

US EPA ARCHIVE DOCUMENT

DP Barcode: D222690

MRID No.: 438870-06

DATA EVALUATION RECORD  
S 71-1(A) - AVIAN SINGLE-DOSE LD<sub>50</sub> TEST

1. CHEMICAL: AC 312,094 Technical PC Code No.: 129093  
A metabolite of AC 303,630

2. TEST MATERIAL: AC 312,094 Technical Purity: 96.3%

3. CITATION

Authors: Brewer, L.W., J.A. Gange, J.P. Sullivan  
and L.C. Taliaferro

Title: 14-Day Acute Toxicity Test with AC  
312,094 Technical in Northern bobwhite  
(*Collinus virginianus*)

Study Completion Date: December 19, 1995

Laboratory: Ecotoxicology and Biosystems Assoc., Inc.  
Snow Camp, NC

Sponsor: American Cyanamid Company, Princeton, NJ

Laboratory Report ID: 039402

MRID No.: 438870-06

4. REVIEWED BY: John D. Eisemann, Wildlife Biologist, EEB, EFED

Signature: John D. Eisemann

Date: 7/30/96

5. APPROVED BY: Ann Stavola, Head, Section (5), EEB, EFED

Signature: Ann Stavola

Date: 9/13/96

6. STUDY PARAMETERS

Scientific Name of Test Organism: *Collinus virginianus*

Test Organisms Age/Size: 16 weeks / Approx. 185 g

Definitive Study Duration: 14 days

7. CONCLUSIONS:

This study is scientifically sound and was conducted in accordance with accepted protocols. This study is deficient in that no treatment group was high enough to result in 50 percent mortality. Therefore, confidence in the calculated LD<sub>50</sub> is low. However, AC 312,268, a metabolite of AC 303,630, is slightly toxic to upland gamebirds on an acute oral basis.

**Results Synopsis**

LD<sub>50</sub>: 1685 mg ai/kg                      95% C.I.: 861 - 58765 mg/kg  
 NOEL (Weight): 160 mg ai/kg              Probit Slope: 2.021

**8. ADEQUACY OF THE STUDY**

- A. **Classification:** Supplemental
- B. **Rational:** This study was not required. Additionally, no treatment group was high enough to result in 50 percent mortality.
- C. **Repairability:** No additional data needs to be submitted.

**9. GUIDELINE DEVIATIONS**

1. At the time of dosing body mean body weights in the 50 mg/kg treatment level were significantly different from the control group.
2. The temperature in the study room during the study was 23°C ± 3°C instead of 21°C ± 3°C. The relative humidity range in the study room was 44% to 72%.
3. The photoperiod was 7 hours light to 17 hours dark.
4. The highest treatment group 1600 mg/kg failed to result in 50 percent mortality.

**10. SUBMISSION PURPOSE:**

To support registration of PIRATE (AC 303,360).

**11. MATERIALS AND METHODS**

**A. Test Organisms**

Guideline Criteria	Reported Information
<b>Species:</b>	<i>Collinus virginianus</i>
<b>Age at beginning of test:</b>	16 weeks

Guideline Criteria	Reported Information
Supplier::	Richey Quail Farm Pendleton, SC
Acclimation period: At least 15 days.	14 days

## B. Test System

Guideline Criteria	Reported Information
Pen facilities adequate?	Yes, 25 cm x 50.8 cm x 30.5 cm epoxy coated galvanized wire mesh
Photoperiod: 10-h light, 14-h dark is recommended.	7-hr light, 17-hr dark 6 foot candles at bird height
Diet was nutritious and appropriate for species?	Yes, Purina Game Bird Ration
Feed withheld at least 15 hours prior to dosing?	Yes - 15 hours

## C. Test Design

Guideline Criteria	Reported Information
Range finding test?	Yes
<b>Definitive Test</b> Nominal concentrations: At least five, in a geometric scale, unless $LD_{50} > 2000$ mg ai / kg.	0, 15, 50, 160, 500, and 1600 mg ai/kg body weight
<b>Controls:</b> Water control or vehicle control (if vehicle is used)	Vehicle control
Number of birds per group: 10 (strongly recommended)	10 - (5 male and 5 female)

Guideline Criteria	Reported Information
<b>Vehicle:</b> Distilled water, corn oil, propylene glycol, 1% carboxy-methylcellulose, or gum arabic.	Corn oil
<b>Amount of vehicle per body weight:</b> Constant volume/weight % of body weight, not to exceed 1% (1ml/100g).	Not reported
<b>Observations period:</b> At least 14 days.	21 days because some birds were still showing signs of intoxication on day 14

12. REPORTED RESULTS

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes,
Individual body weights measured at beginning of test, on day 14 and at end of test if extended beyond 14 days?	Yes - Animals were weighed on days 0, 3, 7, 14 and 21
Mean feed consumption measured at beginning of test, on day 14, and at end of test if extended beyond 14 days?	Yes - food consumption was estimated on days 3, 7, 11, 14 and 21
<b>Control Mortality:</b> Not more than 10%	0 %
Raw data included?	Data summaries
Signs of toxicity (if any) were described?	Yes

Mortality

Mortality of Northern Bobwhite exposed orally to AC 312,094.

Dose Group (mg/kg)	No. of Days Post-treatment							
	1	2	3	4	5	6-10	11-15	16-21
Control	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
500	1	1	1	1	1	2	2	2
1600	0	0	1	1	1	4	4	4

All treatment groups contained 10 birds except the 1600 mg/kg group: One bird in this group died because of the dosing procedure. This bird was excluded from the calculations.

Other Significant Results:

Dose mixture verification showed the doses to be 103%, 10.7%, 110.4% 107.8% and 112.7% of the nominal doses 2878, 9604, 9604, 30,950 and 234,800 mg/ml.

Body weights were compared between groups by ANOVA followed by Dunnett's means separation test. At Day 0 (pre-dosing) the body weights of the 50 mg/kg birds were significantly lower than the controls. By Day 3, the bird weight in this dose group was not significantly different than the controls. However, the 1600 mg/kg group were significantly lower than controls. On Day 7, both the 500 and 1600 mg/kg mean body weights were significantly lower than the controls. On Day 14, and again on Day 21, only the 1600 mg/kg group body weights were different from the controls.

Food consumption was compared between groups by ANOVA followed by Dunnett's means separation test. Food consumption significantly declined in the 500 and 1600 mg/kg treatment groups during the first 3 days after dosing. During the Day 4-7 period Food consumption in the 1600 mg/kg treatment group was significantly lower than the controls. No differences were seen between days 8-14. The final period, Days 14 - 21, food consumption increased in the 1600 mg/kg group to amounts significantly higher than the controls.

Symptoms of intoxication at the 500 and 1600 mg/kg treatment level immediately after dosing included rapid ventilation, esophageal fibrillation, ataxia, and temporary inability to stand. Longer lasting symptoms included unsteadiness, piloerection, inactivity and liquid yellow to light green feces.

Post-mortem examination showed that most birds which died from the treatment had feed in their crops and impacted gizzards. Off colored and liquid feces can result from an impacted gizzard.

### Reported Statistical Results

Statistical Method: visual inspection of the data

LD<sub>50</sub>: 1687 mg ai/kg                      95% C.I.: 865 - 61,063 mg/kg

NOEL (Weight): 160 mg ai/kg              Probit Slope: 2.004

### 13. Verification of Statistical Results

Statistical Method: Probit Analysis

LD<sub>50</sub>: 1685 mg ai/kg                      95% C.I.: 861 - 58,765 mg/kg

NOEL: (Body weight) 160 mg ai/kg              Probit Slope: 2.023

### 15. REVIEWER'S COMMENTS:

This study is scientifically sound and was conducted in accordance with accepted protocols. This study is deficient in that no treatment group was high enough to result in 50 percent mortality. Therefore, confidence in the calculated LD<sub>50</sub> is low. However, AC 312,268, a metabolite of AC 303,630, is slightly toxic to upland gamebirds on an acute oral basis.

Due to a lack of raw data, some statistical results reported by the registrant could not be verified. However, reported means and standard deviations were used to verify statistics when provided.

EEB calculations showed body weights at day 0 were not statistically different as reported by the registrant. All other statistics calculated on weight data were identical between the registrant and the EEB.

DP Barcode: D222690

MRID No.: 438870-06

Statistical comparisons conducted on food consumption data were identical except for Day 3 measurements. Using William's test to compare treatment means, the registrant reported significantly lower food consumption in the 500 and 1600 mg/kg treatment group as compared to the controls. The EEB compared the treatment group means using Dunnett's test. By this method only the 500 mg/kg treatment group was significantly lower than the controls.



John Eisemann pirate Acute oral - Quail

\*\*\*\*\*

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
1600	9	4	44.44445	50
500	10	2	20	5.46875
160	10	0	0	9.765625E-02
50	10	0	0	9.765625E-02
15	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 160 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 0

THE MOVING AVERAGE METHOD CANNOT BE USED WITH THIS DATA SET BECAUSE NO SPAN WHICH PRODUCES MOVING AVERAGE ANGLES THAT BRACKET 45 DEGREES ALSO USES TWO PERCENT DEAD BETWEEN 0 AND 100 PERCENT.

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H
GOODNESS OF FIT PROBABILITY		
6	.6540318	1
.9136844		

SLOPE = 2.022992  
95 PERCENT CONFIDENCE LIMITS = .3869532 AND 3.659031

LC50 = 1684.775  
95 PERCENT CONFIDENCE LIMITS = 860.7666 AND 58764.69

LC10 = 396.9707  
95 PERCENT CONFIDENCE LIMITS = 15.35052 AND 774.0009

\*\*\*\*\*

AC 312,094 - LD50 Test - Day 0 weights

One-way Analysis of Variance (ANOVA)

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	5	2717.6	543.52
Residuals (within columns)	54	12403	229.69
Total	59	15121	

F = 2.366

The P value is 0.0516, considered not quite significant. Variation among column means is not significantly greater than expected by chance.

Bartlett's test for homogeneity of variances.

ANOVA assumes that all columns come from populations with equal SDs. The following calculations test that assumption.

Bartlett statistic (corrected) = 25.943

The P value is < 0.0001.

This test suggests that the difference among the SDs is extremely significant.

Since ANOVA assumes populations with equal SDs, you should consider transforming your data (reciprocal or log) or selecting a nonparametric test.

Post tests were not calculated because the P value was greater than 0.05.

Summary of Data

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
control	10	184.03	8.350	2.641	Unknown
15	10	176.19	24.160	7.640	Unknown
50	10	197.02	8.030	2.539	Unknown
160	10	182.03	10.720	3.390	Unknown
500	10	186.08	6.960	2.201	Unknown
1600	10	178.25	22.290	7.049	Unknown

Group	Minimum	Maximum	Lower 95% Confidence Interval	Upper 95% Confidence Interval
control	Unknown	Unknown	178.06	190.00

15	Unknown	Unknown	158.91	193.47
50	Unknown	Unknown	191.28	202.76
160	Unknown	Unknown	174.36	189.70
500	Unknown	Unknown	181.10	191.06
1600	Unknown	Unknown	162.31	194.19

\* \* \*

03/19/1996 02:32 PM

AC 312,094 - LD50 Test - Day 3 weights

### One-way Analysis of Variance (ANOVA)

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	5	4989.9	997.97
Residuals (within columns)	52	9169.9	176.34
Total	57	14160	

F = 5.659

The P value is 0.0003, considered extremely significant. Variation among column means is significantly greater than expected by chance.

Bartlett's test for homogeneity of variances.

ANOVA assumes that all columns come from populations with equal SDs. The following calculations test that assumption.

Bartlett statistic (corrected) = 7.321

The P value is 0.1979.

This test suggests that the difference among the SDs is not significant.

### Bonferroni Multiple Comparisons Test

If the value of t is greater than 2.674 then the P value is less than 0.05.

Comparison	Mean Difference	t	P value
control vs 15	4.850	0.8167	ns P>0.05
control vs 50	-10.720	1.805	ns P>0.05
control vs 160	4.700	0.7914	ns P>0.05
control vs 500	8.730	1.431	ns P>0.05
control vs 1600	20.520	3.363	** P<0.01

  

Difference	Mean Difference	Lower 95% CI	Upper 95% CI
control - 15	4.850	-11.029	20.729
control - 50	-10.720	-26.599	5.159
control - 160	4.700	-11.179	20.579
control - 500	8.730	-7.584	25.044
control - 1600	20.520	4.206	36.834

Summary of Data

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
control	10	189.81	8.230	2.603	Unknown
15	10	184.96	17.630	5.575	Unknown
50	10	200.53	10.000	3.162	Unknown
160	10	185.11	11.320	3.580	Unknown
500	9	181.08	13.140	4.380	Unknown
1600	9	169.29	17.060	5.687	Unknown

Group	Minimum	Maximum	Lower 95% Confidence Interval	Upper 95% Confidence Interval
control	Unknown	Unknown	183.92	195.70
15	Unknown	Unknown	172.35	197.57
50	Unknown	Unknown	193.38	207.68
160	Unknown	Unknown	177.01	193.21
500	Unknown	Unknown	170.98	191.18
1600	Unknown	Unknown	156.18	182.40

\* \* \*

03/19/1996 02:29 PM

AC 312,094 - LD50 Test - Day 7 weights

One-way Analysis of Variance (ANOVA)

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	5	13393	2678.5
Residuals (within columns)	49	15489	316.10
Total	54	28882	

F = 8.474

The P value is < 0.0001, considered extremely significant. Variation among column means is significantly greater than expected by chance.

Bartlett's test for homogeneity of variances.

ANOVA assumes that all columns come from populations with equal SDs. The following calculations test that assumption.

Bartlett statistic (corrected) = 16.920

The P value is 0.0047.

This test suggests that the difference among the SDs is very significant.

Since ANOVA assumes populations with equal SDs, you should consider transforming your data (reciprocal or log) or selecting a nonparametric test.

Bonferroni Multiple Comparisons Test

If the value of t is greater than 2.680 then the P value is less than 0.05.

Comparison	Mean Difference	t	P value
control vs 15	1.900	0.2390	ns P>0.05
control vs 50	-9.970	1.254	ns P>0.05
control vs 160	5.630	0.7081	ns P>0.05
control vs 500	22.920	2.806	* P<0.05
control vs 1600	42.380	4.616	*** P<0.001

Difference	Mean Difference	Lower 95% CI	Upper 95% CI
control - 15	1.900	-19.409	23.209
control - 50	-9.970	-31.279	11.339
control - 160	5.630	-15.679	26.939

control - 500  
 control --1600

22.920 1.027 44.813  
 42.380 17.775 66.985

Summary of Data

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
control	10	201.23	8.870	2.805	Unknown
15	10	199.33	15.370	4.860	Unknown
50	10	211.20	11.430	3.614	Unknown
160	10	195.60	12.510	3.956	Unknown
500	9	178.31	27.740	9.247	Unknown
1600	6	158.85	27.980	11.423	Unknown

Group	Minimum	Maximum	Lower 95% Confidence Interval	Upper 95% Confidence Interval
control	Unknown	Unknown	194.89	207.57
15	Unknown	Unknown	188.34	210.32
50	Unknown	Unknown	203.02	219.38
160	Unknown	Unknown	186.65	204.55
500	Unknown	Unknown	156.99	199.63
1600	Unknown	Unknown	129.48	188.22

\* \* \*

AC 312,094 - LD50 Test - Day 14 weights

One-way Analysis of Variance (ANOVA)

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	5	14012	2802.4
Residuals (within columns)	48	8211.0	171.06
<b>Total</b>	<b>53</b>	<b>22223</b>	

F = 16.382

The P value is < 0.0001, considered extremely significant. Variation among column means is significantly greater than expected by chance.

Bartlett's test for homogeneity of variances.

ANOVA assumes that all columns come from populations with equal SDs. The following calculations test that assumption.

Bartlett's test cannot be performed because a sample size is too small.

Bonferroni Multiple Comparisons Test

If the value of t is greater than 2.682 then the P value is less than 0.05.

Comparison	Mean Difference	t	P value
control vs 15	-3.160	0.5402	ns P>0.05
control vs 50	-11.270	1.927	ns P>0.05
control vs 160	7.810	1.335	ns P>0.05
control vs 500	0.1800	0.02995	ns P>0.05
control vs 1600	50.360	7.030	*** P<0.001

Difference	Mean Difference	Lower 95% CI	Upper 95% CI
control - 15	-3.160	-18.849	12.529
control - 50	-11.270	-26.959	4.419
control - 160	7.810	-7.879	23.499
control - 500	0.1800	-15.939	16.299
control - 1600	50.360	31.145	69.575

15



Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
control	10	193.08	7.200	2.277	Unknown
15	10	196.24	10.600	3.352	Unknown
50	10	204.35	11.240	3.554	Unknown
160	10	185.27	20.640	6.527	Unknown
500	9	192.90	7.010	2.337	Unknown
1600	5	142.72	18.500	8.273	Unknown

Group	Minimum	Maximum	Lower 95% Confidence Interval	Upper 95% Confidence Interval
control	Unknown	Unknown	187.93	198.23
15	Unknown	Unknown	188.66	203.82
50	Unknown	Unknown	196.31	212.39
160	Unknown	Unknown	170.51	200.03
500	Unknown	Unknown	187.51	198.29
1600	Unknown	Unknown	119.75	165.69

\* \* \*

03/19/1996 02:41 PM

AC 312,094 - LD50 Test - Day 21 weights

One-way Analysis of Variance (ANOVA)

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	5	6745.3	1349.1
Residuals (within columns)	47	8655.4	184.16
Total	52	15401	

F = 7.326

The P value is < 0.0001, considered extremely significant. Variation among column means is significantly greater than expected by chance.

Bartlett's test for homogeneity of variances.

ANOVA assumes that all columns come from populations with equal SDs. The following calculations test that assumption.

Bartlett's test cannot be performed because a sample size is too small.

Bonferroni Multiple Comparisons Test

If the value of t is greater than 2.685 then the P value is less than 0.05.

Comparison	Mean Difference	t	P value
control vs 15	-2.940	0.4844	ns P>0.05
control vs 50	-8.760	1.443	ns P>0.05
control vs 160	6.460	1.064	ns P>0.05
control vs 500	-0.6300	0.09787	ns P>0.05
control vs 1600	33.780	4.545	*** P<0.001

Difference	Mean Difference	Lower 95% CI	Upper 95% CI
control - 15	-2.940	-19.232	13.352
control - 50	-8.760	-25.052	7.532
control - 160	6.460	-9.832	22.752
control - 500	-0.6300	-17.910	16.650
control - 1600	33.780	13.826	53.734

Summary of Data

17

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
control	10	194.66	6.960	2.201	Unknown
15	10	197.60	12.010	3.798	Unknown
50	10	203.42	15.070	4.766	Unknown
160	10	188.20	13.690	4.329	Unknown
500	8	195.29	4.010	1.418	Unknown
1600	5	160.88	27.740	12.406	Unknown

Group	Minimum	Maximum	Lower 95% Confidence Interval	Upper 95% Confidence Interval
control	Unknown	Unknown	189.68	199.64
15	Unknown	Unknown	189.01	206.19
50	Unknown	Unknown	192.64	214.20
160	Unknown	Unknown	178.41	197.99
500	Unknown	Unknown	191.94	198.64
1600	Unknown	Unknown	126.44	195.32

\* \* \*

03/19/1996 03:08 PM

AC 312,094 - LD50 Test - Day 3 Food Consumption

One-way Analysis of Variance (ANOVA)

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	5	745.66	149.13
Residuals (within columns)	24	303.48	12.645
<b>Total</b>	<b>29</b>	<b>1049.1</b>	

F = 11.794

The P value is < 0.0001, considered extremely significant. Variation among column means is significantly greater than expected by chance.

Bartlett's test for homogeneity of variances.

ANOVA assumes that all columns come from populations with equal SDs. The following calculations test that assumption.

Bartlett's test cannot be performed because a sample size is too small.

Dunnett Multiple Comparisons Test

Control column: control

If the value of q is greater than 2.700 then the P value is less than 0.05.

Comparison	Mean Difference	q	P value
control vs 15	-1.160	0.5158 ns	P>0.05
control vs 50	-0.7400	0.3290 ns	P>0.05
control vs 160	2.320	1.032 ns	P>0.05
control vs 500	13.040	5.798 **	P<0.01
control vs 1600	5.800	2.579 ns	P>0.05

Difference	Mean Difference	Lower 95% CI	Upper 95% CI
control - 15	-1.160	-7.232	4.912
control - 50	-0.7400	-6.812	5.332
control - 160	2.320	-3.752	8.392
control - 500	13.040	6.968	19.112
control - 1600	5.800	-0.2723	11.872

Summary of Data

19

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
control	5	14.120	1.160	0.5188	Unknown
15	5	15.280	2.360	1.055	Unknown
50	5	14.860	2.230	0.9973	Unknown
160	5	11.800	0.7900	0.3533	Unknown
500	5	1.080	3.150	1.409	Unknown
1600	5	8.320	7.310	3.269	Unknown

Group	Minimum	Maximum	Lower 95% Confidence Interval	Upper 95% Confidence Interval
control	Unknown	Unknown	12.680	15.560
15	Unknown	Unknown	12.350	18.210
50	Unknown	Unknown	12.092	17.628
160	Unknown	Unknown	10.819	12.781
500	Unknown	Unknown	-2.831	4.991
1600	Unknown	Unknown	-0.7551	17.395

\* \* \*

03/19/1996 03:10 PM

AC 312,094 - LD50 Test - Day 7 Food Consumption

One-way Analysis of Variance (ANOVA)

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	5	343.29	68.657
Residuals (within columns)	24	153.87	6.411
Total	29	497.15	

F = 10.709

The P value is < 0.0001, considered extremely significant. Variation among column means is significantly greater than expected by chance.

Bartlett's test for homogeneity of variances.

ANOVA assumes that all columns come from populations with equal SDs. The following calculations test that assumption.

Bartlett's test cannot be performed because a sample size is too small.

Dunnett Multiple Comparisons Test

Control column: control

If the value of q is greater than 2.700 then the P value is less than 0.05.

Comparison	Mean Difference	q	P value
control vs 15	-1.960	1.224 ns	P>0.05
control vs 50	-0.8800	0.5495 ns	P>0.05
control vs 160	-0.7800	0.4871 ns	P>0.05
control vs 500	1.260	0.7868 ns	P>0.05
control vs 1600	8.220	5.133 **	P<0.01

Difference	Mean Difference	Lower 95% CI	Upper 95% CI
control - 15	-1.960	-6.284	2.364
control - 50	-0.8800	-5.204	3.444
control - 160	-0.7800	-5.104	3.544
control - 500	1.260	-3.064	5.584
control - 1600	8.220	3.896	12.544

Summary of Data

21

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
control	5	15.340	0.4300	0.1923	Unknown
15	5	17.300	0.6200	0.2773	Unknown
50	5	16.220	1.050	0.4696	Unknown
160	5	16.120	1.120	0.5009	Unknown
500	5	14.080	4.890	2.187	Unknown
1600	5	7.120	3.410	1.525	Unknown

Group	Minimum	Maximum	Lower 95% Confidence Interval	Upper 95% Confidence Interval
control	Unknown	Unknown	14.806	15.874
15	Unknown	Unknown	16.530	18.070
50	Unknown	Unknown	14.916	17.524
160	Unknown	Unknown	14.730	17.510
500	Unknown	Unknown	8.009	20.151
1600	Unknown	Unknown	2.887	11.353

\* \* \*

AC 312,094 - LD50 Test - Day 11 Food Consumption

One-way Analysis of Variance (ANOVA)

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	5	260.19	52.039
Residuals (within columns)	24	485.03	20.210
Total	29	745.23	

F = 2.575

The P value is 0.0531, considered not quite significant.

Variation among column means is not significantly greater than expected by chance.

Bartlett's test for homogeneity of variances.

ANOVA assumes that all columns come from populations with equal SDs. The following calculations test that assumption.

Bartlett's test cannot be performed because a sample size is too small.

Post tests were not calculated because the P value was greater than 0.05.

Summary of Data

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
control	5	14.420	0.5000	0.2236	Unknown
15	5	16.580	1.070	0.4785	Unknown
50	5	15.780	1.230	0.5501	Unknown
160	5	11.700	5.450	2.437	Unknown
500	5	20.920	3.810	1.704	Unknown
1600	5	13.080	8.610	3.851	Unknown

Group	Minimum	Maximum	Lower 95% Confidence Interval	Upper 95% Confidence Interval
control	Unknown	Unknown	13.799	15.041
15	Unknown	Unknown	15.252	17.908
50	Unknown	Unknown	14.253	17.307
160	Unknown	Unknown	4.934	18.466
500	Unknown	Unknown	16.190	25.650
1600	Unknown	Unknown	2.391	23.769



AC 312,094 - LD50 Test - Day 14 Food Consumption

One-way Analysis of Variance (ANOVA)

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	5	103.64	20.728
Residuals (within columns)	24	274.79	11.450
Total	29	378.43	

F = 1.810

The P value is 0.1489, considered not significant.

Variation among column means is not significantly greater than expected by chance.

Bartlett's test for homogeneity of variances.

ANOVA assumes that all columns come from populations with equal SDs. The following calculations test that assumption.

Bartlett's test cannot be performed because a sample size is too small.

Post tests were not calculated because the P value was greater than 0.05.

Summary of Data

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
control	5	16.060	0.6300	0.2817	Unknown
15	5	17.360	0.2200	0.09839	Unknown
50	5	17.520	1.470	0.6574	Unknown
160	5	15.820	0.5800	0.2594	Unknown
500	5	15.420	7.770	3.475	Unknown
1600	5	11.900	2.320	1.038	Unknown

Group	Minimum	Maximum	Lower 95% Confidence Interval	Upper 95% Confidence Interval
control	Unknown	Unknown	15.278	16.842
15	Unknown	Unknown	17.087	17.633
50	Unknown	Unknown	15.695	19.345
160	Unknown	Unknown	15.100	16.540
500	Unknown	Unknown	5.774	25.066
1600	Unknown	Unknown	9.020	14.780

24

03/19/1996 03:16 PM

AC 312,094 - LD50 Test - Day 21 Food Consumption

One-way Analysis of Variance (ANOVA)

Source of variation	Degrees of freedom	Sum of squares	Mean square
Treatments (between columns)	5	49.968	9.994
Residuals (within columns)	24	79.534	3.314
Total	29	129.50	

F = 3.016

The P value is 0.0299, considered significant.

Variation among column means is significantly greater than expected by chance.

Bartlett's test for homogeneity of variances.

ANOVA assumes that all columns come from populations with equal SDs. The following calculations test that assumption.

Bartlett's test cannot be performed because a sample size is too small.

Dunnett Multiple Comparisons Test

Control column: control

If the value of q is greater than 2.700 then the P value is less than 0.05.

Comparison	Mean Difference	q	P value
control vs 15	-0.8000	0.6948	ns P>0.05
control vs 50	-0.5600	0.4864	ns P>0.05
control vs 160	0.1200	0.1042	ns P>0.05
control vs 500	-0.3600	0.3127	ns P>0.05
control vs 1600	-3.680	3.196	* P<0.05

Difference	Mean Difference	Lower 95% CI	Upper 95% CI
control - 15	-0.8000	-3.909	2.309
control - 50	-0.5600	-3.669	2.549
control - 160	0.1200	-2.989	3.229
control - 500	-0.3600	-3.469	2.749
control - 1600	-3.680	-6.789	-0.5714

Summary of Data

25

Group	Number of Points	Mean	Standard Deviation	Standard Error of Mean	Median
control	5	12.120	0.9300	0.4159	Unknown
15	5	12.920	0.7000	0.3130	Unknown
50	5	12.680	0.9400	0.4204	Unknown
160	5	12.000	0.1900	0.08497	Unknown
500	5	12.480	3.080	1.377	Unknown
1600	5	15.800	2.850	1.275	Unknown

Group	Minimum	Maximum	Lower 95% Confidence Interval	Upper 95% Confidence Interval
control	Unknown	Unknown	10.965	13.275
15	Unknown	Unknown	12.051	13.789
50	Unknown	Unknown	11.513	13.847
160	Unknown	Unknown	11.764	12.236
500	Unknown	Unknown	8.656	16.304
1600	Unknown	Unknown	12.262	19.338

\* \* \*