IN MEANS   =   0.0300

TABLE t VALUE (0.05 (2), 6) = 2.447   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) = 3.707   NO significant difference at alpha=0.01

Chi-square test for normality: actual and expected frequencies
----

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	1.876	6.776	10.696	6.776	1.876
OBSERVED	1	7	11	9	0

Calculated Chi-Square goodness of fit test statistic =   3.0310
Table Chi-Square value (alpha = 0.01) = 13.277 .

Data PASS normality test. Continue analysis.

     Levene's test for homogeneity of variance

                              ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.032	0.006	1.116
Within (Error)	22	0.125	0.006	
Total	27	0.157		

  Critical F value =   2.66 (0.05,5,22)
  Since F < Critical F FAIL TO REJECT Ho: All equal

TITLE: fonofos:Survival to 28 Days of Po Generation
FILE: 442032p0.28s
TRANSFORM: NO TRANSFORMATION   NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	GRPS 1&2 POOLED	1	0.9200	0.9200
1	GRPS 1&2 POOLED	2	0.9200	0.9200
1	GRPS 1&2 POOLED	3	0.9600	0.9600
1	GRPS 1&2 POOLED	4	0.8400	0.8400
1	GRPS 1&2 POOLED	5	0.9600	0.9600
1	GRPS 1&2 POOLED	6	0.9200	0.9200
1	GRPS 1&2 POOLED	7	0.7200	0.7200
1	GRPS 1&2 POOLED	8	0.9200	0.9200
2	2.5 ug/l	1	1.0000	1.0000
2	2.5 ug/l	2	0.6400	0.6400
2	2.5 ug/l	3	0.9600	0.9600
2	2.5 ug/l	4	1.0000	1.0000
3	5.0 ug/l	1	0.8800	0.8800
3	5.0 ug/l	2	0.9200	0.9200
3	5.0 ug/l	3	0.9200	0.9200
3	5.0 ug/l	4	0.9200	0.9200
4	10 ug/l	1	0.9200	0.9200
4	10 ug/l	2	0.9200	0.9200

4

```
4        10 ug/l    3        1.0000          1.0000
4        10 ug/l    4        0.8800          0.8800
5        20 ug/l    1        1.0000          1.0000
5        20 ug/l    2        0.9600          0.9600
5        20 ug/l    3        0.9600          0.9600
5        20 ug/l    4        1.0000          1.0000
6        40 ug/l    1        0.9200          0.9200
6        40 ug/l    2        0.8000          0.8000
6        40 ug/l    3        0.9600          0.9600
6        40 ug/l    4        0.6800          0.6800
----------------------------------------------------------------
```

TITLE: fonofos:Survival to 28 Days of Po Generation
FILE: 442032p0.28s

SUMMARY STATISTICS ON TRANSFORMED DATA   TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	GRPS 1&2 POOLED	8	0.720	0.960	0.895
2	2.5 ug/l	4	0.640	1.000	0.900
3	5.0 ug/l	4	0.880	0.920	0.910
4	10 ug/l	4	0.880	1.000	0.930
5	20 ug/l	4	0.960	1.000	0.980
6	40 ug/l	4	0.680	0.960	0.840

SUMMARY STATISTICS ON TRANSFORMED DATA   TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	GRPS 1&2 POOLED	0.006	0.080	0.028	8.92
2	2.5 ug/l	0.030	0.174	0.087	19.37
3	5.0 ug/l	0.000	0.020	0.010	2.20
4	10 ug/l	0.003	0.050	0.025	5.41
5	20 ug/l	0.001	0.023	0.012	2.36
6	40 ug/l	0.016	0.126	0.063	15.06

fonofos:Survival to 28 Days of Po Generation
File: 442032p0.28s   Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.043	0.009	0.969
Within (Error)	22	0.194	0.009	
Total	27	0.237		

Critical F value =   2.66 (0.05,5,22)
Since F < Critical F FAIL TO REJECT Ho: All equal

fonofos:Survival to 28 Days of Po Generation
File: 442032p0.28s   Transform: NO TRANSFORMATION

TUKEY method of multiple comparisons
```
-------------------------------------------------------------------------
                                          GROUP
                      TRANSFORMED  ORIGINAL  0 0 0 0 0 0
GROUP  IDENTIFICATION    MEAN        MEAN    6 1 2 3 4 5
-----  --------------  -----------  --------  - - - - - -
  6            40 ug/l     0.840     0.840   \
  1    GRPS 1&2 POOLED     0.895     0.895   . \
  2           2.5 ug/l     0.900     0.900   . . \
  3           5.0 ug/l     0.910     0.910   . . . \
  4            10 ug/l     0.930     0.930   . . . . \
  5            20 ug/l     0.980     0.980   . . . . . \
-------------------------------------------------------------------------
```
* = significant difference (p=0.05)   . = no significant difference
Tukey value (6,22) =   4.45   s =   0.009

fonofos:Survival to 28 Days of Po Generation
File: 442032p0.28s   Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)   TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	GRPS 1&2 POOLED	8	0.895	0.895	0.918
2	2.5 ug/l	4	0.900	0.900	0.918
3	5.0 ug/l	4	0.910	0.910	0.918
4	10 ug/l	4	0.930	0.930	0.918
5	20 ug/l	4	0.980	0.980	0.918
6	40 ug/l	4	0.840	0.840	0.840

WILLIAMS TEST (Isotonic regression model)   TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
GRPS 1&2 POOLED	0.918				
2.5 ug/l	0.918	0.405		1.72	k= 1, v=22
5.0 ug/l	0.918	0.405		1.80	k= 2, v=22
10 ug/l	0.918	0.405		1.83	k= 3, v=22
20 ug/l	0.918	0.405		1.84	k= 4, v=22
40 ug/l	0.840	0.956		1.85	k= 5, v=22

s =   0.094
Note: df used for table values are approximate when v > 20.

fonofos:Survival to 56 Days of Po Generation
File: 442032p0.56s   Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls   Ho:GRP1 MEAN = GRP2 MEAN

  GRP1 (SOLVENT CRTL) MEAN =   0.8900   CALCULATED t VALUE =   0.3189
  GRP2 (BLANK CRTL) MEAN   =   0.8700   DEGREES OF FREEDOM =   6
  DIFFERENCE IN MEANS   =   0.0200

TABLE t VALUE (0.05 (2), 6) = 2.447   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 6) = 3.707   NO significant difference at alpha=0.01

Chi-square test for normality: actual and expected frequencies
----

INTERVAL   <-1.5   -1.5 to <-0.5   -0.5 to 0.5   >0.5 to 1.5   >1.5
             _____   _____   _____   _____   _____

EXPECTED   1.876   6.776   10.696   6.776   1.876
OBSERVED   1   8   11   8   0

Calculated Chi-Square goodness of fit test statistic =   2.7359
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

fonofos:Survival to 56 Days of Po Generation
File: 442032p0.56s   Transform: NO TRANSFORMATION

    Levene's test for homogeneity of variance

                            ANOVA TABLE

SOURCE   DF   SS   MS   F

Between   5   0.021   0.004   0.843

Within (Error) 22   0.108   0.005

Total   27   0.129

   Critical F value =   2.66 (0.05,5,22)
   Since F < Critical F FAIL TO REJECT Ho: All equal

TITLE: fonofos:Survival to 56 Days of Po Generation
FILE: 442032p0.56s
TRANSFORM: NO TRANSFORMATION   NUMBER OF GROUPS: 6

GRP IDENTIFICATION   REP   VALUE   TRANS VALUE
--- ---------------   ----   ----------   ------------
 1   GRPS 1&2 POOLED   1   0.8800   0.8800
 1   GRPS 1&2 POOLED   2   0.9200   0.9200
 1   GRPS 1&2 POOLED   3   0.9600   0.9600
 1   GRPS 1&2 POOLED   4   0.8000   0.8000
 1   GRPS 1&2 POOLED   5   0.9600   0.9600
 1   GRPS 1&2 POOLED   6   0.9200   0.9200
 1   GRPS 1&2 POOLED   7   0.7200   0.7200
 1   GRPS 1&2 POOLED   8   0.8800   0.8800
 2   2.5 ug/l   1   1.0000   1.0000
 2   2.5 ug/l   2   0.6400   0.6400
 2   2.5 ug/l   3   0.9600   0.9600
 2   2.5 ug/l   4   0.9600   0.9600
 3   5.0 ug/l   1   0.8800   0.8800
 3   5.0 ug/l   2   0.9200   0.9200

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```
3        5.0 ug/l    3       0.8800          0.8800
3        5.0 ug/l    4       0.9200          0.9200
4        10 ug/l     1       0.8800          0.8800
4        10 ug/l     2       0.9200          0.9200
4        10 ug/l     3       1.0000          1.0000
4        10 ug/l     4       0.8800          0.8800
5        20 ug/l     1       0.9600          0.9600
5        20 ug/l     2       0.8800          0.8800
5        20 ug/l     3       0.9600          0.9600
5        20 ug/l     4       0.9600          0.9600
6        40 ug/l     1       0.8800          0.8800
6        40 ug/l     2       0.7600          0.7600
6        40 ug/l     3       0.9200          0.9200
6        40 ug/l     4       0.6800          0.6800
```

TITLE: fonofos:Survival to 56 Days of Po Generation
FILE: 442032p0.56s

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	GRPS 1&2 POOLED	8	0.720	0.960	0.880
2	2.5 ug/l	4	0.640	1.000	0.890
3	5.0 ug/l	4	0.880	0.920	0.900
4	10 ug/l	4	0.880	1.000	0.920
5	20 ug/l	4	0.880	0.960	0.940
6	40 ug/l	4	0.680	0.920	0.810

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	GRPS 1&2 POOLED	0.007	0.083	0.029	9.41
2	2.5 ug/l	0.028	0.168	0.084	18.85
3	5.0 ug/l	0.001	0.023	0.012	2.57
4	10 ug/l	0.003	0.057	0.028	6.15
5	20 ug/l	0.002	0.040	0.020	4.26
6	40 ug/l	0.012	0.110	0.055	13.60

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.040	0.008	0.961
Within (Error)	22	0.185	0.008	
Total	27	0.225		

Critical F value =   2.66 (0.05,5,22)
Since F < Critical F FAIL TO REJECT Ho: All equal

TITLE: fonofos:Survival to 56 Days of Po Generation
FILE: 442032p0.56s

                    TUKEY method of multiple comparisons

                                              GROUP
                       TRANSFORMED ORIGINAL 0 0 0 0 0 0
GROUP IDENTIFICATION   MEAN   MEAN   6 1 2 3 4 5
----- -------------- ----------- -------- - - - - - -
  6   40 ug/l   0.810   0.810   \
  1   GRPS 1&2 POOLED   0.880   0.880   . \
  2   2.5 ug/l   0.890   0.890   . . \
  3   5.0 ug/l   0.900   0.900   . . . \
  4   10 ug/l   0.920   0.920   . . . . \
  5   20 ug/l   0.940   0.940   . . . . . \
----
* = significant difference (p=0.05)   . = no significant difference
Tukey value (6,22) =   4.45   s =   0.008

          WILLIAMS TEST (Isotonic regression model)   TABLE 1 OF 2

GROUP   ORIGINAL   TRANSFORMED   ISOTONIZED
       IDENTIFICATION   N   MEAN   MEAN   MEAN
------ --------------   ---   ----------   -----------   ----------
  1   GRPS 1&2 POOLED   8   0.880   0.880   0.902
  2   2.5 ug/l   4   0.890   0.890   0.902
  3   5.0 ug/l   4   0.900   0.900   0.902
  4   10 ug/l   4   0.920   0.920   0.902
  5   20 ug/l   4   0.940   0.940   0.902
  6   40 ug/l   4   0.810   0.810   0.810

          WILLIAMS TEST (Isotonic regression model)   TABLE 2 OF 2

                   ISOTONIZED   CALC.   SIG   TABLE   DEGREES OF
   IDENTIFICATION   MEAN   WILLIAMS   P=.05 WILLIAMS   FREEDOM
  ---------------   --------- ---------- ------- ---------- -----------
   GRPS 1&2 POOLED   0.902
        2.5 ug/l   0.902   0.386   1.72   k= 1, v=22
        5.0 ug/l   0.902   0.386   1.80   k= 2, v=22
         10 ug/l   0.902   0.386   1.83   k= 3, v=22
         20 ug/l   0.902   0.386   1.84   k= 4, v=22
         40 ug/l   0.810   1.247   1.85   k= 5, v=22
----
s =   0.092
Note: df used for table values are approximate when v > 20.

fonofos:Survival of Po Generation betw PH days 158/269
File: 442032p0.tts   Transform: NO TRANSFORM

          t-test of Solvent and Blank Controls   Ho:GRP1 MEAN = GRP2 MEAN

 GRP1 (SOLVENT CRTL) MEAN =   0.8300   CALCULATED t VALUE =   -3.4000
 GRP2 (BLANK CRTL) MEAN   =   1.0000   DEGREES OF FREEDOM =   2
 DIFFERENCE IN MEANS   =   -0.1700

TABLE t VALUE (0.05 (2), 2) = 4.303   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 2) = 9.925   NO significant difference at alpha=0.01

Chi-square test for normality: actual and expected frequencies
----
INTERVAL   <-1.5   -1.5 to <-0.5   -0.5 to 0.5   >0.5 to 1.5   >1.5

            _____   _____   _____   _____   _____

EXPECTED   0.938   3.388   5.348   3.388   0.938
OBSERVED   0   4   5   5   0

Calculated Chi-Square goodness of fit test statistic =   2.7762
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

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fonofos:Survival of Po Generation betw PH days 158/269
File: 442032p0.tts   Transform: NO TRANSFORM

Shapiro - Wilk's test for normality

D =   0.083

W =   0.947

Critical W (P = 0.05) (n = 14) = 0.874
Critical W (P = 0.01) (n = 14) = 0.825

Data PASS normality test at P=0.01 level. Continue analysis.

TITLE: fonofos:Survival of Po Generation betw PH days 158/269
FILE: 442032p0.tts
TRANSFORM: NO TRANSFORMATION   NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	GRPS 1&2 POOLED	1	0.7800	0.7800
1	GRPS 1&2 POOLED	2	0.8800	0.8800
1	GRPS 1&2 POOLED	3	1.0000	1.0000
1	GRPS 1&2 POOLED	4	1.0000	1.0000
2	2.5 ug/l	1	0.8800	0.8800
2	2.5 ug/l	2	0.8800	0.8800
3	5.0 ug/l	1	0.7500	0.7500
3	5.0 ug/l	2	1.0000	1.0000
4	10 ug/l	1	0.8900	0.8900
4	10 ug/l	2	0.7500	0.7500
5	20 ug/l	1	1.0000	1.0000
5	20 ug/l	2	1.0000	1.0000
6	40 ug/l	1	0.8800	0.8800
6	40 ug/l	2	0.7500	0.7500

            SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	GRPS 1&2 POOLED	4	0.780	1.000	0.915
2	2.5 ug/l	2	0.880	0.880	0.880
3	5.0 ug/l	2	0.750	1.000	0.875
4	10 ug/l	2	0.750	0.890	0.820
5	20 ug/l	2	1.000	1.000	1.000
6	40 ug/l	2	0.750	0.880	0.815

            SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	GRPS 1&2 POOLED	0.011	0.106	0.053	11.62
2	2.5 ug/l	0.000	0.000	0.000	0.00
3	5.0 ug/l	0.031	0.177	0.125	20.20
4	10 ug/l	0.010	0.099	0.070	12.07
5	20 ug/l	0.000	0.000	0.000	0.00
6	40 ug/l	0.008	0.092	0.065	11.28
----

fonofos:Survival of Po Generation betw PH days 158/269
File: 442032p0.tts   Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.048	0.010	0.928
Within (Error)	8	0.083	0.010	
Total	13	0.132		

Critical F value =   3.69 (0.05,5,8)
Since F < Critical F FAIL TO REJECT Ho: All equal

BONFERRONI t-TEST   -   TABLE 1 OF 2   Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	0.915	0.915		
2	2.5 ug/l	0.880	0.880	0.396	
3	5.0 ug/l	0.875	0.875	0.452	
4	10 ug/l	0.820	0.820	1.074	
5	20 ug/l	1.000	1.000	-0.961	
6	40 ug/l	0.815	0.815	1.131	

Bonferroni t table value = 2.90   (1 Tailed Value, P=0.05, df=8,5)

BONFERRONI t-TEST   -   TABLE 2 OF 2   Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	GRPS 1&2 POOLED	4			
2	2.5 ug/l	2	0.256	28.0	0.035
3	5.0 ug/l	2	0.256	28.0	0.040
4	10 ug/l	2	0.256	28.0	0.095
5	20 ug/l	2	0.256	28.0	-0.085
6	40 ug/l	2	0.256	28.0	0.100

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	0.048	0.010	0.928
Within (Error)	8	0.083	0.010	
Total	13	0.132		

Critical F value =   3.69 (0.05,5,8)
Since F < Critical F FAIL TO REJECT Ho: All equal

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fonofos:Survival of Po Generation betw PH days 158/269
File: 442032p0.tts   Transform: NO TRANSFORMATION

                    TUKEY method of multiple comparisons

                                              GROUP
                    TRANSFORMED   ORIGINAL   0 0 0 0 0 0
GROUP IDENTIFICATION   MEAN   MEAN   6 4 3 2 1 5
----- -------------- ---------- --------   - - - - - -
  6   40 ug/l   0.815   0.815   \
  4   10 ug/l   0.820   0.820   . \
  3   5.0 ug/l   0.875   0.875   . . \
  2   2.5 ug/l   0.880   0.880   . . . \
  1   GRPS 1&2 POOLED   0.915   0.915   . . . . \
  5   20 ug/l   1.000   1.000   . . . . . \
----
* = significant difference (p=0.05)   . = no significant difference
Tukey value (6,8) =   5.17   s =   0.010

            WILLIAMS TEST (Isotonic regression model)   TABLE 1 OF 2

GROUP   ORIGINAL   TRANSFORMED   ISOTONIZED
          IDENTIFICATION   N   MEAN   MEAN   MEAN
------   --------------   ---   ---------- -----------   ----------
  1   GRPS 1&2 POOLED   4   0.915   0.915   0.915
  2   2.5 ug/l   2   0.880   0.880   0.894
  3   5.0 ug/l   2   0.875   0.875   0.894
  4   10 ug/l   2   0.820   0.820   0.894
  5   20 ug/l   2   1.000   1.000   0.894
  6   40 ug/l   2   0.815   0.815   0.815

            WILLIAMS TEST (Isotonic regression model)   TABLE 2 OF 2

                  ISOTONIZED   CALC.   SIG   TABLE   DEGREES OF
   IDENTIFICATION   MEAN   WILLIAMS P=.05   WILLIAMS   FREEDOM
------------------- ------- -------- -----   --------   ----------
   GRPS 1&2 POOLED   0.915
         2.5 ug/l   0.894   0.240   1.86   k= 1, v= 8
         5.0 ug/l   0.894   0.240   1.96   k= 2, v= 8
          10 ug/l   0.894   0.240   2.00   k= 3, v= 8
          20 ug/l   0.894   0.240   2.01   k= 4, v= 8
          40 ug/l   0.815   1.131   2.02   k= 5, v= 8
----
s =   0.102
Note: df used for table values are approximate when v > 20.

fonofos:Eggs/female repro day - Po Generation
File: 442032p0.erd   Transform: NO TRANSFORMATION

          t-test of Solvent and Blank Controls   Ho:GRP1 MEAN = GRP2 MEAN

  GRP1 (SOLVENT CRTL) MEAN =   9.7700   CALCULATED t VALUE =   0.8727
  GRP2 (BLANK CRTL) MEAN   =   6.7750   DEGREES OF FREEDOM =   2
  DIFFERENCE IN MEANS   =   2.9950

TABLE t VALUE (0.05 (2), 2) =   4.303   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 2) =   9.925   NO significant difference at alpha=0.01

Chi-square test for normality: actual and expected frequencies
----

INTERVAL   <-1.5   -1.5 to <-0.5   -0.5 to 0.5   >0.5 to 1.5   >1.5

EXPECTED   0.938   3.388   5.348   3.388   0.938
OBSERVED   0   6   2   6   0

Calculated Chi-Square goodness of fit test statistic =   7.9994
Table Chi-Square value (alpha = 0.01) = 13.277
Data PASS normality test. Continue analysis.

fonofos:Eggs/female repro day - Po Generation
File: 442032p0.erd   Transform: NO TRANSFORMATION

Shapiro - Wilk's test for normality

D =   70.393

W =   0.945

Critical W (P = 0.05) (n = 14) = 0.874
Critical W (P = 0.01) (n = 14) = 0.825

Data PASS normality test at P=0.01 level. Continue analysis.

Table Chi-square value =   15.09 (alpha = 0.01, df =   5)
Table Chi-square value =   11.07 (alpha = 0.05, df =   5)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.
Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

TITLE: fonofos:Eggs/female repro day - Po Generation
FILE: 442032p0.erd
TRANSFORM: NO TRANSFORMATION   NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	GRPS 1&2 POOLED	1	7.6200	7.6200
1	GRPS 1&2 POOLED	2	11.9200	11.9200
1	GRPS 1&2 POOLED	3	4.1000	4.1000
1	GRPS 1&2 POOLED	4	9.4500	9.4500
2	2.5 ug/l	1	3.4100	3.4100
2	2.5 ug/l	2	10.8000	10.8000
3	5.0 ug/l	1	8.2100	8.2100
3	5.0 ug/l	2	8.5300	8.5300
4	10 ug/l	1	3.3300	3.3300
4	10 ug/l	2	7.7700	7.7700
5	20 ug/l	1	4.7600	4.7600
5	20 ug/l	2	3.6200	3.6200
6	40 ug/l	1	0.0000	0.0000
6	40 ug/l	2	0.0800	0.0800

          SUMMARY STATISTICS ON TRANSFORMED DATA   TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	GRPS 1&2 POOLED	4	4.100	11.920	8.273
2	2.5 ug/l	2	3.410	10.800	7.105
3	5.0 ug/l	2	8.210	8.530	8.370
4	10 ug/l	2	3.330	7.770	5.550
5	20 ug/l	2	3.620	4.760	4.190
6	40 ug/l	2	0.000	0.080	0.040

          SUMMARY STATISTICS ON TRANSFORMED DATA   TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	GRPS 1&2 POOLED	10.842	3.293	1.646	39.80
2	2.5 ug/l	27.306	5.226	3.695	73.55
3	5.0 ug/l	0.051	0.226	0.160	2.70
4	10 ug/l	9.857	3.140	2.220	56.57
5	20 ug/l	0.650	0.806	0.570	19.24
6	40 ug/l	0.003	0.057	0.040	141.42
----

fonofos:Eggs/female repro day - Po Generation
File: 442032p0.erd   Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	112.322	22.464	2.553
Within (Error)	8	70.393	8.799	
Total	13	182.715		

Critical F value = 3.69 (0.05,5,8)
Since F < Critical F FAIL TO REJECT Ho: All equal

BONFERRONI t-TEST - TABLE 1 OF 2   Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	8.273	8.273		
2	2.5 ug/l	7.105	7.105	0.454	
3	5.0 ug/l	8.370	8.370	-0.038	
4	10 ug/l	5.550	5.550	1.060	
5	20 ug/l	4.190	4.190	1.589	
6	40 ug/l	0.040	0.040	3.205	*

Bonferroni t table value = 2.90   (1 Tailed Value, P=0.05, df=8,5)

BONFERRONI t-TEST - TABLE 2 OF 2   Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	GRPS 1&2 POOLED	4			
2	2.5 ug/l	2	7.441	89.9	1.168
3	5.0 ug/l	2	7.441	89.9	-0.098
4	10 ug/l	2	7.441	89.9	2.723
5	20 ug/l	2	7.441	89.9	4.083
6	40 ug/l	2	7.441	89.9	8.233

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	112.322	22.464	2.553
Within (Error)	8	70.393	8.799	
Total	13	182.715		

Critical F value = 3.69 (0.05,5,8)
Since F < Critical F FAIL TO REJECT Ho: All equal

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fonofos:Eggs/female repro day - Po Generation
File: 442032p0.erd   Transform: NO TRANSFORMATION

TUKEY method of multiple comparisons

				GROUP
		TRANSFORMED	ORIGINAL	0 0 0 0 0 0
GROUP	IDENTIFICATION	MEAN	MEAN	6 5 4 2 1 3
-----	--------------	-----------	---------	- - - - - -
6	40 ug/l	0.040	0.040	\
5	20 ug/l	4.190	4.190	. \
4	10 ug/l	5.550	5.550	. . \
2	2.5 ug/l	7.105	7.105	. . . \
1	GRPS 1&2 POOLED	8.273	8.273	. . . . \
3	5.0 ug/l	8.370	8.370	. . . . . \
----

* = significant difference (p=0.05)   . = no significant difference
Tukey value (6,8) =   5.17   s =   8.799

WILLIAMS TEST (Isotonic regression model)   TABLE 1 OF 2

| GROUP | | | ORIGINAL | TRANSFORMED | ISOTONIZED |
	IDENTIFICATION	N	MEAN	MEAN	MEAN
1	GRPS 1&2 POOLED	4	8.273	8.273	8.273
2	2.5 ug/l	2	7.105	7.105	7.738
3	5.0 ug/l	2	8.370	8.370	7.738
4	10 ug/l	2	5.550	5.550	5.550
5	20 ug/l	2	4.190	4.190	4.190
6	40 ug/l	2	0.040	0.040	0.040

WILLIAMS TEST (Isotonic regression model)   TABLE 2 OF 2

| | ISOTONIZED | CALC. | SIG | TABLE | DEGREES OF |
IDENTIFICATION	MEAN	WILLIAMS	P=.05	WILLIAMS	FREEDOM
GRPS 1&2 POOLED	8.273				
2.5 ug/l	7.738	0.208		1.86	k= 1, v= 8
5.0 ug/l	7.738	0.208		1.96	k= 2, v= 8
10 ug/l	5.550	1.060		2.00	k= 3, v= 8
20 ug/l	4.190	1.589		2.01	k= 4, v= 8
40 ug/l	0.040	3.205	*	2.02	k= 5, v= 8
----

s =   2.966
Note: df used for table values are approximate when v > 20.

fonofos:No. batches of eggs/rep - Po Generation
File: 442032p0.nob   Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls   Ho:GRP1 MEAN = GRP2 MEAN

 GRP1 (SOLVENT CRTL) MEAN =   69.0000   CALCULATED t VALUE =   -0.0762
 GRP2 (BLANK CRTL) MEAN   =   71.0000   DEGREES OF FREEDOM =   2
 DIFFERENCE IN MEANS   =   -2.0000

 TABLE t VALUE (0.05 (2), 2) = 4.303   NO significant difference at alpha=0.05
 TABLE t VALUE (0.01 (2), 2) = 9.925   NO significant difference at alpha=0.01

Chi-square test for normality: actual and expected frequencies
----

INTERVAL   <-1.5   -1.5 to <-0.5   -0.5 to 0.5   >0.5 to 1.5   >1.5
            ____   _____   _____   _____   ____

EXPECTED   0.938   3.388   5.348   3.388   0.938
OBSERVED   0   6   2   6   0

Calculated Chi-Square goodness of fit test statistic =   7.9994
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Shapiro - Wilk's test for normality

D = 1853.500

W =   0.980

Critical W (P = 0.05) (n = 14) = 0.874
Critical W (P = 0.01) (n = 14) = 0.825

Data PASS normality test at P=0.01 level. Continue analysis.

Table Chi-square value =   15.09 (alpha = 0.01, df =   5)
Table Chi-square value =   11.07 (alpha = 0.05, df =   5)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.
Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

TITLE: fonofos:No. batches of eggs/rep - Po Generation
FILE: 442032p0.nob
TRANSFORM: NO TRANSFORMATION   NUMBER OF GROUPS: 6

GRP IDENTIFICATION   REP   VALUE   TRANS VALUE
--- --------------   ----   --------   -----------
 1   GRPS 1&2 POOLED   1   61.0000   61.0000
 1   GRPS 1&2 POOLED   2   77.0000   77.0000
 1   GRPS 1&2 POOLED   3   46.0000   46.0000
 1   GRPS 1&2 POOLED   4   96.0000   96.0000
 2   2.5 ug/l   1   26.0000   26.0000
 2   2.5 ug/l   2   51.0000   51.0000
 3   5.0 ug/l   1   50.0000   50.0000
 3   5.0 ug/l   2   55.0000   55.0000
 4   10 ug/l   1   39.0000   39.0000
 4   10 ug/l   2   31.0000   31.0000
 5   20 ug/l   1   32.0000   32.0000
 5   20 ug/l   2   47.0000   47.0000
 6   40 ug/l   1   0.0000   0.0000
 6   40 ug/l   2   2.0000   2.0000

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fonofos:No. batches of eggs/rep - Po Generation
File: 442032p0.nob   Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	GRPS 1&2 POOLED	4	46.000	96.000	70.000
2	2.5 ug/l	2	26.000	51.000	38.500
3	5.0 ug/l	2	50.000	55.000	52.500
4	10 ug/l	2	31.000	39.000	35.000
5	20 ug/l	2	32.000	47.000	39.500
6	40 ug/l	2	0.000	2.000	1.000

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	GRPS 1&2 POOLED	460.667	21.463	10.732	30.66
2	2.5 ug/l	312.500	17.678	12.500	45.92
3	5.0 ug/l	12.500	3.536	2.500	6.73
4	10 ug/l	32.000	5.657	4.000	16.16
5	20 ug/l	112.500	10.607	7.500	26.85
6	40 ug/l	2.000	1.414	1.000	141.42

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	6808.857	1361.771	5.878
Within (Error)	8	1853.500	231.688	
Total	13	8662.357		

Critical F value = 3.69 (0.05,5,8)
Since F > Critical F REJECT Ho: All equal

BONFERRONI t-TEST   -   TABLE 1 OF 2   Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	70.000	70.000		
2	2.5 ug/l	38.500	38.500	2.390	
3	5.0 ug/l	52.500	52.500	1.328	
4	10 ug/l	35.000	35.000	2.655	
5	20 ug/l	39.500	39.500	2.314	
6	40 ug/l	1.000	1.000	5.234	*

Bonferroni t table value = 2.90   (1 Tailed Value, P=0.05, df=8,5)

BONFERRONI t-TEST   -   TABLE 2 OF 2   Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	GRPS 1&2 POOLED	4			
2	2.5 ug/l	2	38.182	54.5	31.500
3	5.0 ug/l	2	38.182	54.5	17.500
4	10 ug/l	2	38.182	54.5	35.000
5	20 ug/l	2	38.182	54.5	30.500
6	40 ug/l	2	38.182	54.5	69.000

```
fonofos:No. batches of eggs/rep - Po Generation
File: 442032p0.nob         Transform: NO TRANSFORMATION

                            ·      ANOVA TABLE
-----------------------------------------------------------------------
SOURCE            DF            SS              MS            F
-----------------------------------------------------------------------
Between           5          6808.857        1361.771       5.878

Within (Error)    8          1853.500         231.688
-----------------------------------------------------------------------
Total            13          8662.357
-----------------------------------------------------------------------
  Critical F value =   3.69  (0.05,5,8)
  Since  F > Critical F  REJECT  Ho: All equal

            TUKEY method of multiple comparisons
-----------------------------------------------------------------------
                                              GROUP
                        TRANSFORMED  ORIGINAL  0 0 0 0 0 0
GROUP  IDENTIFICATION      MEAN       MEAN     6 4 2 5 3 1
-----  --------------   -----------  -------- - - - - - -
  6          40 ug/l       1.000      1.000   \
  4          10 ug/l      35.000     35.000   . \
  2         2.5 ug/l      38.500     38.500   . . \
  5          20 ug/l      39.500     39.500   . . . \
  3         5.0 ug/l      52.500     52.500   . . . . \
  1    GRPS 1&2 POOLED    70.000     70.000   * . . . . \
-----------------------------------------------------------------------
* = significant difference (p=0.05)       . = no significant difference
Tukey value (6,8) =   5.17              s =  231.688

        WILLIAMS TEST  (Isotonic regression model)   TABLE 1 OF 2
-----------------------------------------------------------------------
GROUP                            ORIGINAL    TRANSFORMED   ISOTONIZED
        IDENTIFICATION      N      MEAN         MEAN         MEAN
------  --------------     ---  ----------  -----------  -----------
  1      GRPS 1&2 POOLED    4     70.000       70.000       70.000
  2           2.5 ug/l      2     38.500       38.500       45.500
  3           5.0 ug/l      2     52.500       52.500       45.500
  4            10 ug/l      2     35.000       35.000       37.250
  5            20 ug/l      2     39.500       39.500       37.250
  6            40 ug/l      2      1.000        1.000        1.000

        WILLIAMS TEST  (Isotonic regression model)   TABLE 2 OF 2
-----------------------------------------------------------------------
                  ISOTONIZED  CALC.     SIG    TABLE      DEGREES OF
    IDENTIFICATION   MEAN    WILLIAMS  P=.05  WILLIAMS     FREEDOM
    --------------  --------- --------- -----  ---------  -----------
    GRPS 1&2 POOLED  70.000
         2.5 ug/l    45.500    1.859            1.86      k= 1, v= 8
         5.0 ug/l    45.500    1.859            1.96      k= 2, v= 8
          10 ug/l    37.250    2.484     *      2.00      k= 3, v= 8
          20 ug/l    37.250    2.484     *      2.01      k= 4, v= 8
          40 ug/l     1.000    5.234     *      2.02      k= 5, v= 8
-----------------------------------------------------------------------
s =   15.221
Note: df used for table values are approximate when v > 20.
```

fonofos:Egg Hatchablity of F1 Generation
File: 442032f1.hat   Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls   Ho:GRP1 MEAN = GRP2 MEAN

  GRP1 (SOLVENT CRTL) MEAN =   0.9500   CALCULATED t VALUE =   0.4685
  GRP2 (BLANK CRTL) MEAN   =   0.9350   DEGREES OF FREEDOM =   2
  DIFFERENCE IN MEANS   =   0.0150

TABLE t VALUE (0.05 (2), 2) = 4.303   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 2) = 9.925   NO significant difference at alpha=0.01

Chi-square test for normality: actual and expected frequencies
----

INTERVAL   <-1.5   -1.5 to <-0.5   -0.5 to 0.5   >0.5 to 1.5   >1.5
             ___   _____   _____   _____   ___

EXPECTED   0.804   2.904   4.584   2.904   0.804
OBSERVED   0   6   0   6   0

Calculated Chi-Square goodness of fit test statistic = 12.7934
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Shapiro - Wilk's test for normality

D =   0.166

W =   0.963

Critical W (P = 0.05) (n = 12) = 0.859
Critical W (P = 0.01) (n = 12) = 0.805

Data PASS normality test at P=0.01 level. Continue analysis.

fonofos:Egg Hatchablity of F1 Generation
File: 442032f1.hat   Transform: ARC SINE(SQUARE ROOT(Y))

Table Chi-square value =   13.28 (alpha = 0.01, df =   4)
Table Chi-square value =   9.49 (alpha = 0.05, df =   4)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.
Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

TITLE: fonofos:Egg Hatchablity of F1 Generation
FILE: 442032f1.hat
TRANSFORM: ARC SINE(SQUARE ROOT(Y))   NUMBER OF GROUPS: 5

GRP IDENTIFICATION   REP   VALUE   TRANS VALUE
--- --------------   ----   -------   -----------
 1   GRPS 1&2 POOLED   1   0.9300   1.3030
 1   GRPS 1&2 POOLED   2   0.9700   1.3967
 1   GRPS 1&2 POOLED   3   0.9100   1.2661
 1   GRPS 1&2 POOLED   4   0.9600   1.3694
 2   2.5 ug/l   1   0.9900   1.4706
 2   2.5 ug/l   2   0.8300   1.1458
 3   5.0 ug/l   1   0.8800   1.2171
 3   5.0 ug/l   2   0.8900   1.2327
 4   10 ug/l   1   0.9800   1.4289
 4   10 ug/l   2   0.9700   1.3967
 5   20 ug/l   1   0.5300   0.8154
 5   20 ug/l   2   0.9100   1.2661

```
TITLE:      fonofos:Egg Hatchablity of F1 Generation
FILE:       442032f1.hat
TRANSFORM: ARC SINE(SQUARE ROOT(Y))
```

           SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	GRPS 1&2 POOLED	4	1.266	1.397	1.334
2	2.5 ug/l	2	1.146	1.471	1.308
3	5.0 ug/l	2	1.217	1.233	1.225
4	10 ug/l	2	1.397	1.429	1.413
5	20 ug/l	2	0.815	1.266	1.041

           SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	GRPS 1&2 POOLED	0.004	0.060	0.030	4.49
2	2.5 ug/l	0.053	0.230	0.162	17.56
3	5.0 ug/l	0.000	0.011	0.008	0.90
4	10 ug/l	0.001	0.023	0.016	1.61
5	20 ug/l	0.102	0.319	0.225	30.62

                          ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	4	0.169	0.042	1.782
Within (Error)	7	0.166	0.024	
Total	11	0.334		

```
  Critical F value =   4.12  (0.05,4,7)
  Since  F < Critical F  FAIL TO REJECT  Ho: All equal
```

        BONFERRONI t-TEST   -   TABLE 1 OF 2   Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	1.334	0.943		
2	2.5 ug/l	1.308	0.910	0.192	
3	5.0 ug/l	1.225	0.885	0.817	
4	10 ug/l	1.413	0.975	-0.593	
5	20 ug/l	1.041	0.720	2.199	

```
Bonferroni t table value =  2.84     (1 Tailed Value, P=0.05,  df=7,4)
```

        BONFERRONI t-TEST   -   TABLE 2 OF 2   Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	GRPS 1&2 POOLED	4			
2	2.5 ug/l	2	0.278	29.5	0.033
3	5.0 ug/l	2	0.278	29.5	0.057
4	10 ug/l	2	0.278	29.5	-0.033
5	20 ug/l	2	0.278	29.5	0.222

fonofos:Egg Hatchablity of F1 Generation
File: 442032f1.hat   Transform: ARC SINE(SQUARE ROOT(Y))

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	4	0.169	0.042	1.782
Within (Error)	7	0.166	0.024	
Total	11	0.334		

Critical F value =   4.12 (0.05,4,7)
Since F < Critical F FAIL TO REJECT Ho: All equal

TUKEY method of multiple comparisons

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP 0 0 0 0 0 / 5 3 2 1 4
5	20 ug/l	1.041	0.720	\
3	5.0 ug/l	1.225	0.885	. \
2	2.5 ug/l	1.308	0.910	. . \
1	GRPS 1&2 POOLED	1.334	0.943	. . . \
4	10 ug/l	1.413	0.975	. . . . \

* = significant difference (p=0.05)   . = no significant difference
Tukey value (5,7) =   5.06   s =   0.024

WILLIAMS TEST (Isotonic regression model)   TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	GRPS 1&2 POOLED	4	0.943	1.334	1.334
2	2.5 ug/l	2	0.910	1.308	1.315
3	5.0 ug/l	2	0.885	1.225	1.315
4	10 ug/l	2	0.975	1.413	1.315
5	20 ug/l	2	0.720	1.041	1.041

WILLIAMS TEST (Isotonic regression model)   TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
GRPS 1&2 POOLED	1.334				
2.5 ug/l	1.315	0.139		1.89	k= 1, v= 7
5.0 ug/l	1.315	0.139		2.00	k= 2, v= 7
10 ug/l	1.315	0.139		2.04	k= 3, v= 7
20 ug/l	1.041	2.200	*	2.06	k= 4, v= 7

s =   0.154
Note: df used for table values are approximate when v > 20.

fonofos:Survival of F1 Generation - first trial
File: 442032f1.sr1   Transform: NO TRANSFORM

```
        t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
-----------------------------------------------------------------------------
  GRP1 (SOLVENT CRTL) MEAN =      0.9200    CALCULATED t VALUE =      0.0000
  GRP2 (BLANK CRTL) MEAN   =      0.9200    DEGREES OF FREEDOM =      2
  DIFFERENCE IN MEANS      =      0.0000
-----------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 2) =  4.303    NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 2) =  9.925    NO significant difference at alpha=0.01
```

Chi-square test for normality: actual and expected frequencies
----

```
INTERVAL     <-1.5      -1.5 to <-0.5    -0.5 to 0.5    >0.5 to 1.5    >1.5
             ____       _____      _____     _____     ____

EXPECTED     0.804      2.904            4.584          2.904          0.804
OBSERVED     0          5                2              5              0
```

Calculated Chi-Square goodness of fit test statistic =   6.0902
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Shapiro - Wilk's test for normality

D =   0.158

W =   0.982

Critical W (P = 0.05) (n = 12) = 0.859
Critical W (P = 0.01) (n = 12) = 0.805

Data PASS normality test at P=0.01 level. Continue analysis.

Table Chi-square value =   13.28 (alpha = 0.01, df =   4)
Table Chi-square value =   9.49 (alpha = 0.05, df =   4)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.
Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

TITLE: fonofos:Survival of F1 Generation - first trial
FILE: 442032f1.sr1
TRANSFORM: NO TRANSFORMATION   NUMBER OF GROUPS: 5

GRP IDENTIFICATION   REP   VALUE   TRANS VALUE
--- --------------   ----   --------   -----------
```

| GRP | IDENTIFICATION | REP | VALUE | TRANS VALUE |
|---|---|---|---|---|
| 1 | GRPS 1&2 POOLED | 1 | 0.9200 | 0.9200 |
| 1 | GRPS 1&2 POOLED | 2 | 0.9200 | 0.9200 |
| 1 | GRPS 1&2 POOLED | 3 | 0.8800 | 0.8800 |
| 1 | GRPS 1&2 POOLED | 4 | 0.9600 | 0.9600 |
| 2 | 2.5 ug/l | 1 | 0.9600 | 0.9600 |
| 2 | 2.5 ug/l | 2 | 1.0000 | 1.0000 |
| 3 | 5.0 ug/l | 1 | 0.9600 | 0.9600 |
| 3 | 5.0 ug/l | 2 | 0.5400 | 0.5400 |
| 4 | 10 ug/l | 1 | 0.7100 | 0.7100 |
| 4 | 10 ug/l | 2 | 1.0000 | 1.0000 |
| 5 | 20 ug/l | 1 | 0.7400 | 0.7400 |
| 5 | 20 ug/l | 2 | 0.9600 | 0.9600 |

fonofos:Survival of F1 Generation - first trial
File: 442032f1.sr1        Transform: NO TRANSFORMATION

### SUMMARY STATISTICS ON TRANSFORMED DATA  TABLE 1 of 2

| GRP | IDENTIFICATION | N | MIN | MAX | MEAN |
|---|---|---|---|---|---|
| 1 | GRPS 1&2 POOLED | 4 | 0.880 | 0.960 | 0.920 |
| 2 | 2.5 ug/l | 2 | 0.960 | 1.000 | 0.980 |
| 3 | 5.0 ug/l | 2 | 0.540 | 0.960 | 0.750 |
| 4 | 10 ug/l | 2 | 0.710 | 1.000 | 0.855 |
| 5 | 20 ug/l | 2 | 0.740 | 0.960 | 0.850 |

### SUMMARY STATISTICS ON TRANSFORMED DATA  TABLE 2 of 2

| GRP | IDENTIFICATION | VARIANCE | SD | SEM | C.V. % |
|---|---|---|---|---|---|
| 1 | GRPS 1&2 POOLED | 0.001 | 0.033 | 0.016 | 3.55 |
| 2 | 2.5 ug/l | 0.001 | 0.028 | 0.020 | 2.89 |
| 3 | 5.0 ug/l | 0.088 | 0.297 | 0.210 | 39.60 |
| 4 | 10 ug/l | 0.042 | 0.205 | 0.145 | 23.98 |
| 5 | 20 ug/l | 0.024 | 0.156 | 0.110 | 18.30 |

### ANOVA TABLE

| SOURCE | DF | SS | MS | F |
|---|---|---|---|---|
| Between | 4 | 0.063 | 0.016 | 0.698 |
| Within (Error) | 7 | 0.158 | 0.023 | |
| Total | 11 | 0.222 | | |

Critical F value =  4.12  (0.05,4,7)
Since  F < Critical F  FAIL TO REJECT  Ho: All equal

### BONFERRONI t-TEST  -  TABLE 1 OF 2                Ho:Control<Treatment

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | MEAN CALCULATED IN ORIGINAL UNITS | T STAT | SIG |
|---|---|---|---|---|---|
| 1 | GRPS 1&2 POOLED | 0.920 | 0.920 | | |
| 2 | 2.5 ug/l | 0.980 | 0.980 | -0.460 | |
| 3 | 5.0 ug/l | 0.750 | 0.750 | 1.305 | |
| 4 | 10 ug/l | 0.855 | 0.855 | 0.499 | |
| 5 | 20 ug/l | 0.850 | 0.850 | 0.537 | |

Bonferroni t table value = 2.84    (1 Tailed Value, P=0.05,  df=7,4)

### BONFERRONI t-TEST  -  TABLE 2 OF 2                Ho:Control<Treatment

| GROUP | IDENTIFICATION | NUM OF REPS | Minimum Sig Diff (IN ORIG. UNITS) | % of CONTROL | DIFFERENCE FROM CONTROL |
|---|---|---|---|---|---|
| 1 | GRPS 1&2 POOLED | 4 | | | |
| 2 | 2.5 ug/l | 2 | 0.370 | 40.2 | -0.060 |
| 3 | 5.0 ug/l | 2 | 0.370 | 40.2 | 0.170 |
| 4 | 10 ug/l | 2 | 0.370 | 40.2 | 0.065 |
| 5 | 20 ug/l | 2 | 0.370 | 40.2 | 0.070 |

### TUKEY method of multiple comparisons

| GROUP | IDENTIFICATION | TRANSFORMED MEAN | ORIGINAL MEAN | GROUP 0 0 0 0 0 / 3 5 4 1 2 |
|---|---|---|---|---|
| 3 | 5.0 ug/l | 0.750 | 0.750 | \ |
| 5 | 20 ug/l | 0.850 | 0.850 | . \ |

```
    4   10 ug/l   0.855   0.855 . . \
    1   GRPS 1&2 POOLED   0.920   0.920 . . . \
    2   2.5 ug/l   0.980   0.980 . . . . \
```
-------------------------------------------------------------------------
```
* = significant difference (p=0.05)   . = no significant difference
Tukey value (5,7) =   5.06   s =   0.023
```

fonofos:Survival of F1 Generation - first trial
File: 442032f1.sr1        Transform: NO TRANSFORMATION

WILLIAMS TEST  (Isotonic regression model)    TABLE 1 OF 2

| GROUP | IDENTIFICATION | N | ORIGINAL MEAN | TRANSFORMED MEAN | ISOTONIZED MEAN |
|---|---|---|---|---|---|
| 1 | GRPS 1&2 POOLED | 4 | 0.920 | 0.920 | 0.940 |
| 2 | 2.5 ug/l | 2 | 0.980 | 0.980 | 0.940 |
| 3 | 5.0 ug/l | 2 | 0.750 | 0.750 | 0.818 |
| 4 | 10 ug/l | 2 | 0.855 | 0.855 | 0.818 |
| 5 | 20 ug/l | 2 | 0.850 | 0.850 | 0.818 |

WILLIAMS TEST  (Isotonic regression model)    TABLE 2 OF 2

| IDENTIFICATION | ISOTONIZED MEAN | CALC. WILLIAMS | SIG P=.05 | TABLE WILLIAMS | DEGREES OF FREEDOM |
|---|---|---|---|---|---|
| GRPS 1&2 POOLED | 0.940 | | | | |
| 2.5 ug/l | 0.940 | 0.153 | | 1.89 | k= 1, v= 7 |
| 5.0 ug/l | 0.818 | 0.780 | | 2.00 | k= 2, v= 7 |
| 10 ug/l | 0.818 | 0.780 | | 2.04 | k= 3, v= 7 |
| 20 ug/l | 0.818 | 0.780 | | 2.06 | k= 4, v= 7 |

```
s =   0.150
```
Note: df used for table values are approximate when v > 20.

fonofos:Survival of F1 Generation - 2nd trial
File: 442032f1.sr2        Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls        Ho:GRP1 MEAN = GRP2 MEAN
--------------------------------------------------------------------------
  GRP1 (SOLVENT CRTL) MEAN =      0.9000    CALCULATED t VALUE =    -2.8284
  GRP2 (BLANK CRTL) MEAN   =      0.9800    DEGREES OF FREEDOM =    2
  DIFFERENCE IN MEANS      =     -0.0800
--------------------------------------------------------------------------
TABLE t VALUE (0.05 (2), 2) =  4.303    NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 2) =  9.925    NO significant difference at alpha=0.01


Chi-square test for normality: actual and expected frequencies
--------------------------------------------------------------------------


INTERVAL     <-1.5      -1.5 to <-0.5     -0.5 to 0.5     >0.5 to 1.5     >1.5

            ____       _____          _____        _____        ____

EXPECTED    0.804        2.904            4.584           2.904          0.804
OBSERVED    0            5                2               5              0


--------------------------------------------------------------------------
Calculated Chi-Square goodness of fit test statistic =   6.0902
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Shapiro - Wilk's test for normality
--------------------------------------------------------------------------


D =    0.110

W =    0.963

Critical W (P = 0.05) (n = 12) = 0.859
Critical W (P = 0.01) (n = 12) = 0.805
--------------------------------------------------------------------------


Data PASS normality test at P=0.01 level. Continue analysis.


--------------------------------------------------------------------------
Bartlett's test for homogeneity of variance
Calculated B1 statistic =    6.95


--------------------------------------------------------------------------
Bartlett's test using average degrees of freedom
Calculated B2 statistic =    7.92
    Based on average replicate size of    1.40


--------------------------------------------------------------------------
Table Chi-square value =   13.28  (alpha = 0.01, df =   4)
Table Chi-square value =    9.49  (alpha = 0.05, df =   4)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.
Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

TITLE:     fonofos:Survival of F1 Generation - 2nd trial
FILE:      442032f1.sr2
TRANSFORM: NO TRANSFORMATION            NUMBER OF GROUPS: 5
--------------------------------------------------------------------------

GRP  IDENTIFICATION    REP      VALUE         TRANS VALUE
---  ---------------   ----    -------------  -------------
 1   GRPS 1&2 POOLED    1       0.8800         0.8800
 1   GRPS 1&2 POOLED    2       0.9200         0.9200
 1   GRPS 1&2 POOLED    3       1.0000         1.0000
 1   GRPS 1&2 POOLED    4       0.9600         0.9600
 2         2.5 ug/l     1       1.0000         1.0000
 2         2.5 ug/l     2       0.9600         0.9600
 3         5.0 ug/l     1       0.9600         0.9600
 3         5.0 ug/l     2       1.0000         1.0000


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```
4        10 ug/l    1         0.8000              0.8000
4        10 ug/l    2         1.0000              1.0000
5        20 ug/l    1         0.6000              0.6000
5        20 ug/l    2         1.0000              1.0000
-------------------------------------------------------------------
```

fonofos:Survival of F1 Generation - 2nd trial
File: 442032f1.sr2   Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	GRPS 1&2 POOLED	4	0.880	1.000	0.940
2	2.5 ug/l	2	0.960	1.000	0.980
3	5.0 ug/l	2	0.960	1.000	0.980
4	10 ug/l	2	0.800	1.000	0.900
5	20 ug/l	2	0.600	1.000	0.800

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	GRPS 1&2 POOLED	0.003	0.052	0.026	5.49
2	2.5 ug/l	0.001	0.028	0.020	2.89
3	5.0 ug/l	0.001	0.028	0.020	2.89
4	10 ug/l	0.020	0.141	0.100	15.71
5	20 ug/l	0.080	0.283	0.200	35.36

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	4	0.045	0.011	0.726
Within (Error)	7	0.110	0.016	
Total	11	0.155		

Critical F value = 4.12 (0.05,4,7)
Since F < Critical F FAIL TO REJECT Ho: All equal

BONFERRONI t-TEST   -   TABLE 1 OF 2   Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	0.940	0.940		
2	2.5 ug/l	0.980	0.980	-0.369	
3	5.0 ug/l	0.980	0.980	-0.369	
4	10 ug/l	0.900	0.900	0.369	
5	20 ug/l	0.800	0.800	1.292	

Bonferroni t table value = 2.84   (1 Tailed Value, P=0.05, df=7,4)

fonofos:Survival of F1 Generation - 2nd trial
File: 442032f1.sr2   Transform: NO TRANSFORMATION

```
        BONFERRONI t-TEST    -    TABLE 2 OF 2          Ho:Control<Treatment
-----------------------------------------------------------------------------
                          NUM OF   Minimum Sig Diff   % of      DIFFERENCE
GROUP    IDENTIFICATION    REPS    (IN ORIG. UNITS)  CONTROL   FROM CONTROL
-----    --------------   ------   ----------------  -------   ------------
  1       GRPS 1&2 POOLED    4
  2              2.5 ug/l    2          0.308          32.8       -0.040
  3              5.0 ug/l    2          0.308          32.8       -0.040
  4               10 ug/l    2          0.308          32.8        0.040
  5               20 ug/l    2          0.308          32.8        0.140
-----------------------------------------------------------------------------
                              ANOVA TABLE
-----------------------------------------------------------------------------

SOURCE           DF             SS              MS            F
-----------------------------------------------------------------------------
Between           4            0.045           0.011        0.726

Within (Error)    7            0.110           0.016
-----------------------------------------------------------------------------
Total            11            0.155
-----------------------------------------------------------------------------
```

```
   Critical F value =   4.12  (0.05,4,7)
   Since  F < Critical F  FAIL TO REJECT  Ho: All equal

         TUKEY method of multiple comparisons
-----------------------------------------------------------------------------
                                          GROUP
                      TRANSFORMED  ORIGINAL   0 0 0 0 0
GROUP   IDENTIFICATION   MEAN        MEAN     5 4 1 2 3
-----   --------------  --------    --------  - - - - -
  5          20 ug/l     0.800       0.800    \
  4          10 ug/l     0.900       0.900    . \
  1   GRPS 1&2 POOLED    0.940       0.940    . . \
  2         2.5 ug/l     0.980       0.980    . . . \
  3         5.0 ug/l     0.980       0.980    . . . . \
-----------------------------------------------------------------------------
* = significant difference (p=0.05)      . = no significant difference
Tukey value (5,7) =   5.06           s =    0.016
```

```
        WILLIAMS TEST  (Isotonic regression model)    TABLE 1 OF 2
-----------------------------------------------------------------------------
GROUP                            ORIGINAL    TRANSFORMED    ISOTONIZED
        IDENTIFICATION    N        MEAN         MEAN          MEAN
------  --------------   ---    --------     -----------    ----------
  1     GRPS 1&2 POOLED   4       0.940         0.940         0.960
  2            2.5 ug/l   2       0.980         0.980         0.960
  3            5.0 ug/l   2       0.980         0.980         0.960
  4             10 ug/l   2       0.900         0.900         0.900
  5             20 ug/l   2       0.800         0.800         0.800
-----------------------------------------------------------------------------
        WILLIAMS TEST  (Isotonic regression model)    TABLE 2 OF 2
-----------------------------------------------------------------------------
                ISOTONIZED   CALC.     SIG      TABLE      DEGREES OF
   IDENTIFICATION   MEAN    WILLIAMS  P=.05   WILLIAMS      FREEDOM
   --------------  ------   --------  -----   --------     ----------
   GRPS 1&2 POOLED  0.960
          2.5 ug/l  0.960    0.185              1.89       k= 1, v= 7
          5.0 ug/l  0.960    0.185              2.00       k= 2, v= 7
           10 ug/l  0.900    0.369              2.04       k= 3, v= 7
           20 ug/l  0.800    1.292              2.06       k= 4, v= 7
-----------------------------------------------------------------------------
s =   0.125
Note: df used for table values are approximate when v > 20.
```

fonofos:Female Lengths of Po Generation at test term
File: a:\442032PO.FLN   Transform: NO TRANSFORM

          t-test of Solvent and Blank Controls   Ho:GRP1 MEAN = GRP2 MEAN

  GRP1 (SOLVENT CRTL) MEAN =   51.0000   CALCULATED t VALUE =   0.3841
  GRP2 (BLANK CRTL) MEAN   =   49.5000   DEGREES OF FREEDOM =   2
  DIFFERENCE IN MEANS   =   1.5000

TABLE t VALUE (0.05 (2), 2) = 4.303   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 2) = 9.925   NO significant difference at alpha=0.01

fonofos:Female Lengths of Po Generation at test term
File: a:\442032PO.FLN   Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
----

INTERVAL   <-1.5   -1.5 to <-0.5   -0.5 to 0.5   >0.5 to 1.5   >1.5
             _____   _____   _____   _____   ____

EXPECTED   0.938   3.388   5.348   3.388   0.938
OBSERVED   0   6   2   6   0

Calculated Chi-Square goodness of fit test statistic =   7.9994
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Shapiro - Wilk's test for normality

D =   72.250

W =   0.958

Critical W (P = 0.05) (n = 14) = 0.874
Critical W (P = 0.01) (n = 14) = 0.825

Data PASS normality test at P=0.01 level. Continue analysis.

fonofos:Female Lengths of Po Generation at test term
File: a:\442032PO.FLN   Transform: NO TRANSFORMATION

Hartley's test for homogeneity of variance
Bartlett's test for homogeneity of variance

These two tests can not be performed because at least one group has
zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.

1

TITLE: fonofos:Female Lengths of Po Generation at test term
FILE: a:\442032PO.FLN
TRANSFORM: NO TRANSFORMATION   NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	GRPS 1&2 POOLED	1	54.0000	54.0000
1	GRPS 1&2 POOLED	2	48.0000	48.0000
1	GRPS 1&2 POOLED	3	47.0000	47.0000
1	GRPS 1&2 POOLED	4	52.0000	52.0000
2	2.5 ug/l	1	53.0000	53.0000
2	2.5 ug/l	2	58.0000	58.0000
3	5.0 ug/l	1	51.0000	51.0000
3	5.0 ug/l	2	51.0000	51.0000
4	10 ug/l	1	47.0000	47.0000
4	10 ug/l	2	46.0000	46.0000
5	20 ug/l	1	48.0000	48.0000
5	20 ug/l	2	46.0000	46.0000
6	40 ug/l	1	34.0000	34.0000
6	40 ug/l	2	41.0000	41.0000
----

fonofos:Female Lengths of Po Generation at test term
File: a:\442032PO.FLN   Transform: NO TRANSFORMATION

          SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	GRPS 1&2 POOLED	4	47.000	54.000	50.250
2	2.5 ug/l	2	53.000	58.000	55.500
3	5.0 ug/l	2	51.000	51.000	51.000
4	10 ug/l	2	46.000	47.000	46.500
5	20 ug/l	2	46.000	48.000	47.000
6	40 ug/l	2	34.000	41.000	37.500
----

fonofos:Female Lengths of Po Generation at test term
File: a:\442032PO.FLN   Transform: NO TRANSFORMATION

          SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	GRPS 1&2 POOLED	10.917	3.304	1.652	6.58
2	2.5 ug/l	12.500	3.536	2.500	6.37
3	5.0 ug/l	0.000	0.000	0.000	0.00
4	10 ug/l	0.500	0.707	0.500	1.52
5	20 ug/l	2.000	1.414	1.000	3.01
6	40 ug/l	24.500	4.950	3.500	13.20
----

fonofos:Female Lengths of Po Generation at test term
File: a:\442032PO.FLN   Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)   TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	GRPS 1&2 POOLED	4	50.250	50.250	52.000
2	2.5 ug/l	2	55.500	55.500	52.000
3	5.0 ug/l	2	51.000	51.000	51.000
4	10 ug/l	2	46.500	46.500	46.750
5	20 ug/l	2	47.000	47.000	46.750
6	40 ug/l	2	37.500	37.500	37.500

fonofos:Female Lengths of Po Generation at test term
File: a:\442032PO.FLN   Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)   TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
GRPS 1&2 POOLED	52.000				
2.5 ug/l	52.000	0.672		1.86	k= 1, v= 8
5.0 ug/l	51.000	0.288		1.96	k= 2, v= 8
10 ug/l	46.750	1.345		2.00	k= 3, v= 8
20 ug/l	46.750	1.345		2.01	k= 4, v= 8
40 ug/l	37.500	4.899	*	2.02	k= 5, v= 8

s =   3.005
Note: df used for table values are approximate when v > 20.

fonofos:Female Lengths of Po Generation at test term
File: a:\442032PO.FLN   Transform: NO TRANSFORMATION

KRUSKAL - WALLIS' ANOVA BY RANKS - TABLE 1 OF 2 (p=0.05)

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	GRPS 1&2 POOLED	50.250	50.250	37.000
2	2.5 ug/l	55.500	55.500	26.000
3	5.0 ug/l	51.000	51.000	19.000
4	10 ug/l	46.500	46.500	9.000
5	20 ug/l	47.000	47.000	11.000
6	40 ug/l	37.500	37.500	3.000

Calculated H Value = 10.305   Critical H Value Table = 11.070
Since Calc H < Crit H FAIL TO REJECT Ho:All groups are equal.

fonofos:Female Lengths of Po Generation at test term
File: a:\442032PO.FLN   Transform: NO TRANSFORMATION

DUNN'S MULTIPLE COMPARISON - KRUSKAL - WALLIS - TABLE 2 OF 2 (p=0.05)

                                            GROUP
                         TRANSFORMED ORIGINAL 0 0 0 0 0 0
GROUP IDENTIFICATION   MEAN   MEAN   6 4 5 1 3 2
----- --------------   ----------- -------- - - - - - -
  6   40 ug/l   37.500   37.500   \
  4   10 ug/l   46.500   46.500   . \
  5   20 ug/l   47.000   47.000   . . \
  1   GRPS 1&2 POOLED   50.250   50.250   . . . \
  3   5.0 ug/l   51.000   51.000   . . . . \
  2   2.5 ug/l   55.500   55.500   . . . . . \
----
* = significant difference (p=0.05)   . = no significant difference
Table q value (0.05,6) =   2.936   Unequal reps - several SE values used

fonofos:Male Lengths of Po Generation at test term
File: 442032p0.mln   Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls   Ho:GRP1 MEAN = GRP2 MEAN

 GRP1 (SOLVENT CRTL) MEAN =   70.0000   CALCULATED t VALUE =   -1.3416
 GRP2 (BLANK CRTL) MEAN   =   71.5000   DEGREES OF FREEDOM =   2
 DIFFERENCE IN MEANS   =   -1.5000

TABLE t VALUE (0.05 (2), 2) = 4.303   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 2) = 9.925   NO significant difference at alpha=0.01

fonofos:Male Lengths of Po Generation at test term
File: 442032p0.mln   Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
----

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	0.938	3.388	5.348	3.388	0.938
OBSERVED	0	5	4	5	0

Calculated Chi-Square goodness of fit test statistic =   3.7497
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

4

fonofos:Male Lengths of Po Generation at test term
File: 442032p0.mln   Transform: NO TRANSFORMATION

Shapiro - Wilk's test for normality

D =   14.750

W =   0.932

Critical W (P = 0.05) (n = 14) = 0.874
Critical W (P = 0.01) (n = 14) = 0.825

Data PASS normality test at P=0.01 level. Continue analysis.

fonofos:Male Lengths of Po Generation at test term
File: 442032p0.mln   Transform: NO TRANSFORMATION

Hartley's test for homogeneity of variance
Bartlett's test for homogeneity of variance

These two tests can not be performed because at least one group has
zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.

TITLE: fonofos:Male Lengths of Po Generation at test term
FILE: 442032p0.mln
TRANSFORM: NO TRANSFORMATION   NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	GRPS 1&2 POOLED	1	69.0000	69.0000
1	GRPS 1&2 POOLED	2	71.0000	71.0000
1	GRPS 1&2 POOLED	3	72.0000	72.0000
1	GRPS 1&2 POOLED	4	71.0000	71.0000
2	2.5 ug/l	1	71.0000	71.0000
2	2.5 ug/l	2	70.0000	70.0000
3	5.0 ug/l	1	70.0000	70.0000
3	5.0 ug/l	2	67.0000	67.0000
4	10 ug/l	1	65.0000	65.0000
4	10 ug/l	2	65.0000	65.0000
5	20 ug/l	1	56.0000	56.0000
5	20 ug/l	2	53.0000	53.0000
6	40 ug/l	1	50.0000	50.0000
6	40 ug/l	2	49.0000	49.0000
----

fonofos:Male Lengths of Po Generation at test term
File: 442032p0.mln   Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	GRPS 1&2 POOLED	4	69.000	72.000	70.750
2	2.5 ug/l	2	70.000	71.000	70.500
3	5.0 ug/l	2	67.000	70.000	68.500
4	10 ug/l	2	65.000	65.000	65.000
5	20 ug/l	2	53.000	56.000	54.500
6	40 ug/l	2	49.000	50.000	49.500

fonofos:Male Lengths of Po Generation at test term
File: 442032p0.mln   Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	GRPS 1&2 POOLED	1.583	1.258	0.629	1.78
2	2.5 ug/l	0.500	0.707	0.500	1.00
3	5.0 ug/l	4.500	2.121	1.500	3.10
4	10 ug/l	0.000	0.000	0.000	0.00
5	20 ug/l	4.500	2.121	1.500	3.89
6	40 ug/l	0.500	0.707	0.500	1.43

fonofos:Male Lengths of Po Generation at test term
File: 442032p0.mln   Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)   TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	GRPS 1&2 POOLED	4	70.750	70.750	70.750
2	2.5 ug/l	2	70.500	70.500	70.500
3	5.0 ug/l	2	68.500	68.500	68.500
4	10 ug/l	2	65.000	65.000	65.000
5	20 ug/l	2	54.500	54.500	54.500
6	40 ug/l	2	49.500	49.500	49.500

WILLIAMS TEST (Isotonic regression model)   TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
GRPS 1&2 POOLED	70.750				
2.5 ug/l	70.500	0.213		1.86	k= 1, v= 8
5.0 ug/l	68.500	1.913		1.96	k= 2, v= 8
10 ug/l	65.000	4.890	*	2.00	k= 3, v= 8
20 ug/l	54.500	13.819	*	2.01	k= 4, v= 8
40 ug/l	49.500	18.071	*	2.02	k= 5, v= 8

s =   1.358
Note: df used for table values are approximate when v > 20.

fonofos:Male Lengths of Po Generation at test term
File: 442032p0.mln   Transform: NO TRANSFORMATION

KRUSKAL - WALLIS' ANOVA BY RANKS - TABLE 1 OF 2 (p=0.05)

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	GRPS 1&2 POOLED	70.750	70.750	46.000
2	2.5 ug/l	70.500	70.500	21.500
3	5.0 ug/l	68.500	68.500	16.500
4	10 ug/l	65.000	65.000	11.000
5	20 ug/l	54.500	54.500	7.000
6	40 ug/l	49.500	49.500	3.000

   Calculated H Value = 11.480   Critical H Value Table = 11.070
   Since Calc H > Crit H REJECT Ho:All groups are equal.

fonofos:Male Lengths of Po Generation at test term
File: 442032p0.mln   Transform: NO TRANSFORMATION

DUNN'S MULTIPLE COMPARISON - KRUSKAL - WALLIS - TABLE 2 OF 2 (p=0.05)

				GROUP					
		TRANSFORMED	ORIGINAL	0	0	0	0	0	0
GROUP	IDENTIFICATION	MEAN	MEAN	6	5	4	3	2	1
6	40 ug/l	49.500	49.500	\					
5	20 ug/l	54.500	54.500	.	\				
4	10 ug/l	65.000	65.000	.	.	\			
3	5.0 ug/l	68.500	68.500	.	.	.	\		
2	2.5 ug/l	70.500	70.500	.	.	.	.	\	
1	GRPS 1&2 POOLED	70.750	70.750	.	.	.	.	.	\

----
* = significant difference (p=0.05)   . = no significant difference
Table q value (0.05,6) =   2.936   Unequal reps - several SE values used

fonofos:Female Weights of Po Generation at test term
File: 442032p0.fwt   Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls   Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN = 2870.0000   CALCULATED t VALUE =   1.2280
GRP2 (BLANK CRTL) MEAN   = 2285.0000   DEGREES OF FREEDOM =   2
DIFFERENCE IN MEANS   =   585.0000

TABLE t VALUE (0.05 (2), 2) = 4.303   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 2) = 9.925   NO significant difference at alpha=0.01

fonofos:Female Weights of Po Generation at test term
File: 442032p0.fwt   Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies
----

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	0.938	3.388	5.348	3.388	0.938
OBSERVED	0	6	2	6	0

Calculated Chi-Square goodness of fit test statistic =   7.9994
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

fonofos:Female Weights of Po Generation at test term
File: 442032p0.fwt   Transform: NO TRANSFORMATION

Shapiro - Wilk's test for normality

D = 2484387.500

W =   0.946

Critical W (P = 0.05) (n = 14) = 0.874
Critical W (P = 0.01) (n = 14) = 0.825

Data PASS normality test at P=0.01 level. Continue analysis.

fonofos:Female Weights of Po Generation at test term
File: 442032p0.fwt   Transform: NO TRANSFORMATION

Bartlett's test for homogeneity of variance
Calculated B1 statistic =   5.29

Bartlett's test using average degrees of freedom
Calculated B2 statistic =   7.33
    Based on average replicate size of   1.33

Table Chi-square value =   15.09 (alpha = 0.01, df =   5)
Table Chi-square value =   11.07 (alpha = 0.05, df =   5)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.
Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

```
TITLE:     fonofos:Female Weights of Po Generation at test term
FILE:      442032p0.fwt
TRANSFORM: NO TRANSFORMATION                  NUMBER OF GROUPS: 6
------------------------------------------------------------------

GRP  IDENTIFICATION   REP      VALUE          TRANS VALUE
---  ---------------- ----  -------------   -------------
  1  GRPS 1&2 POOLED   1     2700.0000         2700.0000
  1  GRPS 1&2 POOLED   2     3040.0000         3040.0000
  1  GRPS 1&2 POOLED   3     1840.0000         1840.0000
  1  GRPS 1&2 POOLED   4     2730.0000         2730.0000
  2        2.5 ug/l    1     2620.0000         2620.0000
  2        2.5 ug/l    2     4310.0000         4310.0000
  3        5.0 ug/l    1     2830.0000         2830.0000
  3        5.0 ug/l    2     2630.0000 ·       2630.0000
  4         10 ug/l    1     1840.0000         1840.0000
  4         10 ug/l    2     2030.0000         2030.0000
  5         20 ug/l    1     2330.0000         2330.0000
  5         20 ug/l    2     2610.0000         2610.0000
  6         40 ug/l    1      925.0000          925.0000
  6         40 ug/l    2     1530.0000         1530.0000
------------------------------------------------------------------


fonofos:Female Weights of Po Generation at test term
File: 442032p0.fwt        Transform: NO TRANSFORMATION

          SUMMARY STATISTICS ON TRANSFORMED DATA   TABLE 1 of 2
------------------------------------------------------------------

GRP   IDENTIFICATION    N     MIN       MAX       MEAN
---   ---------------- ---- --------- --------- ---------
  1   GRPS 1&2 POOLED   4    1840.000  3040.000  2577.500
  2         2.5 ug/l    2    2620.000  4310.000  3465.000
  3         5.0 ug/l    2    2630.000  2830.000  2730.000
  4          10 ug/l    2    1840.000  2030.000  1935.000
  5          20 ug/l    2    2330.000  2610.000  2470.000
  6          40 ug/l    2     925.000  1530.000  1227.500
------------------------------------------------------------------



fonofos:Female Weights of Po Generation at test term
File: 442032p0.fwt        Transform: NO TRANSFORMATION

          SUMMARY STATISTICS ON TRANSFORMED DATA   TABLE 2 of 2
------------------------------------------------------------------

GRP   IDENTIFICATION    VARIANCE       SD        SEM      C.V. %
---   ---------------- ------------- --------- --------- ---------
  1   GRPS 1&2 POOLED   265358.333    515.129   257.565    19.99
  2         2.5 ug/l   1428050.000   1195.010   845.000    34.49
  3         5.0 ug/l     20000.000    141.421   100.000     5.18
  4          10 ug/l     18050.000    134.350    95.000     6.94
  5          20 ug/l     39200.000    197.990   140.000     8.02
  6          40 ug/l    183012.500    427.800   302.500    34.85
------------------------------------------------------------------
```

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fonofos:Female Weights of Po Generation at test term
File: 442032p0.fwt   Transform: NO TRANSFORMATION

```
                              ANOVA TABLE
---------------------------------------------------------------------

SOURCE           DF           SS                MS              F
---------------------------------------------------------------------
Between          5         5794521.429      1158904.286        3.732

Within (Error)   8         2484387.500       310548.437
---------------------------------------------------------------------
Total            13        8278908.929
---------------------------------------------------------------------
```

Critical F value =   3.69 (0.05,5,8)
Since F > Critical F REJECT Ho: All equal

fonofos:Female Weights of Po Generation at test term
File: 442032p0.fwt   Transform: NO TRANSFORMATION

	BONFERRONI t-TEST - TABLE 1 OF 2		Ho:Control<Treatment		
GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	2577.500	2577.500		
2	2.5 ug/l	3465.000	3465.000	-1.839	
3	5.0 ug/l	2730.000	2730.000	-0.316	
4	10 ug/l	1935.000	1935.000	1.331	
5	20 ug/l	2470.000	2470.000	0.223	
6	40 ug/l	1227.500	1227.500	2.797	

Bonferroni t table value = 2.90   (1 Tailed Value, P=0.05, df=8,5)

fonofos:Female Weights of Po Generation at test term
File: 442032p0.fwt   Transform: NO TRANSFORMATION

	BONFERRONI t-TEST - TABLE 2 OF 2		Ho:Control<Treatment		
GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	GRPS 1&2 POOLED	4			
2	2.5 ug/l	2	1397.877	54.2	-887.500
3	5.0 ug/l	2	1397.877	54.2	-152.500
4	10 ug/l	2	1397.877	54.2	642.500
5	20 ug/l	2	1397.877	54.2	107.500
6	40 ug/l	2	1397.877	54.2	1350.000

fonofos:Female Weights of Po Generation at test term
File: 442032p0.fwt   Transform: NO TRANSFORMATION

        WILLIAMS TEST (Isotonic regression model)   TABLE 1 OF 2

GROUP   ORIGINAL   TRANSFORMED   ISOTONIZED
        IDENTIFICATION   N   MEAN   MEAN   MEAN
------ --------------   --- ----------   -----------   -----------
   1   GRPS 1&2 POOLED   4   2577.500   2577.500   2873.333
   2   2.5 ug/l   2   3465.000   3465.000   2873.333
   3   5.0 ug/l   2   2730.000   2730.000   2730.000
   4   10 ug/l   2   1935.000   1935.000   2202.500
   5   20 ug/l   2   2470.000   2470.000   2202.500
   6   40 ug/l   2   1227.500   1227.500   1227.500
----

fonofos:Female Weights of Po Generation at test term
File: 442032p0.fwt   Transform: NO TRANSFORMATION

        WILLIAMS TEST (Isotonic regression model)   TABLE 2 OF 2

                   ISOTONIZED   CALC.   SIG   TABLE   DEGREES OF
    IDENTIFICATION   MEAN   WILLIAMS P=.05   WILLIAMS   FREEDOM
    -------------- ---------- -------- ----- --------- -----------
    GRPS 1&2 POOLED   2873.333
         2.5 ug/l   2873.333   0.613   1.86   k= 1, v= 8
         5.0 ug/l   2730.000   0.316   1.96   k= 2, v= 8
          10 ug/l   2202.500   0.777   2.00   k= 3, v= 8
          20 ug/l   2202.500   0.777   *   2.01   k= 4, v= 8
          40 ug/l   1227.500   2.797   *   2.02   k= 5, v= 8
----
s = 557.269
Note: df used for table values are approximate when v > 20.

fonofos:Male Weights of Po Generation at test term
File: 442032p0.mwt   Transform: NO TRANSFORM

        t-test of Solvent and Blank Controls   Ho:GRP1 MEAN = GRP2 MEAN

 GRP1 (SOLVENT CRTL) MEAN = 7570.0000   CALCULATED t VALUE =   -1.0539
 GRP2 (BLANK CRTL) MEAN   = 8340.0000   DEGREES OF FREEDOM =   2
 DIFFERENCE IN MEANS   = -770.0000

TABLE t VALUE (0.05 (2), 2) = 4.303   NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 2) = 9.925   NO significant difference at alpha=0.01

Chi-square test for normality: actual and expected frequencies
----

INTERVAL   <-1.5   -1.5 to <-0.5   -0.5 to 0.5   >0.5 to 1.5   >1.5
          _____   _____   _____   _____   _____

EXPECTED 0.938   3.388   5.348   3.388   0.938
OBSERVED 0   6   2   6   0

Calculated Chi-Square goodness of fit test statistic =   7.9994
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

fonofos:Male Weights of Po Generation at test term
File: 442032p0.mwt   Transform: NO TRANSFORMATION

Shapiro - Wilk's test for normality

D = 4277800.000

W =   0.875

Critical W (P = 0.05) (n = 14) = 0.874
Critical W (P = 0.01) (n = 14) = 0.825

Data PASS normality test at P=0.01 level. Continue analysis.

fonofos:Male Weights of Po Generation at test term
File: 442032p0.mwt   Transform: NO TRANSFORMATION

Bartlett's test for homogeneity of variance
Calculated B1 statistic =   1.13

Bartlett's test using average degrees of freedom
Calculated B2 statistic =   1.57
   Based on average replicate size of   1.33

Table Chi-square value =   15.09 (alpha = 0.01, df =   5)
Table Chi-square value =   11.07 (alpha = 0.05, df =   5)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.
Data PASS B2 homogeneity test at 0.01 level. Continue analysis.

TITLE: fonofos:Male Weights of Po Generation at test term
FILE: 442032p0.mwt
TRANSFORM: NO TRANSFORMATION   NUMBER OF GROUPS: 6

GRP	IDENTIFICATION	REP	VALUE	TRANS VALUE
1	GRPS 1&2 POOLED	1	6840.0000	6840.0000
1	GRPS 1&2 POOLED	2	8300.0000	8300.0000
1	GRPS 1&2 POOLED	3	8310.0000	8310.0000
1	GRPS 1&2 POOLED	4	8370.0000	8370.0000
2	2.5 ug/l	1	8910.0000	8910.0000
2	2.5 ug/l	2	7690.0000	7690.0000
3	5.0 ug/l	1	8560.0000	8560.0000
3	5.0 ug/l	2	7420.0000	7420.0000
4	10 ug/l	1	6600.0000	6600.0000
4	10 ug/l	2	7790.0000	7790.0000
5	20 ug/l	1	4680.0000	4680.0000
5	20 ug/l	2	5640.0000	5640.0000
6	40 ug/l	1	3480.0000	3480.0000
6	40 ug/l	2	3810.0000	3810.0000

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fonofos:Male Weights of Po Generation at test term
File: 442032p0.mwt   Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	GRPS 1&2 POOLED	4	6840.000	8370.000	7955.000
2	2.5 ug/l	2	7690.000	8910.000	8300.000
3	5.0 ug/l	2	7420.000	8560.000	7990.000
4	10 ug/l	2	6600.000	7790.000	7195.000
5	20 ug/l	2	4680.000	5640.000	5160.000
6	40 ug/l	2	3480.000	3810.000	3645.000

----

fonofos:Male Weights of Po Generation at test term
File: 442032p0.mwt   Transform: NO TRANSFORMATION

SUMMARY STATISTICS ON TRANSFORMED DATA TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	GRPS 1&2 POOLED	553500.000	743.976	371.988	9.35
2	2.5 ug/l	744200.000	862.670	610.000	10.39
3	5.0 ug/l	649800.000	806.102	570.000	10.09
4	10 ug/l	708050.000	841.457	595.000	11.70
5	20 ug/l	460800.000	678.823	480.000	13.16
6	40 ug/l	54450.000	233.345	165.000	6.40

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	38164742.857	7632948.571	14.275
Within (Error)	8	4277800.000	534725.000	
Total	13	42442542.857		

Critical F value = 3.69 (0.05,5,8)
Since F > Critical F REJECT Ho: All equal

BONFERRONI t-TEST - TABLE 1 OF 2   Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	7955.000	7955.000		
2	2.5 ug/l	8300.000	8300.000	-0.545	
3	5.0 ug/l	7990.000	7990.000	-0.055	
4	10 ug/l	7195.000	7195.000	1.200	
5	20 ug/l	5160.000	5160.000	4.414	*
6	40 ug/l	3645.000	3645.000	6.806	*

Bonferroni t table value = 2.90   (1 Tailed Value, P=0.05, df=8,5)

fonofos:Male Weights of Po Generation at test term
File: 442032p0.mwt   Transform: NO TRANSFORMATION

```
        BONFERRONI t-TEST   -   TABLE 2 OF 2          Ho:Control<Treatment
```

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	GRPS 1&2 POOLED	4			
2	2.5 ug/l	2	1834.296	23.1	-345.000
3	5.0 ug/l	2	1834.296	23.1	-35.000
4	10 ug/l	2	1834.296	23.1	760.000
5	20 ug/l	2	1834.296	23.1	2795.000
6	40 ug/l	2	1834.296	23.1	4310.000

fonofos:Male Weights of Po Generation at test term
File: 442032p0.mwt   Transform: NO TRANSFORMATION

```
        WILLIAMS TEST  (Isotonic regression model)    TABLE 1 OF 2
```

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	GRPS 1&2 POOLED	4	7955.000	7955.000	8070.000
2	2.5 ug/l	2	8300.000	8300.000	8070.000
3	5.0 ug/l	2	7990.000	7990.000	7990.000
4	10 ug/l	2	7195.000	7195.000	7195.000
5	20 ug/l	2	5160.000	5160.000	5160.000
6	40 ug/l	2	3645.000	3645.000	3645.000

fonofos:Male Weights of Po Generation at test term
File: 442032p0.mwt   Transform: NO TRANSFORMATION

```
        WILLIAMS TEST  (Isotonic regression model)    TABLE 2 OF 2
```

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
GRPS 1&2 POOLED	8070.000				
2.5 ug/l	8070.000	0.182		1.86	k= 1, v= 8
5.0 ug/l	7990.000	0.055		1.96	k= 2, v= 8
10 ug/l	7195.000	1.200		2.00	k= 3, v= 8
20 ug/l	5160.000	4.414	*	2.01	k= 4, v= 8
40 ug/l	3645.000	6.806	*	2.02	k= 5, v= 8

s = 731.249
Note: df used for table values are approximate when v > 20.

OBS	LEVEL	REP	LEN28	LEN56
1	Control	1	21	27
2	Control	1	19	18
3	Control	1	19	29
4	Control	1	20	31
5	Control	1	19	30
6	Control	1	17	34
7	Control	1	15	37
8	Control	1	19	22
9	Control	1	17	31
10	Control	1	13	29
11	Control	1	18	24
12	Control	1	19	30
13	Control	1	19	33
14	Control	1	18	32
15	Control	1	21	25
16	Control	1	19	28
17	Control	1	21	30
18	Control	1	20	32
19	Control	1	19	29
20	Control	1	20	32
21	Control	1	20	35
22	Control	1	21	33
23	Control	1	20	33
24	Control	1	21	31
25	Control	1	18	33
26	Control	1	20	29
27	Control	1	21	31
28	Control	1	19	27
29	Control	1	20	30
30	Control	1	22	34
31	Control	1	16	29
32	Control	1	17	30
33	Control	1	19	27
34	Control	1	19	32
35	Control	1	20	28
36	Control	1	21	27
37	Control	1	15	32
38	Control	1	17	26
39	Control	1	19	30
40	Control	1	18	31
41	Control	1	16	34
42	Control	1	18	30
43	Control	1	20	33
44	Control	1	20	29
45	Control	1	17	30
46	Control	1	19	29
47	Control	1	18	29
48	Control	2	20	31
49	Control	2	19	31
50	Control	2	22	28
51	Control	2	23	30
52	Control	2	19	30
53	Control	2	20	30
54	Control	2	19	34
55	Control	2	20	33
56	Control	2	19	35
57	Control	2	19	29
58	Control	2	20	34
59	Control	2	17	26
60	Control	2	18	32
61	Control	2	18	33
62	Control	2	18	30
63	Control	2	19	34
64	Control	2	21	37

OBS	LEVEL	REP	LEN28	LEN56
65	Control	2	18	30
66	Control	2	20	34
67	Control	2	17	30
68	Control	2	23	27
69	Control	2	20	29
70	Control	2	22	33
71	Control	2	23	34
72	Control	2	18	32
73	Control	2	24	28
74	Control	2	22	30
75	Control	2	19	26
76	Control	2	16	33
77	Control	2	21	30
78	Control	2	20	33
79	Control	2	16	32
80	Control	2	21	33
81	Control	2	18	31
82	Control	2	19	32
83	Control	2	17	34
84	Control	2	16	26
85	Control	2	21	29
86	Control	2	20	33
87	Control	2	22	29
88	Control	2	20	.
89	Sol_Cont	1	13	29
90	Sol_Cont	1	21	34
91	Sol_Cont	1	19	31
92	Sol_Cont	1	20	33
93	Sol_Cont	1	23	30
94	Sol_Cont	1	22	30
95	Sol_Cont	1	19	36
96	Sol_Cont	1	23	34
97	Sol_Cont	1	20	32
98	Sol_Cont	1	12	32
99	Sol_Cont	1	19	31
100	Sol_Cont	1	20	36
101	Sol_Cont	1	21	32
102	Sol_Cont	1	23	28
103	Sol_Cont	1	22	18
104	Sol_Cont	1	19	32
105	Sol_Cont	1	19	31
106	Sol_Cont	1	21	29
107	Sol_Cont	1	20	33
108	Sol_Cont	1	22	31
109	Sol_Cont	1	15	35
110	Sol_Cont	1	20	27
111	Sol_Cont	1	22	.
112	Sol_Cont	1	16	32
113	Sol_Cont	1	23	26
114	Sol_Cont	1	20	32
115	Sol_Cont	1	20	29
116	Sol_Cont	1	18	23
117	Sol_Cont	1	18	32
118	Sol_Cont	1	18	37
119	Sol_Cont	1	21	30
120	Sol_Cont	1	17	31
121	Sol_Cont	1	18	30
122	Sol_Cont	1	19	32
123	Sol_Cont	1	20	31
124	Sol_Cont	1	19	28
125	Sol_Cont	1	18	31
126	Sol_Cont	1	24	34
127	Sol_Cont	1	19	30
128	Sol_Cont	1	20	33

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

OBS	LEVEL	REP	LEN28	LEN56
129	Sol_Cont	1	22	36
130	Sol_Cont	1	21	30
131	Sol_Cont	1	17	29
132	Sol_Cont	1	22	33
133	Sol_Cont	1	21	31
134	Sol_Cont	1	22	33
135	Sol_Cont	2	18	34
136	Sol_Cont	2	19	28
137	Sol_Cont	2	22	31
138	Sol_Cont	2	20	33
139	Sol_Cont	2	14	27
140	Sol_Cont	2	18	28
141	Sol_Cont	2	18	35
142	Sol_Cont	2	19	26
143	Sol_Cont	2	21	30
144	Sol_Cont	2	21	28
145	Sol_Cont	2	18	32
146	Sol_Cont	2	18	22
147	Sol_Cont	2	19	25
148	Sol_Cont	2	22	31
149	Sol_Cont	2	22	30
150	Sol_Cont	2	16	31
151	Sol_Cont	2	20	32
152	Sol_Cont	2	16	27
153	Sol_Cont	2	16	31
154	Sol_Cont	2	17	25
155	Sol_Cont	2	21	31
156	Sol_Cont	2	16	33
157	Sol_Cont	2	19	31
158	Sol_Cont	2	22	34
159	Sol_Cont	2	17	33
160	Sol_Cont	2	21	31
161	Sol_Cont	2	18	34
162	Sol_Cont	2	16	29
163	Sol_Cont	2	20	32
164	Sol_Cont	2	21	32
165	Sol_Cont	2	20	31
166	Sol_Cont	2	19	30
167	Sol_Cont	2	18	29
168	Sol_Cont	2	20	30
169	Sol_Cont	2	20	29
170	Sol_Cont	2	19	32
171	Sol_Cont	2	18	34
172	Sol_Cont	2	21	32
173	Sol_Cont	2	20	32
174	Sol_Cont	2	16	35
175	Sol_Cont	2	20	29
176	Sol_Cont	2	21	34
177	Sol_Cont	2	22	27
178	Sol_Cont	2	21	32
179	Sol_Cont	2	21	.
180	TRT 1	1	15	31
181	TRT 1	1	21	31
182	TRT 1	1	21	26
183	TRT 1	1	18	29
184	TRT 1	1	19	31
185	TRT 1	1	19	30
186	TRT 1	1	19	31
187	TRT 1	1	21	27
188	TRT 1	1	18	30
189	TRT 1	1	20	32
190	TRT 1	1	21	30
191	TRT 1	1	18	31
192	TRT 1	1	21	26

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

OBS	LEVEL	REP	LEN28	LEN56
193	TRT 1	1	20	29
194	TRT 1	1	17	32
195	TRT 1	1	18	27
196	TRT 1	1	23	29
197	TRT 1	1	18	28
198	TRT 1	1	18	31
199	TRT 1	1	20	34
200	TRT 1	1	19	30
201	TRT 1	1	18	33
202	TRT 1	1	20	34
203	TRT 1	1	18	32
204	TRT 1	1	19	31
205	TRT 1	1	21	31
206	TRT 1	1	18	29
207	TRT 1	1	18	32
208	TRT 1	1	18	28
209	TRT 1	1	19	33
210	TRT 1	1	20	32
211	TRT 1	1	19	28
212	TRT 1	1	22	26
213	TRT 1	1	19	29
214	TRT 1	1	21	32
215	TRT 1	1	20	27
216	TRT 1	1	18	28
217	TRT 1	1	20	34
218	TRT 1	1	19	31
219	TRT 1	1	22	28
220	TRT 1	1	20	29
221	TRT 1	2	19	34
222	TRT 1	2	21	33
223	TRT 1	2	19	35
224	TRT 1	2	20	30
225	TRT 1	2	19	24
226	TRT 1	2	19	26
227	TRT 1	2	14	31
228	TRT 1	2	19	32
229	TRT 1	2	20	32
230	TRT 1	2	21	28
231	TRT 1	2	21	31
232	TRT 1	2	16	30
233	TRT 1	2	20	31
234	TRT 1	2	19	31
235	TRT 1	2	15	31
236	TRT 1	2	19	35
237	TRT 1	2	20	30
238	TRT 1	2	18	28
239	TRT 1	2	22	33
240	TRT 1	2	19	24
241	TRT 1	2	19	32
242	TRT 1	2	17	27
243	TRT 1	2	18	30
244	TRT 1	2	16	34
245	TRT 1	2	20	27
246	TRT 1	2	20	30
247	TRT 1	2	20	34
248	TRT 1	2	19	31
249	TRT 1	2	19	32
250	TRT 1	2	16	29
251	TRT 1	2	15	36
252	TRT 1	2	18	32
253	TRT 1	2	19	27
254	TRT 1	2	22	31
255	TRT 1	2	20	32
256	TRT 1	2	20	34

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

OBS	LEVEL	REP	LEN28	LEN56
257	TRT 1	2	21	27
258	TRT 1	2	22	32
259	TRT 1	2	21	25
260	TRT 1	2	24	35
261	TRT 1	2	18	30
262	TRT 1	2	18	32
263	TRT 1	2	20	32
264	TRT 1	2	19	29
265	TRT 1	2	20	33
266	TRT 1	2	19	29
267	TRT 1	2	20	31
268	TRT 1	2	20	31
269	TRT 1	2	20	.
270	TRT 2	1	14	35
271	TRT 2	1	18	26
272	TRT 2	1	14	27
273	TRT 2	1	18	27
274	TRT 2	1	18	28
275	TRT 2	1	20	30
276	TRT 2	1	16	32
277	TRT 2	1	16	26
278	TRT 2	1	20	29
279	TRT 2	1	19	26
280	TRT 2	1	19	31
281	TRT 2	1	16	27
282	TRT 2	1	19	30
283	TRT 2	1	19	22
284	TRT 2	1	19	34
285	TRT 2	1	19	28
286	TRT 2	1	21	30
287	TRT 2	1	23	31
288	TRT 2	1	19	25
289	TRT 2	1	19	34
290	TRT 2	1	23	29
291	TRT 2	1	18	31
292	TRT 2	1	19	31
293	TRT 2	1	14	30
294	TRT 2	1	20	29
295	TRT 2	1	21	28
296	TRT 2	1	22	30
297	TRT 2	1	18	24
298	TRT 2	1	20	29
299	TRT 2	1	18	26
300	TRT 2	1	18	25
301	TRT 2	1	20	35
302	TRT 2	1	18	23
303	TRT 2	1	14	24
304	TRT 2	1	19	29
305	TRT 2	1	17	36
306	TRT 2	1	15	34
307	TRT 2	1	21	30
308	TRT 2	1	24	21
309	TRT 2	1	19	24
310	TRT 2	1	20	36
311	TRT 2	1	18	35
312	TRT 2	1	20	32
313	TRT 2	1	14	26
314	TRT 2	1	21	28
315	TRT 2	2	21	36
316	TRT 2	2	21	30
317	TRT 2	2	19	34
318	TRT 2	2	18	26
319	TRT 2	2	19	27
320	TRT 2	2	18	28

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

OBS	LEVEL	REP	LEN28	LEN56
321	TRT 2	2	19	32
322	TRT 2	2	17	25
323	TRT 2	2	22	25
324	TRT 2	2	16	30
325	TRT 2	2	15	31
326	TRT 2	2	19	27
327	TRT 2	2	18	32
328	TRT 2	2	16	29
329	TRT 2	2	17	32
330	TRT 2	2	17	26
331	TRT 2	2	20	27
332	TRT 2	2	20	26
333	TRT 2	2	20	28
334	TRT 2	2	18	32
335	TRT 2	2	21	35
336	TRT 2	2	17	30
337	TRT 2	2	17	.
338	TRT 2	2	20	36
339	TRT 2	2	17	34
340	TRT 2	2	21	31
341	TRT 2	2	18	25
342	TRT 2	2	16	32
343	TRT 2	2	18	28
344	TRT 2	2	18	31
345	TRT 2	2	19	31
346	TRT 2	2	21	31
347	TRT 2	2	21	23
348	TRT 2	2	17	32
349	TRT 2	2	19	31
350	TRT 2	2	21	34
351	TRT 2	2	22	32
352	TRT 2	2	18	28
353	TRT 2	2	20	27
354	TRT 2	2	17	31
355	TRT 2	2	21	35
356	TRT 2	2	18	29
357	TRT 2	2	18	28
358	TRT 2	2	20	23
359	TRT 2	2	20	24
360	TRT 2	2	18	29
361	TRT 3	1	16	26
362	TRT 3	1	19	30
363	TRT 3	1	20	35
364	TRT 3	1	16	23
365	TRT 3	1	17	29
366	TRT 3	1	20	31
367	TRT 3	1	18	32
368	TRT 3	1	21	33
369	TRT 3	1	19	30
370	TRT 3	1	17	24
371	TRT 3	1	20	31
372	TRT 3	1	18	28
373	TRT 3	1	18	27
374	TRT 3	1	20	31
375	TRT 3	1	19	28
376	TRT 3	1	20	23
377	TRT 3	1	20	29
378	TRT 3	1	16	28
379	TRT 3	1	17	32
380	TRT 3	1	23	34
381	TRT 3	1	15	29
382	TRT 3	1	16	28
383	TRT 3	1	16	.
384	TRT 3	1	18	.

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

OBS	LEVEL	REP	LEN28	LEN56
385	TRT 3	1	19	.
386	TRT 3	1	14	.
387	TRT 3	1	19	.
388	TRT 3	1	16	.
389	TRT 3	1	16	.
390	TRT 3	1	16	.
391	TRT 3	1	20	.
392	TRT 3	1	16	.
393	TRT 3	1	18	.
394	TRT 3	1	19	.
395	TRT 3	1	17	.
396	TRT 3	1	19	.
397	TRT 3	1	16	.
398	TRT 3	1	20	.
399	TRT 3	1	21	.
400	TRT 3	1	19	.
401	TRT 3	1	21	.
402	TRT 3	1	19	.
403	TRT 3	1	18	.
404	TRT 3	1	17	.
405	TRT 3	1	17	.
406	TRT 3	1	17	.
407	TRT 3	2	19	24
408	TRT 3	2	20	29
409	TRT 3	2	17	27
410	TRT 3	2	15	26
411	TRT 3	2	17	31
412	TRT 3	2	19	21
413	TRT 3	2	17	23
414	TRT 3	2	19	31
415	TRT 3	2	18	28
416	TRT 3	2	15	27
417	TRT 3	2	17	33
418	TRT 3	2	19	26
419	TRT 3	2	20	23
420	TRT 3	2	18	29
421	TRT 3	2	19	35
422	TRT 3	2	19	36
423	TRT 3	2	18	34
424	TRT 3	2	20	26
425	TRT 3	2	18	24
426	TRT 3	2	18	33
427	TRT 3	2	15	27
428	TRT 3	2	14	30
429	TRT 3	2	18	29
430	TRT 3	2	19	31
431	TRT 3	2	17	24
432	TRT 3	2	16	26
433	TRT 3	2	17	34
434	TRT 3	2	17	32
435	TRT 3	2	17	25
436	TRT 3	2	17	31
437	TRT 3	2	20	27
438	TRT 3	2	18	26
439	TRT 3	2	21	35
440	TRT 3	2	17	29
441	TRT 3	2	20	24
442	TRT 3	2	18	26
443	TRT 3	2	15	28
444	TRT 3	2	17	32
445	TRT 3	2	21	29
446	TRT 3	2	18	22
447	TRT 3	2	19	34
448	TRT 3	2	17	27

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

OBS	LEVEL	REP	LEN28	LEN56
449	TRT 3	2	17	22
450	TRT 3	2	16	26
451	TRT 3	2	15	25
452	TRT 3	2	19	30
453	TRT 3	2	19	29
454	TRT 4	1	15	15
455	TRT 4	1	17	9
456	TRT 4	1	19	28
457	TRT 4	1	20	23
458	TRT 4	1	16	35
459	TRT 4	1	17	29
460	TRT 4	1	9	17
461	TRT 4	1	17	30
462	TRT 4	1	18	23
463	TRT 4	1	17	21
464	TRT 4	1	14	28
465	TRT 4	1	16	25
466	TRT 4	1	17	27
467	TRT 4	1	13	28
468	TRT 4	1	16	18
469	TRT 4	1	17	31
470	TRT 4	1	14	25
471	TRT 4	1	15	24
472	TRT 4	1	6	22
473	TRT 4	1	13	30
474	TRT 4	1	13	25
475	TRT 4	1	16	32
476	TRT 4	1	21	23
477	TRT 4	1	25	21
478	TRT 4	1	17	18
479	TRT 4	1	17	30
480	TRT 4	1	15	26
481	TRT 4	1	19	24
482	TRT 4	1	16	24
483	TRT 4	1	16	33
484	TRT 4	1	16	22
485	TRT 4	1	19	26
486	TRT 4	1	17	30
487	TRT 4	1	19	23
488	TRT 4	1	14	30
489	TRT 4	1	16	23
490	TRT 4	1	16	22
491	TRT 4	1	15	23
492	TRT 4	1	15	22
493	TRT 4	1	17	28
494	TRT 4	1	14	23
495	TRT 4	1	16	23
496	TRT 4	1	17	20
497	TRT 4	1	16	34
498	TRT 4	1	19	22
499	TRT 4	1	18	18
500	TRT 4	1	16	25
501	TRT 4	1	15	.
502	TRT 4	1	11	.
503	TRT 4	2	16	25
504	TRT 4	2	16	23
505	TRT 4	2	18	22
506	TRT 4	2	16	21
507	TRT 4	2	15	23
508	TRT 4	2	18	32
509	TRT 4	2	18	22
510	TRT 4	2	16	26
511	TRT 4	2	14	18
512	TRT 4	2	17	38

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

OBS	LEVEL	REP	LEN28	LEN56
513	TRT 4	2	16	26
514	TRT 4	2	18	24
515	TRT 4	2	15	28
516	TRT 4	2	16	23
517	TRT 4	2	18	34
518	TRT 4	2	14	32
519	TRT 4	2	16	26
520	TRT 4	2	21	27
521	TRT 4	2	15	27
522	TRT 4	2	17	26
523	TRT 4	2	14	25
524	TRT 4	2	16	25
525	TRT 4	2	17	24
526	TRT 4	2	15	32
527	TRT 4	2	15	26
528	TRT 4	2	16	24
529	TRT 4	2	16	28
530	TRT 4	2	17	26
531	TRT 4	2	16	22
532	TRT 4	2	12	35
533	TRT 4	2	13	33
534	TRT 4	2	17	27
535	TRT 4	2	20	32
536	TRT 4	2	15	25
537	TRT 4	2	16	19
538	TRT 4	2	18	21
539	TRT 4	2	16	24
540	TRT 4	2	15	28
541	TRT 4	2	18	17
542	TRT 4	2	15	33
543	TRT 4	2	18	26
544	TRT 4	2	17	25
545	TRT 4	2	18	25
546	TRT 4	2	16	22
547	TRT 4	2	19	29
548	TRT 4	2	19	31
549	TRT 4	2	19	25
550	TRT 4	2	17	26
551	TRT 4	2	15	.
552	TRT 5	1	16	24
553	TRT 5	1	13	26
554	TRT 5	1	15	25
555	TRT 5	1	13	19
556	TRT 5	1	16	17
557	TRT 5	1	17	25
558	TRT 5	1	15	23
559	TRT 5	1	13	30
560	TRT 5	1	15	33
561	TRT 5	1	16	19
562	TRT 5	1	16	25
563	TRT 5	1	9	10
564	TRT 5	1	9	20
565	TRT 5	1	14	25
566	TRT 5	1	16	25
567	TRT 5	1	14	25
568	TRT 5	1	11	22
569	TRT 5	1	13	29
570	TRT 5	1	15	24
571	TRT 5	1	13	21
572	TRT 5	1	13	29
573	TRT 5	1	19	28
574	TRT 5	1	14	.
575	TRT 5	1	14	18
576	TRT 5	1	17	21

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

OBS	LEVEL	REP	LEN28	LEN56
577	TRT 5	1	17	28
578	TRT 5	1	9	22
579	TRT 5	1	14	23
580	TRT 5	1	11	33
581	TRT 5	1	16	21
582	TRT 5	1	19	29
583	TRT 5	1	12	21
584	TRT 5	1	14	31
585	TRT 5	1	15	25
586	TRT 5	1	16	22
587	TRT 5	1	16	39
588	TRT 5	1	12	19
589	TRT 5	1	15	18
590	TRT 5	1	16	24
591	TRT 5	1	13	27
592	TRT 5	1	17	18
593	TRT 5	1	17	21
594	TRT 5	1	16	.
595	TRT 5	2	13	29
596	TRT 5	2	15	26
597	TRT 5	2	15	21
598	TRT 5	2	15	19
599	TRT 5	2	12	25
600	TRT 5	2	15	28
601	TRT 5	2	14	26
602	TRT 5	2	11	24
603	TRT 5	2	15	17
604	TRT 5	2	15	19
605	TRT 5	2	16	24
606	TRT 5	2	14	20
607	TRT 5	2	14	20
608	TRT 5	2	15	27
609	TRT 5	2	15	23
610	TRT 5	2	15	25
611	TRT 5	2	14	20
612	TRT 5	2	13	24
613	TRT 5	2	14	20
614	TRT 5	2	13	17
615	TRT 5	2	13	25
616	TRT 5	2	14	27
617	TRT 5	2	15	28
618	TRT 5	2	13	.
619	TRT 5	2	15	20
620	TRT 5	2	14	19
621	TRT 5	2	16	24
622	TRT 5	2	10	29
623	TRT 5	2	11	28
624	TRT 5	2	14	20
625	TRT 5	2	13	27
626	TRT 5	2	16	19
627	TRT 5	2	17	17
628	TRT 5	2	16	19
629	TRT 5	2	13	24
630	TRT 5	2	16	17
631	TRT 5	2	16	28
632	TRT 5	2	12	24
633	TRT 5	2	13	28
634	TRT 5	2	16	24
635	TRT 5	2	15	21

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

-------------------------- LEVEL=Control --------------------------

Variable	N	Mean	Std Dev	CV
REP	88	1.466	0.502	34.224
LEN28	88	19.182	1.963	10.231
LEN56	87	30.460	3.110	10.209

-------------------------- LEVEL=Sol_Cont --------------------------

Variable	N	Mean	Std Dev	CV
REP	91	1.495	0.503	33.639
LEN28	91	19.440	2.296	11.811
LEN56	89	30.775	3.129	10.167

-------------------------- LEVEL=TRT 1 --------------------------

Variable	N	Mean	Std Dev	CV
REP	90	1.544	0.501	32.427
LEN28	90	19.256	1.758	9.131
LEN56	89	30.393	2.596	8.543

-------------------------- LEVEL=TRT 2 --------------------------

Variable	N	Mean	Std Dev	CV
REP	91	1.505	0.503	33.394
LEN28	91	18.681	2.118	11.338
LEN56	90	29.289	3.614	12.339

-------------------------- LEVEL=TRT 3 --------------------------

Variable	N	Mean	Std Dev	CV
REP	93	1.505	0.503	33.392
LEN28	93	17.946	1.790	9.973
LEN56	69	28.507	3.681	12.912

-------------------------- LEVEL=TRT 4 --------------------------

Variable	N	Mean	Std Dev	CV
REP	98	1.500	0.503	33.505
LEN28	98	16.245	2.403	14.792
LEN56	95	25.432	4.844	19.046

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

-------------------------- LEVEL=TRT 5 --------------------------

Variable	N	Mean	Std Dev	CV
REP	84	1.488	0.503	33.792
LEN28	84	14.310	2.024	14.143
LEN56	81	23.531	4.594	19.522

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

General Linear Models Procedure
Class Level Information

Class	Levels	Values
LEVEL	7	Control Sol_Cont TRT 1 TRT 2 TRT 3 TRT 4 TRT 5

Number of observations in data set = 635

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
    1. ANALYSIS OF Length at 28 Days - F0 GENERATION
    ****

General Linear Models Procedure
Type I Estimable Functions for: LEVEL

Effect		Coefficients
INTERCEPT		0
LEVEL	Control	L2
	Sol_Cont	L3
	TRT 1	L4
	TRT 2	L5
	TRT 3	L6
	TRT 4	L7
	TRT 5	-L2-L3-L4-L5-L6-L7

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
    1. ANALYSIS OF Length at 28 Days - F0 GENERATION
    ****

General Linear Models Procedure

Dependent Variable: LEN28

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	1932.4680	322.0780	75.38	0.0001
Error	628	2683.1950	4.2726		
Corrected Total	634	4615.6630			

R-Square	C.V.	Root MSE	LEN28 Mean
0.418676	11.56137	2.0670	17.879

Source	DF	Type I SS	Mean Square	F Value	Pr > F
LEVEL	6	1932.4680	322.0780	75.38	0.0001

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
    1. ANALYSIS OF Length at 28 Days - F0 GENERATION
    ****

General Linear Models Procedure
Least Squares Means

	LEVEL	LEN28 LSMEAN	LSMEAN Number
	Control	19.1818182	1
	Sol_Cont	19.4395604	2
	TRT 1	19.2555556	3
	TRT 2	18.6813187	4
	TRT 3	17.9462366	5
	TRT 4	16.2448980	6
	TRT 5	14.3095238	7

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

i/j	1	2	3	4	5	6	7
1	.	0.4046	0.8120	0.1058	0.0001	0.0001	0.0001
2	0.4046	.	0.5495	0.0136	0.0001	0.0001	0.0001
3	0.8120	0.5495	.	0.0621	0.0001	0.0001	0.0001
4	0.1058	0.0136	0.0621	.	0.0162	0.0001	0.0001
5	0.0001	0.0001	0.0001	0.0162	.	0.0001	0.0001
6	0.0001	0.0001	0.0001	0.0001	0.0001	.	0.0001
7	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	.

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

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 28 Days - FO GENERATION
****

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: LEN28

NOTE: This test controls the type I experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 628 MSE= 4.272603
Critical Value of Studentized Range= 4.183

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

LEVEL Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
Sol_Cont - TRT 1	-0.7249	0.1840	1.0929	
Sol_Cont - Control	-0.6564	0.2577	1.1719	
Sol_Cont - TRT 2	-0.1482	0.7582	1.6647	
Sol_Cont - TRT 3	0.5918	1.4933	2.3949	***
Sol_Cont - TRT 4	2.3046	3.1947	4.0847	***
Sol_Cont - TRT 5	4.2049	5.1300	6.0551	***
TRT 1 - Sol_Cont	-1.0929	-0.1840	0.7249	
TRT 1 - Control	-0.8429	0.0737	0.9903	
TRT 1 - TRT 2	-0.3347	0.5742	1.4832	
TRT 1 - TRT 3	0.4053	1.3093	2.2134	***
TRT 1 - TRT 4	2.1180	3.0107	3.9033	***
TRT 1 - TRT 5	4.0185	4.9460	5.8736	***
Control - Sol_Cont	-1.1719	-0.2577	0.6564	
Control - TRT 1	-0.9903	-0.0737	0.8429	
Control - TRT 2	-0.4136	0.5005	1.4146	
Control - TRT 3	0.3263	1.2356	2.1448	***
Control - TRT 4	2.0390	2.9369	3.8348	***
Control - TRT 5	3.9396	4.8723	5.8049	***

TRT 2	- Sol_Cont	-1.6647	-0.7582	0.1482	
TRT 2	- TRT 1	-1.4832	-0.5742	0.3347	
TRT 2	- Control	-1.4146	-0.5005	0.4136	
TRT 2	- TRT 3	-0.1664	0.7351	1.6366	
TRT 2	- TRT 4	1.5463	2.4364	3.3265	***
TRT 2	- TRT 5	3.4467	4.3718	5.2969	***
TRT 3	- Sol_Cont	-2.3949	-1.4933	-0.5918	***
TRT 3	- TRT 1	-2.2134	-1.3093	-0.4053	***
TRT 3	- Control	-2.1448	-1.2356	-0.3263	***
TRT 3	- TRT 2	-1.6366	-0.7351	0.1664	
TRT 3	- TRT 4	0.8162	1.7013	2.5864	***
TRT 3	- TRT 5	2.7164	3.6367	4.5570	***
TRT 4	- Sol_Cont	-4.0847	-3.1947	-2.3046	***
TRT 4	- TRT 1	-3.9033	-3.0107	-2.1180	***
TRT 4	- Control	-3.8348	-2.9369	-2.0390	***
TRT 4	- TRT 2	-3.3265	-2.4364	-1.5463	***
TRT 4	- TRT 3	-2.5864	-1.7013	-0.8162	***
TRT 4	- TRT 5	1.0263	1.9354	2.8445	***
TRT 5	- Sol_Cont	-6.0551	-5.1300	-4.2049	***
TRT 5	- TRT 1	-5.8736	-4.9460	-4.0185	***
TRT 5	- Control	-5.8049	-4.8723	-3.9396	***
TRT 5	- TRT 2	-5.2969	-4.3718	-3.4467	***
TRT 5	- TRT 3	-4.5570	-3.6367	-2.7164	***

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 28 Days - FO GENERATION
****

General Linear Models Procedure

LEVEL Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
TRT 5 - TRT 4	-2.8445	-1.9354	-1.0263	***

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 28 Days - FO GENERATION
****

General Linear Models Procedure

Dunnett's One-tailed T tests for variable: LEN28

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

Alpha= 0.05 Confidence= 0.95 df= 628 MSE= 4.272603
Critical Value of Dunnett's T= 2.298

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

LEVEL Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
TRT 1 - Sol_Cont	-0.8900	-0.1840	0.5220	
Control - Sol_Cont	-0.9678	-0.2577	0.4523	
TRT 2 - Sol_Cont	-1.4623	-0.7582	-0.0542	***
TRT 3 - Sol_Cont	-2.1936	-1.4933	-0.7931	***
TRT 4 - Sol_Cont	-3.8860	-3.1947	-2.5033	***
TRT 5 - Sol_Cont	-5.8486	-5.1300	-4.4115	***

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F0 GENERATION
****

General Linear Models Procedure
Class Level Information

Class	Levels	Values
LEVEL	7	Control Sol_Cont TRT 1 TRT 2 TRT 3 TRT 4 TRT 5

Number of observations in data set = 635

NOTE: Due to missing values, only 600 observations can be used in this
analysis.

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F0 GENERATION
****

General Linear Models Procedure
Type I Estimable Functions for: LEVEL

Effect		Coefficients
INTERCEPT		0
LEVEL	Control	L2
	Sol_Cont	L3
	TRT 1	L4
	TRT 2	L5
	TRT 3	L6
	TRT 4	L7
	TRT 5	-L2-L3-L4-L5-L6-L7

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F0 GENERATION
****

General Linear Models Procedure

Dependent Variable: LEN56

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	4053.5009	675.5835	48.48	0.0001
Error	593	8263.5641	13.9352		
Corrected Total	599	12317.0650			

	R-Square	C.V.	Root MSE	LEN56 Mean
	0.329096	13.16054	3.7330	28.365

Source	DF	Type I SS	Mean Square	F Value	Pr > F
LEVEL	6	4053.5009	675.5835	48.48	0.0001

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F0 GENERATION
****

General Linear Models Procedure
Least Squares Means

LEVEL	LEN56 LSMEAN	LSMEAN Number
Control	30.4597701	1
Sol_Cont	30.7752809	2
TRT 1	30.3932584	3
TRT 2	29.2888889	4
TRT 3	28.5072464	5
TRT 4	25.4315789	6
TRT 5	23.5308642	7

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

i/j	1	2	3	4	5	6	7
1	.	0.5753	0.9060	0.0374	0.0012	0.0001	0.0001
2	0.5753	.	0.4951	0.0079	0.0002	0.0001	0.0001
3	0.9060	0.4951	.	0.0483	0.0017	0.0001	0.0001
4	0.0374	0.0079	0.0483	.	0.1912	0.0001	0.0001
5	0.0012	0.0002	0.0017	0.1912	.	0.0001	0.0001
6	0.0001	0.0001	0.0001	0.0001	0.0001	.	0.0008
7	0.0001	0.0001	0.0001	0.0001	0.0001	0.0008	.

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

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F0 GENERATION
****

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: LEN56

NOTE: This test controls the type I experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 593 MSE= 13.93518
Critical Value of Studentized Range= 4.184

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

LEVEL Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
Sol_Cont - Control	-1.3495	0.3155	1.9806	
Sol_Cont - TRT 1	-1.2735	0.3820	2.0376	
Sol_Cont - TRT 2	-0.1646	1.4864	3.1374	
Sol_Cont - TRT 3	0.4966	2.2680	4.0395	***
Sol_Cont - TRT 4	3.7145	5.3437	6.9729	***
Sol_Cont - TRT 5	5.5485	7.2444	8.9404	***
Control - Sol_Cont	-1.9806	-0.3155	1.3495	
Control - TRT 1	-1.5985	0.0665	1.7316	
Control - TRT 2	-0.4896	1.1709	2.8314	
Control - TRT 3	0.1722	1.9525	3.7329	***
Control - TRT 4	3.3893	5.0282	6.6671	***
Control - TRT 5	5.2237	6.9289	8.6341	***

```
     TRT 1    - Sol_Cont     -2.0376     -0.3820      1.2735
     TRT 1    - Control      -1.7316     -0.0665      1.5985
     TRT 1    - TRT 2        -0.5466      1.1044      2.7553
     TRT 1    - TRT 3         0.1145      1.8860      3.6575    ***
     TRT 1    - TRT 4         3.3325      4.9617      6.5909    ***
     TRT 1    - TRT 5         5.1664      6.8624      8.5584    ***

     TRT 2    - Sol_Cont     -3.1374     -1.4864      0.1646
     TRT 2    - Control      -2.8314     -1.1709      0.4896
     TRT 2    - TRT 1        -2.7553     -1.1044      0.5466
     TRT 2    - TRT 3        -0.9855      0.7816      2.5488
     TRT 2    - TRT 4         2.2328      3.8573      5.4819    ***
     TRT 2    - TRT 5         4.0666      5.7580      7.4495    ***

     TRT 3    - Sol_Cont     -4.0395     -2.2680     -0.4966    ***
     TRT 3    - Control      -3.7329     -1.9525     -0.1722    ***
     TRT 3    - TRT 1        -3.6575     -1.8860     -0.1145    ***
     TRT 3    - TRT 2        -2.5488     -0.7816      0.9855
     TRT 3    - TRT 4         1.3288      3.0757      4.8225    ***
     TRT 3    - TRT 5         3.1671      4.9764      6.7857    ***

     TRT 4    - Sol_Cont     -6.9729     -5.3437     -3.7145    ***
     TRT 4    - Control      -6.6671     -5.0282     -3.3893    ***
     TRT 4    - TRT 1        -6.5909     -4.9617     -3.3325    ***
     TRT 4    - TRT 2        -5.4819     -3.8573     -2.2328    ***
     TRT 4    - TRT 3        -4.8225     -3.0757     -1.3288    ***
     TRT 4    - TRT 5         0.2305      1.9007      3.5710    ***

     TRT 5    - Sol_Cont     -8.9404     -7.2444     -5.5485    ***
     TRT 5    - Control      -8.6341     -6.9289     -5.2237    ***
     TRT 5    - TRT 1        -8.5584     -6.8624     -5.1664    ***
     TRT 5    - TRT 2        -7.4495     -5.7580     -4.0666    ***
     TRT 5    - TRT 3        -6.7857     -4.9764     -3.1671    ***
```

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F0 GENERATION
****

General Linear Models Procedure

LEVEL Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
TRT 5 - TRT 4	-3.5710	-1.9007	-0.2305	***

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F0 GENERATION
****

General Linear Models Procedure

Dunnett's One-tailed T tests for variable: LEN56

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

Alpha= 0.05 Confidence= 0.95 df= 593 MSE= 13.93518
Critical Value of Dunnett's T= 2.302

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

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

```
     Control  - Sol_Cont     -1.6110     -0.3155      0.9800
     TRT 1    - Sol_Cont     -1.6702     -0.3820      0.9061
     TRT 2    - Sol_Cont     -2.7710     -1.4864     -0.2018    ***
     TRT 3    - Sol_Cont     -3.6464     -2.2680     -0.8897    ***
     TRT 4    - Sol_Cont     -6.6114     -5.3437     -4.0760    ***
     TRT 5    - Sol_Cont     -8.5640     -7.2444     -5.9248    ***
```

OBS	LEVEL	REP	LEN56_1	WT56_1	LEN56_2	WT56_2
1	Control	1	28.2	349	25.6	241
2	Control	1	28.8	353	26.8	297
3	Control	1	26.5	267	25.4	225
4	Control	1	26.1	244	25.9	281
5	Control	1	29.1	368	26.9	302
6	Control	1	26.2	237	29.7	424
7	Control	1	28.7	308	23.5	157
8	Control	1	25.2	236	26.4	244
9	Control	1	31.5	450	27.8	303
10	Control	1	29.3	343	28.9	372
11	Control	1	29.5	411	27.9	303
12	Control	1	29.6	362	26.9	267
13	Control	1	30.9	449	28.4	392
14	Control	1	28.2	302	26.4	268
15	Control	1	28.7	294	25.6	225
16	Control	1	29.7	329	27.7	306
17	Control	1	28.6	350	26.0	263
18	Control	1	27.6	317	24.7	220
19	Control	1	28.4	334	28.6	360
20	Control	1	26.3	247	27.4	275
21	Control	1	33.2	468	25.6	246
22	Control	1	25.6	232	26.5	243
23	Control	1	.	.	27.0	286
24	Control	1	.	.	26.4	217
25	Control	1	.	.	28.7	358
26	Control	1	.	.	25.8	266
27	Control	2	28.7	330	27.2	295
28	Control	2	29.6	372	27.7	319
29	Control	2	26.8	294	24.4	231
30	Control	2	28.4	361	24.3	229
31	Control	2	27.1	298	24.8	263
32	Control	2	25.4	240	26.1	278
33	Control	2	29.3	365	27.7	302
34	Control	2	31.4	450	25.0	234
35	Control	2	24.6	237	26.6	281
36	Control	2	25.3	269	25.6	281
37	Control	2	28.4	355	27.8	325
38	Control	2	27.5	313	26.5	237
39	Control	2	26.6	295	25.9	269
40	Control	2	29.5	387	25.3	232
41	Control	2	27.4	328	26.0	247
42	Control	2	28.5	380	26.4	269
43	Control	2	26.3	251	27.2	296
44	Control	2	28.0	315	27.2	321
45	Control	2	24.5	225	27.1	306
46	Control	2	26.4	257	25.3	233
47	Control	2	29.2	376	26.2	267
48	Control	2	26.7	267	24.4	222
49	Control	2	25.7	256	24.8	221
50	Control	2	27.3	309	25.5	272
51	Sol_Cont	1	27.2	316	28.3	305
52	Sol_Cont	1	27.6	298	30.3	450
53	Sol_Cont	1	28.6	326	27.4	335
54	Sol_Cont	1	27.1	273	28.3	341
55	Sol_Cont	1	28.5	319	26.3	291
56	Sol_Cont	1	28.0	309	25.5	238
57	Sol_Cont	1	25.2	225	27.8	306
58	Sol_Cont	1	27.8	282	27.6	324
59	Sol_Cont	1	32.2	448	26.4	287
60	Sol_Cont	1	28.3	302	27.3	319
61	Sol_Cont	1	28.2	294	27.9	297
62	Sol_Cont	1	28.3	379	26.9	285
63	Sol_Cont	1	26.3	260	27.0	326
64	Sol_Cont	1	26.4	270	25.6	273
65	Sol_Cont	1	27.4	292	28.7	368.0
66	Sol_Cont	1	29.4	314	27.7	330.0
67	Sol_Cont	1	28.9	318	26.3	333.0
68	Sol_Cont	1	27.6	282	26.3	297.0
69	Sol_Cont	1	27.7	312	28.6	343.0
70	Sol_Cont	1	27.1	283	29.4	406.0
71	Sol_Cont	1	28.6	297	28.3	320.0
72	Sol_Cont	1	27.4	269	29.4	446.0
73	Sol_Cont	1	28.5	319	.	.
74	Sol_Cont	2	27.4	312	16.5	63.7
75	Sol_Cont	2	27.5	342	16.6	66.5
76	Sol_Cont	2	29.6	392	29.4	404.0
77	Sol_Cont	2	25.6	239	27.2	319.0
78	Sol_Cont	2	28.0	325	28.4	368.0
79	Sol_Cont	2	27.7	322	30.2	418.0
80	Sol_Cont	2	28.4	337	26.7	310.0
81	Sol_Cont	2	28.8	322	28.2	307.0
82	Sol_Cont	2	28.8	359	27.8	354.0
83	Sol_Cont	2	27.9	333	26.2	242.0
84	Sol_Cont	2	27.7	274	31.2	474.0
85	Sol_Cont	2	26.4	298	27.8	410.0
86	Sol_Cont	2	27.5	288	25.4	245.0
87	Sol_Cont	2	27.0	310	28.9	353.0
88	Sol_Cont	2	28.0	323	17.4	70.6
89	Sol_Cont	2	27.8	325	18.0	74.8
90	Sol_Cont	2	28.0	306	28.5	356.0
91	Sol_Cont	2	27.4	319	27.8	324.0
92	Sol_Cont	2	27.5	340	27.7	316.0
93	Sol_Cont	2	27.1	314	28.2	335.0
94	Sol_Cont	2	28.0	314	27.0	301.0
95	Sol_Cont	2	28.5	315	30.3	415.0
96	Sol_Cont	2	26.4	284	26.6	353.0
97	TRT 1	1	29.2	353	27.9	342.0
98	TRT 1	1	29.5	379	22.8	153.0
99	TRT 1	1	28.6	345	24.0	174.0
100	TRT 1	1	28.1	302	28.1	275.0
101	TRT 1	1	28.4	317	24.9	211.0
102	TRT 1	1	28.6	293	25.6	239.0
103	TRT 1	1	31.5	416	23.7	189.0
104	TRT 1	1	27.5	294	27.9	259.0
105	TRT 1	1	29.5	350	27.5	274.0
106	TRT 1	1	30.5	442	24.7	215.0
107	TRT 1	1	30.3	369	28.8	354.0
108	TRT 1	1	30.8	389	26.0	247.0
109	TRT 1	1	29.2	377	27.2	243.0
110	TRT 1	1	31.6	446	27.8	279.0
111	TRT 1	1	25.3	209	26.9	267.0
112	TRT 1	1	27.4	337	27.8	279.0
113	TRT 1	1	26.5	311	27.4	305.0
114	TRT 1	1	30.4	468	26.3	229.0
115	TRT 1	1	28.7	365	26.8	245.0
116	TRT 1	1	29.4	351	27.3	288.0
117	TRT 1	1	29.2	337	27.9	306.0
118	TRT 1	1	29.6	361	26.3	272.0
119	TRT 1	1	30.3	375	29.3	362.0
120	TRT 1	1	29.0	348	27.4	302.0
121	TRT 1	1	.	.	28.0	319.0
122	TRT 1	2	27.5	320	28.1	315.0
123	TRT 1	2	29.0	358	23.4	212.0
124	TRT 1	2	31.2	439	24.3	220.0
125	TRT 1	2	26.2	238	29.9	369.0
126	TRT 1	2	28.2	345	28.3	312.0
127	TRT 1	2	29.2	415	29.7	379.0
128	TRT 1	2	29.4	373	26.7	268.0

OBS	LEVEL	REP	LEN56_1	WT56_1	LEN56_2	WT56_2
129	TRT 1	2	32.0	495	25.8	232
130	TRT 1	2	26.8	309	27.7	325
131	TRT 1	2	26.8	285	25.8	244
132	TRT 1	2	31.3	444	30.2	430
133	TRT 1	2	25.4	236	27.3	301
134	TRT 1	2	26.0	258	27.9	300
135	TRT 1	2	27.3	279	25.7	253
136	TRT 1	2	25.8	256	28.9	354
137	TRT 1	2	28.8	313	27.6	303
138	TRT 1	2	31.2	445	29.5	397
139	TRT 1	2	29.3	391	26.3	256
140	TRT 1	2	29.6	382	26.4	243
141	TRT 1	2	30.1	398	26.3	250
142	TRT 1	2	27.8	359	26.3	267
143	TRT 1	2	32.4	470	26.6	278
144	TRT 1	2	27.4	298	22.7	180
145	TRT 1	2	27.2	273	23.5	195
146	TRT 1	2	28.9	361	.	.
147	TRT 2	1	27.3	285	27.7	305
148	TRT 2	1	29.4	436	28.0	270
149	TRT 2	1	28.7	383	28.7	313
150	TRT 2	1	28.3	336	27.6	277
151	TRT 2	1	28.7	345	27.4	266
152	TRT 2	1	27.9	317	29.3	354
153	TRT 2	1	25.0	243	28.7	304
154	TRT 2	1	27.8	339	29.4	300
155	TRT 2	1	27.8	307	26.9	230
156	TRT 2	1	26.4	291	25.4	252
157	TRT 2	1	29.5	368	29.1	296
158	TRT 2	1	32.0	466	28.4	310
159	TRT 2	1	28.5	312	27.0	268
160	TRT 2	1	24.9	261	27.8	270
161	TRT 2	1	25.8	263	27.2	264
162	TRT 2	1	27.6	319	24.5	225
163	TRT 2	1	28.5	350	29.2	340
164	TRT 2	1	29.0	392	26.8	288
165	TRT 2	1	25.7	251	30.3	363
166	TRT 2	1	27.1	312	26.7	236
167	TRT 2	1	31.2	439	27.3	242
168	TRT 2	1	30.5	442	28.4	334
169	TRT 2	1	26.8	250	27.7	260
170	TRT 2	1	27.8	341	27.4	296
171	TRT 2	2	27.3	342	26.9	309
172	TRT 2	2	27.7	331	24.4	215
173	TRT 2	2	27.1	324	27.0	292
174	TRT 2	2	25.9	305	26.7	285
175	TRT 2	2	28.8	380	26.3	293
176	TRT 2	2	30.8	543	26.4	271
177	TRT 2	2	29.0	439	26.8	319
178	TRT 2	2	26.5	279	25.5	258
179	TRT 2	2	27.7	367	24.6	229
180	TRT 2	2	31.4	525	24.8	231
181	TRT 2	2	29.5	381	27.9	337
182	TRT 2	2	28.5	365	27.0	290
183	TRT 2	2	27.4	333	24.7	229
184	TRT 2	2	.	.	25.9	259
185	TRT 2	2	.	.	27.7	295
186	TRT 2	2	.	.	28.6	358
187	TRT 2	2	.	.	25.8	270
188	TRT 2	2	.	.	25.8	244
189	TRT 2	2	.	.	26.6	264
190	TRT 2	2	.	.	26.0	268
191	TRT 2	2	.	.	24.8	215
192	TRT 2	2	.	.	25.5	229

OBS	LEVEL	REP	LEN56_1	WT56_1	LEN56_2	WT56_2
193	TRT 2	2	.	.	25.3	242
194	TRT 2	2	.	.	26.2	253
195	TRT 2	2	.	.	25.8	269
196	TRT 2	2	.	.	24.5	213
197	TRT 3	1	29.5	431.0	28.8	381
198	TRT 3	1	28.7	384.0	26.8	416
199	TRT 3	1	11.3	18.0	21.9	275
200	TRT 3	1	31.4	563.0	24.4	273
201	TRT 3	1	23.2	233.0	24.5	205
202	TRT 3	1	29.7	411.0	25.3	221
203	TRT 3	1	20.7	195.0	23.2	197
204	TRT 3	1	29.2	403.0	27.2	292
205	TRT 3	1	29.8	443.0	20.8	141
206	TRT 3	1	33.1	575.0	22.6	188
207	TRT 3	1	29.3	383.0	27.5	360
208	TRT 3	1	30.4	459.0	27.8	284
209	TRT 3	1	21.4	257.0	27.2	375
210	TRT 3	1	14.1	29.3	27.3	390
211	TRT 3	1	23.2	165.0	26.4	263
212	TRT 3	1	24.8	395.0	28.2	378
213	TRT 3	1	31.5	526.0	23.1	191
214	TRT 3	1	.	.	23.6	196
215	TRT 3	1	.	.	20.9	142
216	TRT 3	1	.	.	23.9	187
217	TRT 3	2	27.7	361.0	24.7	277
218	TRT 3	2	27.4	290.0	26.5	276
219	TRT 3	2	28.1	259.0	26.8	266
220	TRT 3	2	27.0	296.0	22.5	206
221	TRT 3	2	25.4	296.0	27.8	323
222	TRT 3	2	28.9	359.0	27.0	297
223	TRT 3	2	27.6	324.0	22.9	195
224	TRT 3	2	26.1	245.0	28.4	349
225	TRT 3	2	29.2	335.0	28.0	319
226	TRT 3	2	28.0	305.0	25.9	257
227	TRT 3	2	26.9	311.0	24.8	236
228	TRT 3	2	25.1	260.0	28.9	387
229	TRT 3	2	26.0	241.0	28.4	324
230	TRT 3	2	29.3	374.0	25.3	237
231	TRT 3	2	27.8	357.0	25.3	243
232	TRT 3	2	27.5	297.0	28.3	308
233	TRT 3	2	28.6	302.0	24.9	226
234	TRT 3	2	27.2	316.0	27.9	309
235	TRT 3	2	26.5	301.0	27.6	328
236	TRT 3	2	28.4	364.0	27.0	270
237	TRT 3	2	28.7	359.0	23.8	198
238	TRT 3	2	27.3	287.0	27.3	312
239	TRT 3	2	28.9	357.0	25.1	229
240	TRT 3	2	28.0	324.0	26.6	298
241	TRT 3	2	25.3	232.0	28.5	323
242	TRT 3	2	29.2	368.0	.	.
243	TRT 4	1	19.9	186.0	25.0	306
244	TRT 4	1	15.8	122.0	23.7	314
245	TRT 4	1	23.9	384.0	24.5	314
246	TRT 4	1	22.8	245.0	21.4	268
247	TRT 4	1	26.4	339.0	20.8	216
248	TRT 4	1	23.0	310.0	26.2	355
249	TRT 4	1	23.2	312.0	19.6	176
250	TRT 4	1	33.7	622.0	25.0	399
251	TRT 4	1	23.7	278.0	21.9	312
252	TRT 4	1	31.2	611.0	25.7	426
253	TRT 4	1	21.3	304.0	24.2	293
254	TRT 4	1	22.5	248.0	31.0	520
255	TRT 4	1	27.4	521.0	25.8	358
256	TRT 4	1	29.0	585.0	27.5	361

OBS	LEVEL	REP	LEN56_1	WT56_1	LEN56_2	WT56_2
257	TRT 4	1	.	.	21.3	198
258	TRT 4	2	28.7	411	27.8	390
259	TRT 4	2	30.0	445	25.1	294
260	TRT 4	2	25.9	288	31.5	474
261	TRT 4	2	24.4	311	26.0	278
262	TRT 4	2	26.6	394	24.6	267
263	TRT 4	2	28.5	357	24.5	255
264	TRT 4	2	24.9	362	25.3	265
265	TRT 4	2	31.3	514	24.4	304
266	TRT 4	2	24.3	268	21.5	165
267	TRT 4	2	25.4	329	27.5	352
268	TRT 4	2	23.1	229	29.6	367
269	TRT 4	2	24.5	338	24.4	357
270	TRT 4	2	23.3	292	28.3	364
271	TRT 4	2	25.0	315	20.8	208
272	TRT 4	2	27.7	340	28.4	329
273	TRT 4	2	23.5	206	24.9	244
274	TRT 4	2	31.3	480	24.5	247
275	TRT 4	2	26.0	326	19.9	151
276	TRT 4	2	22.5	271	25.6	312
277	TRT 4	2	20.6	158	22.4	219
278	TRT 4	2	25.8	340	26.4	290
279	TRT 4	2	22.0	221	24.5	296
280	TRT 4	2	23.4	279	22.8	223
281	TRT 4	2	20.6	150	23.2	214
282	TRT 4	2	.	.	27.2	362

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

	LEVEL			
	Control	Sol_Cont	TRT 1	TRT 2
	MEAN	MEAN	MEAN	MEAN
LEN56_1	27.92	27.81	28.86	28.10
WT56_1	321.30	310.43	352.53	350.32
LEN56_2	26.43	26.87	26.80	26.89
WT56_2	275.42	313.32	275.73	276.00

(CONTINUED)
FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

	LEVEL	
	TRT 3	TRT 4
	MEAN	MEAN
LEN56_1	26.92	25.08
WT56_1	325.36	333.97
LEN56_2	25.81	24.87
WT56_2	274.40	301.08

------------------------------- LEVEL=Control -------------------------------

Variable	N	Mean	Std Dev	CV
REP	50	1.480	0.505	34.099
LEN56_1	46	27.924	1.898	6.798
WT56_1	46	321.304	64.388	20.040
LEN56_2	50	26.430	1.324	5.008
WT56_2	50	275.420	49.423	17.945

------------------------------- LEVEL=Sol_Cont -------------------------------

Variable	N	Mean	Std Dev	CV
REP	46	1.500	0.506	33.702
LEN56_1	46	27.811	1.111	3.996
WT56_1	46	310.435	37.410	12.051
LEN56_2	45	26.873	3.349	12.462
WT56_2	45	313.324	93.525	29.849

------------------------------- LEVEL=TRT 1 -------------------------------

Variable	N	Mean	Std Dev	CV
REP	50	1.500	0.505	33.672
LEN56_1	49	28.855	1.770	6.136
WT56_1	49	352.531	65.761	18.654
LEN56_2	49	26.800	1.840	6.865
WT56_2	49	275.735	59.482	21.572

------------------------------- LEVEL=TRT 2 -------------------------------

Variable	N	Mean	Std Dev	CV
REP	50	1.520	0.505	33.202
LEN56_1	37	28.103	1.710	6.084
WT56_1	37	350.324	72.398	20.666
LEN56_2	50	26.888	1.470	5.469
WT56_2	50	276.000	38.792	14.055

------------------------------- LEVEL=TRT 3 -------------------------------

Variable	N	Mean	Std Dev	CV
REP	46	1.565	0.501	32.022
LEN56_1	43	26.916	4.042	15.016
WT56_1	43	325.356	110.657	34.011
LEN56_2	45	25.813	2.225	8.618
WT56_2	45	274.400	69.293	25.252

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows

------------------------------- LEVEL=TRT 4 -------------------------------

Variable	N	Mean	Std Dev	CV

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----------------------------------------------------
  REP       40        1.625        0.490      30.172
  LEN56_1   38       25.082        3.648      14.544
  WT56_1    38      333.974      121.435      36.361
  LEN56_2   40       24.868        2.821      11.344
  WT56_2    40      301.075       81.031      26.914
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FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 1ST ELS
   ****

General Linear Models Procedure
Class Level Information

Class	Levels	Values
LEVEL	6	Control Sol_Cont TRT 1 TRT 2 TRT 3 TRT 4

Number of observations in data set = 282

NOTE: Due to missing values, only 259 observations can be used in this
analysis.

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 1ST ELS
   ****

General Linear Models Procedure
Type I Estimable Functions for: LEVEL

Effect		Coefficients
INTERCEPT		0
LEVEL	Control	L2
	Sol_Cont	L3
	TRT 1	L4
	TRT 2	L5
	TRT 3	L6
	TRT 4	-L2-L3-L4-L5-L6

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 1ST ELS
   ****

General Linear Models Procedure

Dependent Variable: LEN56_1

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	352.91828	70.58366	10.81	0.0001
Error	253	1651.89493	6.52923		
Corrected Total	258	2004.81320			

R-Square	C.V.	Root MSE	LEN56_1 Mean
0.176035	9.284596	2.5552	27.521

Source	DF	Type I SS	Mean Square	F Value	Pr > F

```
LEVEL              5      352.91828     70.58366     10.81     0.0001
```

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 1ST ELS
   ****

General Linear Models Procedure
Least Squares Means

LEVEL	LEN56_1 LSMEAN	LSMEAN Number
Control	27.9239130	1
Sol_Cont	27.8108696	2
TRT 1	28.8551020	3
TRT 2	28.1027027	4
TRT 3	26.9162791	5
TRT 4	25.0815789	6

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

i/j	1	2	3	4	5	6
1	.	0.8321	0.0771	0.7516	0.0642	0.0001
2	0.8321	.	0.0476	0.6055	0.1001	0.0001
3	0.0771	0.0476	.	0.1776	0.0003	0.0001
4	0.7516	0.6055	0.1776	.	0.0394	0.0001
5	0.0642	0.1001	0.0003	0.0394	.	0.0014
6	0.0001	0.0001	0.0001	0.0001	0.0014	.

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

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 1ST ELS
   ****

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: LEN56_1

NOTE: This test controls the type I experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 253 MSE= 6.529229
Critical Value of Studentized Range= 4.061

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

LEVEL Comparison		Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
TRT 1	- TRT 2	-0.8458	0.7524	2.3506	
TRT 1	- Control	-0.5753	0.9312	2.4376	
TRT 1	- Sol_Cont	-0.4622	1.0442	2.5507	
TRT 1	- TRT 3	0.4055	1.9388	3.4721	***
TRT 1	- TRT 4	2.1874	3.7735	5.3597	***
TRT 2	- TRT 1	-2.3506	-0.7524	0.8458	
TRT 2	- Control	-1.4416	0.1788	1.7992	
TRT 2	- Sol_Cont	-1.3286	0.2918	1.9123	
TRT 2	- TRT 3	-0.4590	1.1864	2.8319	
TRT 2	- TRT 4	1.3264	3.0211	4.7159	***

Control	- TRT 1	-2.4376	-0.9312	0.5753	
Control	- TRT 2	-1.7992	-0.1788	1.4416	
Control	- Sol_Cont	-1.4170	0.1130	1.6431	
Control	- TRT 3	-0.5489	1.0076	2.5641	
Control	- TRT 4	1.2338	2.8423	4.4509	***
Sol_Cont	- TRT 1	-2.5507	-1.0442	0.4622	
Sol_Cont	- TRT 2	-1.9123	-0.2918	1.3286	
Sol_Cont	- Control	-1.6431	-0.1130	1.4170	
Sol_Cont	- TRT 3	-0.6619	0.8946	2.4511	
Sol_Cont	- TRT 4	1.1207	2.7293	4.3379	***
TRT 3	- TRT 1	-3.4721	-1.9388	-0.4055	***
TRT 3	- TRT 2	-2.8319	-1.1864	0.4590	
TRT 3	- Control	-2.5641	-1.0076	0.5489	
TRT 3	- Sol_Cont	-2.4511	-0.8946	0.6619	
TRT 3	- TRT 4	0.2009	1.8347	3.4685	***
TRT 4	- TRT 1	-5.3597	-3.7735	-2.1874	***
TRT 4	- TRT 2	-4.7159	-3.0211	-1.3264	***
TRT 4	- Control	-4.4509	-2.8423	-1.2338	***
TRT 4	- Sol_Cont	-4.3379	-2.7293	-1.1207	***
TRT 4	- TRT 3	-3.4685	-1.8347	-0.2009	***

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 1ST ELS
   ****

General Linear Models Procedure

Dunnett's One-tailed T tests for variable: LEN56_1

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

Alpha= 0.05 Confidence= 0.95 df= 253 MSE= 6.529229
   Critical Value of Dunnett's T= 2.252

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

LEVEL Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
TRT 1 - Sol_Cont	-0.1373	1.0442	2.2257	
TRT 2 - Sol_Cont	-0.9791	0.2918	1.5627	
Control - Sol_Cont	-1.0870	0.1130	1.3131	
TRT 3 - Sol_Cont	-2.1154	-0.8946	0.3262	
TRT 4 - Sol_Cont	-3.9909	-2.7293	-1.4677	***

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF WEIGHT at 56 Days - F1 GENERATION - 1ST ELS
   ****

General Linear Models Procedure
Class Level Information

Class	Levels	Values
LEVEL	6	Control Sol_Cont TRT 1 TRT 2 TRT 3 TRT 4

Number of observations in data set = 282

NOTE: Due to missing values, only 259 observations can be used in this
   analysis.

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF WEIGHT at 56 Days - F1 GENERATION - 1ST ELS
   ****

General Linear Models Procedure
Type I Estimable Functions for: LEVEL

Effect		Coefficients
INTERCEPT		0
LEVEL	Control	L2
	Sol_Cont	L3
	TRT 1	L4
	TRT 2	L5
	TRT 3	L6
	TRT 4	-L2-L3-L4-L5-L6

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF WEIGHT at 56 Days - F1 GENERATION - 1ST ELS
   ****

General Linear Models Procedure

Dependent Variable: WT56_1

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	61778.473	12355.695	1.83	0.1069
Error	253	1705710.375	6741.938		
Corrected Total	258	1767488.848			

R-Square	C.V.	Root MSE	WT56_1 Mean
0.034953	24.73480	82.109	331.96

Source	DF	Type I SS	Mean Square	F Value	Pr > F
LEVEL	5	61778.473	12355.695	1.83	0.1069

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF WEIGHT at 56 Days - F1 GENERATION - 1ST ELS
   ****

General Linear Models Procedure
Least Squares Means

LEVEL	WT56_1 LSMEAN	LSMEAN Number
Control	321.304348	1
Sol_Cont	310.434783	2
TRT 1	352.530612	3
TRT 2	350.324324	4
TRT 3	325.355814	5
TRT 4	333.973684	6

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

i/j	1	2	3	4	5	6
1	.	0.5261	0.0651	0.1107	0.8162	0.4822
2	0.5261	.	0.0132	0.0287	0.3924	0.1921
3	0.0651	0.0132	.	0.9019	0.1145	0.2968
4	0.1107	0.0287	0.9019	.	0.1763	0.3894
5	0.8162	0.3924	0.1145	0.1763	.	0.6378
6	0.4822	0.1921	0.2968	0.3894	0.6378	.

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

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF WEIGHT at 56 Days - F1 GENERATION - 1ST ELS
   ****

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: WT56_1

NOTE: This test controls the type I experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 253 MSE= 6741.938
        Critical Value of Studentized Range= 4.061

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

LEVEL Comparison		Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
TRT 1	- TRT 2	-49.15	2.21	53.56
TRT 1	- TRT 4	-32.41	18.56	69.53
TRT 1	- TRT 3	-22.10	27.17	76.45
TRT 1	- Control	-17.18	31.23	79.63
TRT 1	- Sol_Cont	-6.31	42.10	90.50
TRT 2	- TRT 1	-53.56	-2.21	49.15
TRT 2	- TRT 4	-38.11	16.35	70.81
TRT 2	- TRT 3	-27.91	24.97	77.84
TRT 2	- Control	-23.05	29.02	81.09
TRT 2	- Sol_Cont	-12.18	39.89	91.96
TRT 4	- TRT 1	-69.53	-18.56	32.41
TRT 4	- TRT 2	-70.81	-16.35	38.11
TRT 4	- TRT 3	-43.88	8.62	61.12
TRT 4	- Control	-39.02	12.67	64.36
TRT 4	- Sol_Cont	-28.15	23.54	75.23
TRT 3	- TRT 1	-76.45	-27.17	22.10
TRT 3	- TRT 2	-77.84	-24.97	27.91
TRT 3	- TRT 4	-61.12	-8.62	43.88
TRT 3	- Control	-45.96	4.05	54.07
TRT 3	- Sol_Cont	-35.10	14.92	64.94
Control	- TRT 1	-79.63	-31.23	17.18
Control	- TRT 2	-81.09	-29.02	23.05
Control	- TRT 4	-64.36	-12.67	39.02
Control	- TRT 3	-54.07	-4.05	45.96
Control	- Sol_Cont	-38.30	10.87	60.04
Sol_Cont	- TRT 1	-90.50	-42.10	6.31
Sol_Cont	- TRT 2	-91.96	-39.89	12.18
Sol_Cont	- TRT 4	-75.23	-23.54	28.15
Sol_Cont	- TRT 3	-64.94	-14.92	35.10

Sol_Cont - Control   -60.04   -10.87   38.30

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF WEIGHT at 56 Days - F1 GENERATION - 1ST ELS
   ****

General Linear Models Procedure

Dunnett's One-tailed T tests for variable: WT56_1

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

Alpha= 0.05 Confidence= 0.95 df= 253 MSE= 6741.938
        Critical Value of Dunnett's T= 2.252

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

LEVEL Comparison		Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
TRT 1	- Sol_Cont	4.13	42.10	80.06
TRT 2	- Sol_Cont	-0.95	39.89	80.73
TRT 4	- Sol_Cont	-17.00	23.54	64.08
TRT 3	- Sol_Cont	-24.31	14.92	54.15
Control	- Sol_Cont	-27.69	10.87	49.43

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 2ND ELS
   ****

General Linear Models Procedure
Class Level Information

Class	Levels	Values
LEVEL	6	Control Sol_Cont TRT 1 TRT 2 TRT 3 TRT 4

Number of observations in data set = 282

NOTE: Due to missing values, only 279 observations can be used in this
      analysis.

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 2ND ELS
   ****

General Linear Models Procedure
Type I Estimable Functions for: LEVEL

Effect		Coefficients
INTERCEPT		0
LEVEL	Control	L2
	Sol_Cont	L3
	TRT 1	L4
	TRT 2	L5
	TRT 3	L6
	TRT 4	-L2-L3-L4-L5-L6

        FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
    1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 2ND ELS
        ****

                General Linear Models Procedure

Dependent Variable: LEN56_2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	137.73882	27.54776	5.47	0.0001
Error	273	1375.92555	5.04002		
Corrected Total	278	1513.66437			

	R-Square	C.V.	Root MSE	LEN56_2 Mean
	0.090997	8.527982	2.2450	26.325

Source	DF	Type I SS	Mean Square	F Value	Pr > F
LEVEL	5	137.73882	27.54776	5.47	0.0001

    FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
    1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 2ND ELS
        ****

                General Linear Models Procedure
                    Least Squares Means

LEVEL	LEN56_2 LSMEAN	LSMEAN Number
Control	26.4300000	1
Sol_Cont	26.8733333	2
TRT 1	26.8000000	3
TRT 2	26.8880000	4
TRT 3	25.8133333	5
TRT 4	24.8675000	6

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

i/j	1	2	3	4	5	6
1	.	0.3374	0.4130	0.3086	0.1824	0.0012
2	0.3374	.	0.8744	0.9747	0.0259	0.0001
3	0.4130	0.8744	.	0.8455	0.0342	0.0001
4	0.3086	0.9747	0.8455	.	0.0206	0.0001
5	0.1824	0.0259	0.0342	0.0206	.	0.0536
6	0.0012	0.0001	0.0001	0.0001	0.0536	.

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

    FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
    1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 2ND ELS
        ****

                General Linear Models Procedure

    Tukey's Studentized Range (HSD) Test for variable: LEN56_2

    NOTE: This test controls the type I experimentwise error rate.

    Alpha= 0.05 Confidence= 0.95 df= 273 MSE= 5.04002
            Critical Value of Studentized Range= 4.059

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

LEVEL Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
TRT 2 - Sol_Cont	-1.3093	0.0147	1.3386	
TRT 2 - TRT 1	-1.2072	0.0880	1.3832	
TRT 2 - Control	-0.8307	0.4580	1.7467	
TRT 2 - TRT 3	-0.2493	1.0747	2.3986	
TRT 2 - TRT 4	0.6537	2.0205	3.3873	***
Sol_Cont - TRT 2	-1.3386	-0.0147	1.3093	
Sol_Cont - TRT 1	-1.2570	0.0733	1.4037	
Sol_Cont - Control	-0.8806	0.4433	1.7673	
Sol_Cont - TRT 3	-0.2984	1.0600	2.4184	
Sol_Cont - TRT 4	0.6057	2.0058	3.4060	***
TRT 1 - TRT 2	-1.3832	-0.0880	1.2072	
TRT 1 - Sol_Cont	-1.4037	-0.0733	1.2570	
TRT 1 - Control	-0.9252	0.3700	1.6652	
TRT 1 - TRT 3	-0.3437	0.9867	2.3170	
TRT 1 - TRT 4	0.5595	1.9325	3.3055	***
Control - TRT 2	-1.7467	-0.4580	0.8307	
Control - Sol_Cont	-1.7673	-0.4433	0.8806	
Control - TRT 1	-1.6652	-0.3700	0.9252	
Control - TRT 3	-0.7073	0.6167	1.9406	
Control - TRT 4	0.1957	1.5625	2.9293	***
TRT 3 - TRT 2	-2.3986	-1.0747	0.2493	
TRT 3 - Sol_Cont	-2.4184	-1.0600	0.2984	
TRT 3 - TRT 1	-2.3170	-0.9867	0.3437	
TRT 3 - Control	-1.9406	-0.6167	0.7073	
TRT 3 - TRT 4	-0.4543	0.9458	2.3460	
TRT 4 - TRT 2	-3.3873	-2.0205	-0.6537	***
TRT 4 - Sol_Cont	-3.4060	-2.0058	-0.6057	***
TRT 4 - TRT 1	-3.3055	-1.9325	-0.5595	***
TRT 4 - Control	-2.9293	-1.5625	-0.1957	***
TRT 4 - TRT 3	-2.3460	-0.9458	0.4543	

    FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
    1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 2ND ELS
        ****

                General Linear Models Procedure

        Dunnett's One-tailed T tests for variable: LEN56_2

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

    Alpha= 0.05 Confidence= 0.95 df= 273 MSE= 5.04002
            Critical Value of Dunnett's T= 2.242

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

LEVEL	Simultaneous Lower Confidence	Difference Between	Simultaneous Upper Confidence

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Comparison	Limit	Means	Limit	
TRT 2 - Sol_Cont	-1.0194	0.0147	1.0487	
TRT 1 - Sol_Cont	-1.1124	-0.0733	0.9657	
Control - Sol_Cont	-1.4774	-0.4433	0.5907	
TRT 3 - Sol_Cont	-2.1209	-1.0600	0.0009	
TRT 4 - Sol_Cont	-3.0994	-2.0058	-0.9123	***

Weigher

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 2ND ELS
****

General Linear Models Procedure
Class Level Information

Class	Levels	Values
LEVEL	6	Control Sol_Cont TRT 1 TRT 2 TRT 3 TRT 4

Number of observations in data set = 282

Weigher

NOTE: Due to missing values, only 279 observations can be used in this analysis.

General Linear Models Procedure
Type I Estimable Functions for: LEVEL

Effect	Coefficients
INTERCEPT	0
LEVEL	
Control	L2
Sol_Cont	L3
TRT 1	L4
TRT 2	L5
TRT 3	L6
TRT 4	-L2-L3-L4-L5-L6

Weight

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 2ND ELS
****

General Linear Models Procedure

Dependent Variable: WT56_2

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	64328.139	12865.628	2.89	0.0146
Error	273	1215457.309	4452.225		
Corrected Total	278	1279785.448			

R-Square	C.V.	Root MSE	WT56_2 Mean
0.050265	23.39533	66.725	285.21

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FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 2ND ELS
****

Weight

General Linear Models Procedure

Source	DF	Type I SS	Mean Square	F Value	Pr > F
LEVEL	5	64328.139	12865.628	2.89	0.0146

General Linear Models Procedure
Least Squares Means

LEVEL	WT56_2 LSMEAN	LSMEAN Number
Control	275.420000	1
Sol_Cont	313.324444	2
TRT 1	275.736694	3
TRT 2	276.000000	4
TRT 3	274.400000	5
TRT 4	301.075000	6

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

i/j	1	2	3	4	5	6
1	.	0.0061	0.9813	0.9654	0.9408	0.0710
2	0.0061	.	0.0068	0.0069	0.0060	0.3990
3	0.9813	0.0068	.	0.9842	0.9229	0.0758
4	0.9654	0.0069	0.9842	.	0.9072	0.0776
5	0.9408	0.0060	0.9229	0.9072	.	0.0669
6	0.0710	0.3990	0.0758	0.0776	0.0669	.

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

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF Length at 56 Days - F1 GENERATION - 2ND ELS
****

Weight

General Linear Models Procedure

Tukey's Studentized Range (HSD) Test for variable: WT56_2

NOTE: This test controls the type I experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 273 MSE= 4452.225
Critical Value of Studentized Range= 4.059

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

LEVEL Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
Sol_Cont - TRT 4	-29.37	12.25	53.86
Sol_Cont - TRT 2	-2.03	37.32	76.68
Sol_Cont - TRT 1	-1.95	37.59	77.13
Sol_Cont - Control	-1.45	37.90	77.26
Sol_Cont - TRT 3	-1.45	38.92	79.30
TRT 4 - Sol_Cont	-53.86	-12.25	29.37
TRT 4 - TRT 2	-15.55	25.07	65.70
TRT 4 - TRT 1	-15.47	25.34	66.15
TRT 4 - Control	-14.97	25.65	66.28

TRT 4	- TRT 3	-14.94	26.68	68.29
TRT 2	- Sol_Cont	-76.68	-37.32	2.03
TRT 2	- TRT 4	-65.70	-25.07	15.55
TRT 2	- TRT 1	-38.23	0.27	38.76
TRT 2	- Control	-37.72	0.58	38.88
TRT 2	- TRT 3	-37.75	1.60	40.95
TRT 1	- Sol_Cont	-77.13	-37.59	1.95
TRT 1	- TRT 4	-66.15	-25.34	15.47
TRT 1	- TRT 2	-38.76	-0.27	38.23
TRT 1	- Control	-38.18	0.31	38.81
TRT 1	- TRT 3	-38.21	1.33	40.88
Control	- Sol_Cont	-77.26	-37.90	1.45
Control	- TRT 4	-66.28	-25.65	14.97
Control	- TRT 2	-38.88	-0.58	37.72
Control	- TRT 1	-38.81	-0.31	38.18
Control	- TRT 3	-38.33	1.02	40.37
TRT 3	- Sol_Cont	-79.30	-38.92	1.45
TRT 3	- TRT 4	-68.29	-26.68	14.94
TRT 3	- TRT 2	-40.95	-1.60	37.75
TRT 3	- TRT 1	-40.88	-1.33	38.21
TRT 3	- Control	-40.37	-1.02	38.33

FONOFOS:Effects to the Full-Life Cycle of Fathead Minnows
1. ANALYSIS OF ~~Length~~ at 56 Days - F1 GENERATION - 2ND ELS
****
        weight

General Linear Models Procedure

Dunnett's One-tailed T tests for variable: WT56_2

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

Alpha= 0.05 Confidence= 0.95 df= 273 MSE= 4452.225
        Critical Value of Dunnett's T= 2.242

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

LEVEL Comparison		Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
TRT 4	- Sol_Cont	-44.75	-12.25	20.25	
TRT 2	- Sol_Cont	-68.06	-37.32	-6.59	***
TRT 1	- Sol_Cont	-68.47	-37.59	-6.71	***
Control	- Sol_Cont	-68.64	-37.90	-7.17	***
TRT 3	- Sol_Cont	-70.46	-38.92	-7.39	***