1/12/89

DATA EVALUATION RECORD

1. Chemical: Ignite; Hoe 39866

2. Test Material: 98.4% (Technical ai)

3. Study Type: Avian Reproduction

   Species Tested: Bobwhite quail (Colinus virginianus)

4. Study ID: Roberts, N.L., Phillips, C.N.K., and Chanter, D.O. (1986) The Effects of Dietary Inclusion of Hoe 39866 Active Ingredient Technical (Code: Hoe 39866 OH ZC98 0002) on Reproduction in the Bobwhite Quail; Report No. A33114; Prepared by Huntingdon Research Centre Ltd. for Hoechst Celanese Corporation, Route 202-206 North, Somerville, New Jersey 08876.

5. Reviewed By:

   Curtis E. Laird
   Fishery Biologist
   EEB/HED

   Signature: Curtis E. Laird
   Date: 9-30-88

6. Approved By:

   Norman J. Cook
   Supervisory Biologist
   EEB/HED

   Signature: Norman J. Cook
   Date: 1-12-89

7. Conclusions:

Based on the submitted data, it appears that Ignite does not cause reproductive impairment for the number of eggs laid, eggs set, eggs cracked, food consumption, 14-day survival, egg shell thickness, 14-day body weights, and number hatched. This study indicates the NOEL was > 400 ppm for Ignite. This study, however, does not fulfill the requirement in support of registration for an avian reproduction study because the residue analysis data require clarification. Also, said study would only support those uses resulting in EECs in/on avian food items of 400 ppm or less.

8. Recommendations: N/A

9. Background:

This study was submitted to support Ignite (Hoe 39866) registration.

10. Discussion of Individual Test: N/A

11. Material and Methods

A. Test Animals - Young adult bobwhite quail that were approaching their first breeding season were obtained from Mr. Wise, Monkfield, Bourne, Cambridgeshire. The birds were approximately 4 months old on arrival and 5 months old when the test was initiated. A total of 80 males and 80 females, with an additional 16 males and 16 females for use as replacement birds, were used.

B. Test System - Adult birds were housed in treatment replicate groups each consisting of one male and one female. The groups were housed in tiered cages of polythene-coated steel wire, each measuring approximately 31.5 cm x 38.5 cm x 24 cm. Each cage contained a nipple drinker and had an externally-attached stainless steel food hopper. There was a sloping floor with a 10 cm egg catcher. The maximum and minimum temperature and the relative humidity were recorded once daily throughout the study, with the following results:

	Mean	Standard Deviation
Maximum temperature	22 °C	± 3 °C
Minimum temperature	18 °C	± 3 °C
Relative humidity	60%	± 14%

C. Dose - Fourteen days prior to the start of the treatment period the birds were allocated randomly to cages, with one male and one female in each cage. There was a total of four treatment groups, with 20 replicates of each treatment as shown below:

Group	Treatment	Number of Replicates	Birds per Replicate		Birds per Treatment	
			M	F	M	F
A	Control	20	1	1	20	20
B	Hoe 39866 25 ppm	20	1	1	20	20
C	Hoe 39866 100 ppm	20	1	1	20	20
D	Hoe 39866 400 ppm	20	1	1	20	20

In addition to the above birds, four replicates per treatment were maintained for use as replacements if

necessary during the pre-egg production period.

D. Statistics - No statistical analysis method was mentioned in this report.

Feeding - The adult birds were given basic diet only or basic diet with test compound incorporated, depending on

treatment group, throughout the 24-week test period. The basic diet was quail layer diet manufactured by Special Diet Services Limited, Witham, Essex, and contained no antibiotics or other growth promoters. Water was available at all times from automatic cup drinkers.

Diet Preparation - A weighed amount of test material was added to untreated diet to give a premix of 20,000 ppm (3000 ppm in preliminary study), which was mixed by being shaken in an inflated polythene bag for a minimum of 3 minutes prior to incorporation in the diets. Aliquots of premix were used to prepare the final inclusion levels. The diets were prepared weekly in batches of 30 to 40 kg (12 kg in preliminary study) and were blended in a double-cone blender for a minimum of 7 minutes.

Samples were taken from all diets at the time of the week 1 mix of the preliminary study as follows:

2 x 200 g from the first kg discharged;
2 x 200 g from the approximate center of the discharge; and
2 x 200 g from the final kg discharged.

The above samples were analzyed for homogeneity and stability by the sponsor.

Egg Collection, Storage, and Incubation

Egg Collection - All eggs laid were collected over a 12-week period from the beginning of week 13 until the end of week 24. The eggs were labeled with the study schedule number, treatment and replicate number, and the date collected, and were then stored on plastic egg trays according to replicate at a temperature of approximately 16 °C and mean relative humidity of 84 percent. Eggs were allowed to stand at room temperature (20 °C) for at least 12 hours prior to incubation. At the end of each 7-day period the eggs were weighed and replicate group mean weights recorded. Each egg was then candled and any broken or cracked eggs were recorded and discarded. The remaining eggs, with the exception of those taken for shell thickness determination, were placed on setting trays in an incubator.

Egg Shell Thickness - The first egg laid in each replicate during weeks 13, 15, 17, 19, 21, and 23 in the egg production period were taken to be examined for shell thickness. The eggs were cracked open at the widest point and the contents washed out with tap water. The shells were then left to dry out at room temperature for at least 48 hours. The shell thickness of each egg was measured at four points around the circumference of the shell using a micrometer calibrated to 0.01 mm.

Incubation - Eggs were placed in a Sologne 36 incubator at weekly intervals. The incubator was set to run at a temperature of 37.7 °C and a humidity of 57 percent. The eggs were turned automatically once every 60 minutes through an angle of 90° (45° each side of the horizontal) throughout the incubation period. After 21 days the eggs were transferred to hatchers, where hatching occurred within a few days.

Candling - In addition to being candled prior to incubation for cracks, all eggs were candled on days 11 and 18 of the incubation period. At day 11 all infertile eggs and eggs showing early embryonic deaths were recorded and removed. At day 18 late embryonic deaths were recorded and removed. Early and late embryonic deaths were determined on the basis of candling only and the eggs were not cracked open unless the candling result was difficult to assess.

Hatching - On day 21 of the incubation period the eggs were transferred from one incubator to the hatcher. Each hatcher tray was divided into sections using hardboard partitions so that the chicks could be kept separate according to replicate on hatching. The temperature of the hatchers was checked daily. The hatchers used were sill-air Bristol incubator models PH 90 and PH 150 and were designed to run at a temperature of 37.5 °C (99.5 °F). All chicks were removed from the hatcher within 24 hours of hatching and were weighed, tagged, and placed in floor pens.

Chicks

Identification - After hatching, the chicks were individually identified by means of colored plastic leg bands. The following color coding system was used:

Group A	Control	- White
Group B	Hoe 39866 25 ppm	- Yellow
Group C	Hoe 39866 100 ppm	- Green

Group D Hoe 39866 400 ppm - Red

Accommodation - The chicks were housed in wooden pens with concrete floors. Each pen contained two drinkers and two food hoppers. Wood shavings supplied by the Sawdust Marketing Company Limited, were used as bedding. Each pen contained two 300-watt infrared lamps placed at bird level to supply additional heat to the chicks. Maximum and minimum temperatures and relative humidity

were recorded once daily throughout the study with the following mean values:

	Mean	Standard Deviation
Maximum temperature	26 °C	± 2 °C
Minimum temperature	22 °C	± 2 °C
Relative humidity	53%	± 7%

A continuous lighting pattern was adopted for the chicks.

Feeding - The chicks were given standard HRC chick diet made by Joseph Odam Limited, Petersborough, Cambridgeshire, which had the following composition:

Ingredient	Percent w/w
Ground wheat	30.0
Ground maize	25.0
Ground barley	10.0
Provimi 66 fish meal	15.0
Soya bean meal	13.75
Weatings	5.0
Pantoribin 537*	1.25

*Mineral, vitamin, and trace element supplement (BP Nutrition (UK) Ltd.)

The diet contained no antibiotic or other growth promoter.

Observations

Adult birds

Mortalities	Daily
Bird Health	Assessed daily
Bodyweights	Individual bodyweights were recorded on days -14, 0, 14, 28, 42, 56, 70, 4, and 168.

Food Consumption	Replicate group mean food consumption was recorded once weekly throughout the study.
Macroscopic post mortem examination	All birds which died during the study and all birds surviving at termination of the study were examined post mortem.
<u>Eggs</u>	
Egg collection	Eggs were collected daily throughout the 12-week egg production period.
Egg weights	Eggs were weighed at the end of each 7-day collection period.
Cracked and broken eggs	Recorded and removed at time of weighing.
Egg shell thickness	The first egg laid in each replicate in weeks 13, 15, 17, 19, 21, and 23 was taken for egg shell thickness examination.
Infertile eggs	Eggs were candled on day 11 of the incubation period and infertile eggs removed.
Early embryonic deaths	Eggs were candled on day 11 of the incubation period and eggs showing early embryonic death were removed.
Late embryonic deaths	Eggs were candled on day 18 of the incubation period and eggs showing late embryonic death were removed.
<u>Chicks</u>	

Number of chicks hatched alive	Weekly
Chick health	Assessed daily
Bodyweights	Individual bodyweights were recorded within 24 hours of hatching and on day 14 after hatching.
Mortalities	Daily
Macroscopic post mortem examination	All chicks which died during the 14-day observation period were examined for gross abnormalities.

Summary of Study Duration

Adults - 12-week pre-egg production period.

Incubation - 12-week egg production period.

The total study duration from the start of the adult observation period to the final chick observation was 24 weeks.

Statistical Analysis

The following parameters were analyzed statistically:

1. Adult food consumption;
2. Adult bodyweight;
3. Number of eggs laid and mean egg weight;
4. Proportion of eggs damaged;
5. Egg shell thickness;
6. Numbers of infertilities, embryonic deaths and hatchings;
7. Numbers of 14-day-old surviving chicks; and
8. Chick bodyweights at hatching and 14 days later.

12. Reported Results

1. Mortalities and Bird Health - The following mortalities occurred during weeks -1 to 12 (pre-egg production period):

Replicate/ Group	Bird Number	Day of Death	Replacement
14A	28F	-1*	82A (163M, 164F)
3A	5M	56	81A (161M, 162F)
18A	36F	74	83A (165M, 166F)
35B	70F	52	85B (169M, 170F)
54C	107M	-1*	90C (179M, 180F)
48C	95M	56*	89C (177M, 178F)
51C	102F	76*	92C (183M, 184F)
67D	134F	77	93D (185M, 186F)

*Sacrificed

Where one bird in a replicate group died or was sacrificed, the replicate was replaced by a spare replicate. Two birds (Nos. 28F and 107M) showed marked body-weight losses during the pretreatment period (week -1) and replicates 14A and 54C were, therefore, discarded.

The following mortalities occurred during weeks 13 to 24 (egg production period).

Replicate/ Group	Bird Number	Day of Death
83A+	166F	100
4A	7M	126
85B+	170F	160
41C	82F	98
41C	81M	112
43C	85M	117
53C	105M	133*
77D	154F	147

+Replacement replicate
*Sacrificed

In general, bird health was good throughout the study. Individual bird observations are given in Appendix 4.

The majority of observations made were of physical injuries and were not considered to be related to treatment.

Adult Bodyweight - There were no treatment-related effects on body weight during the study. Statistical analysis of the results confirmed that there were no significant differences between groups (see Table 3 for more detail).

Food Consumption - Food consumption was similar in all groups, tending to be generally higher during the egg production period (weeks 13 to 24). Statistical analysis of the results showed no significant differences between treatments (see Table 4 for more detail).

Postmortem Examination - Sporadic mortalities. One bird was found hanging by the neck at the back of the cage, swollen foot, wound on the top of the head, etc. None of the above observations was considered to be related to treatment.

Postexamination Finding - All birds surviving the 24-week study period were also examined. No abnormalities were detected in any of the birds.

2. Eggs

Eggs Laid - The total number of eggs laid was higher in Group B (25 ppm) and Group D (400 ppm). The number of eggs laid in Group A (control) and Group C (100 ppm) were similar. The statistical analysis of the results shows no significant difference between treatments (see Table 5).

Broken and Cracked Eggs - The percentage of eggs laid which were cracked or broken varied considerably from week to week, but did not appear to be due to treatment-related effects. Statistical analysis of the results shows no significant differences between treatments (see Table 6 for more detail).

Egg Weight - The total egg weight (mass) was directly related to the number of eggs laid. Statistical analysis showed that there were no significant differences in mean egg weights between treatments.

Egg Shell Thickness - Egg shell thickness was similar in all groups and statistical analysis shows no significant difference between treatments (see Table 8 for more detail).

Infertile Eggs - The proportions of infertile eggs varied considerably from week to week within treatment groups, but there was no evidence of any treatment-related effect. Statistical analysis of the results showed no significant differences between treatments (see Tables 9 and 10).

Early Embryonic Deaths - The proportions of fertile eggs which showed early embryonic death at day 11 candling were generally small and no significant treatment differences were detected during statistical analysis (see Tables 9 and 10).

Late Embryonic Deaths - The incidence of late embryonic death recorded at day 18 candling was low and no statistically significant treatment differences were found (see Tables 9 and 10).

Hatching - The proportions of fertile eggs which subsequently hatched (hatchability) were generally high and statistical analysis of the results showed no significant differences between treatments. No significant differences in numbers of dead in shell were found between treatments (see Table 11).

3. Chicks

Chick Health and Mortalities The majority of chicks were in good health at time of hatching and remained so for the duration of the 14-day observation period. During week 22 of the study two infrared lamps failed overnight and a number of chicks from the week 165 hatch died as a result. A small number of birds which died during the 14-day observation period were found to have been pecked on or around the beak. This may have occurred after death or may have been caused by "bullying," leading to death. Details of mortalities and abnormalities observed (curled toes, twisted necks) are given in Appendix 10.

Bodyweight - All mean chick bodyweights at hatching and after 14 days were similar overall. Statistical analysis showed no significant differences between treatments (see Table 12).

Numbers of 14-Day Survivors - The proportion of chicks surviving to day 14 was within normal limits and no statistically significant differences were found between treatments. There was no evidence of treatment-related differences in the percentage of 14-day survivors/number of eggs set.

13. Study Author's Conclusion/QA Measures

Under the conditions of this study there was no evidence that dietary administration of Hoe 39866 technical at dose levels of 25, 100, and 400 ppm had any adverse effects on reproduction in the bobwhite quail.

To the best of the author's knowledge and belief, the study was conducted in compliance with Good Laboratory Practice Regulations as set forth in "Part 158 of Title 21 of the U.S. Code of Federal Regulations."

To the best of the author's knowledge and belief the study described in this report was conducted in compliance with the following Good Laboratory Practice Standard: U.S. Environmental Protection Agency, FEDERAL REGISTER, Part 160 of Title 40 of the Code of Federal Regulations, November 29, 1983 (Signed by Nicholas L. Roberts, N.D.A., Study Director).

14. Reviewer's Discussion and Interpretation of the Study:

A. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except it was not reported if the adult diet was available ad libitum. Also, neither corn oil nor any other diluent were used for the test compound during diet preparation.

B. Statistical Analysis - The following parameters were verified using an ANOVA program and Duncan's Multiple Range Test: Eggs laid, eggs set, eggs cracked, and food consumption.

The results are as follows:

Eggs laid = NOEL > 400 ppm
Eggs set = NOEL > 400 ppm
Eggs cracked = NOEL > 400 ppm
Food consumption = NOEL > 400 ppm
Number of 14-Day Survivors - . No significant different from control

The statistics were not verified for the following parameters: Number of 14-day survivors and bodyweight, egg shell thickness, and number hatched due to lack of replicates in the raw data. There did not appear to be a significant difference between treatment groups and the control group.

C. Discussion/Results - During week 22 of the study two infrared lamps malfunctioned overnight. A number of chicks from the week 16 hatch died as a result. A small number of birds died during the 14-day observation period. They were found pecked on or around the beak.

It is not clear to the reviewer whether pecking occurred before or after death.

The statistical analysis indicates no significant differences between treatments and control group for the following: Eggs laid, eggs set, eggs cracked, and food consumption (see attached printout). Also, postmortem examination of birds dying during the study and of those sacrificed at the end of the study showed no treatment-related effects. Therefore, the NOEL value is greater than 400 ppm.

Relative to the residue analysis data for avian feed, it is unclear, as presented in Appendix 2, what is being shown in the tables. Are these analyses of avian premix? Or are they representative samples taken from test diets during the test? When were these samples taken? Also, where are the analyses of samples taken for each dose level during weeks 1, 12, and 22 of the main study?

D. Adequacy of the Study

1. Category - Supplemental

2. Rationale - The residue analysis data need to be clarified as discussed above under the Discussion/ Results section.

3. Reparability - With adequate clarification of the residue analysis data this study could be upgraded to Core. However, said study--since it did not produce an effect level, but only a no-effect level--can only be used to support label uses resulting in EEC's in/on avian food items of 400 ppm or less.

Attachments

SUMMARY

In order to investigate the dietary effects of Hoe 039866 technical on reproduction in the Bobwhite quail, 3 groups of 20 replicates were given the test substance at dose levels of 25 ppm, 100 ppm and 400 ppm. A further group of 20 replicates received untreated diet throughout the same period for control purposes. The diets were given over a 24-week period, 12 weeks prior to the start of egg production and 12 weeks during egg production.

The findings in the study can be summarised as follows:

At all dietary concentrations general behaviour, health, bodyweights and food consumption remained unaffected and were not impaired by treatment with Hoe 039866 technical. None of the mortalities was considered to be associated with treatment and post mortem examination of birds which died during the study, and of those sacrificed at termination, indicated no treatment-related effects.

After feeding at 25 ppm, 100 ppm and 400 ppm the results of all reproductive parameters, including number of eggs laid, broken and cracked eggs, egg weights, egg shell thickness, number of infertile eggs, early and late embryonic death, hatching, chick health, chick bodyweights and number of 14-day survivors, gave no indication of any reproductive impairment.

The reproductive data are summarised below:

	Control	Hoe 039866 - Substance Technical		
		25 ppm	100 ppm	400 ppm
Eggs laid	957	1088	874	1033
Eggs cracked or broken	177	153	91	138
Eggs set	673	843	660	802
Viable embryos	561	771	535	720
Live 18-day embryos	544	742	516	706
Normal hatchlings	464	668	438	599
14-day survivors	358	573	351	491
Eggs laid per hen in 12 weeks	48	54	44	52
Eggs cracked or broken of eggs laid (%)	18	14	10	13
Viable embryos of eggs set (%)	83	91	81	90
Live 18-day embryos of viable embryos (%)	97	96	96	98
Normal hatchlings of live 18-day embryos (%)	85	90	85	85
14-day survivors of normal hatchlings (%)	77	86	80	82
14-day survivors per hen	18	29	18	25

Conclusion

Under the conditions of this test, and taking the results as a whole, there was no evidence that dietary administration of Hoe 039866 technical at dose levels of 25 ppm, 100 ppm and 400 ppm had any adverse effects on the reproduction of the Bobwhite quail. The high dose level of 400 ppm of Hoe 039866 is equivalent to an estimated intake of approximately 40 mg/kg/day.

BWB

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OBS	TRT	EL	EC	ES	VE	LE	NH
1	A	46	1	40	15	15	11
2	A	64	15	46	45	44	31
3	A	30	4	23	22	22	17
4	A	73	17	26	21	20	15
5	A	54	10	39	37	37	34
6	A	57	12	42	38	37	29
7	A	57	5	47	46	46	44
8	A	62	14	44	42	42	38
9	A	56	10	42	36	36	35
10	A	44	0	38	29	29	28
11	A	46	1	40	1	1	0
12	A	29	7	17	17	16	8
13	A	47	4	38	36	36	30
14	A	75	51	20	22	17	10
15	A	31	6	22	22	21	12
16	A	64	3	55	55	55	44
17	A	27	1	22	16	16	13
18	A	0	0	0	0	0	0
19	A	25	4	18	18	18	18
20	A	70	11	54	48	48	47
21	B	67	14	48	47	45	36
22	B	68	8	55	41	41	41
23	B	55	4	46	33	33	20
24	B	0	0	0	0	0	0
25	B	64	8	55	55	55	49
26	B	79	19	55	54	54	50
27	B	54	9	40	36	36	32
28	B	73	16	51	49	49	29
29	B	47	1	41	35	35	26
30	B	30	3	25	17	17	16
31	B	43	5	33	30	30	28
32	B	76	9	61	61	61	52
33	B	74	2	66	67	67	59
34	B	76	12	58	57	57	58
35	B	59	9	45	37	37	36
36	B	23	2	19	19	19	15
37	B	45	2	36	31	31	25
38	B	42	4	35	29	29	28
39	B	52	13	30	29	28	28
40	B	61	13	44	44	44	42
41	C	0	0	0	0	0	0
42	C	62	14	42	32	32	29
43	C	66	0	25	15	15	13
44	C	83	6	72	50	50	52
45	C	2	0	1	5	5	0
46	C	2	1	0	0	0	0
47	C	74	4	64	56	56	56
48	C	17	4	11	15	15	8
49	C	63	5	52	44	44	39
50	C	44	12	30	33	33	24
51	C	35	2	29	29	29	22
52	C	64	3	56	49	49	46
53	C	21	2	2	7	7	.
54	C	79	5	69	65	65	49
55	C	55	4	46	48	47	35

56	C	48	6	38	37	37	18
57	C	55	11	40	34	34	30
58	C	15	1	11	11	11	10
59	C	68	6	57	0	0	0
60	D	57	2	49	49	49	46
61	D	67	11	50	33	33	28
62	D	14	0	11	0	0	0
63	D	58	2	50	36	36	21
64	D	46	11	30	29	29	26
65	D	77	29	43	43	43	30
66	D	60	1	53	52	52	49
67	D	75	15	54	50	50	48
68	D	52	4	53	49	49	43
69	D	69	3	59	60	60	40
70	D	71	3	62	.	50	36
71	D	36	3	29	23	23	19
72	D	74	17	50	50	50	45
73	D	52	3	45	45	45	42
74	D	33	3	26	26	26	22
75	D	1	0	0	0	0	0
76	D	26	5	18	18	18	18
77	D	22	3	14	4	4	4
78	D	56	4	47	44	44	42
79	D	76	4	59	59	59	40

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	4	A B C D

NUMBER OF OBSERVATIONS IN DATA SET = 79

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
MODEL	3	1020.99723518	340.33241173	0.67	0.5732	0.026097	45.3083
ERROR	75	38101.93947368	508.02585965		ROOT MSE		RESP MEAN
CORRECTED TOTAL	78	39122.93670886			22.53942900		49.74683544

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
TRT	3	1020.99723518	0.67	0.5732	3	1020.99723518	0.67	0.5732

GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP

ALPHA=0.05 DF=75 MSE=508.026

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=19.7403

NUMBER OF MEANS	2	3	4
CRITICAL RANGE	14.3059	15.0431	15.5233

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	54.400	20	B
A			
A	51.600	20	D
A			
A	47.850	20	A
A			
A	44.895	19	C

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	4	A B C D

NUMBER OF OBSERVATIONS IN DATA SET = 79

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
MODEL	3	201.11505663	67.03835221	1.18	0.3215	0.045234	110.4727
ERROR	75	4245.03684211	56.60049123		ROOT MSE		RESP MEAN
CORRECTED TOTAL	78	4446.15189873			7.52332980		6.81012658

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
TRT	3	201.11505663	1.18	0.3215	3	201.11505663	1.18	0.3215

GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP
NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,
NOT THE EXPERIMENTWISE ERROR RATE

ALPHA=0.05 DF=7

5 MEAN=56.6005

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=19.7403

NUMBER OF MEANS	2	3	4
CRITICAL RANGE	4.77511	5.02115	5.18145

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	8.800	20	A
A			
A	7.650	20	B
A			
A	6.150	20	D
A			
A	4.526	19	C

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	4	A B C D

NUMBER OF OBSERVATIONS IN DATA SET = 79

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
MODEL	3	1103.89946702	367.96648901	1.08	0.3639	0.041317	49.2722
ERROR	75	25613.84736842	341.51796491		ROOT MSE		RESP MEAN
CORRECTED TOTAL	78	26717.74683544			18.48020468		37.50632911

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
TRT	3	1103.89946702	1.08	0.3639	3	1103.89946702	1.08	0.3639

GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP
NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,
NOT THE EXPERIMENTWISE ERROR RATE

ALPHA=0.05 DF=75 MSE=341.518

NUMBER OF MEANS	2	3	4
CRITICAL RANGE	11.7295	12.3339	12.727

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	42.150	20	B
A			
A	40.100	20	D
A			
A	33.947	19	C
A			
A	33.650	20	A

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	4	A B C D

NUMBER OF OBSERVATIONS IN DATA SET = 79

NOTE: ALL DEPENDENT VARIABLES ARE CONSISTENT WITH RESPECT TO THE PRESENCE OR ABSENCE OF MISSING VALUES. HOWEVER, ONLY 78 OBSERVATIONS CAN BE USED IN THIS ANALYSIS.

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
MODEL	3	1632.82503374	544.27501125	1.68	0.1777	0.063923	55.2655
ERROR	74	23910.62368421	323.11653627		ROOT MSE		RESP MEAN
CORRECTED TOTAL	77	25543.44871795			17.97544259		32.52564103

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
TRT	3	1632.82503374	1.68	0.1777	3	1632.82503374	1.68	0.1777

GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP

NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE, NOT THE EXPERIMENTWISE ERROR RATE

ALPHA=0.05 DF=74 MSE=323.117

WARNING: CELL SIZES ARE NOT EQUAL.

CRITICAL RANGE 11.4633 12.0771 12.4629

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	38.550	20	B
A			
A	35.263	19	D
A			
A	28.300	20	A
A			
A	27.895	19	C

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	4	A B C D

NUMBER OF OBSERVATIONS IN DATA SET = 79

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
MODEL	3	1794.84077282	598.28025761	1.86	0.1440	0.069172	55.0983
ERROR	75	24152.52631579	322.03368421		ROOT MSE		RESP MEAN
CORRECTED TOTAL	78	25947.36708861			17.94529699		32.56962025

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
TRT	3	1794.84077282	1.86	0.1440	3	1794.84077282	1.86	0.1440

GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP

NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,
NOT THE EXPERIezTWISE ERROR RATE

ALPHA=0.05 DF=75 MSE=322.034

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=19.7403

NUMBER OF MEANS	2	3	4
CRITICAL RANGE	11.39	11.9769	12.3592

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

```
                                    A          38.400     20  B
                                    A
                                    A          36.000     20  D
                                    A
                                    A          27.842     19  C
                                    A
                                    A          27.800     20  A
                                6. ANALYSIS OF NH DATA                14:54 TUESDAY, NOVEMBER 15, 1988   18
                                 ********************

                                GENERAL LINEAR MODELS PROCEDURE

                                  CLASS LEVEL INFORMATION

                                CLASS     LEVELS    VALUES

                                TRT          4      A B C D


                              NUMBER OF OBSERVATIONS IN DATA SET = 79


NOTE: ALL DEPENDENT VARIABLES ARE CONSISTENT WITH RESPECT TO THE PRESENCE OR ABSENCE OF MISSING VALUES. HOWEVER,
      ONLY     78 OBSERVATIONS CAN BE USED IN THIS ANALYSIS.
                                6. ANALYSIS OF NH DATA                14:54 TUESDAY, NOVEMBER 15, 1988   19
                                 ********************

                                GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE                  DF       SUM OF SQUARES          MEAN SQUARE        F VALUE         PR > F        R-SQUARE          C.V.

MODEL                    3        1432.77735043          477.59245014           1.81         0.1525        0.068414       58.5263

ERROR                   74        19510.09444444         263.64992492                      ROOT MSE                      RESP MEAN

CORRECTED TOTAL         77        20942.87179487                                        16.23730042                    27.74358974


SOURCE                  DF            TYPE I SS      F VALUE      PR > F          DF          TYPE III SS      F VALUE      PR > F

TRT                      3        1432.77735043          1.81      0.1525           3        1432.77735043          1.81      0.1525
                                6. ANALYSIS OF NH DATA                14:54 TUESDAY, NOVEMBER 15, 1988   20
                                 ********************

                                GENERAL LINEAR MODELS PROCEDURE

                          DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP
                          NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,
                                NOT THE EXPERIMENTWISE ERROR RATE

                                     ALPHA=0.05  DF=74  MSE=263.65

                                WARNING: CELL SIZES ARE NOT EQUAL.
                                        HARMONIC MEAN OF CELL SIZES=19.4595

                                NUMBER OF MEANS          2         3         4
                                CRITICAL RANGE     10.3822   10.9171   11.2658

                           MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

                                DUNCAN   GROUPING              MEAN       N  TRT
```

```
                                A          29.950     20  D
                                A
                                A          23.944     18  C
                                A
                                A          23.200     20  A
                                    7. ANALYSIS OF ES/EL DATA                14:54 TUESDAY, NOVEMBER 15, 1988   21
                                    **********************

                                    GENERAL LINEAR MODELS PROCEDURE

                                    CLASS LEVEL INFORMATION

                                    CLASS     LEVELS    VALUES

                                    TRT          4      A B C D


                                NUMBER OF OBSERVATIONS IN DATA SET = 79

NOTE: ALL DEPENDENT VARIABLES ARE CONSISTENT WITH RESPECT TO THE PRESENCE OR ABSENCE OF MISSING VALUES. HOWEVER,
      ONLY     76 OBSERVATIONS CAN BE USED IN THIS ANALYSIS.
                                    7. ANALYSIS OF ES/EL DATA                14:54 TUESDAY, NOVEMBER 15, 1988   22
                                    **********************

                                    GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESPONSE
WEIGHT:             WT

SOURCE                 DF       SUM OF SQUARES          MEAN SQUARE        F VALUE        PR > F        R-SQUARE          C.V.

MODEL                   3       13643.84596828       4547.94865609           1.07        0.3658        0.042815      107.1019

ERROR                  72      305022.43252909       4236.42267402                     ROOT MSE                  RESPONSE MEAN

CORRECTED TOTAL        75      318666.27849737                                      65.08780741                    60.77182901


SOURCE                 DF            TYPE I SS      F VALUE      PR > F          DF          TYPE III SS      F VALUE      PR > F

TRT                     3       13643.84596828         1.07      0.3658           3       13643.84596828         1.07      0.3658
                                    7. ANALYSIS OF ES/EL DATA                14:54 TUESDAY, NOVEMBER 15, 1988   23
                                    **********************

                                    GENERAL LINEAR MODELS PROCEDURE

                                DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESPONSE
                                NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,
                                      NOT THE EXPERIMENTWISE ERROR RATE

                                            ALPHA=0.05  DF=72  MSE=4236.42

                                        WARNING: CELL SIZES ARE NOT EQUAL.
                                                 HARMONIC MEAN OF CELL SIZES=18.9736

                                        NUMBER OF MEANS          2          3          4
                                        CRITICAL RANGE      42.1647    44.3369    45.7548

                                    MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

                                        DUNCAN  GROUPING              MEAN       N  TRT
```

```
                                    A
                                    A              58.72     19  A
                                    A
                                    A              54.68     18  C
                        7. ANALYSIS OF ES/EL DATA                    14:54 TUESDAY, NOVEMBER 15, 1988   24
                        **********************

 VARIABLE        N          MEAN       STANDARD      MINIMUM       MAXIMUM      STD ERROR          SUM        VARIANCE        C.V.
                                       DEVIATION      VALUE         VALUE       OF MEAN

 ------------------------------------------------------ TRT=A ------------------------------------------------------

 EL             20    47.85000000   19.30441727   0.00000000   75.00000000   4.31659893   957.0000000   372.66052632      40.344
 ES             20    33.65000000   14.28755439   0.00000000   55.00000000   3.19479429   673.0000000   204.13421053      42.459
 WT             20    47.85000000   19.30441727   0.00000000   75.00000000   4.31659893   957.0000000   372.66052632      40.344
 Z              19     0.72233321    0.16235488   0.26666667    0.86956522   0.03724676    13.7243310     0.02635911      22.476
 ARS            19     1.02529827    0.17617556   0.54263910    1.20128739   0.04041744    19.4806671     0.03103783      17.183
 RESPONSE       19    58.72162799   10.09005463   31.07842131   68.80100491   2.31481729  1115.7109318   101.80920243      17.183

 ------------------------------------------------------ TRT=B ------------------------------------------------------

 EL             20    54.40000000   20.18702032   0.00000000   79.00000000   4.51395497  1088.0000000   407.51578947      37.108
 ES             20    42.15000000   15.79898398   0.00000000   66.00000000   3.53276022   843.0000000   249.60789474      37.483
 WT             20    54.40000000   20.18702032   0.00000000   79.00000000   4.51395497  1088.0000000   407.51578947      37.108
 Z              19     0.77935354    0.07627567   0.57692308    0.89189189   0.01749884    14.8077172     0.00581798       9.787
 ARS            19     1.08688535    0.09086766   0.86262796    1.23576583   0.02084647    20.6508217     0.00825693       8.360
 RESPONSE       19    62.24888842    5.20423872   49.40505604   70.77567915   1.19393425  1182.7288799    27.08410070       8.360

 ------------------------------------------------------ TRT=C ------------------------------------------------------

 EL             19    44.89473684   27.56587007            0   83.00000000   6.32404431   853.00000000   759.87719298      61.401
 ES             19    33.94736842   24.46192889            0   72.00000000   5.61195137   645.00000000   598.38596491      72.058
 WT             19    44.89473684   27.56587007            0   83.00000000   6.32404431   853.00000000   759.87719298      61.401
 Z              18     0.66899526    0.26361694            0    0.87500000   0.06213511    12.04191471     0.06949389      39.405
 ARS            18     0.95473163    0.33103932            0    1.20942920   0.07802672    17.18516935     0.10958703      34.674
 RESPONSE       18    54.68008431   18.95952457            0   69.26730889   4.46880280   984.24151750   359.46357173      34.674

 ------------------------------------------------------ TRT=D ------------------------------------------------------

 EL             20    51.60000000   22.47899604   1.00000000   77.00000000   5.02645632  1032.0000000   505.30526316      43.564
 ES             20    40.10000000   18.09594313   0.00000000   62.00000000   4.04637590   802.0000000   327.46315789      45.127
 WT             20    51.60000000   22.47899604   1.00000000   77.00000000   5.02645632  1032.0000000   505.30526316      43.564
 Z              20     0.73647840    0.19670200   0.00000000    0.88333333   0.04398390    14.7295679     0.03869168      26.708
 ARS            20     1.03024744    0.26615292   0.00000000    1.22221476   0.05951360    20.6049488     0.07083737      25.834
 RESPONSE       20    59.00508066   15.24330340   0.00000000   69.99957262   3.40850626  1180.1016132   232.35829841      25.834
                        8. ANALYSIS OF VE/ES DATA                    14:54 TUESDAY, NOVEMBER 15, 1988   25
                        **********************

                                GENERAL LINEAR MODELS PROCEDURE

                                  CLASS LEVEL INFORMATION

                                  CLASS      LEVELS    VALUES

                                  TRT             4    A B C D


                                NUMBER OF OBSERVATIONS IN DATA SET = 79

NOTE: ALL DEPENDENT VARIABLES ARE CONSISTENT kRTH RESPECT TO THE PRESENCE OR ABSENCE OF MISSING VALUES. HOWEVER,
      ONLY     65 OBSERVATIONS CAN BE USED IN THIS ANALYSIS.
                        8. ANALYSIS OF VE/ES DATA                    14:54 TUESDAY, NOVEMBER 15, 1988   26
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1064 DEPENDENT VARIABLE: RESPONSE
1065 WEIGHT: WT
1066

1067 SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
1068							
1069 MODEL	3	85572.60246902	28524.20082301	2.06	0.1149	0.091991	164.4321
1070							
1071 ERROR	61	844653.04947163	13846.77130281		ROOT MSE		RESPONSE MEAN
1072							
1073 CORRECTED TOTAL	64	930225.65194065			117.67230474		71.56283765

1074
1075

1076 SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
1077								
1078 TRT	3	85572.60246902	2.06	0.1149	3	85572.60246902	2.06	0.1149

1079
1080 8. ANALYSIS OF VE/ES DATA 14:54 TUESDAY, NOVEMBER 15, 1988 27
1081 ***
1082 GENERAL LINEAR MODELS PROCEDURE
1083
1084 DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESPONSE
1085 NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,
1086 NOT THE EXPERIMENTWISE ERROR RATE
1087
1088 ALPHA=0.05 DF=61 MSE=13846.8
1089
1090 WARNING: CELL SIZES ARE NOT EQUAL.
1091 HARMONIC MEAN OF CELL SIZES=15.7935
1092
1093 NUMBER OF MEANS 2 3 4
1094 CRITICAL RANGE 83.7918 88.1053 90.9441
1095
1096 MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.
1097

1098 DUNCAN GROUPING	MEAN	N	TRT
1099			
1100 A	74.85	18	B
1101 A			
1102 A	71.90	17	D
1103 A			
1104 A	70.70	18	A
1105 A			
1106 A	64.76	12	C

1107
1108 8. ANALYSIS OF VE/ES DATA 14:54 TUESDAY, NOVEMBER 15, 1988 28
1109 ***
1110

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN	SUM	VARIANCE	C.V.
1111									
1112									
1113 ---------- TRT=A ----------									
1114									
1115 ES	20	33.65000000	14.28755439	0.00000000	55.00000000	3.19479429	673.0000000	204.13421053	42.459
1116 VE	20	28.30000000	15.30428217	0.00000000	55.00000000	3.42214153	566.0000000	234.22105263	54.079
1117 WT	20	33.65000000	14.28755439	0.00000000	55.00000000	3.19479429	673.0000000	204.13421053	42.459
1118 Z	19	0.85331865	0.25407998	0.02500000	1.10000000	0.05828995	16.2130544	0.06455664	29.776
1119 ARS	18	1.23436298	0.35624975	0.15878021	1.57079633	0.08396887	22.2185336	0.12691389	28.861
1120 RESPONSE	18	70.69533417	20.40339484	9.09377593	89.96378963	4.80912628	1272.5160151	416.29852088	28.861
1121									
1122 ---------- TRT=B ----------									
1123									
1124 ES	20	42.15000000	15.79898398	0.00000000	66.00000000	3.53276022	843.0000000	249.60789474	37.483
1125 VE	20	38.55000000	16.34649488	0.00000000	67.00000000	3.65518737	771.0000000	267.20789474	42.403

RESPONSE	18	74.85035166	11.62931528	55.52774812	89.96378963	2.74105590	1347.3063299	135.24097391	15.537

TRT=C

ES	19	33.94736842	24.46192889	0	72.00000000	5.61195137	645.00000000	598.38596491	72.058
VE	19	27.89473684	20.87234943	0	65.00000000	4.78844536	530.00000000	435.65497076	74.825
WT	19	33.94736842	24.46192889	0	72.00000000	5.61195137	645.00000000	598.38596491	72.058
Z	17	1.26031358	1.18937151	0	5.00000000	0.28846496	21.42533087	1.41460459	94.371
ARS	12	1.13075184	0.41373060	0	1.57079633	0.11943374	13.56902208	0.17117301	36.589
RESPONSE	12	64.76124177	23.69548007	0	89.96378963	6.84029590	777.13490119	561.47577569	36.589

TRT=D

ES	20	40.10000000	18.09594313	0	62.00000000	4.04637590	802.0000000	327.46315789	45.127
VE	19	35.26315789	19.06375883	0	60.00000000	4.37352622	670.0000000	363.42690058	54.061
WT	20	40.10000000	18.09594313	0	62.00000000	4.04637590	802.0000000	327.46315789	45.127
Z	18	0.84501056	0.27987715	0	1.01694915	0.06596768	15.2101901	0.07833122	33.121
ARS	17	1.25545796	0.43182163	0	1.57079633	0.10473213	21.3427854	0.18646992	34.396
RESPONSE	17	71.90350146	24.73160219	0	89.96378963	5.99829459	1222.3595249	611.65214677	34.396

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	4	A B C D

NUMBER OF OBSERVATIONS IN DATA SET = 79

NOTE: ALL DEPENDENT VARIABLES ARE CONSISTENT WITH RESPECT TO THE PRESENCE OR ABSENCE OF MISSING VALUES. HOWEVER, ONLY 71 OBSERVATIONS CAN BE USED IN THIS ANALYSIS.

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESPONSE
WEIGHT: WT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
MODEL	3	4794.71082889	1598.23694296	2.79	0.0470	0.111130	26.9969
ERROR	67	38350.43881841	572.39460923		ROOT MSE		RESPONSE MEAN
CORRECTED TOTAL	70	43145.14964730			23.92476978		88.62050516

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
TRT	3	4794.71082889	2.79	0.0470	3	4794.71082889	2.79	0.0470

GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESPONSE

NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=17.6533

NUMBER OF MEANS	2	3	4
CRITICAL RANGE	16.0869	16.9154	17.4581

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	89.964	17	D
A			
A	89.445	16	C
A			
A	88.774	19	B
A			
A	85.474	19	A

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN	SUM	VARIANCE	C.V.
TRT=A									
VE	20	28.30000000	15.30428217	0.00000000	55.00000000	3.42214153	566.0000000	234.22105263	54.079
LE	20	27.80000000	15.44974876	0.00000000	55.00000000	3.45466885	556.0000000	238.69473684	55.575
WT	20	28.30000000	15.30428217	0.00000000	55.00000000	3.42214153	566.0000000	234.22105263	54.079
Z	19	0.97748906	0.05323169	0.77272727	1.00000000	0.01221219	18.5722921	0.00283361	5.446
ARS	19	1.49241110	0.13615957	1.07386384	1.57079633	0.03123715	28.3558109	0.01853943	9.123
RESPONSE	19	85.47445378	7.79822981	61.50311061	89.96378963	1.78903662	1624.0146218	60.81238823	9.123
TRT=B									
VE	20	38.55000000	16.34649488	0.00000000	67.00000000	3.65518737	771.0000000	267.20789474	42.403
LE	20	38.40000000	16.33014648	0.00000000	67.00000000	3.65153176	768.0000000	266.67368421	42.526
WT	20	38.55000000	16.34649488	0.00000000	67.00000000	3.65518737	771.0000000	267.20789474	42.403
Z	19	0.99594548	0.01221904	0.95744681	1.00000000	0.00280324	18.9229640	0.00014931	1.227
ARS	19	1.55003025	0.06230038	1.36302032	1.57079633	0.01429269	29.4505747	0.00388134	4.019
RESPONSE	19	88.77445975	3.56811251	78.06389122	89.96378963	0.81858115	1686.7147353	12.73142685	4.019
TRT=C									
VE	19	27.89473684	20.87234943	0.00000000	65.00000000	4.78844536	530.0000000	435.65497076	74.825
LE	19	27.84210526	20.82003084	0.00000000	65.00000000	4.77644265	529.0000000	433.47368421	74.779
WT	19	27.89473684	20.87234943	0.00000000	65.00000000	4.78844536	530.0000000	435.65497076	74.825
Z	16	0.99869792	0.00520833	0.97916667	1.00000000	0.00130208	15.9791667	0.00002713	0.522
ARS	16	1.56174361	0.03621087	1.42595283	1.57079633	0.00905272	24.9878977	0.00131123	2.319
RESPONSE	16	89.44531574	2.07389553	81.66820752	89.96378963	0.51847388	1431.1250519	4.30104265	2.319
TRT=D									
VE	19	35.26315789	19.06375883	0.00000000	60.00000000	4.37352622	670.0000000	363.42690058	54.061
LE	20	36.00000000	18.84563331	0.00000000	60.00000000	4.21401172	720.0000000	355.15789474	52.349
WT	19	35.26315789	19.06375883	0.00000000	60.00000000	4.37352622	670.0000000	363.42690058	54.061
Z	17	1.00000000	0.00000000	1.00000000	1.00000000	0.00000000	17.0000000	0.00000000	0.000
ARS	17	1.57079633	0.00000000	1.57079633	1.57079633	0.00000000	26.7035376	0.00000000	0.000
RESPONSE	17	89.96378963	0.00000000	89.96378963	89.96378963	0.00000000	1529.3844236	0.00000000	0.000

GENERAL LINEAR MODELS PROCEDURE

CLASS	LEVELS	VALUES
TRT	4	A B C D

NUMBER OF OBSERVATIONS IN DATA SET = 79

NOTE: ALL DEPENDENT VARIABLES ARE CONSISTENT WITH RESPECT TO THE PRESENCE OR ABSENCE OF MISSING VALUES. HOWEVER, ONLY 69 OBSERVATIONS CAN BE USED IN THIS ANALYSIS.

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GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESPONSE
WEIGHT: WT

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
MODEL	3	5841.53071143	1947.17690381	0.41	0.7498	0.018354	101.8788
ERROR	65	312429.49747146	4806.60765341		ROOT MSE		RESPONSE MEAN
CORRECTED TOTAL	68	318271.02818289			69.32970253		68.05117859

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
TRT	3	5841.53071143	0.41	0.7498	3	5841.53071143	0.41	0.7498

****

GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESPONSE

NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE, NOT THE EXPERIMENTWISE ERROR RATE

ALPHA=0.05 DF=65 MSE=4806.61

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=17.0089

NUMBER OF MEANS	2	3	4
CRITICAL RANGE	47.5168	49.9637	51.5689

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	70.65	18	B
A			
A	69.38	18	D
A			
A	62.74	19	A
A			
A	60.64	14	C

****

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN	SUM	VARIANCE	C.V.

1327	LE	20	27.80000000	15.44974876	0	55.00000000	3.45466885	556.0000000	238.69473684	55.575
1328	NH	20	23.20000000	14.62370102	0	47.00000000	3.26995896	464.0000000	213.85263158	63.033
1329	WT	20	27.80000000	15.44974876	0	55.00000000	3.45466885	556.0000000	238.69473684	55.575
1330	Z	19	0.76563135	0.23590834	0	1.00000000	0.05412109	14.5469957	0.05565275	30.812
1331	ARS	19	1.09544407	0.33892780	0	1.57079633	0.07775537	20.8134374	0.11487205	30.940
1332	RESPONSE	19	62.73906960	19.41131929	0	89.96378963	4.45326206	1192.0423225	376.79931645	30.940
1333										
1334	---------- TRT=B ----------									
1335										
1336	LE	20	38.40000000	16.33014648	0.00000000	67.00000000	3.65153176	768.0000000	266.67368421	42.526
1337	NH	20	33.50000000	15.28845454	0.00000000	59.00000000	3.41860236	670.0000000	233.73684211	45.637
1338	WT	20	38.40000000	16.33014648	0.00000000	67.00000000	3.65153176	768.0000000	266.67368421	42.526
1339	Z	19	0.87160784	0.12347759	0.59183673	1.01754386	0.02832770	16.5605491	0.01524671	14.167
1340	ARS	18	1.23350180	0.19503075	0.87775926	1.57079633	0.04596919	22.2030325	0.03803699	15.811
1341	RESPONSE	18	70.64601244	11.16994293	50.27166698	89.96378963	2.63278080	1271.6282238	124.76762[illegible]8	15.811
1342										
1343	---------- TRT=C ----------									
1344										
1345	LE	19	27.84210526	20.82003084	0	65.00000000	4.77644265	529.00000000	433.47368421	74.779
1346	NH	18	23.94444444	1raE322910	0	56.00000000	4.51610931	431.00000000	367.11437908	80.020
1347	WT	19	27.84210526	20.82003084	0	65.00000000	4.77644265	529.00000000	433.47368421	74.779
1348	Z	15	0.76224933	0.26171832	0	1.04000000	0.06757538	11.43373991	0.06849648	34.335
1349	ARS	14	1.05873235	0.36687555	0	1.57079633	0.09805161	14.82225296	0.13459767	34.652
1350	RESPONSE	14	60.63648937	21.01196306	0	89.96378963	5.61568334	848.91085124	441.50259152	34.652
1351										
1352	---------- TRT=D ----------									
1353										
1354	LE	20	36.00000000	18.84563331	0.00000000	60.00000000	4.21401172	720.0000000	355.15789474	52.349
1355	NH	20	29.95000000	15.83625089	0.00000000	49.00000000	3.54109335	599.0000000	250.78684211	52.876
1356	WT	20	36.00000000	18.84563331	0.00000000	60.00000000	4.21401172	720.0000000	355.15789474	52.349
1357	Z	18	0.84830172	0.12643531	0.58333333	1.00000000	0.02980109	15.2694309	0.01598589	14.905
1358	ARS	18	1.21134759	0.20024375	0.86912220	1.57079633	0.04719790	21.8042566	0.04009756	16.531
1359	RESPONSE	18	69.37718009	11.46850566	49.77699890	89.96378963	2.70315271	1248.7892416	131.52662199	16.531

1361 **********

1362

1363 GENERAL LINEAR MODELS PROCEDURE

1364

1365 CLASS LEVEL INFORMATION

1366

1367	CLASS	LEVELS	VALUES
1368			
1369	TRT	4	A B C D

1370

1371

1372 NUMBER OF OBSERVATIONS IN DATA SET = 79

1373

1374

1375 NOTE: ALL DEPENDENT VARIABLES ARE CONSISTENT WITH RESPECT TO THE PRESENCE OR ABSENCE OF MISSING VALUES. HOWEVER,

1376 ONLY 75 OBSERVATIONS CAN BE USED IN THIS ANALYSIS.

1378 **********

1379

1380 GENERAL LINEAR MODELS PROCEDURE

1381

1382 DEPENDENT VARIABLE: RESPONSE

1383 WEIGHT: WT

1384

1385	SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
1386								
1387	MODEL	3	50613.96094842	16871.32031614	1.94	0.1314	0.075662	196.1198
1388								
1389	ERROR	71	618335.19506982	8708.94640943		ROOT MSE		RESPONSE MEAN

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
TRT	3	50613.96094842	1.94	0.1314	3	50613.96094842	1.94	0.1314

GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESPONSE

NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE, NOT THE EXPERIMENTWISE ERROR RATE

ALPHA=0.05 DF=71 MSE=8708.95

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=18.684

NUMBER OF MEANS	2	3	4
CRITICAL RANGE	60.9353	64.0744	66.1248

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	51.48	19	B
A			
A	45.10	20	D
A			
A	43.30	19	A
A			
A	40.01	17	C

VARIABLE	N	MEAN	STANDARD DEVIATION	MINIMUM VALUE	MAXIMUM VALUE	STD ERROR OF MEAN	SUM	VARIANCE	C.V.
TRT=A									
EL	20	47.85000000	19.30441727	0	75.00000000	4.31659893	957.00000000	372.66052632	40.344
NH	20	23.20000000	14.62370102	0	47.00000000	3.26995896	464.00000000	213.85263158	63.033
WT	20	47.85000000	19.30441727	0	75.00000000	4.31659893	957.00000000	372.66052632	40.344
Z	19	0.48817105	0.22041145	0	0.77192982	0.05056585	9.27524990	0.04858121	45.150
ARS	19	0.75597094	0.26909264	0	1.07291297	0.06173409	14.36344786	0.07241085	35.596
RESPONSE	19	43.29651747	15.41166938	0	61.44865217	3.53567944	822.63383189	237.51955295	35.596
TRT=B									
EL	20	54.40000000	20.18702032	0.00000000	79.00000000	4.51395497	1088.0000000	407.51578947	37.108
NH	20	33.50000000	15.28845454	0.00000000	59.00000000	3.41860236	670.0000000	233.73684211	45.637
WT	20	54.40000000	20.18702032	0.00000000	79.00000000	4.51395497	1088.0000000	407.51578947	37.108
Z	19	0.60979923	0.11314070	0.36363636	0.79729730	0.02595626	11.5861853	0.01280082	18.554
ARS	19	0.89879924	0.11812097	0.64728485	1.10377883	0.02709881	17.0771855	0.01395256	13.142
RESPONSE	19	51.47668356	6.76510996	37.07176857	63.21642396	1.55202267	978.0569877	45.76671274	13.142
TRT=C									
EL	19	44.89473684	27.56587007	0	83.00000000	6.32404431	853.00000000	759.87719298	61.401
NH	18	23.94444444	19.16022910	0	56.00000000	4.51610931	431.00000000	367.11437908	80.020
WT	19	44.89473684	27.56587007	0	83.00000000	6.32404431	853.00000000	759.87719298	61.401
Z	17	0.46318378	0.25760481	0	0.75675676	0.06247834	7.87412425	0.06636024	55.616
ARS	17	0.69862717	0.36098180	0	1.05503537	0.08755095	11.87666193	0.13030786	51.670

1459										
1460	EL	20	51.60000000	22.47899604	1.00000000	77.00000000	5.02645632	1032.0000000	505.30526316	43.564
1461	NH	20	29.95000000	15.83625089	0.00000000	49.00000000	3.54109335	599.0000000	250.78684211	52.876
1462	WT	20	51.60000000	22.47899604	1.00000000	77.00000000	5.02645632	1032.0000000	505.30526316	43.564
1463	Z	20	0.52697394	0.24300515	0.00000000	0.81666667	0.05433760	10.5394787	0.05905150	46.113
1464	ARS	20	0.78745245	0.32020537	0.00000000	1.12832465	0.07160010	15.7490490	0.10253148	40.663
1465	RESPONSE	20	45.09954939	18.33903469	0.00000000	64.62222971	4.10073282	901.9909878	336.32019332	40.663

QUEUE

EL

CHEMICAL: Ignite

TOTAL NUMBER OF LEVELS 4

NUMBER OF CONTROL REPLICATES: 20

CONTROL MEAN: 47.85

TOTAL NUMBER OF REPLICATES: 80

MEAN SQUARE ERROR: 508.026

ERROR DEGREES OF FREEDOM: 76

V1 used for this calculation: 3

V2 used for this calculation: 100

PHI value used for calculation of D 1.64

MEAN 1
47.85
NUMBER OF REPLICATES: 20

MEAN 2
54.40
NUMBER OF REPLICATES: 20

MEAN 3
44.90
NUMBER OF REPLICATES: 20

MEAN 4
51.60
NUMBER OF REPLICATES: 20

GRAND MEAN: 49.68625

==========

Calculated PHI value for the Power Test .716833

PERCENT CHANGE DETECTION LIMIT = 35.82436

BWQ
EC

CHEMICAL: Ignite

TOTAL NUMBER OF LEVELS 4

NUMBER OF CONTROL REPLICATES: 20

CONTROL MEAN: 8.8

TOTAL NUMBER OF REPLICATES: 80

MEAN SQUARE ERROR: 56.6005

ERROR DEGREES OF FREEDOM: 76

V1 used for this calculation: 3

V2 used for this calculation: 60

PHI value used for calculation of D 1.7

MEAN 1
8.80
NUMBER OF REPLICATES: 20

MEAN 2
7.65
NUMBER OF REPLICATES: 20

MEAN 3
6.15
NUMBER OF REPLICATES: 20

MEAN 4
4.26
NUMBER OF REPLICATES: 20

GRAND MEAN: 6.714

==========

Calculated PHI value for the Power Test 1.011735

PERCENT CHANGE DETECTION LIMIT = 117.3878

CHEMICAL: Ignite

TOTAL NUMBER OF LEVELS 4

NUMBER OF CONTROL REPLICATES: 20

CONTROL MEAN: 33.65

TOTAL NUMBER OF REPLICATES: 80

MEAN SQUARE ERROR: 341.158

ERROR DEGREES OF FREEDOM: 76

V1 used for this calculation: 3

V2 used for this calculation: 60

PHI value used for calculation of D 1.7

MEAN 1
33.65
NUMBER OF REPLICATES: 20

MEAN 2
42.15
NUMBER OF REPLICATES: 20

MEAN 3
33.95
NUMBER OF REPLICATES: 20

MEAN 4
40.10
NUMBER OF REPLICATES: 20

GRAND MEAN: 37.46175

==========

Calculated PHI value for the Power Test .9045106

PERCENT CHANGE DETECTION LIMIT = 59.01625

BWA 4
VE

CHEMICAL: Ignite

TOTAL NUMBER OF LEVELS 4

NUMBER OF CONTROL REPLICATES: 20

CONTROL MEAN: 28.3

TOTAL NUMBER OF REPLICATES: 80

MEAN SQUARE ERROR: 323.117

ERROR DEGREES OF FREEDOM: 76

V1 used for this calculation: 3

V2 used for this calculation: 60

PHI value used for calculation of D 1.7

MEAN 1
28.30
NUMBER OF REPLICATES: 20

MEAN 2
38.55
NUMBER OF REPLICATES: 20

MEAN 3
27.90
NUMBER OF REPLICATES: 20

MEAN 4
35.26
NUMBER OF REPLICATES: 20

GRAND MEAN: 32.502

==========

Calculated PHI value for the Power Test 1.133862 0.40

PERCENT CHANGE DETECTION LIMIT = 56.44675

LE

CHEMICAL: Ignite

TOTAL NUMBER OF LEVELS 4

NUMBER OF CONTROL REPLICATES: 12

CONTROL MEAN: 27

TOTAL NUMBER OF REPLICATES: 80

MEAN SQUARE ERROR: 322.034

ERROR DEGREES OF FREEDOM: 76

V1 used for this calculation: 3

V2 used for this calculation: 100

PHI value used for calculation of D 1.64

MEAN 1
27.40
NUMBER OF REPLICATES: 20

MEAN 2
38.40
NUMBER OF REPLICATES: 20

MEAN 3
27.84
NUMBER OF REPLICATES: 20

MEAN 4
36.00
NUMBER OF REPLICATES: 20

GRAND MEAN: 32.4105

==========

Calculated PHI value for the Power Test 1.2128

PERCENT CHANGE DETECTION LIMIT = 61.41517 0.49

NH

CHEMICAL: Ignite

TOTAL NUMBER OF LEVELS 4

NUMBER OF CONTROL REPLICATES: 12

CONTROL MEAN: 23.2

TOTAL NUMBER OF REPLICATES: 80

MEAN SQUARE ERROR: 263.65

ERROR DEGREES OF FREEDOM: 76

V1 used for this calculation: 3

V2 used for this calculation: 100

PHI value used for calculation of D 1.64

MEAN 1
23.20
NUMBER OF REPLICATES: 20

MEAN 2
33.50
NUMBER OF REPLICATES: 20

MEAN 3
23.94
NUMBER OF REPLICATES: 20

MEAN 4
23.20
NUMBER OF REPLICATES: 20

GRAND MEAN: 25.961

==========

Calculated PHI value for the Power Test 1.201736 0.49

PERCENT CHANGE DETECTION LIMIT = 68.06503

Egg Laid (BWG)

(L-11

```
fetch 6751
Q0A01  JOBNAME MUST BEGIN WITH USERID
QUEUE
fetch 6571
    1                    J E S 2  J O B  L O G  --  S Y S T E M  E P A 2  --  N O D E  N C C I B M 1
QUEUE
1 227 999
  227                                                                SAS                                    9:02 MONDAY, JUNE 6, 1988    1
  228
  229                                                                                                  R  R  R  R  R  R  R  R  R  R  R
  230                 R  R  R  R  R  R  R  R  R  R  E  E  E  E  E  E  E  E  E  E  E  E  E
  231                 E  E  E  E  E  E  E  E  E  E  S  S  S  S  S  S  S  S  S  S  S  S  S
  232  O  T  S  S  S  S  S  S  S  S  S  P  P  P  P  P  P  P  P  P  P  P
  233  B  R  P  P  P  P  P  P  P  P  P  1  1  1  1  1  1  1  1  1  1  2
  234  S  T  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6  7  8  9  0
  235
  236  1  A  46 64 30 73 54 57 57 62 56 44 46 29 48 69 31 62 27  0 25 70
  237  2  B  67 68 55  0 64 79 54 76 48 34 42 73 74 76 66 17 45 42 52 61
  238  3  C   0 62 66 83  2  2 74 17 63 44 35 64 21 21 78 55 48 55 15 66
  239  4  D  57 67 14 58 46 77 60 75 62 69 71 36 74 52 33  1 26 22 56 75
  240                                                                SAS                                    9:02 MONDAY, JUNE 6, 1988    2
  241
  242                                                          GENERAL LINEAR MODELS PROCEDURE
  243
  244                                                           CLASS LEVEL INFORMATION
  245
  247                                                        CLASS     LEVELS    VALUES
  247
  248                                                        TRT          4      A B C D
  249
  250
  251                                                     NUMBER OF OBSERVATIONS IN DATA SET = 80
  252                                                                SAS                                    9:02 MONDAY, JUNE 6, 1988    3
  253
  254                                                          GENERAL LINEAR MODELS PROCEDURE
  255
  256 DEPENDENT VARIABLE: RESP
  257
  258 SOURCE                      DF       SUM OF SQUARES          MEAN SQUARE       F VALUE       PR > F        R-SQUARE          C.V.
  259
  260 MODEL                        3        1399.73750000        466.57916667          0.92       0.4341        0.035138         45.6039
  261
  262 ERROR                       76       38435.45000000        505.72960526                  ROOT MSE                        RESP MEAN
  263
  264 CORRECTED TOTAL             79       39835.18750000                                   22.48843270                      49.31250000
  265
  266
  267 SOURCE                      DF            TYPE I SS     F VALUE     PR > F          DF         TYPE III SS     F VALUE     PR > F
  268
  269 TRT                          3        1399.73750000          0.92     0.4341           3        1399.73750000          0.92     0.4341
  270                                                                SAS                                    9:02 MONDAY, JUNE 6, 1988    4
  271
  272                                                          GENERAL LINEAR MODELS PROCEDURE
  273
  274                                                DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP
  275                                                NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,
  276                                                      NOT THE EXPERIMENTWISE ERROR RATE
  277
  278                                                                ALPHA=0.05  DF=76  MSE=505.73
```

280	NUMBER OF MEANS	2	3	4
281	CRITICAL RANGE	14.1778	14.9083	15.384

282

283 MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

284

	DUNCAN	GROUPING	MEAN	N	TRT
285					
286					
287		A	54.650	20	B
288		A			
289		A	51.550	20	D
290		A			
291		A	47.500	20	A
292		A			
293		A	43.550	20	C

QUEUE

Eggs set (BWO)

```
1 227 999
  227                                                    SAS                                  8:20 WEDNESDAY, JUNE 8, 1988    1
  228
  229                                                                                  R  R  R  R  R  R  R  R  R  R  R
  230              R  R  R  R  R  R  R  R  R  R  E  E  E  E  E  E  E  E  E  E  E
  231              E  E  E  E  E  E  E  E  E  E  S  S  S  S  S  S  S  S  S  S  S
  232  O  T  S  S  S  S  S  S  S  S  S  S  P  P  P  P  P  P  P  P  P  P  P
  233  B  R  P  P  P  P  P  P  P  P  P  1  1  1  1  1  1  1  1  1  1  2
  234  S  T  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6  7  8  9  0
  235
  236  1  A  40 46 23 26 39 42 47 44 42 38 40 17 38 23 22 55 22  0 18 54
  237  2  B  48 55 46  0 55 55 49 51 41 25 33 61 66 58 45 19 36 35 30 44
  238  3  C   0 42 25 72  1  0 64 11 52 30 29 56  2 15 69 47 38 40 11 59
  239  4  D  49 50 11 50 30 43 53 54 54 59 61 29 50 46 26  0 18 14 47 59
  240                                                    SAS                                  8:20 WEDNESDAY, JUNE 8, 1988    2
  241
  242                                                GENERAL LINEAR MODELS PROCEDURE
  243
  244                                                 CLASS LEVEL INFORMATION
  245
  246                                                 CLASS     LEVELS    VALUES
  247
  248                                                 TRT          4      A B C D
  249
  250
  251                                              NUMBER OF OBSERVATIONS IN DATA SET = 80
  252                                                    SAS                                  8:20 WEDNESDAY, JUNE 8, 1988    3
  253
  254                                                GENERAL LINEAR MODELS PROCEDURE
  255
  256 DEPENDENT VARIABLE: RESP
  257
  258 SOURCE                    DF       SUM OF SQUARES        MEAN SQUARE       F VALUE       PR > F       R-SQUARE          C.V.
  259
  260 MODEL                      3        1312.45000000         437.48333333          1.28       0.2884       0.047981       49.4608
  261
  262 ERROR                     76       26041.10000000         342.64605263                  ROOT MSE                    RESP MEAN
  263
  264 CORRECTED TOTAL           79       27353.55000000                                18.51070103                  37.42500000
  265
  266
  267 SOURCE                    DF            TYPE I SS     F VALUE      PR > F          DF         TYPE III SS     F VALUE      PR > F
  268
  269 TRT                        3        1312.45000000          1.28      0.2884           3        1312.45000000          1.28      0.2884
  270                                                    SAS                                  8:20 WEDNESDAY, JUNE 8, 1988    4
  271
  272                                                GENERAL LINEAR MODELS PROCEDURE
  273
  274                                  DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP
  275                                  NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,
  276                                        NOT THE EXPERIMENTWISE ERROR RATE
  277
  278                                                ALPHA=0.05  DF=76  MSE=342.646
  279
  280                                             NUMBER OF MEANS          2          3          4
  281                                             CRITICAL RANGE       11.67    12.2713    12.6629
  282
  283                                  MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.
  284
```

```
   286
   287                                  A          42.600    20  B
   288                                  A
   289                                  A          40.150    20  D
   290                                  A
   291                                  A          33.800    20  A
   292                                  A
   293                                  A          33.150    20  C
QUEUE
```

Eggs Cracked (BWQ)

CH13

1 227 999

SAS 8:52 WEDNESDAY, JUNE 8, 1988 1

												R	R	R	R	R	R	R	R	R	R	R
			R	R	R	R	R	R	R	R	R	E	E	E	E	E	E	E	E	E	E	E
			E	E	E	E	E	E	E	E	E	S	S	S	S	S	S	S	S	S	S	S
	O	T	S	S	S	S	S	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P
	B	R	P	P	P	P	P	P	P	P	P	1	1	1	1	1	1	1	1	1	1	2
	S	T	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
	1	A	1	13	4	14	10	10	5	11	9	0	1	7	3	47	4	3	1	0	4	11
	2	B	12	8	4	0	7	17	8	16	1	3	4	9	2	12	8	2	2	4	11	12
	3	C	0	14	0	5	0	1	4	4	5	10	1	2	2	4	4	4	5	11	1	5
	4	D	2	11	0	2	11	29	1	15	4	3	3	3	17	3	3	0	5	3	4	11

SAS 8:52 WEDNESDAY, JUNE 8, 1988 2

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	4	A B C D

NUMBER OF OBSERVATIONS IN DATA SET = 80

SAS 8:52 WEDNESDAY, JUNE 8, 1988 3

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
MODEL	3	160.80000000	53.60000000	1.09	0.3587	0.041239	109.5863
ERROR	76	3738.40000000	49.18947368		ROOT MSE		RESP MEAN
CORRECTED TOTAL	79	3899.20000000			7.01352078		6.40000000

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
TRT	3	160.80000000	1.09	0.3587	3	160.80000000	1.09	0.3587

SAS 8:52 WEDNESDAY, JUNE 8, 1988 4

GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP

NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,
NOT THE EXPERIMENTWISE ERROR RATE

ALPHA=0.05 DF=76 MSE=49.1895

NUMBER OF MEANS	2	3	4
CRITICAL RANGE	4.42165	4.64949	4.79783

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

40

```
285                          DUNCAN   GROUPING        MEAN        N  TRT
286
287                                   A              7.500       20  A
288                                   A
289                                   A              7.100       20  B
290                                   A
291                                   A              6.500       20  D
292                                   A
293                                   A              4.100       20  C
QUEUE
```

Food Consumption (BWQ)

```
1 227 999
                                                    SAS                                  7:46 FRIDAY, JUNE 10, 1988    1

                                                                                  R  R  R  R  R  R  R  R  R  R  R
                    R     R     R     R     R     R     R  R  R  E  E  E  E  E  E  E  E  E  E  E  E
                    E     E     E     E     E     E     E  E  E  S  S  S  S  S  S  S  S  S  S  S  S
  O  T  S     S     S     S     S     S     S  S  S  P  P  P  P  P  P  P  P  P  P  P  P
  B  R  P     P     P     P     P     P     P  P  P  1  1  1  1  1  1  1  1  1  1  1  2
  S  T  1     2     3     4     5     6     7  8  9  0  1  2  3  4  5  6  7  8  9  0

  1  A  1172  1031  1106   998   984  1077  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  2  B  1088   883  1133  1024   967   969  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  3  C  1038  1013  1068   866   906   873  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  4  D  1044   994  1043   935  1105   958  .  .  .  .  .  .  .  .  .  .  .  .  .  .
                                                    SAS                                  7:46 FRIDAY, JUNE 10, 1988    2

                                                GENERAL LINEAR MODELS PROCEDURE

                                                CLASS LEVEL INFORMATION

                                                CLASS     LEVELS    VALUES

                                                TRT          4      A B C D


                                            NUMBER OF OBSERVATIONS IN DATA SET = 80


NOTE: ALL DEPENDENT VARIABLES ARE CONSISTENT WITH RESPECT TO THE PRESENCE OR ABSENCE OF MISSING VALUES. HOWEVER,
      ONLY     24 OBSERVAT.   CAN BE USED IN THIS ANALYSIS.
                                                    SAS                                  7:46 FRIDAY, JUNE 10, 1988    3

                                                GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE                  DF       SUM OF SQUARES          MEAN SQUARE       F VALUE        PR > F       R-SQUARE          C.V.

MODEL                    3       30425.12500000       10141.70833333          1.61        0.2190       0.194335        7.8515

ERROR                   20      126134.83333334        6306.74166667                     ROOT MSE                    RESP MEAN

CORRECTED TOTAL         23      156559.95833334                                      79.41499648                  1011.45833333


SOURCE                  DF            TYPE I SS     F VALUE     PR > F          DF          TYPE III SS     F VALUE     PR > F

TRT                      3       30425.12500000        1.61     0.2190           3       30425.12500000        1.61     0.2190
                                                    SAS                                  7:46 FRIDAY, JUNE 10, 1988    4

                                                GENERAL LINEAR MODELS PROCEDURE

                                    DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP
                                    NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,
                                          NOT THE EXPERIMENTWISE ERROR RATE

                                                ALPHA=0.05  DF=20  MSE=6306.74

                                            NUMBER OF MEANS          2          3          4
```

CRITICAL RANGE 95.5139 100.305 103.617

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	1061.33	6	A
A			
A	1013.17	6	D
A			
A	1010.67	6	B
A			
A	960.67	6	C

QUEUE

GLUFOSINATE 128850

Page_____ is not included in this copy.

Pages 44 through 55 are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

____ Identity of the source of product ingredients.

____ Sales or other commercial/financial information.

____ A draft product label.

____ The product confidential statement of formula.

____ Information about a pending registration action.

X FIFRA registration data.

____ The document is a duplicate of page(s) _____.

____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

fetch 9814

BWO

1 JES2 JOB LOG -- SYSTEM EPA2 -- NODE NCCIBM1

QUEUE
f 'n.c.' all
168 NOTE: COPYRIGHT (C) 1984,1986 SAS INSTITUTE INC., CARY, N.C. 27511, U.S.A.
226 CARY, N.C. 27511-8000
QUEUE
1 227 999
227 SAS 10:10 MONDAY, JANUARY 23, 1989 1
228
229 R R R R R R R R R R R R R R R R R R R R
230 R E E E E E E E E E E E E E E E E E E E
231 E S S S S S S S S S S S S S S S S S S S
232 O T S S S S S S S S S P P P P P P P P P P
233 B R P P P P P P P P P 1 1 1 1 1 1 1 1 1 2
234 S T 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0
235
236 1 A 15 39 43 7 35 42 58 53 54 61 24 57 11 29 39 32 68 57 . .
237 2 B 45 60 2 69 57 59 33 47 33 58 60 72 74 44 61 36 52 33 64 .
238 3 C 40 12 57 65 41 60 50 31 45 14 53 40 35 51 27 . . . . .
239 4 D 68 34 34 43 26 50 53 52 39 45 53 51 77 56 62 14 64 49 . .
240 SAS 10:10 MONDAY, JANUARY 23, 1989 2
241
242 GENERAL LINEAR MODELS PROCEDURE
243
244 CLASS LEVEL INFORMATION
245
246 CLASS LEVELS VALUES
247
248 TRT 4 A B C D
249
250
251 NUMBER OF OBSERVATIONS IN DATA SET = 80
252
253
254 NOTE: ALL DEPENDENT VARIABLES ARE CONSISTENT WITH RESPECT TO THE PRESENCE OR ABSENCE OF MISSING VALUES. HOWEVER,
255 ONLY 70 OBSERVATIONS CAN BE USED IN THIS ANALYSIS.
256 SAS 10:10 MONDAY, JANUARY 23, 1989 3
257
258 GENERAL LINEAR MODELS PROCEDURE
259
260 DEPENDENT VARIABLE: RESP
261
262 SOURCE DF SUM OF SQUARES MEAN SQUARE F VALUE PR > F R-SQUARE C.V.
263
264 MODEL 3 1366.32347536 455.44115845 1.62 0.1923 0.068729 36.9371
265
266 ERROR 66 18513.44795322 280.50678717 ROOT MSE RESP MEAN
267
268 CORRECTED TOTAL 69 19879.77142857 16.74833685 45.34285714
269
270
271 SOURCE DF TYPE I SS F VALUE PR > F DF TYPE III SS F VALUE PR > F
272
273 TRT 3 1366.32347536 1.62 0.1923 3 1366.32347536 1.62 0.1923
274 SAS 10:10 MONDAY, JANUARY 23, 1989 4
275
276 GENERAL LINEAR MODELS PROCEDURE
277
278 DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP
279 NOTE: THIS TEST CONTROLS THE TYPE I COMPARISONWISE ERROR RATE,
280 NOT THE EXPERIMENTWISE ERROR RATE

GLUFOSINATE 128850

Page_____ is not included in this copy.

Pages 58 through 68 are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

____ Identity of the source of product ingredients.

____ Sales or other commercial/financial information.

____ A draft product label.

____ The product confidential statement of formula.

____ Information about a pending registration action.

____ FIFRA registration data.

____ The document is a duplicate of page(s) _____.

____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.