128867

DATA EVALUATION RECORD

1. Chemical: Cyhalothrin

2. Test Material: Cyhalothrin 92.% w/w

Chemical structure: (R,S) a-cyano-3-phenoxybenzyl (±)-cis-3,3(z-2-chloro-3,3,3-trifluoroprop-1-en)-2,2-dimethylcycloproponecarboxylate.

Cis/trans ratio: 96.8:3.2

3. Study Type: Avian Reproduction on the mallard

Species Tested: Anas platyrhynchos

4. Study ID: Roberts, N.L., Fairley, C., Chanter, D.O., McAllister, A., and Almond, R.H. (1982) The Effect of the Dietary Inclusion of Cyhalothrin on Reproduction in the Mallard Duck. Prepared by Huntingdon Research Centre, Huntingdon, Cambridgeshire, PE18 6ES and submitted by ICI Americas, Inc., EPA Accession No. 073989.

5. Reviewed By: Candy Brassard
EER/HED
Signature: Candy Brassard
Date: 3/1/88

6. Approved By: Douglas J. Urban
Head, Section III
EER/HED
Signature: Douglas J. Urban
Date: 3/7/88

7. Conclusion:

This study is classified as supplemental. There are data discrepancies that detract from the study. It appears the lowest NOEL = 5 ppm and LOEL = 50 ppm for eggs laid and eggs set. The NOEL may even be less than 5 ppm depending on the raw data that needs to be submitted with regards to terminal findings.

8. Recommendations:

The study author should submit all raw data with regard to gross postmortem examination, and specifically the underdeveloped ovaries found in both treatment groups. The raw data on 17A Week 7 should also be submitted so that a complete ANOVA can be conducted.

9. Background:

This study was submitted to support registration of Karate or PP321 on cotton and soybeans.

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10. Discussion of Individual Tests: N/A

11. Materials and Methods:

a. Test Animals - The mallard ducks were obtained from Mr. T. Coles, The County Game Farms, Home Farm, Hothfield, Ashford, Kent, England and were young adults approaching their first laying season. All the birds were wild caught. The birds arrived > 9 weeks prior to test initiation.

b. Test System - Adults - The adult mallards were housed by replicate group in wooden pens measuring approximately 1.6 x 0.6 x 1.7 m, with concrete floors. Each pen contained an automatic nipple drinker and a food hopper. Sawdust was used as bedding. Ambient temperature ranged from 8 to 25 °C ($\bar{x}$ = 15) and the relative humidity ranged from 48 to 85 percent ($\bar{x}$ = 66%).

Ventilation fans were adjusted as necessary. The following photoperiod regime was used.

Days of study	Hours light	Hours dark
1 - 71	7	17
72 - 78	8	16
79 - 92	9	15
93 - 99	12	12
100 - 106	13	11
107 - 175	14	10

The basal diet without test compound consisted of the following ingredients:

Ingredient	% w/w
Ground wheat	38.25
Ground maize	30.00
Weatings (Wheatfeed)	5.00
Provimi 66 fishmeal	10.00
Soya bean meal	10.00
Limestone flour	5.50
Pantoribin 537*	1.25

Water was available ad libitum.

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* Mineral vitamin and trace element supplement (B.P. Nutrition (UK) Ltd.).

Diet Preparation - The test compound was mixed with corn oil in the final diet. Corn oil, at a rate of 0.1 percent w/w, was incorporated in all diets (as well as control). Diets were generally mixed on a weekly basis, and the diet was analyzed on four weekly intervals and from the final batch of diets mixed to check inclusion levels.

Eggs

The eggs were incubated at weekly intervals in a "Wester Incubator." Temperature was 37 °C (no range reported) and relative humidity ranged from 34 to 93 percent ($\bar{x}$ = 63%).

Eggs were turned every 45 minutes through an angle of 90° throughout incubation period. Eggs were incubated for 23 to 24 days before transferring to hatchers.

Hatching

Hatchers were air Bristol Incubator Models PH 90 and PH 150, which operated at 37 °C (temp.). The ducklings hatched approximately 27 to 29 days after eggs were set in incubator. After hatching, ducklings were banded with color-coded plastic leghands for identification.

Ducklings were housed in wooden pens that were 2.4 x 3.0 m with concrete floors, with two drinkers and two food hoppers. Wood shavings were used as bedding. Each pen contained two 300-watt infrared lamps placed at bird level to supply additional heat. The temperature ranged from 18 to 40 °C ($\bar{x}$ = 28 °C). The relative humidity ranged from 47 to 95 percent ($\bar{x}$ = 68%). Continuous controlled artificial lighting pattern was adopted for the duckling. Ventilation fans were used as necessary.

The chick diet was as follows:

Ingredient	% w/w
Ground wheat	30.00
Ground maize	25.00
Ground barley	10.00
Provimi 66 fishmeal	15.00
Extracted soya bean meal	13.75
Weatings (Wheatfeed)	5.00
Pantoribin 537*	1.25

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

The diet was offered ad libitum and was known not to contain antibiotics or growth promoters in the formulation. Water was also available ad libitum.

c. Dose - A control and two treatment levels were used -- 5 and 50 ppm cyhalothrin.

d. Study Design - Each pen contained two males and five females. Each treatment level included six replicates (a total of 12 males and 30 females per dose). The birds were randomly assigned to each pen.

Observations

Adult bird observations were as follows:

1. Mortalities - daily.

2. Bird health - daily.

3. Group mean food consumption - weekly per replicate.

4. Individual body weights - Days 0, 14, 28, 42, 56, 70, and 175.

5. Macroscopic postmortem examination - All birds were examined postmortem for gross abnormalities.

Egg observations were as follows:

1. Egg collection - Eggs collected daily during 12-week egg production period.

2. Egg weight - At 7-day intervals the collected eggs were weighed and the replicate group total weight, mean egg weight, and number of eggs weighed were recorded. Broken eggs were not weighed.

3. Egg quality - At 7-day intervals the collected eggs were candled after weighing to check for cracks and breakages.

4. Eggshell thickness - All eggs collected in the first 2 days of Weeks 1, 3, 5, 7, 9, and 11 were examined. The eggs, after cracked at widest point, were washed, dried for 48 hours, and measured to the nearest 0.01 mm at four points around the circumference.

Candling and hatching - The incubated eggs were candled on Days 14 and 21.

The following observations were recorded:

1. Infertile eggs - Appearing as clears at Day 14 candling

2. Early embryonic mortalities - Day 14 - Any embryos observed to be dead were removed.

3. Late Embryonic mortalities - Day 21 - Any embryos observed to be dead were removed. At this stage the embryos were fully differentiated.

4. "Dead in shells" - Any eggs that failed to hatch after the infertile and embryonic death eggs were removed. Pipped eggs were also noted.

5. Ducklings hatched - Live and dead ducklings that hatched were recorded. Abnormalities were recorded.

Ducklings - Ducklings were reared for 14 days. The following observations were recorded:

1.	Individual body weight	- Within 24 hours of hatching and 14 days later.
2.	Bird health	- Daily
3.	Mortalities	- Daily
4.	Macroscopic postmortem examination	- Only sporadic mortalities were examined for gross abnormalities. No examination was made at termination.

Summary of Study Duration (excerpted from submission)

"Adults	13-week pre-egg production period 12-week egg production period.
Incubation	Eggs collected over the 12-week egg production period were incubated weekly. The incubation period lasted 27 to 29 days.
Ducklings	The weekly hatches of ducklings from the 12-week egg production period were reared until they were 14 days old.

The total study duration from the start of the adult observation period to the final duckling observations was 31 weeks approximately."

e. Statistical Analysis (excerpted from submission) -

"A statistical analysis of the following responses was carried out:

1. Adult food consumption
2. Adult bodyweight
3. Number of eggs laid and proportion damaged
4. Egg weight
5. Egg shell thickness
6. Number of infertilities, embryonic mortalities and hatchings
7. Number of 14-day old surviving ducklings
8. Duckling bodyweights

12. Reported Results:

Any birds that died during the pre-egg-laying period (Days 1 to 91) were replaced by spare birds maintained for this purpose. See Table 1 for distribution of adult mortalities. These mortalities were considered not to be from cyhalothrin but from bullying between male birds. Replicate 8C (Cyhalothrin 50 ppm) had problems with the waterer on Days 122 and 123.

Summary of body weights are shown in Table 2. All body weight changes were within normal limits and no treatment-related effects were found.

Food consumption was within normal limits for all groups (except 8C [Cyhalothrin 50 ppm] at Week 18) throughout the study and no treatment-related effects were observed. See Tables 3 and 4.

Gross postmortem examination showed evidence of bullying (bruising, feathers missing from head, neck, and back,) was noted in three controls, three at treatment level 5 ppm, and seven at 50 ppm.

Terminal findings (excerpted from submission):

"Pale livers and/or intestines were noted in a number of birds in both control and test groups. They were not considered to be abnormalities. Other observations noted at termination were as follows:

Group	Treatment (ppm)	Pen No.	Bird No.	Observation
B	Cyhalothrin (5)	3	521F	
		5	533F	Ovary small or
		14	596F	underdeveloped
		14	598F	
		12	584F	Broken egg found in body cavity
C	Cyhalothrin (50)	13	589F	Ovary underdeveloped;
		11	574F	bird had been bullied
		1	505F	Bird small or light
		1	506F	in weight, ovary underdeveloped
		13	587F	Ovary underdeveloped

An underdeveloped ovary in a bird would indicate that at the time of sacrifice the bird was not producing eggs. The bird may, however, have produced eggs earlier in the study. Although underdeveloped ovaries were not found in any of the control birds it is doubtful that the above observations were related to treatment with cyhalothrin in view of the egg production results obtained.

Other observations were as follows:

Group	Treatment (ppm)	Pen No.	Bird No.	Observation
A	Control (0)	9	560F	Four broken eggs found in body cavity.
		2	509M	No abnormality found
B	Cyhalothrin (5)	5	532F	Intestine apparently ruptured. Body cavity filled with faecal matter.
		5	531F	Egg yolk found in body cavity
		5	534F	Body cavity filled with faecal matter

Group	Treatment (ppm)	Pen No.	Bird No.	Observation
C	Cyhalothrin (50)	6	541F	Blotchy liver
		8	555F*	No abnormality found
		8	552F*	Liver orange/red in colour
		8	553F*	Punctured yolk sac in abdomen probably produced peritonitis
		8	554F*	Pericardial fibrination A developing egg was dark greenish in colour
		13	590F	Bird was egg bound i.e. passage of eggs through the oviduct prevented probably by a broken egg leading eventually to peritonitis
		18	624F	Broken egg found in body cavity.

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* Birds which died as a result of low water pressure in pen drinker.

Throughout the results sections for eggs and ducklings the data from pen 8C has been excluded from the statistical analysis. The data has, however, been included in Tables 5 to 13."

Eggs laid - Over Weeks 1 to 6 and 7 to 12 the birds given cyhalothrin at 50 ppm produced significantly fewer eggs than the control. The study author reported that it was probably not biologically significant since the total number of eggs produced was high in comparison with historical control data.

The number of broken and cracked eggs were considered to be within normal limits. See Table 6.

The mean egg weights were not statistically different. However, there was a statistically significant difference in egg mass due to the number of eggs produced and not biologically significant in comparison with historical data. See Table 7.

Eggshell thickness - The data indicate there were no statistically significant differences between treatments. See Table 8.

Infertile eggs - The statistical analysis indicated that Group B (cyhalothrin 5 ppm) had a significantly lower proportion of infertile eggs than the control. See Table 9.

Early embryonic mortalities - The proportions of early embryonic mortalities were marginally higher for treatment group 5 ppm; however, there were no statistically significant differences between treatments. See Table 10.

Late embryonic mortalities - No statistically significant differences were found between treatment groups. See Table 11.

Hatchlings - Number of hatchlings were lower for treatment group cyhalothrin 50 ppm. This difference was not statistically significant.

Bird health and mortalities - Bird health was generally good and the numbers of mortalities were within normal limits. See Table 11A.

Number of 14-day survivors - The percentage of ducklings surviving to 14 days were within normal limits, and there was no statistical difference. See Table 12.

Body weights of ducklings at hatching and after 14 days were within normal limits and no statistically significant difference was noted between treatments. See Table 13.

Postmortem examination - Except for observations outlined in Bird Health, no abnormalities were detected.

13. Study Authors' Conclusions/QA Measures: (excerpted from submission):

"Under the conditions of this study there was no evidence that dietary administration of cyhalothrin at dose levels of 5 ppm and 50 ppm had any adverse effects on reproduction in the mallard duck.

"To the best of my knowledge and belief, this study was conducted in compliance with Good Laboratory Practice regulations as set forth in Title 21 of the U.S. Code of Federal Regulations, Part 58 with the exception of possible minor items, none of which is considered to have an impact on the validity of the data, or the interpretation of the results in the report" - signed N.L. Roberts.

14. Reviewer's Discussion and Interpretation of Study:

The following discrepancies were noted in the study:

A. Test Procedures:

- The primary concern is that the gross postmortem examination (Terminal Findings section) reported four females in Test Group B and five females in Group C as having underdeveloped ovaries. The gross mortem examination should have included information as to whether the follicles were "ruptured." Ruptured follicles indicate that the hens at one time have laid eggs and the ovaries have regressed (Rick Bennett, personal communications, February 18, 1988, U.S. Environmental Protection Agency, Corvallis, Oregon). A total of 13 percent of females were apparently affected at the lowest level tested (5 ppm) and 17 percent at the highest level tested (50 ppm). These results are partially confirmed by the statistically significant difference in number of eggs laid, even when Replicate 8C is eliminated from data.

  When the number of eggs laid per hen were estimated (taking mortalities into account) Treatment Group C had a decrease in number of eggs laid per hen of 15 percent when compared to the control. See Table A.

  The study author should include all raw data with regard to gross postmortem examinations to determine if the hens did indeed lay eggs during the egglaying period.

  It appears that until raw data are submitted, that indeed the effect may be at even the lowest level tested and therefore, for this reproductive parameter we do not have a NOEL.

- Exact age not indicated in study. Only that the birds were approaching first breeding season.

- The study author did not report the disease record or history of health observations for the birds prior to study initiation.

- The study author did not indicate if provisions for minimizing food spillage were included.

- The study author did not indicate if the diet was available ad libitum to the adults. The study author did indicate that the water was available ad libitum.

- The study author should account for the variability in the number of eggs measured for thickness in each replicate.

- The recommended temperatures for the adults is 21 °C and 55 percent relative humidity. The study author reported that the adults were housed at 15 °C (mean) with a range of 8 to 25 °C. There is a considerable range as well. The test conditions should have been more constant.

- The duckling housing temperature ranged from 18 to 40 °C ($\bar{x}$ = 28 °C) and relative humidity ranged from 47 to 95 percent ($\bar{x}$ = 68%).

- The egg production, candling, and hatching results (Appendix 5) were not reported for replicate 17A, Week 7. Therefore, all the statistical analyses, except for eggs laid, (ANOVAs) were incomplete.

- The study author reported 6.4 percent egg cracking for the control group. The historical control data ranged 4.4 to 6.1. This study indicated percent cracking higher than the range.

- The body weight of the 14-day survivors appeared to be significantly lower for Treatment Group C (50 ppm). However, a statistical analysis using ANOVA indicates there was no statistically significant difference.

- The number of pale livers and/or intestines should be reported for both the control and two treatment groups.

- Bullying was reported to have caused three mortalities in the control (though data for adult health observations indicated four), three in Group B (5 ppm), and seven in Group C (50 ppm). It appears that the increase in bullying at the highest dose may have been caused by behavorial changes from exposure to the test compound.

- Control mortality (12%) appeared to be high. Though only one female died (2.3 percent), a total of four males died within the control group, with three males in one pen (the replacement also died).

B. Statistical Analysis - The data were incorporated as replicates, not as weeks, and a statistical analysis using ANOVA and Duncans multiple range test were conducted on several parameters with the results as follows:

Summary of Statistical Analysis (ANOVA)

Eggs laid = NOEL = 5 ppm
LOEL = 50 ppm
MATC > 5 ppm < 50 ppm

Eggs cracked = NOEL > 50 ppm

Eggs set = NOEL = 5 ppm
LOEL = 50 ppm
MATC > 5 ppm < 50 ppm

Viable embryos = NOEL > 50 ppm

Live embryos = NOEL > 50 ppm

Normal hatched = NOEL > 50 ppm

See Attachment A for ANOVA results. These data analyses include Replicate 8C. See Table A for summary of reproductive effects.

- A statistical analysis on adult mortality was conducted using ANOVA arcsin and it was determined that there was no statistical difference between the control and the two treatment groups, even when Replicate 8C was deleted from the data. See Attachment B.

- Statistical analysis was conducted on all the reproductive parameters (eggs laid, eggs cracked, eggs set, viable embryos, live embryos, and normal hatchlings) eliminating Replicate 8C. It was determined that the NOEL for eggs laid remained the same as if it were included:

eggs laid = NOEL = 5 ppm
LOEL = 50 ppm

However eggs set did change, the NOEL being > 50 ppm. The study author claimed that there was a problem with Replicate 8C (drinker had failed to supply adequate water). First these waterers should have been maintained on a daily basis. The mortalities occurred over 2 days. Second, there were three other mortalities in that pen that were not attributed to the drinker. This is 43 percent of the adult birds in that pen.

C. Discussion of Results - Currently there are raw data and data discrepancies as outlined in Section 14. Based on the concerns for reported underdeveloped ovaries for both treatment groups and none appeared in the control. The study author should submit all raw data with regard to gross postmortem examination. The data should indicate if the follicles were "ruptured."

The number of pale livers and or intestines should also be reported (along with the raw data).

The results of the statistical analysis indicate that there is an effect on eggs laid at 50 ppm and no effect at 5 ppm.

If the ovaries were actually regressed, then indeed the effect would be at the lowest level tested (5 ppm) and no-observable-effect-level would be lower than the lowest dose tested.

The raw data for the control should be submitted by the study author on Replicate 17A, week 7, so that the ANOVA can be accurate (See Appendix 5 in the study).

D. Adequacy of Study

1) Classification - Supplemental for 92 percent w/w cyhalothrin

2) Rationale - See Discussion and Results

3) Repairability - This depends on whether the raw data satisfy concerns.

Table A. Analysis of Reproductive Effects

	Control	Concentrations of Cyhalothrin 5 ppm	50 ppm
Eggs laid*	1881	1754	1419
Eggs laid/hen/season	63.83	59.5	54.36
Eggs cracked**	120	74	84
Eggs cracked/hen/season	3.96	2.64	3.24
Percent of eggs laid	6.4	4.2	5.9
Eggs set	1524	1422	1144
Eggs set/hen	4.30	4.01	3.65
Percent of eggs laid	81%	81%	81%
Viable embryos (14-day)	1251	1258	935
Percent of eggs laid	67%	72%	66%
Percent of eggs set	82%	88%	82%
Live 21-day embryos	1165	1136	866
Percent of viable embryos	93%	90%	93%
Hatchlings	807	718	610
Percent of eggs laid	43%	41%	43%
Percent of eggs set	53%	51%	53%
Percent of viable embryos	65%	57%	65%
Percent of 21-day embryos	70%	63%	70%
14-day survivors ***	755	677	564
Percent of normal hatchlings	94	94	92
Average hatch weight (g)	37	38	37
Average 14-day-old survivors' weight (g)	192	188	185
Adult body weight (g/bird) (at study termination)			
Female	1173	1135	1113
Males	1215	1249	1251
Adult body weight (g/bird) Increase compared with Day 0			
Females	+211	+173	+151
Males	+136	+162	+176
Mean eggshell thickness	0.33	0.33	0.33
Mean egg weight	59	59	58

	Control	5 ppm	50 ppm
Average Feed Consumption			
Pre-egg production period	160.2	158.1	163.5
Egg production period	213.1	225.8	218
Mean total	185.6	190.6	189.8

* The number of females per week were used to estimate number per hen. Therefore, the mortalities were excluded.

**Eggs cracked include all broken, damaged, and cracked eggs.

***No. of survivors per hen could not be calculated since there were mortalities within each treatment level and control.

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Pages 16 through 24 are not included in this copy.

The material not included contains the following type of information:

_____ Identity of product inert ingredients.

_____ Identity of product inert 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.

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Big Bird
Cyhalothrin
w/o Replicate
8C

13

OBS	TRT	EL	EC	ES	VE	LE	NH
1	A	289	26	223	167	159	108
2	A	339	19	255	215	209	136
3	A	246	17	204	139	128	88
4	A	339	28	272	257	247	183
5	A	334	12	275	216	208	146
6	A	362	16	255	208	191	130
7	B	263	5	217	183	173	120
8	B	268	24	204	182	177	129
9	B	331	8	275	263	246	132
10	B	296	18	241	122	117	88
11	B	315	15	259	241	229	130
12	B	273	9	226	197	194	117
13	C	184	3	152	145	142	98
14	C	264	14	209	196	187	112
15	C	254	15	206	62	61	38
16	C	305	18	248	235	229	163
17	C	303	27	244	185	171	137

1. ANALYSIS OF EL DATA   16:01 THURSDAY, FEBRUARY 18, 1988

2

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GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	3	A B C

NUMBER OF OBSERVATIONS IN DATA SET = 17

1. ANALYSIS OF EL DATA   16:01 THURSDAY, FEBRUARY 18, 1988

3

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GENERAL LINEAR MODELS PROCEDURE

25

DEPENDENT VARIABLE: RESP

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

MODEL	2	8614.10784314	4307.05392157	2.67	0.1045	0.275802	13.762
ERROR	14	22618.83333333	1615.63095238		ROOT MSE		RESP MEA
CORRECTED TOTAL	16	31232.94117647			40.19491202		292.0588235

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR >
TRT	2	8614.10784314	2.67	0.1045	2	8614.10784314	2.67	0.104

1. ANALYSIS OF EL DATA 16:01 THURSDAY, FEBRUARY 18, 1988

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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=14 MSE=1615.63

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=5.625

NUMBER OF MEANS	2	3
CRITICAL RANGE	51.3107	53.8051

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	318.17	6	A
A			
B A	291.00	6	B
B			
B	262.00	5	C

2. ANALYSIS OF EC DATA 16:01 THURSDAY, FEBRUARY 18, 1988

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GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	3	A B C

NUMBER OF OBSERVATIONS IN DATA SET = 17

2. ANALYSIS OF EC DATA 16:01 THURSDAY, FEBRUARY 18, 1988

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GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	

MODEL	2	130.39803922	65.19901961	1.23	0.3217	0.149579	45.149
ERROR	14	741.36666667	52.95476190		ROOT MSE		RESP MEA
CORRECTED TOTAL	16	871.76470588			7.27700226		16.1176470

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR >
TRT	2	130.39803922	1.23	0.3217	2	130.39803922	1.23	0.321

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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=14 MSE=52.9548

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=5.625

NUMBER OF MEANS	2	3
CRITICAL RANGE	9.28944	9.74102

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	19.667	6	A
A			
A	15.400	5	C
A			
A	13.167	6	B

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GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	3	A B C

NUMBER OF OBSERVATIONS IN DATA SET = 17

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GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V
MODEL	2	3574.92549020	1787.46274510	1.86	0.1927	0.209611	13.304
ERROR	14	13480.13333333	962.86666667		ROOT MSE		RESP MEA
CORRECTED TOTAL	16	17055.05882353			31.03009292		233.2352941

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR > F
TRT	2	3574.92549020	1.86	0.1927	2	3574.92549020	1.86	0.192

3. ANALYSIS OF ES DATA 16:01 THURSDAY, FEBRUARY 18, 1988 1

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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=14 MSE=962.867

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=5.625

NUMBER OF MEANS	2	3
CRITICAL RANGE	39.6114	41.537

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	247.33	6	A
A			
A	237.00	6	B
A			
A	211.80	5	C

4. ANALYSIS OF VE DATA 16:01 THURSDAY, FEBRUARY 18, 1988 1

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GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	3	A B C

NUMBER OF OBSERVATIONS IN DATA SET = 17

4. ANALYSIS OF VE DATA 16:01 THURSDAY, FEBRUARY 18, 1988 1

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GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V
MODEL	2	4233.46666667	2116.73333333	0.78	0.4792	0.099757	27.639
ERROR	14	38204.53333333	2728.89523810		ROOT MSE		RESP MEA
CORRECTED TOTAL	16	42438.00000000			52.23882884		189.0000000

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR >
TRT	2	4233.46666667	0.78	0.4792	2	4233.46666667	0.78	0.479

****

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=14 MSE=2728.9

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=5.625

NUMBER OF MEANS	2	3
CRITICAL RANGE	66.6854	69.9271

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	200.33	6	A
A			
A	198.00	6	B
A	164.60	5	C

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
C		

NUMBER OF OBSERVATIONS IN

****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

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

29

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V
MODEL	2	4233.46666667	2116.73333333	0.78	0.4792	0.099757	27.639
ERROR	14	38204.53333333	2728.89523810		ROOT MSE		RESP MEA
CORRECTED TOTAL	16	42438.00000000			52.23882884		189.0000000

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR >
TRT	2	4233.46666667	0.78	0.4792	2	4233.46666667	0.78	0.479

4. ANALYSIS OF VE DATA 16:01 THURSDAY, FEBRUARY 18, 1988 1

****

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=14 MSE=2728.9

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=5.625

NUMBER OF MEANS	2	3
CRITICAL RANGE	66.6854	69.9271

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	200.33	6	A
A			
A	198.00	6	B
A	164.60	5	C

DAY, FEBRUARY 18, 1988 14

****** GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
C		

NUMBER OF OBSERVATIONS IN 5. ANALYSIS OF LE DATA

01 THURSDAY, FEBRUARY 15

****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

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

719 A

A

A 158.00 5 C

722

6. ANALYSIS OF NH DATA **********

724

725

GENERAL LINEAR MODELS PROCEDURE

728

CLASS LEVELS VALUES

730

731

NS IN DATA SET = 17

735

6. ANALYSIS OF NH DATA 16:01 THURSDAY, FE

737

738 GENERAL LINEAR MODELS PROCEDURE

739

740 DEPENDENT VARIABLE: RESP

741

742 SOURCE DF SQUARE 744 MODEL 2 1370.39803922 685.19901961

.62 0.5537 0.080975 27.573OOT MSE RESP MEAN

747

748 CORRECTED TOTAL 16 16923.76470588

URCE DF TYPE I

F VALUE PR > F DF TYP 2 1370.39803922 0.62 0.5537 2 1370.398

0. ANALYSIS OF NH DATA 16:01 THURSDAY, FEBRUARY 18, 1988 19

755 **********

756

757 GENERAL LINEAR MODELS PROCEDURE

758

759 IABLE: RESP

760 NOTE: THIS TEST CONTROLS THE TYPE I COMPAR THE EXPERIMENTWISE ERROR RATE

762

763 ALPHA=0.05 DF=14 MSE=1110.95

764

765 CELL SIZES ARE NOT EQUAL.

766 HARMONIOF CELL SIZES=5.625

767

768 NUMBER OF MEANS 3

769 CRITICAL RANGE 42.5486 44.617

770

71TLY DIFFERENT.

772

773 DUNCAN GROUPING ME A 131.83

A

776 A

777 A 119.33 6 B

778 A

779 109.60 5 C

780 7. ANALYSIS OF ES/EL DATA 16:01 THURSDAY, FEBRUARY 18, 1988 20

781 **********

782

783 GENERAL CLASS LEVEL INFORMATION

786

787 788

789 790

791 NUMBER OF OBSERVATIONS IN DATA SET = 17

792 7. ANALYSIS OF 794 **

****

795

ODELS PROCEDURE

797

798 DEPENDENT VARIABLE: RESPONSE

799 WEIGHT: DF SUM OF SQN SQUARE C.V.

800

801 MODEL 2 6746.03655054 3373.01827527 2.06 0.1646 22941.61171987

1638.68655142 ROOT 807 CORRECTED TOTAL 16 29687.64827041 40.480

63.38263844

31

CARY, N.C. 27511-8000

SAS 8:53 THURSDAY, FEBRUARY 18, 1988

OBS	TRT	EL	EC	ES	VE	LE	NH
1	A	289	26	223	167	159	108
2	A	339	19	255	215	209	136
3	A	246	17	204	139	128	88
4	A	339	28	272	257	247	183
5	A	334	12	275	216	208	146
6	A	362	16	255	208	191	130
7	B	263	5	217	183	173	120
8	B	268	24	204	182	177	129
9	B	331	8	275	263	246	132
10	B	296	18	241	122	117	88
11	B	315	15	259	241	229	130
12	B	273	9	226	197	194	117
13	C	184	3	152	145	142	98
14	C	264	14	209	196	187	112
15	C	109	7	85	79	76	60
16	C	254	15	206	62	61	38
17	C	305	18	248	235	229	163
18	C	303	27	244	185	171	137

2 g Bird Cytochrome w/ Replicate SC

1. ANALYSIS OF EL DATA 8:53 THURSDAY, FEBRUARY 18, 1988

****

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	3	A B C

NUMBER OF OBSERVATIONS IN DATA SET = 18

1. ANALYSIS OF EL DATA 8:53 THURSDAY, FEBRUARY 18, 1988

****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V
MODEL	2	20755.44444444	10377.72222222	3.70	0.0496	0.330071	18.799
ERROR	15	42126.33333333	2808.42222222		ROOT MSE	32	RESP MEA
CORRECTED TOTAL	17	62881.77777778			52.99454899		281.8888888

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR >
TRT	2	20755.44444444	3.70	0.0496	2	20755.44444444	3.70	0.049

1. ANALYSIS OF EL DATA 8:53 THURSDAY, FEBRUARY 18, 1988

****

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=15 MSE=2808.42

NUMBER OF MEANS	2	3
CRITICAL RANGE	65.0989	68.2889

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	318.17	6	A
A			
B A	291.00	6	B
B			
B	236.50	6	C

2. ANALYSIS OF EC DATA 8:53 THURSDAY, FEBRUARY 18, 1988

****

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	3	A B C

NUMBER OF OBSERVATIONS IN DATA SET = 18

2. ANALYSIS OF EC DATA 8:53 THURSDAY, FEBRUARY 18, 1988

****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V
MODEL	2	150.11111111	75.05555556	1.41	0.2754	0.157966	46.785
ERROR	15	800.16666667	53.34444444		ROOT MSE		RESP MEA
CORRECTED TOTAL	17	950.27777778			7.30372812		15.6111111

TRT	2	150.11111111	1.41	0.2754	2	150.11111111	1.41	0.275

2. ANALYSIS OF EC DATA 8:53 THURSDAY, FEBRUARY 18, 1988

****

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=15 MSE=53.3444

NUMBER OF MEANS	2	3
CRITICAL RANGE	8.97196	9.4116

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	19.667	6	A
A			
A	14.000	6	C
A			
A	13.167	6	B

3. ANALYSIS OF ES DATA 8:53 THURSDAY, FEBRUARY 18, 1988

****

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
TRT	3	A B C

NUMBER OF OBSERVATIONS IN DATA SET = 18

3. ANALYSIS OF ES DATA 8:53 THURSDAY, FEBRUARY 18, 1988

****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V
MODEL	2	10929.33333333	5464.66666667	3.05	0.0774	0.289075	18.813
ERROR	15	26878.66666667	1791.91111111		ROOT MSE		RESP MEA
CORRECTED TOTAL	17	37808.00000000			42.33097106		225.0000000

34

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

572 TRT	2	10929.33333333	3.05	0.0774	2	10929.33333333	3.05	0.077

573 3. ANALYSIS OF ES DATA 8:53 THURSDAY, FEBRUARY 18, 1988 1

574 **********

575

576 GENERAL LINEAR MODELS PROCEDURE

577

578 DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP

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

580 NOT THE EXPERIMENTWISE ERROR RATE

581

582 ALPHA=0.05 DF=15 MSE=1791.91

583

584 NUMBER OF MEANS 2 3

585 CRITICAL RANGE 51.9997 54.5478

586

587 MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

588

589 DUNCAN GROUPING	MEAN	N	TRT
590			
591 A	247.33	6	A
592 A			
593 B A	237.00	6	B
594 B			
595 B	190.67	6	C

596 4. ANALYSIS OF VE DATA 8:53 THURSDAY, FEBRUARY 18, 1988 1

597 **********

598

599 GENERAL LINEAR MODELS PROCEDURE

600

601 CLASS LEVEL INFORMATION

602

603 CLASS	LEVELS	VALUES
604		
605 TRT	3	A B C

606

607

608 NUMBER OF OBSERVATIONS IN DATA SET = 18

609 4. ANALYSIS OF VE DATA 8:53 THURSDAY, FEBRUARY 18, 1988 1

610 **********

611

612 GENERAL LINEAR MODELS PROCEDURE

613

614 DEPENDENT VARIABLE: RESP

615

616 SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V
617							
618 MODEL	2	9555.11111111	4777.55555556	1.62	0.2312	0.177387	29.718
619							
620 ERROR	15	44310.66666667	2954.04444444		ROOT MSE		RESP MEA
621							
622 CORRECTED TOTAL	17	53865.77777778			54.35112183		182.8888888

623

624

625 SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR >
626								
627 TRT	2	9555.11111111	1.62	0.2312	2	9555.11111111	1.62	0.231

35

****

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=15 MSE=2954.04

NUMBER OF MEANS	2	3
CRITICAL RANGE	66.7654	70.037

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	200.33	6	A
A			
A	198.00	6	B
A			
A	150.33	6	C

****

CLASS LEVEL INFORMATION

VALUES

TRT 3 NUMBER OF OBSERVATIONS
DATA SET = 18

****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESP

	DF	MEAN SQUARE	F VALUE	PR > F	R-SQUARE	C.V.
MODEL	2	8284.00000000	4142.00000000	1.53	0.24	29.7548
ERROR	15	40516.00000000	2701.06666667	D TOTAL	17	48800.00000000
		51.97178722	DF	TYPE I SS	F VALUE	PR > F

	DF	TYPE	F VALUE R > F					
TRT	2	8284.000053	0.2478	2	8284.00000000	1.53	0.2478	

****

GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP

NOT THE EXPERIMENTWISE ERROR RATE

NUMBER OF MEANS 2 ITICAL RANGE 63.8426 66.9709

36

MEANS WITH 699

N TR	DUNCAN GROUPING	MEAN
6 A		
	A	
	A 189.33 6 B	
	A 144.33 6 C	

CLASS LEVELS VAL 3 717
NUMBER OF OBSERVATIONS IN DATA SET = 18
720 **********

GENERAL LINEAR MODELS PRO D MEAN SQUARE F VALUE PR > F
R-SQUARE C.V.

MODEL 2 2821.000000 730 ERRO 15 666667 ROOT MSE RESP M
N

CORRECTED TOTAL 17 20424.50000000 734
E DF TYPE I SS F VALUE PR > F DF TYPE III SS F VALUE PR > F

20 0.3280

6. ANALYSIS OF NH DATA 8:53 THURSDAY, FEBRUAR 740
GENERAL LINEAR MODELS PROCEDURCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESP
NOTE: THIS NOT THE EXPERIMENTWISE ERROR RATE

ALPHA=0.05 DF=15 MSE=1173.57

NUMBER OF MEANS 2 3
41

MEANS WITH THE SAME LETTER ARE NOT SIGNIFIC DUNCAN GROUPING
EAN N TRT

A 131.83 6 A
A
A 760
A 101.33 6 C
8:53 THURSDAY, FEBRUARY 18, 1988 20

****

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS LEVELS VALUES

TRT 3 A B C

NUMBER OF OBSERVATIONS IN DATA SET = 18
7. ANALYSIS OF ES/EL DATA 8:53 THURSDAY, FEBRUARY 18, 1988 2

****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESPO 782 SOURCE DF SUM OF SQUARES MEAN SQUARE F VALUE PR
R-SQUARE C.V.

MODEL 2 6536.89176517 3268.44588259 2.10 0.1571 0.218666 62.287

E357.53701484 1557.16913432.46098243 ROOT MSE35272729 RSE MEAN

37

SOURCE TYPE III SS F VALUE PR > F

TRT 2 6536.89176517 2.10 0.1571

:S LINE IS COMPRESSED AT 17 CHARACTERS PER INCH.
THIS ACCEPTABLE?
:1111111111111111111111111111111111111111111111111111111111111111111111111

IS LINE IS COMPRESSED AT 17 CHARACTERS PER INCH.
THIS ACCEPTABLE?
111111111111111111111111111111111111111111111111111111111111111111111111111
tch 4264
  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
EUE
'n.c.' all
 168 NOTE: COPYRIGHT (C) 1984,1986 SAS INSTITUTE INC., CARY, N.C. 27511, U.S.A.
 252 CARY, N.C. 27511-8000
EUE
252 999
 252 CARY, N.C. 27511-8000
 253 SAS 8:56 THURSDAY, FEBRUARY 18, 1988

 254
 255 R R R R R R R R R R R R R R R R R R R R R R R
 256 R R R R R R R R R E E E E E E E E E E E E E E
 257 E E E E E E E E E S S S S S S S S S S S S S S
 258 O T S S S S S S S S S P P P P P P P P P P P P
 259 B R P P P P P P P P P 1 1 1 1 1 1 1 1 1 1 1 2
 260 S T 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0
 261
 262 1 A 62.5 100 86 100 100 86 . . . .
 263 2 B 100.0 57 86 100 86 86 . . . .
 264 3 C 86.0 57 100 86 86 . . . .
 265 SAS 8:56 THURSDAY, FEBRUARY 18, 1988

 266
 267 GENERAL LINEAR MODELS PROCEDURE
 268
 269 CLASS LEVEL INFORMATION
 270
 271 CLASS LEVELS VALUES
 272
 273 TRT 3 A B C
 274
 275
 276 NUMBER OF OBSERVATIONS IN DATA SET = 60
 277
 278
 279 NOTE: ALL DEPENDENT VARIABLES ARE CONSISTENT WITH RESPECT TO THE PRESENCE OR ABSENCE OF MISSING VALUES. HOWEVER,
 280 ONLY 17 OBSERVATIONS CAN BE USED IN THIS ANALYSIS.
 281 SAS 8:56 THURSDAY, FEBRUARY 18, 1988

 282
 283 GENERAL LINEAR MODELS PROCEDURE
 284
 285 DEPENDENT VARIABLE: EFFECT
 286
 287 SOURCE DF SUM OF SQUARES MEAN SQUARE F VALUE PR > F R-SQUARE C.V
 288

ERROR	14	3341.36922348	238.66923025	ROOT MSE	EFFECT MEA
CORRECTED TOTAL	16	3507.25475203		15.44892327	72.5886962

SOURCE	DF	TYPE I SS	F VALUE	PR > F	DF	TYPE III SS	F VALUE	PR >
TRT	2	165.88552855	0.35	0.7124	2	165.88552855	0.35	0.712

SAS 8:56 THURSDAY, FEBRUARY 18, 1988

GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: EFFECT

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

ALPHA=0.05 DF=14 MSE=238.669

WARNING: CELL SIZES ARE NOT EQUAL.
HARMONIC MEAN OF CELL SIZES=5.625

NUMBER OF MEANS	2	3
CRITICAL RANGE	19.7213	20.68

MEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	76.351	6	A
A			
A	72.155	6	B
A			
A	68.594	5	C

JOBNAME	QUEUE		POSITION	LINES	DESTINATION
RMHXX	OUTPUT	A	217	307	HOLD
RMHXX	OUTPUT	A	1357	323	HOLD
RMHXX	OUTPUT	A	1359	320	HOLD
RMHXX	OUTPUT	A	1364	320	HOLD
RMHXX	OUTPUT	A	1623	1200	HOLD

JES2 JOB LOG -- SYSTEM EPA2 -- NODE NCCIBM1

all
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SAS 9:00 THURSDAY, FEBRUARY 18, 1988

		R E S	R E S	R E S	R E S	R E S	R E S	R E S	R E S	R E S	R E S	R E S	R E S	R E S	R E S	R E S	R E S	R E S	R E S	R E S
O	T	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S