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Ninety-Day Subchronic Oral Toxicity Study of Nitroguanidine in Rats

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MAMMALIAN TOXICOLOGY BRANCH
DIVISION OF TOXICOLOGY

November, 1988

Toxicology Series: 170

LETTERMAN ARMY INSTITUTE OF RESEARCH
PRESIDIO OF SAN FRANCISCO, CALIFORNIA 94129

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Edwin S. Beatrice 3 Nov 88

Edwin S. Beatrice (date)
COL, MC
Commanding

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19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The 90-day subchronic oral toxicity of nitroguanidine was evaluated in male and female Sprague-Dawley rats. Nitroguanidine was administered in the diet at dose levels of 0, 100, 316, and 1000 mg/kg/day for 90 days. The addition of nitroguanidine to the diet consistently reduced food consumption and caused significant ($p \leq 0.05$) increases in water consumption. Significantly ($p \leq 0.05$) reduced weight gains were observed in the female high-dose group for 5 of the 13 weeks of the study period. No other clinical signs attributable to the test compound were observed during the study. Blood samples taken at necropsy for hematological and serum chemistry analyses exhibited no significant ($p \leq 0.05$) abnormalities that could be attributed to nitroguanidine dosing. Microscopic examination of tissues from the control and 1000 mg/kg/day dose group animals revealed no lesions attributable to the administration of nitroguanidine. These findings indicate that nitroguanidine is nontoxic in rats when administered at doses as high as 1000 mg/kg/day for 90 days. (continued on reverse)

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19. (ABSTRACT -- continued)

The findings of increased water consumption suggest that nitroguanidine, which is excreted unchanged in the rat's urine, may be acting as an osmotic diuretic.

ABSTRACT

The 90-day subchronic oral toxicity of nitroguanidine was evaluated in male and female Sprague-Dawley rats. Nitroguanidine was administered in the diet at dose levels of 0, 100, 316, and 1000 mg/kg/day for 90 days. The addition of nitroguanidine to the diet consistently reduced food consumption and caused significant ($p \leq 0.05$) increases in water consumption. Significantly ($p \leq 0.05$) reduced weight gains were observed in the female high-dose group for 5 of the 13 weeks of the study period. No other clinical signs attributable to the test compound were observed during the study. Blood samples taken at necropsy for hematological and serum chemistry analyses exhibited no significant ($p \leq 0.05$) abnormalities that could be attributed to nitroguanidine dosing. Microscopic examination of tissues from the control and 1000 mg/kg/day dose group animals revealed no lesions attributable to the administration of nitroguanidine. These findings indicate that nitroguanidine is nontoxic in rats when administered at doses as high as 1000 mg/kg/day for 90 days. The findings of increased water consumption suggest that nitroguanidine, which is excreted unchanged in the rat's urine, may be acting as an osmotic diuretic.

Key Words: Subchronic Oral Toxicity, Nitroguanidine, Sprague-Dawley Rat

PREFACE

TYPE REPORT: 90-Day Subchronic Oral Toxicity GLP Study Report

TESTING FACILITY:
US Army Medical Research and Development Command
Letterman Army Institute of Research
Presidio of San Francisco, CA 94129-6800

SPONSOR:
US Army Medical Research and Development Command
US Army Biomedical Research and Development Laboratory
Fort Detrick, Maryland 21701-5010
Project Officer: Gunda Reddy, PhD

WORK UNIT/APC: 180 Environmental Health Effects of Army Materials/TL09

GLP STUDY NUMBER: 85042

STUDY DIRECTOR: MAJ Don W. Korte Jr., PhD, MSC

PRINCIPAL INVESTIGATOR:
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CO-PRINCIPAL INVESTIGATOR: Carolyn M. Lewis, MS

PATHOLOGIST: MAJ G. Tracy Makovec, DVM, VC
Diplomate, ACVP

REPORT AND DATA MANAGEMENT:
A copy of the final report, study protocol, retired SOPs, raw data, analytical, stability, and purity data of the test compound, and an aliquot of the test compound will be retained in the LAIR Archives.

TEST SUBSTANCE: Nitroguanidine

INCLUSIVE STUDY DATES: 7 Aug - 22 Nov 1985

OBJECTIVE:
The objective of this study was to determine the 90-day subchronic oral toxicity of nitroguanidine in male and female Sprague-Dawley rats.

ACKNOWLEDGMENTS

SSG James D. Justus, BS, SPC John R. G. Ryabik, BS, SPC James J. Fischer, SPC Scott L. Schwebe, Richard A. Spieler, and Charlotte L. Speckman provided research assistance and animal care; SPC Paul B. Simboli, BS, provided chemical preparation and analysis; MAJ Carlin V. Okerberg, DVM, ACVP, SGT Thomas W. Johnson, BA, and SGT Lisa E. Carson provided necropsy and pathology support; SSG Clinton H. Beckett, SGT Samuel S. Liu, BS, and SPC Gary E. Mattison provided hematology support; SPC Julius Harmon and Mary E. Lyons provided clinical chemistry support; Lucille M. Cote, ASCP, and Tom Hironaga provided histology preparation support; and Synitha Fuller provided secretarial assistance.

SIGNATURES OF PRINCIPAL SCIENTISTS AND MANAGERS INVOLVED IN THE STUDY

We, the undersigned, declare that GLP Study 85042 was performed under our supervision, according to the procedures described herein, and that this report is an accurate record of the results obtained.

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DEPARTMENT OF THE ARMY

LETTERMAN ARMY INSTITUTE OF RESEARCH
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REPLY TO
ATTENTION OF:

SGRD-ULZ-QA 1 November 1988

MEMORANDUM FOR RECORD

SUBJECT: GLP Compliance for GLP Study 85Ø42

1. This is to certify that in relation to LAIR GLP Study 85Ø42, the following inspections were made:

18 June 1985	- Protocol Review
Ø9 October 1985	- Diet Preparation

2. The institute report entitled "Ninety-Day Subchronic Oral Toxicity Study of Nitroguanidine in Rats," Toxicology Series 17Ø, was audited on 17 October 1988.

Walter G. Bell

WALTER G. BELL
SFC, USA
Quality Assurance Auditor

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

Ninety-Day Subchronic Oral Toxicity Study of Nitroguanidine in Rats -- Morgan *et al*

INTRODUCTION

Nitroguanidine, a primary component of US Army triple-base propellants, is now produced in a Government-owned contractor-operated ammunition plant. The US Army Biomedical Research and Development Laboratory (USABRDL), as part of its mission to evaluate the environmental and health hazards of military-unique propellants generated by US Army munitions-manufacturing facilities, conducted a review of the nitroguanidine data base and identified significant gaps in the toxicity data (1). The Mammalian Toxicology Branch, LAIR, was tasked by USABRDL to develop a genetic and mammalian toxicity profile for nitroguanidine, related intermediates/by-products of its manufacture, and its environmental degradation products.

Objective of the Study

The objective of this study was to determine the 90-day subchronic toxicity of nitroguanidine in male and female Sprague-Dawley rats.

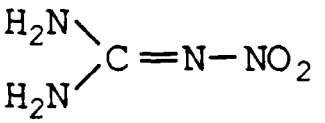
MATERIALS

Test Substance

Chemical name: Nitroguanidine

Chemical Abstract Service Registry No.: 556-88-7

Structural formula:



Molecular formula: $CH_4N_4O_2$

Other test substance information is presented in Appendix A.

Vehicle

The test compound was mixed into the feed (see Husbandry).

Animals

Seventy-five male and 73 female albino Sprague-Dawley rats (Bantin-Kingman, Inc., Fremont, CA) were used in this study. Ear tags were used to identify each animal individually. Two males and 2 females were used for necropsy quality controls. Thirteen males and 11 females were used as baseline controls. The weights on receipt (7 Aug 1985) ranged from 98 g to 135 g. Additional animal data appear in Appendix B.

Husbandry

The animals assigned to this study were housed individually in clear, polycarbonate shoe boxes in drawer rack cages. Alpha-dri®, a cellulose fiber, was used as bedding. The shoe boxes and bedding were changed twice weekly. The diet, fed *ad libitum*, consisted of Certified Purina Rodent Chow® 5002 Meal Form (Ralston Purina, St. Louis, MO). Water was provided by 16-ounce water bottles with stoppers and sipper tubes. Both food and water consumption were measured weekly.

The temperature range maintained throughout this study was 20.3°C - 27.0°C with a relative humidity of 31-50%. The photoperiod was 12 hours of light daily with a 1/2-hour dawn phase-in and a 1/2-hour dusk phase-out.

METHODS

This study was performed in accordance with LAIR Standard Operating Procedure OP-STX-74 "Ninety-Day Subchronic Oral Toxicity Testing in Rodents" (2) and EPA guidelines (3).

Group Assignment/Acclimation

The animals were acclimated for 14 or 16 days (males and females, respectively) from receipt to the onset of dosing. During the acclimation period, the animals were observed daily for signs of illness. Food and water consumption were measured during the second week of quarantine.

The TOXSYS® Animal Allocation Program (LAIR SOP-OP-ISG-24) was used to assign the study animals to groups. LAIR SOP OP-ISG-21 was used to select interim sacrifice animals for each group.

Dose Levels

Dose levels were selected on the basis of the results of an acute toxicity study (4) and a 14-day subacute study(5). The acute oral median lethal dose exceeded a LIMIT dose of 5000 mg/kg. Thus, the upper dose level used in the subacute study was a LIMIT dose of 1000 mg/kg (3). At this dose level no deaths nor obvious toxicity were observed (5). Using a logarithmic progression table the following dose levels were selected: 0 mg/kg/day, 100 mg/kg/day, 316 mg/kg/day, and 1000 mg/kg/day.

Compound and Diet Preparation

The nitroguanidine was received as a dry white powder, 99.6% pure. All diet preparations were done in accordance with LAIR SOP OP-STX-16 (6). A premix consisting of 50 mg nitroguanidine/kg of the Rodent Chow was prepared. Since the compound tends to clump, it was further ground in a jar mill (Norton Inc., Akron, OH) using porcelain grinding pellets for two hours to break up the clumps. The nitroguanidine was then mixed into the meal in a series of 1-, 2-, 4-, and 6-fold dilutions. Each dilution was mixed for 15-30 minutes in the jar mill. The dilutions were then sieved through a 10-mesh screen to ensure the grinding was complete and to remove the grinding pellets.

On the day of the diet change, after the new diet concentrations had been calculated, the appropriate amounts of premix and meal were blended together using a Model A200D mixer (Hobart Inc., Troy, OH) for at least 15 minutes. Nitroguanidine was mixed into the feed at a level that, based on the feed consumption of the previous week and the animal's weight, would provide the desired dose (mg/kg) on a daily basis. All diet mixes were within 6.4% of target concentration and were adequately homogeneous. Additional mixing data and analyses are presented in Appendix C.

Test Procedures

Feed consumption and water consumption were measured on a weekly basis. Individual feed jars were used. They were weighed at the beginning and at the end of each week. The feed was sifted using a 10-mesh sieve to remove bedding and feces prior to the final weighing. If there were signs of spillage in the bedding, the bedding was also sifted and the feed obtained was returned to the jar prior to weighing. Records for water bottles with obvious spillage were flagged, and the weights were omitted. Record-keeping was initiated

during the final week of quarantine and provided the baseline consumption data to calculate the first week's diet mixture.

Early on the day of diet change, the animals were weighed, observed, and their water bottles and feeders were weighed. These data were collected on a Beckman TOXSYS® data collection terminal. The Beckman Diet Computation Subsystem was used for the calculations. After the new diet was mixed, the feeders and water bottles were filled, weighed, and returned to the cages.

Observations were performed twice daily throughout the 90-day test period. During the morning observations, the animals were observed undisturbed in their cages, outside of their cages, and after return to their cages. All findings were recorded. A second "walk through" observation was performed in the afternoon, and only significant observations were recorded. Body weights were recorded weekly and on the day of sacrifice. Appendix D contains a listing of the historical events.

All animals were subjected to a complete necropsy following exsanguination under sodium pentobarbital anesthesia. Blood was collected from the right ventricle while under anesthesia for hematology and clinical chemistry measurements. A listing of the measurements and SOPs is provided in Appendix E. A listing of the tissues examined microscopically is provided in Appendix F.

Changes/Deviations

The dosing phase of this study was accomplished according to the protocol and applicable amendments with the following exception: food consumption data collected on 13 September 1985 (Week 3) for animals 85D00858 through 85D00906 were lost due to a computer malfunction.

Food consumption and body weight data from the wrong dose groups were inadvertently used to calculate the concentration of nitroguanidine in the diets prepared each week from 21 August 85 to approximately 20 September 85. However, the food consumption and body weight data were similar among the dose groups and the error had little effect on the actual nitroguanidine consumption by the study animals (Table 1).

Statistics

The animal weights, food consumption, and water consumption were analyzed statistically with packaged

programs available on BMDP software (7). The equality of the variances of the groups was tested using the Levene's Test. If the variances were equal, the vehicle control group and the dose groups were compared by the standard one-way analysis of variance (ANOVA). Otherwise, the Welch one-way ANOVA, which is not based on the assumption that the variances are equal, was performed. If the F-statistic was significant in either case, the Dunnett's test was performed to determine whether or not the vehicle control group was significantly different from any of the dose groups. Total bilirubin values are nonparametric data and were analyzed using the Kruskal-Wallis one-way ANOVA. Statistical analysis for organ weights, hematology and serum chemistry were done on the Xybion software program using the standard one-way ANOVA. The homogeneity of the groups was tested by the Bartlett's test. If the groups were found to be non-homogeneous, then a modified t-test was performed instead of the Dunnett's test.

Storage of Raw Data and Final Report

A copy of the final report, study protocols, raw data, retired SOPs, and an aliquot of the test compound will be retained in the LAIR Archives.

RESULTS

Mortalities

No deaths occurred during the study.

Food and Water Consumption

Mean daily consumption of nitroguanidine is presented in Table 1. Mean weekly food and water consumption data are presented in Tables 2 and 3, respectively. Food consumption in the males increased in all dose groups during the 13 weeks of the study. The rate of the increase in food consumption was not dose related. Food consumption in the 1000 mg/kg/day groups was significantly ($p \leq 0.05$) lower than in the control group during Week 1 for the males, and Weeks 5 and 6 for the females. Water consumption by both sexes increased in a dose-related manner during the study. For the 316 and 1000 mg/kg/day dose groups this increased water consumption was significant. Individual consumption of nitroguanidine is presented in Appendix G. Individual food and water consumption data are presented in Appendices H and I, respectively.

Body Weights

The mean body weights for each group are presented in Table 4. No significant differences from controls were exhibited in the male dose groups. The females in the 1000 mg/kg/day group exhibited a statistically significant ($p \leq 0.05$) decrease in the rate of growth when compared to the controls on Weeks 5, 6, 8, 9, and 12. During the course of the study, the female control group mean weight gain was 103 g while the female high-dose group mean weight gain was only 81 g. Individual body weight data are presented in Appendix J.

Clinical Signs

No clinical signs attributable to nitroguanidine administration were observed. The incidence of such signs as alopecia, staining, irritability, diarrhea, dehydration, and emaciation appeared to be random and a function of a subchronic study rather than compound or dose related. Clinical signs data are presented in Appendix K.

Clinical Chemistry

The effect of nitroguanidine on the level of several serum electrolytes (Table 5), various serum biochemistry measurements (Table 6), and the activity of several serum enzymes (Table 7) was examined. No significant ($p \leq 0.05$) differences from controls were observed in electrolyte levels for either sex at any of the dose groups. The group 4 males exhibited mean cholesterol values significantly ($p \leq 0.05$) greater than those of the controls at interim and terminal sacrifice, but these values remained within normal limits. The group 3 males exhibited mean LDH and total protein values significantly ($p \leq 0.05$) less than those of the controls at terminal sacrifice, but the values remained within normal limits. The group 2 and group 4 females exhibited mean triglyceride values significantly ($p \leq 0.05$) less than those of the controls at terminal sacrifice, but these values remained within normal limits. Individual clinical chemistry values are presented in Appendix L.

Hematology

The effect of nitroguanidine on various hematological measurements was examined. These data are summarized in Table 8. No statistically significant ($p \leq 0.05$) variances from the controls were found in the male and female dose

groups. Individual hematology values are presented in Appendix M.

Organ Weights and Ratios

Group mean organ weights and the comparative ratios are presented in Tables 9 through 11. Organ weight, organ-to-body weight ratios, and organ-to-brain weight ratios were compared for liver, spleen, adrenals, kidneys, heart, testes/ovaries, and brain. The group 3 males showed a significant ($p \leq 0.05$) decrease in absolute adrenal gland weight as compared to controls at interim sacrifice. At terminal sacrifice the males exhibited a loss in heart weight that appeared to be dose related but not statistically significant ($p \leq 0.05$). The females showed significant ($p \leq 0.05$) decreases in absolute ovarian weights in the 100, 316, and 1000 mg/kg groups at interim sacrifice, decreased brain weight at interim sacrifice in the 1000 mg/kg group, and a decreased spleen weight in the 316 mg/kg group at term sacrifice. The spleen-to-brain weight ratios for the 100 and 316 mg/kg female groups were significantly ($p \leq 0.05$) decreased compared to that of the controls at terminal sacrifice. The female 1000 mg/kg group had a significantly ($p \leq 0.05$) increased brain-to-body weight ratio compared to that of the controls at terminal sacrifice. Individual organ weight, organ-to-body weight ratio, and organ-to-brain weight ratio data are presented in Appendices N, O, and P, respectively.

Necropsy

No compound-related gross or microscopic lesions were observed. All gross and microscopic lesions were minimal to mild in severity and considered to be incidental findings commonly observed in Sprague-Dawley rats. There were no microscopic lesions that were significantly different in severity from the control using the Kolmogorov-Smirnov two-tailed test. The pathology report is presented in Appendix Q.

Table 1:

Daily Consumption of Nitroguanidine#

Group	Week	n	Males (mg/kg/day)	n	Females (mg/kg/day)
Controls	1	15	0* ±0	15	0 ±0
	2	15	0 ±0	15	0 ±0
	3	15	0 ±0	15	0 ±0
	4	15	0 ±0	15	0 ±0
	5	15	0 ±0	15	0 ±0
	6	15	0 ±0	15	0 ±0
	7	10	0 ±0	10	0 ±0
	8	10	0 ±0	10	0 ±0
	9	10	0 ±0	10	0 ±0
	10	10	0 ±0	10	0 ±0
	11	10	0 ±0	10	0 ±0
	12	10	0 ±0	10	0 ±0
	13	10	0 ±0	10	0 ±0
100 mg/kg/day	1	15	85 ±2	15	91 ±2
	2	14	87 ±2	15	95 ±6
	3	15	87 ±3	7	90 ±2
	4	15	97 ±2	15	99 ±2
	5	15	92 ±1	15	104 ±4
	6	15	98 ±2	15	90 ±2
	7	10	98 ±3	10	106 ±3
	8	10	91 ±4	10	106 ±5
	9	9	101 ±2	10	96 ±3
	10	10	106 ±4	10	99 ±2
	11	10	101 ±2	10	96 ±1
	12	10	91 ±1	10	91 ±2
	13	10	113 ±3	10	94 ±3

* Mean ± Standard Error.
\# Concentration of nitroguanidine in feed x mean feed consumption per day ÷ body weight in kg.

Table 1 (cont.):

Daily Consumption of Nitroguanidine#

Group	Week	n	Males (mg/kg/day)	n	Females (mg/kg/day)
316 mg/kg/day	1	15	295* ± 5	15	275 ±10
	2	15	259 ± 5	15	325 ±21
	3	15	298 ± 5	6	292 ± 5
	4	15	322 ±13	15	304 ± 5
	5	15	293 ± 3	15	297 ± 4
	6	15	284 ± 6	14	275 ± 4
	7	10	295 ± 8	10	323 ± 4
	8	9	332 ±10	8	348 ±12
	9	10	326 ±11	10	326 ±11
	10	10	335 ±15	10	311 ± 8
	11	10	320 ± 4	9	317 ± 6
	12	10	315 ±11	10	340 ±10
	13	10	348 ± 9	10	324 ±11
1000 mg/kg/day	1	15	793 ±12	15	819 ±29
	2	13	829 ±18	15	1046 ±65
	3	15	963 ±32	2	924 ± 7
	4	15	968 ±28	15	909 ±11
	5	15	882 ±12	15	1027 ± 9
	6	15	985 ±17	15	918 ±11
	7	10	962 ±19	15	1042 ±11
	8	10	1083 ±28	10	1058 ±23
	9	10	878 ±16	10	987 ±22
	10	10	1065 ±17	10	1045 ±14
	11	9	1003 ±19	10	1039 ±25
	12	10	1019 ±40	10	1085 ±30
	13	10	906 ±25	10	1030 ±23

* Mean ± Standard Error.
# Concentration of nitroguanidine in feed x mean feed consumption per day ÷ mean body weight in kg.

Table 2:

Food Consumption

Group	Week	Males n	Males (g/week)	Females n	Females (g/week)
Controls	1	15	169* ±4	15	118 ±3
	2	15	174 ±3	15	123 ±7
	3	15	171 ±2	8	116 ±4
	4	15	176 ±4	14	113 ±3
	5	15	162 ±8	15	124 ±3
	6	15	163 ±4	15	120 ±6
	7	10	167 ±7	10	114 ±2
	8	10	155 ±6	10	112 ±4
	9	10	164 ±5	10	112 ±3
	10	10	166 ±5	9	122 ±7
	11	10	178 ±3	9	120 ±3
	12	10	172 ±4	9	118 ±4
	13	9	192 ±5	10	112 ±4
100 mg/kg/day	1	15	167 ±3	15	115 ±3
	2	14	164 ±4	15	118 ±7
	3	15	167 ±4	7	119 ±4
	4	15	167 ±5	15	118 ±4
	5	15	164 ±3	15	124 ±5
	6	15	161 ±3	15	108 ±2
	7	10	163 ±5	10	113 ±4
	8	10	157 ±6	10	122 ±6
	9	9	164 ±6	10	122 ±5
	10	10	167 ±7	10	121 ±5
	11	10	175 ±4	10	119 ±3
	12	10	162 ±4	10	116 ±4
	13	10	184 ±7	10	117 ±3

* Mean ± Standard Error.

Table 2 (cont.):

Food Consumption

Group	Week	Males n	Males (g/week)	Females n	Females (g/week)
316 mg/kg/day	1	15	162*± 3	15	118 ±4
	2	15	166 ± 4	15	118 ±8
	3	15	161 ± 4	6	115 ±3
	4	15	174 ± 6	15	115 ±2
	5	15	165 ± 4	15	120 ±2
	6	15	154 ± 4	14	107 ±3
	7	10	154 ± 5	10	106 ±2
	8	9	168 ± 3	8	117 ±3
	9	10	159 ± 7	10	113 ±3
	10	10	169 ±10	10	115 ±3
	11	10	167 ± 6	9	120 ±2
	12	10	163 ± 8	10	117 ±2
	13	10	179 ± 9	10	116 ±4
1000 mg/kg/day	1	15	156@ ±2	15	110 ±3
	2	13	160 ±4	15	123 ±8
	3	15	165 ±4	2	114 ±2
	4	15	166 ±5	15	107 ±2
	5	15	158 ±2	15	112$ ±2
	6	15	160 ±3	15	104$ ±2
	7	10	154 ±3	10	105 ±3
	8	10	167 ±5	10	106 ±3
	9	10	153 ±4	10	105 ±4
	10	10	166 ±5	10	111 ±3
	11	9	170 ±5	10	112 ±6
	12	10	167 ±7	10	117 ±4
	13	10	181 ±6	10	117 ±4

* Mean ± Standard Error.
$ Significant difference from controls at $p \leq 0.05$.
@ Significant difference from controls at $p \leq 0.01$.

Table 3:

Water Consumption

Group	Week	Males n	Males (ml/week)	Females n	Females (ml/week)
Controls	1	15	262* ±14	15	187 ± 7
	2	15	269 ± 8	15	203 ±11
	3	15	261 ± 7	15	197 ±10
	4	15	265 ± 8	15	172 ± 8
	5	15	257 ± 7	15	199 ±10
	6	15	258 ± 9	15	179 ± 8
	7	10	271 ±16	10	182 ±13
	8	10	291 ±14	10	186 ±16
	9	10	252 ±12	10	168 ± 7
	10	10	242 ± 7	10	180 ± 7
	11	10	259 ±10	10	162 ±10
	12	10	256 ±12	10	166 ± 6
	13	10	247 ±13	10	170 ± 7
100 mg/kg/day	1	15	266 ±11	14	175 ± 5
	2	14	279 ±12	14	186 ± 7
	3	15	276 ±14	14	190 ±10
	4	15	283 ±14	14	187 ± 7
	5	15	284 ±15	15	196 ± 9
	6	15	271 ±15	15	183 ± 7
	7	10	264 ±15	10	196 ±26
	8	10	298 ±20	9	189 ±11
	9	10	253 ±30	10	189 ±11
	10	9	278 ±19	9	186 ±12
	11	10	282 ±19	10	184 ±11
	12	9	253 ±17	9	170 ± 8
	13	10	272 ±23	9	174 ± 7

* Mean ± Standard Error.

Table 3 (cont.):

Water Consumption

Group ..	Week	Males n	Males (ml/week)	Females n	Females (ml/week)
316 mg/kg/day	1	15	271* ± 8	14	207$ ± 5
	2	15	290 ±12	15	204 ± 7
	3	15	286 ±14	15	200 ± 5
	4	14	298 ±15	15	194 ± 6
	5	14	307$ ±17	15	208 ± 4
	6	15	286 ±15	15	188 ± 6
	7	10	263 ±17	10	189 ± 3
	8	8	303 ±17	10	179 ±19
	9	9	292 ±22	10	206 ±12
	10	10	290 ±22	10	213 ±10
	11	9	292 ±18	9	201$ ± 9
	12	10	286 ±20	10	203@ ±10
	13	9	275 ±15	10	200$ ± 8
1000 mg/kg/day	1	15	296 ± 6	15	224@ ± 3
	2	13	290 ±13	15	215 ± 8
	3	15	314@ ±10	15	215 ± 5
	4	15	314$ ±10	15	202@ ± 6
	5	15	308$ ±11	15	210 ± 7
	6	15	324@ ±15	15	200 ± 6
	7	10	320 ±16	10	201 ± 8
	8	10	300 ±14	10	206 ± 9
	9	10	306 ±16	10	196 ±10
	10	10	314$ ±14	10	225@ ± 8
	11	10	299 ±18	10	222$ ±13
	12	9	302 ±11	10	218@ ± 6
	13	10	311 ±14	10	230@ ± 9

* Mean ± Standard Error.
$ Significant difference from controls at $p \leq 0.05$.
@ Significant difference from controls at $p \leq 0.01$.

Table 4:

Body Weights (g)

Group	Week	n	Males	n	Females
Controls	1	15	290*± 6	15	215 ±4
	2	15	333 ± 6	15	232 ±4
	3	15	368 ± 6	15	246 ±4
	4	15	397 ± 7	15	254 ±5
	5	15	417 ± 7	15	270 ±5
	6	15	431 ± 7	15	276 ±6
	7	10	445 ±10	10	290 ±7
	8	10	455 ± 9	10	290 ±8
	9	10	477 ±10	10	296 ±8
	10	10	488 ±10	10	308 ±9
	11	10	509 ±11	10	313 ±8
	12	10	515 ± 9	10	316 ±8
	13	10	528 ±11	10	318 ±8
100 mg/kg/day	1	15	284 ± 6	15	212 ±4
	2	15	319 ± 8	15	222 ±5
	3	15	358 ± 6	15	241 ±6
	4	15	385 ± 6	15	250 ±6
	5	15	415 ± 6	15	260 ±6
	6	15	422 ± 6	15	264 ±6
	7	10	444 ± 7	10	279 ±7
	8	10	458 ± 8	10	287 ±8
	9	10	459 ±13	10	291 ±9
	10	10	479 ± 8	10	302 ±9
	11	10	492 ± 7	10	308 ±9
	12	10	505 ±10	10	312 ±9
	13	10	512 ± 8	10	315 ±9

* Mean ± Standard Error.

Table 4 (cont.):

Body Weights (g)

Group	Week	n	Males	n	Females
316 mg/kg/day	1	15	281*± 6	15	215 ± 4
	2	15	325 ± 6	15	226 ± 4
	3	15	359 ± 7	15	242 ± 5
	4	15	378 ± 8	15	249 ± 5
	5	15	415 ± 9	15	263 ± 4
	6	15	421 ± 9	15	265 ± 5
	7	10	436 ±12	10	275 ± 7
	8	10	442 ±20	10	275 ± 8
	9	10	460 ±16	10	281 ± 7
	10	10	474 ±16	10	291 ± 7
	11	10	484 ±16	10	292 ±12
	12	10	486 ±19	10	297 ± 8
	13	10	506 ±18	10	304 ± 8
1000 mg/kg/day	1	15	280 ± 6	15	209 ± 4
	2	15	309 ± 9	15	220 ± 4
	3	15	344 ± 7	15	234 ± 4
	4	15	372 ± 6	15	239 ± 4
	5	15	398 ± 6	15	248@± 4
	6	15	412 ± 6	15	252@± 4
	7	10	431 ± 9	10	263 ± 6
	8	10	450 ± 9	10	261$± 6
	9	10	459 ±10	10	265$± 7
	10	10	480 ±10	10	278 ± 7
	11	10	487 ±12	10	282 ± 8
	12	10	496 ±12	10	284$± 8
	13	10	511 ±11	10	290 ± 7

* Mean ± Standard Error.
$ Significant difference from controls at $p \leq 0.05$.
@ Significant difference from controls at $p \leq 0.01$.

Table 5: Serum Electrolyte Levels

Group@	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
Males								
SOD (mEq/dl)	166* ±2	159 ±6	162 ±4	158 ±5	163 ±6	160 ±2	162 ±4	161 ±13
POT (mEq/dl)	7.1 ±0.6	6.6 ±1.1	6.8 ±0.5	6.4 ±0.8	7.0 ±1.1	7.2 ±1.0	7.1 ±0.5	6.5 ±0.8
CHLO (mEq/dl)	103 ±2	102 ±4	103 ±2	100 ±4	105 ±3	101 ±3	103 ±2	103 ±7
CAL (mEq/dl)	11.1 ±0.3	10.4 ±0.6	10.7 ±0.4	10.3 ±0.6	10.7 ±0.2	10.3 ±0.7	10.7 ±0.3	10.7 ±0.8
PHOS (mEq/dl)	9.4 ±0.8	8.1 ±1.6	9.0 ±1.5	7.7 ±1.2	8.7 ±0.4	8.3 ±0.6	8.3 ±1.6	7.1 ±1.9
MG (mEq/dl)	3.1 ±0.2	2.6 ±0.2	3.0 ±0.1	2.5 ±0.1	3.0 ±0.4	2.7 ±0.4	3.0 ±0.3	2.6 ±0.2
Females								
SOD (mEq/dl)	178 ±8	160 ±8	181 ±2	159 ±7	181 ±8	159 ±6	172 ±10	162 ±9
POT (mEq/dl)	6.4 ±0.7	5.6 ±0.6	6.3 ±0.5	6.0 ±1.1	6.3 ±1.0	6.0 ±0.9	6.0 ±0.6	6.3 ±1.0
CHLO (mEq/dl)	113 ±4	108 ±4	114 ±3	108 ±4	114 ±4	106 ±2	110 ±4	107 ±4
CAL (mEq/dl)	10.7 ±0.4	10.7 ±0.8	10.7 ±0.4	10.8 ±0.6	10.6 ±0.4	10.6 ±0.8	10.5 ±0.5	10.4 ±0.9
PHOS (mEq/dl)	7.8 ±1.2	7.4 ±1.4	8.1 ±1.9	7.8 ±1.7	8.3 ±1.4	7.6 ±1.1	7.5 ±1.5	8.1 ±1.6
MG (mEq/dl)	3.3 ±0.1	3.3 ±0.3	3.2 ±0.3	3.3 ±0.4	3.3 ±0.4	3.3 ±0.3	3.3 ±0.6	3.2 ±0.5

@ mg/kg/day.
* Mean ± Standard Deviation.

Table 6: Serum Chemistry

Group[@]	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
Males								
TRIG (mg/dl)	121* ±65	136 ±56	87 ±23	123 ±66	86 ±43	107 ±22	92 ±27	120 ±47
CHOL (mg/dl)	64.7 ±8.8	68.0 ±8.8	57.7 ±3.4	66.5 ±9.8	67.0 ±4.8	72.2 ±7.0	78.3[$] ±9.2	81.9[#] ±8.2
GLU (mg/dl)	228 ±18	226 ±35	219 ±15	231 ±40	215 ±14	262 ±37	212 ±14	249 ±21
CREA (mg/dl)	0.57 ±0.08	0.75 ±0.20	0.66 ±0.11	0.74 ±0.13	0.52 ±0.12	0.65 ±0.10	0.71 ±0.04	0.75 ±0.08
BUN (mg/dl)	17.0 ±2.2	18.2 ±2.9	18.0 ±1.6	20.6 ±4.5	17 4 ±2.9	16.7 ±2.7	18.4 ±1.6	18.0 ±1.7
URIC (mg/dl)	1.64 ±0.28	2.02 ±0.72	1.94 ±0.51	1.93 ±0.80	2.18 ±0.98	2.62 ±0.85	2.00 ±1.03	1.87 ±0.54
ALB (g/dl)	3.40 ±0.34	3.17 ±0.47	3.33 ±0.39	3.13 ±0.37	3.30 ±0.22	3.08 ±0.44	3.10 ±0.33	3.16 ±0.47
GLOB (g/dl)	2.36 ±0.26	2.62 ±0.59	2.40 ±0.39	2.63 ±0.34	2.50 ±0.31	2.41 ±0.38	2.66 ±0.34	2.51 ±0.55
TPRO (g/dl)	5.77 ±0.23	5.77 ±0.22	5.74 ±0.09	5.76 ±0.19	5.81 ±0.30	5.49[#] ±0.15	5.76 ±0.20	5.68 ±0.20
TBIL (g/dl)	0.76 ±0.36	0.80 ±0.78	0.62 ±0.22	0.67 ±0.35	1.18 ±1.02	0.62 ±0.12	0.54 ±0.05	0.56 ±0.17
IRON (µg/dl)	208 ±61	183 ±38	165 ±36	176 ±27	143 ±15	183 ±36	155 ±17	183 ±25
COP (µg/dl)	98 ±7	115 ±15	104 ±9	112 ±12	102 ±3	115 ±16	103 ±13	116 ±10

[@] mg/kg/day.
* Mean ± Standard Deviation.
[$] Significant difference from controls at $p \leq 0.05$.
[#] Significant difference from controls at $p \leq 0.01$.

Table 6 (cont.): Serum Chemistry

Group[@]	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
Females								
TRIG (mg/dl)	106* ±38	115 ±38	90 ±36	82[$] ±26	91 ±36	103 ±26	98 ±29	82[$] ±18
CHOL (mg/dl)	71.7 ±8.6	77.8 ±12.6	76.1 ±10.1	78.1 ±11.9	75.5 ±5.6	80.1 ±11.8	70.0 ±5.6	81.5 ±5.5
GLU (mg/dl)	218 ±28	234 ±29	220 ±36	237 ±27	231 ±17	258 ±26	219 ±17	232 ±40
CREA (mg/dl)	0.66 ±0.07	0.68 ±0.10	0.67 ±0.04	0.68 ±0.07	0.67 ±0.06	0.73 ±0.11	0.68 ±0.05	0.64 ±0.13
BUN (mg/dl)	17.1 ±2.2	15.8 ±2.2	16.0 ±1.7	14.6 ±4.2	15.4 ±1.8	15.7 ±2.5	15.6 ±2.7	15.5 ±2.4
URIC (mg/dl)	3.00 ±0.73	2.38 ±0.50	2.94 ±0.88	2.50 ±1.05	3.26 ±1.08	3.02 ±1.17	3.24 ±1.53	3.24 ±1.26
ALB (g/dl)	3.52 ±0.12	3.60 0.40	3.77 ±0.31	3.49 ±0.43	3.32 ±0.18	3.58 ±0.24	3.38 ±0.34	3.38 ±0.49
GLOB (g/dl)	2.81 ±0.08	2.76 ±0.23	2.86 ±0.16	2.90 ±0.43	2.85 ±0.13	2.90 ±0.18	2.83 ±0.16	2.73 ±0.21
TPRO (g/dl)	6.33 ±0.15	6.36 ±0.51	6.63 ±0.26	6.39 ±0.41	6.16 ±0.25	6.49 ±0.32	6.20 ±0.44	6.12 ±0.49
TBIL (g/dl)	0.58 ±0.08	0.86 ±0.43	0.48 ±0.08	0.62 ±0.14	0.46 ±0.09	0.85 ±0.32	0.58 ±0.13	0.90 ±0.63
IRON (µg/dl)	327 ±60	345 ±92	331 ±29	303 ±85	350 ±57	317 ±46	303 ±47	315 ±78
COP (µg/dl)	135 ±20	161 ±23	160 ±23	152 ±24	127 ±13	162 ±19	131 ±10	154 ±23

[@] mg/kg/day.
* Mean ± Standard Deviation.
[$] Significant difference from controls at $p \leq 0.05$.

Table 7: Serum Enzyme Activity

Group[@]	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
Males								
AST (I.U.)	84* ±13	118 ±116	81 ±21	83 ±38	143 ±84	88 ±23	92 ±16	80 ±20
ALT (I.U.)	34 ±5	36 ±7	33 ±4	39 ±18	35 ±5	37 ±5	35 ±2	38 ±8
LDH (I.U.)	602 ±143	803 ±347	539 ±255	561 ±229	847 ±343	448[$] ±173	816 ±241	716 ±375
CPK (I.U.)	322 ±97	279 ±69	270 ±67	323 ±180	511 ±256	343 ±117	298 ±86	301 ±113
ALKP (I.U.)	138 ±36	109 ±26	153 ±29	109 ±36	160 ±46	102 ±25	156 ±18	137 ±28
Females								
AST (I.U.)	86 ±35	98 ±35	75 ±14	78 ±14	82 ±16	100 ±34	79 ±3	110 ±55
ALT (I.U.)	33 ±8	36 ±17	39 ±11	30 ±6	45 ±25	32 ±5	36 ±8	36 ±7
LDH (I.U.)	524 ±228	425 ±134	440 ±99	410 ±155	651 ±173	401 ±116	519 ±216	365 ±279
CPK (I.U.)	303 ±154	281 ±139	195 ±48	216 ±73	254 ±29	315 ±143	277 ±58	464 ±564
ALKP (I.U.)	122 ±37	65 ±28	99 ±31	59 ±16	129 ±16	65 ±36	102 ±36	59 ±19

[@] mg/kg/day.
* Mean ± Standard Deviation.
[$] Significant difference from controls at $p \leq 0.05$.

Table 8: Hematology Values

Males

Group[@]	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
RBC ($\times 10^6/\mu l$)	8.09* ±0.46	7.76 ±2.18	8.35 ±0.17	8.34 ±0.62	8.44 ±1.15	7.85 ±1.02	8.24 ±0.22	8.19 ±0.51
HGB (g/dl)	14.6 ±0.7	13.5 ±3.3	15.2 ±0.2	14.5 ±0.6	15.3 ±1.4	14.1 ±0.8	14.8 ±0.3	14.3 ±0.5
HCT (%)	46.7 ±2.1	43.9 ±11.8	48.0 ±1.2	47.0 ±2.5	48.7 ±5.6	46.3 ±3.1	46.7 ±0.9	46.8 ±2.0
MCV (μ^3)	57.6 ±1.5	54.1 ±1.5	57.4 ±2.3	54.0 ±1.6	57.5 ±1.7	55.0 ±2.0	56.4 ±0.9	55.5 ±2.1
MCH (pg)	18.1 ±0.8	17.2 ±1.7	18.2 ±0.5	16.9 ±0.5	18.3 ±0.8	16.9 ±0.7	18.0 ±0.8	17.2 ±0.7
MCHC (%)	31.4 ±0.5	31.6 ±3.1	31.7 ±0.7	30.9 ±0.8	31.7 ±1.1	30.5 ±0.7	31.7 ±1.0	30.7 ±0.7
PLT ($\times 10^4/\mu l$)	100 ±5	101 ±23	98 ±7	102 ±26	110 ±9	90 ±30	99 ±6	107 ±8
WBC ($\times 10^3/\mu l$)	6.9 ±1.4	6.5 ±2.5	7.1 ±1.0	5.5 ±1.3	6.3 ±2.6	6.0 ±1.3	6.6 ±1.2	6.9 ±1.5
SEG (#/µl)	411 ±245	742 ±344	655 ±326	660 ±238	519 ±364	735 ±156	639 ±192	772 ±255
LYM (#/µl)	6422 ±1367	5625 ±2388	6458 ±1097	4763 ±1049	5659 ±2533	5216 ±1248	5810 ±1053	6035 ±1271
EOS (#/µl)	58 ±55	47 ±56	55 ±60	21 ±38	43 ±37	28 ±47	52 ±32	53 ±56
MON (#/µl)	49 ±48	46 ±48	38 ±53	46 ±37	29 ±38	42 ±57	59 ±35	30 ±40

@ mg/kg/day.
* Mean ± Standard Deviation.

Table 8 (cont.): Hematology Values

Females

Group[@]	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
RBC ($\times 10^6/\mu l$)	8.06* ±0.26	8.19 ±0.21	7.80 ±0.44	7.95 ±0.49	7.80 ±0.53	7.79 ±0.48	7.61 ±0.58	7.73 ±0.41
HGB (g/dl)	14.3 ±0.4	14.1 ±0.4	13.9 ±0.8	14.0 ±0.8	14.1 ±0.9	13.9 ±0.8	13.8 ±0.7	13.4 ±0.5
HCT (%)	46.8 ±0.9	46.5 ±1.2	44.6 ±2.0	45.5 ±2.5	46.0 ±2.7	45.2 ±2.3	44.5 ±2.2	44.1 ±1.9
MCV (μ^3)	57.8 ±2.2	56.5 ±1.4	56.6 ±1.1	56.9 ±1.9	58.6 ±1.3	57.1 ±1.7	56.4 ±1.8	55.9 ±1.4
MCH (pg)	17.8 ±0.5	17.3 ±0.5	17.9 ±0.4	17.6 ±0.7	18.2 ±0.3	17.7 ±0.7	17.6 ±0.5	17.2 ±0.4
MCHC (%)	30.7 ±1.1	30.4 ±0.5	31.2 ±0.8	30.7 ±0.5	30.8 ±0.6	30.8 ±1.0	30.9 ±0.8	30.6 ±0.7
PLT ($\times 10^4/\mu l$)	108 ±9	90 ±22	91 ±8	100 ±10	101 ±13	93 ±22	105 ±9	97 ±11
WBC ($\times 10^3/\mu l$)	4.9 ±1.5	3.5 ±1.0	3.9 ±0.6	3.7 ±0.8	3.8 ±1.2	4.5 ±1.0	4.7 ±1.8	3.7 ±1.4
SEG (#/µl)	272 ±110	483 ±252	183 ±120	448 ±99	293 ±230	643 ±332	289 ±156	487 ±261
LYM (#/µl)	4514 ±1421	2956 ±742	3688 ±500	3206 ±724	3414 ±925	3812 ±947	4322 ±1670	3083 ±1107
EOS (#/µl)	38 ±26	15 ±28	30 ±29	31 ±25	32 ±21	9 ±19	35 ±33	31 ±24
MON (#/µl)	36 ±33	16 ±22	39 ±36	33 ±29	40 ±29	36 ±30	35 ±26	48 ±41

@ mg/kg/day.
* Mean ± Standard Deviation.

Table 9:

Organ Weights

Group[@]	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
Males								
Testes (g)	2.99* ±0.36	3.33 ±0.42	2.94 ±0.15	3.42 ±0.52	2.99 ±0.22	3.55 ±1.11	2.87 ±0.24	3.31 ±0.30
Liver (g)	14.08 ±1.13	16.22 ±3.81	13.67 ±1.53	16.14 ±2.33	13.74 ±2.10	15.15 ±1.62	13.42 ±1.00	16.29 ±0.51
Heart (g)	1.33 ±0.16	2.15 ±0.69	1.40 ±0.15	1.91 ±0.53	1.44 ±0.18	1.73 ±0.29	1.24 ±0.05	1.64 ±0.29
Brain (g)	2.04 ±0.11	2.14 ±0.28	2.05 ±0.05	2.16 ±0.33	1.97 ±0.08	2.20 ±0.54	1.96 ±0.07	2.29 ±0.87
Spleen (mg)	806 ±103	1375 ±125	809 ±33	791 ±42	696 ±158	870 ±183	770 ±125	997 ±434
Adrenal (mg)	58 ±6	101 ±142	55 ±4	101 ±132	50[$] ±4	53 ±17	58 ±6	64 ±43
Kidney (g)	3.00 ±0.32	3.62 ±0.44	2.95 ±0.21	3.55 ±0.52	2.87 ±0.24	3.30 ±0.57	2.80 ±0.07	3.96 ±0.90

[@] mg/kg/day.
* Mean ± Standard Deviation.
[$] Significant difference from the control at $p \leq .05$.

Table 9 (cont.):

Organ Weights

Group[@]	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
Females								
Ovaries (mg)	165* ±28	125 ±31	126$ ±19	155 ±63	129$ ±8	137 ±35	135$ ±10	259 ±418
Liver (g)	10.10 ±1.21	10.35 ±0.68	9.24 ±1.24	9.37 ±1.69	9.06 ±1.04	9.84 ±0.72	8.94 ±1.41	9.38 ±1.06
Heart (g)	0.89 ±0.06	1.05 ±0.11	0.90 ±0.17	1.10 ±0.24	0.91 ±0.12	1.07 ±0.13	0.88 ±0.13	0.94 ±0.14
Brain (g)	1.92 ±0.06	1.81 ±0.14	1.88 ±0.05	1.81 ±0.10	1.87 ±0.07	1.86 ±0.12	1.81$ ±0.02	1.85 ±0.11
Spleen (mg)	577 ±55	590 ±151	495 ±86	484 ±50	507 ±37	473$ ±59	515 ±92	511 ±49
Adrenal (mg)	70 ±7	72 ±26	64 ±7	81 ±18	66 ±8	70 ±24	68 ±11	63 ±9
Kidney (g)	1.84 ±0.19	2.10 ±0.37	1.76 ±0.25	2.16 ±0.56	1.75 ±0.09	1.96 ±0.27	1.80 ±0.25	1.89 ±0.14

@ mg/kg/day.
* Mean ± Standard Deviation.
$ Significantly different from the control at $p \leq 0.05$.

Table 10:

Organ-to-Body Weight Ratio

Group[@]	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
Males								
Liver (%)	3.24* ±0.20	3.05 ±0.61	3.25 ±0.11	3.15 ±0.46	3.27 ±0.36	3.00 ±0.19	3.32 ±0.18	3.19 ±0.22
Heart (%)	0.31 ±0.03	0.41 ±0.12	0.34 ±0.05	0.38 ±0.11	0.34 ±0.04	0.34 ±0.04	0.31 ±0.02	0.32 ±0.04
Brain (%)	0.47 ±0.03	0.41 ±0.05	0.49 ±0.03	0.42 ±0.07	0.47 ±0.03	0.44 ±0.11	0.49 ±0.03	0.45 ±0.13
Spleen (%)	0.19 ±0.02	0.27 ±0.26	0.19 ±0.01	0.16 ±0.01	0.17 ±0.03	0.17 ±0.03	0.19 ±0.03	0.20 ±0.08
Adrenal (%)	0.01 ±0.0	0.02 ±0.02	0.01 ±0.0	0.02 ±0.02	0.01 ±0.0	0.01 ±0.0	0.01 ±0.0	0.01 ±0.01
Kidney (%)	0.69 ±0.05	0.69 ±0.12	0.71 ±0.02	0.69 ±0.10	0.69 ±0.05	0.65 ±0.11	0.69 ±0.03	0.78 ±0.16
Testes (%)	0.69 ±0.08	0.63 ±0.10	0.70 ±0.03	0.67 ±0.11	0.72 ±0.07	0.71 ±0.23	0.71 ±0.06	0.65 ±0.07

[@] mg/kg/day.
* Mean ± Standard Deviation.

Table 10 (cont.):

Organ-to-Body Weight Ratio

Group[@]	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
Females								
Liver (%)	3.64* ±0.19	3.27 ±0.38	3.65 ±0.29	2.97 ±0.41	3.49 ±0.20	3.24 ±0.16	3.56 ±0.37	3.23 ±0.21
Heart (%)	0.32 ±0.03	0.33 ±0.03	0.35 ±0.05	0.35 ±0.09	0.35 ±0.03	0.35 ±0.03	0.35 ±0.04	0.32 ±0.05
Brain (%)	0.70 ±0.06	0.57 ±0.08	0.75 ±0.06	0.58 ±0.06	0.72 ±0.06	0.61 ±0.04	0.73 ±0.04	0.64[$] ±0.05
Spleen (%)	0.21 ±0.01	0.19 ±0.06	0.20 ±0.02	0.15 ±0.02	0.20 ±0.02	0.16 ±0.02	0.21 ±0.03	0.18 ±0.02
Adrenal (%)	0.03 ±0.0	0.02 ±0.01	0.03 ±0.0	0.03 ±0.01	0.03 ±0.0	0.02 ±0.01	0.03 ±0.01	0.02 ±0.00
Kidney (%)	0.67 ±0.04	0.67 ±0.16	0.69 ±0.05	0.70 ±0.21	0.68 ±0.04	0.64 ±0.08	0.72 ±0.06	0.65 ±0.04
Ovaries (%)	0.06 ±0.01	0.04 ±0.01	0.05 ±0.0	0.05 ±0.02	0.05 ±0.01	0.05 ±0.01	0.05 ±0.0	0.09 ±0.13

[@] mg/kg/day.
* Mean ± Standard Deviation.
[$] Significantly different from controls at $p \leq 0.05$.

Table 11:

Organ-to-Brain Weight Ratio (%)

Group[@]	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
Males								
Liver (%)	695* ±80	769 ±216	666 ±62	760 ±154	701 ±123	717 ±147	686 ±55	761 ±177
Heart (%)	65.7 ±10.7	100.4 ±30.1	68.5 ±6.8	88.6 ±21.5	73.4 ±9.1	81.4 ±18.3	63.5 ±4.1	75.2 ±14.4
Brain (%)	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0
Spleen (%)	39.8 ±6.6	62.7 ±52.6	39.5 ±1.5	37.2 ±4.7	35.4 ±7.7	41.3 ±12.5	39.5 ±7.6	46.9 ±23.7
Adrenal (%)	2.9 ±0.3	4.2 ±4.9	2.7 ±0.2	4.8 ±6.3	2.5 ±0.3	2.5 ±0.9	3.0 ±0.3	3.0 ±1.9
Kidney (%)	148 ±16	171 ±26	144 ±9	165 ±16	146 ±13	156 ±38	143 ±4	180 ±39
Testes (%)	147 ±21	158 ±31	143 ±6	161 ±35	152 ±13	166 ±56	147 ±16	154 ±30

@ mg/kg/day.
* Mean ± Standard Deviation.

Table 11 (cont.):

Organ-to-Brain Weight Ratio (%)

Group[@]	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
Females								
Liver (%)	528* ±64	575 ±51	492 ±53	521 ±98	484 ±53	531 ±48	493 ±75	507 ±57
Heart (%)	46.2 ±3.0	58.4 ±8.0	47.8 ±7.9	60.7 ±12.8	48.9 ±6.7	57.6 ±6.9	48.3 ±7.0	50.7 ±8.0
Brain (%)	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0
Spleen (%)	30.1 ±3.0	32.5 ±6.6	26.4 ±4.2	26.8[$] ±2.6	27.0 ±1.1	25.6[$] ±4.3	28.4 ±5.0	27.6 ±2.0
Adrenal (%)	3.7 ±0.3	4.0 ±1.4	3.4 ±0.4	4.6 ±1.0	3.5 ±0.4	3.8 ±1.3	3.8 ±0.6	3.5 ±0.5
Kidney (%)	96 ±9	116 ±18	94 ±11	119 ±26	94 ±4	105 ±13	99 ±13	102 ±7
Ovaries (%)	8.7 ±1.6	7.0 ±1.7	6.7 ±1.0	8.6 ±3.2	6.9 ±0.3	7.3 ±1.8	7.4 ±0.5	13.3 ±20.1

[@] mg/kg/day.
* Mean ± Standard Deviation.
[$] Significantly different from controls at $p \leq 0.05$.

DISCUSSION

No clinical signs of toxicity attributable to nitroguanidine administration were observed during the 90-day study period. In addition, there were no mortalities or lesions noted at necropsy or on microscopic examination that could be attributed to nitroguanidine administration. No consistent treatment-related changes were noted in serum chemistry or hematology values.

Inspection of the data revealed that Group 4 female body weights were approximately 30 grams less than those of the controls through most of the study. These differences were significant ($p \leq 0.05$) on Weeks 5, 6, 8, 9, and 12. Food consumption for the same group was down approximately 6 grams per animal through the study period, with significant ($p \leq 0.05$) reductions noted on Weeks 5 and 6. To a lesser degree, the males in the high-dose group also lagged behind the controls in body weight and food consumption. However, the differences were not statistically significant ($p \leq 0.05$), with the exception of food consumption on Week 1. Reduced weight gain could be attributed in part to the reduced food consumption in the high-dose groups during the study. A reduced food consumption upon initial exposure to a test compound in the feed is often observed in toxicity studies and is generally associated with the reduced palatability at the higher concentration of the test compound.

Metabolism studies (8) have indicated that nitroguanidine is rapidly absorbed following oral administration and is excreted in the urine over a dose range from 20 mg/kg to 200 mg/kg. Absorption and excretion were not measured at doses equivalent to the 1000 mg/kg/day administered in this study. However, the results of this study suggest that nitroguanidine might also be rapidly absorbed following oral administration and excreted in the urine at dose levels up to 1000 mg/kg/day. Urea, a chemically related compound, has been used as an osmotic diuretic (9). Since nitroguanidine is considerably less soluble in water than guanidine or urea (10), the excretion of nitroguanidine in the urine would require considerably more urinary volume than would be required to excrete a similar quantity of guanidine or urea. The dose-related increases in water consumption following nitroguanidine administration observed in this study are consistent with an increased urinary volume requirement for excretion of nitroguanidine. The diuretic effect of nitroguanidine may have also contributed to the reduced body weights of the high-dose study animals.

The male dose groups did not exhibit any consistent treatment-related changes in organ weights or organ weight ratios. The females showed significantly ($p \leq 0.05$) decreased ovarian weights for all dose groups at interim sacrifice. However, these differences did not appear to be dose related. The female high-dose group also had a significantly ($p \leq 0.05$) increased brain-to-body weight ratio at terminal sacrifice. This appears to be related to the reduced growth rate of the high-dose females.

These results indicate that female rats may be more sensitive to nitroguanidine than are male rats. Other than nonspecific effects related to reduced growth, the lack of toxicity observed in this study is consistent with the results of the previously reported single-dose oral toxicity (4) and subacute toxicity studies (5).

CONCLUSION

Nitroguanidine, fed at dose levels from 100 mg/kg/day to 1000 mg/kg/day in the diet for 90 days, did not cause any appreciable toxicologic effects under the conditions of this study.

REFERENCES

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Appendices

Appendix A: CHEMICAL DATA

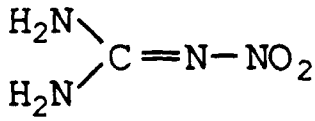
Chemical Name: Nitroguanidine (NGu)

Other Listed Names: Guanidine, Nitro; alpha-Nitroguanidine; beta-Nitroguanidine

Chemical Abstracts Service Registry No.: 556-88-7

LAIR Code: TP36 (Lot number: SOW83H001-004)
TP36A (Lot number: SOW84K010A001)

Chemical Structure:



Molecular Formula: $CH_4N_4O_2$

Molecular Weight: 104.1

Physical State: White powder

Melting Point: 232°C[1]

Purity: (Data Sheets Attached) HPLC analysis showed only one peak eluting for TP36[2] and TP36A[3]. The conditions employed were as follows: column, Brownlee RP-18 (4.6 x 250 mm); solvent, 10% methanol-90% water; flow rate, 0.7 ml/min; oven temperature, 50°C; monitoring wavelength, 265nm.

Analytical Data:

Infrared spectra were obtained upon receipt of the compounds. For TP36 major absorption peaks were observed at 3330 (broad), 1660, 1630, 1525, 1400, 1300, 1050, and 780 cm^{-1}.[4] For TP36A major absorption peaks were observed at 3450, 3396, 3342, 3278, 3201, 1666, 1634, 1525, 1404, 1314, 1151, 1045, 782 cm^{-1}.[5] The spectral differences between the two lots reflects the greater resolution of the instrument used to analyze the second lot. Both spectra were virtually identical to the Sadtler standard spectrum for nitroguanidine.[6]

Source: Hercules Aerospace Division
Sunflower Ammunition Plant
DeSoto, Kansas

[1]Fedoroff BT, Sheffield OE. Encyclopedia of explosives and related items. Vol 6. Dover, NJ: Picatinny Arsenal, 1975: G154.

[2]Wheeler CR. Nitrocellulose-Nitroguanidine Projects. Laboratory Notebook #84-05-010, p 61-69. Presidio of San Francisco, CA: Letterman Army Institute of Research.

[3]Wheeler, CR. Nitrocellulose-Nitroguanidine Projects Laboratory Notebook #85-12-022, pp. 24-25. Presidio of San Francisco, CA: Letterman Army Institute of Research.

[4]Wheeler CR. Nitrocellulose-Nitroguanidine Projects. Laboratory Notebook #84-05-010.2, p 39. Presidio of San Francisco, CA: Letterman Army Institute of Research.

[5]Wheeler, CR. Nitrocellulose-Nitroguanidine Projects. Laboratory Notebook #85-12-022, p. 22-23. Presidio of San Francisco, CA: Letterman Army Institute of Research.

[6]Sadtler Research Laboratory, Inc. Sadtler standard spectra. Philadelphia: The Sadtler Research Laboratory, Inc., 1962: Infrared spectrogram #21421.

Appendix A (cont.): CHEMICAL DATA

DESCRIPTION SHEET FOR EXPLOSIVES, CHEMICALS, ETC
(CRSAR-R-702-109)

ESN CONTROL SYMBOL: EXEMPT-Para 7-2a AR 335-15 | PAGE: 1 OF 1

TO: Commander, US Army Armament Munitions and Chemical Command, Attn: DRSMC-QAD, Rock Island, ILL. 61201

FROM: Sunflower Army Ammunition Plant, DeSoto, Kansas 66018

DATE: September 13, 1983

MATERIAL: Nitroguanidine Type II, Class 2 *

MANUFACTURER: Hercules Aerospace Division, Hercules Incorporated

CONTRACT NO.: DAAA-09-77-C-4016, CLIN 0270

SECTION A - DESCRIPTION OF LOTS

FROM NUMBER	THRU NUMBER	TOTAL NO. LOTS	TOTAL NET AMOUNT ACCEPTED
SOW83H001-004		1	7,000 lbs.

PLACE MANUFACTURED: Sunflower Army Ammunition Plant, DP Facility

SPECIFICATION AND AMENDMENT/DRAWING NO.: MIL-N-494A w/Int. Amend 6 (AR) dated 25 March 1981 *

SECTION B - DESCRIPTION OF MATERIAL

Property	Requirement Min.	Requirement Max.	Analysis
Purity, %	99.0		99.6
Ash Content, %		0.30	0.03
pH Value	4.5	7.0	7.55 **
Acidity (as H_2SO_4), %		0.06	ND ***
Total Volatiles, %		0.25	0.03
Sulfates (as $NaSO_4$), %		0.20	0.01
Impurities, H_2O Insoluble, %		0.20	0.01
Particle Size, Microns		3.0 *	4.0 ****
Particle Size, Std. Dev.		± 0.5	0.168

* As amended by Contract Scope of Work
** Approved by Waiver No. NQ83-1 dated Sept. 2, 1983
*** ND = None Detected
**** Approved by Waiver No. NQ83-2 dated Sept. 9, 1983

REMARKS

1.) Manufactured under SOW ES 1A-3-8423, Nitroguanidine Particle Size, dated 1 Feb. 83.

2.) Packaging: Level B - fiber drums to Spec. DOT 21C60. Drums numbered 3 thru 243 and 247 thru 285. 25 pounds per drum per HAD letter dated Aguust 1, 1983, to COR.

SECTION C - CERTIFICATION

SAMPLING CONDUCTED BY: Hercules Aerospace Division

TESTING CONDUCTED BY: Hercules Aerospace Division

THE ABOVE MATERIAL COMPLIES WITH ALL SPECIFICATION REQUIREMENTS AND IS CERTIFIED TRUE AND CORRECT.

13 Sept '83 (DATE) A. W. English (SIGNATURE)

THE ABOVE DESCRIBED LOTS ARE HEREBY ACCEPTED

FOR THE COMMANDER

14 Sep 83 (DATE) Quality Assurance Specialist (TITLE) M. A. Kozak (SIGNATURE)

ARRCOM FORM 213-R, 10 AUG 77 — REPLACES ARMCOM FORM 213-R, 15 JUL 75(TEMP), WHICH MAY BE USED.

Appendix A (cont.): CHEMICAL DATA

DESCRIPTION SHEET FOR EXPLOSIVES, CHEMICALS, ETC

(DRSAR-P-702-109)

AQR CONTROL SYMBOL: EXEMPT-Para 7-2a AR 335-15 | PAGE: 1 OF 1

TO: Commander, US Army Armament Munitions and Chemical Command, Attn: DRSMC-QAD, Rock Island, ILL. 61299

FROM: Sunflower Army Ammunition Plant, DeSoto, Kansas 66018

DATE: October 9, 1984

MATERIAL: Nitroguanidine

MANUFACTURER: Hercules Aerospace Division, Hercules Inc.

CONTRACT NO.: DAAA-09-77-C-4016 CLIN 0295

SECTION A - DESCRIPTION OF LOTS

FROM NUMBER	THRU NUMBER	TOTAL NO. LOTS	TOTAL NET AMOUNT ACCEPTED
S0W84K010A001	-	1	25 pounds

PLACE MANUFACTURED: Sunflower Army Ammunition Plant

SPECIFICATION AND AMENDMENT/DRAWING NO.: MIL-N-00494B dtd. 17 July 1984

SECTION B - DESCRIPTION OF MATERIAL

Property	Requirement Min.	Requirement Max.	Analysis *
Purity, %	99.0		99.20
Ash Content, %		0.30	0.12
pH Value	4.5	7.0	6.0
Acidity (as H_2SO_4), %		0.06	0.0
Total Volatiles, %		0.25	0.16
Sulfates (as N_2SO_4), %		0.20	0.17
Impurities, H_2O Insoluble, %		0.20	0.02
Particle Size, microns	3.4	6.0	3.5
Color			White
Consistency			Crystalline, Free Flowing

* Combined averages of sampling taken in accordance with MIL-N-00494B, Para. 4.4.3.2.

REMARKS

1) Packaging: Level C Fiber drums per specification DOT 21C60
2) This lot was manufactured 5 October 1984 and is submitted as First Article in compliance with Paragraph 4.3 of MIL-N-00494B.
3) Guanidine Nitrate supplied by SKW-American Hoesch was used in manufacture of this lot.

SECTION C - CERTIFICATION

SAMPLING CONDUCTED BY: Hercules Aerospace Division

TESTING CONDUCTED BY: Hercules Aerospace Division

THE ABOVE MATERIAL COMPLIES WITH ALL SPECIFICATION REQUIREMENTS AND IS CERTIFIED TRUE AND CORRECT.

9 Oct. 84 (DATE) A. W. English (SIGNATURE)

THE ABOVE DESCRIBED LOTS ARE HEREBY ACCEPTED

FOR THE COMMANDER

10 Oct 1984 (DATE) CHIEF, QA DIV, SFAP (TITLE) (SIGNATURE)

ARRCOM FORM 213-R, 18 AUG 77

REPLACES ARRCOM FORM 213-R, 15 JUL 75 (TEMP), WHICH MAY BE USED.

Appendix B: ANIMAL DATA

Species: *Rattus norvegicus*

Strain: Sprague-Dawley

Source: Bantin Kingman
Fremont, CA

Sex: Male and female.

Date of birth: Male - 2 July 1985
Female - 26 June 1985

Method of randomization: Weight bias, stratified animal allocation (TOXSYS Animal Allocation Program, LAIR SOP OP-ISG-24).

Animals in each group: 15 male and 15 female animals.

Condition of animals at start of study: Normal

Body weight range at start of dosing: 95 - 264 g

Identification procedures: Ear tag (SOP OP-ARG-1).

Pretest conditioning: Quarantine/acclimation from 7 August to 21 August 1985.

Justification: The laboratory rat has proven to be a sensitive and reliable system for sub-chronic oral toxicity determination.

Appendix C: ANALYSIS OF FEED MIXTURES

Introduction

Feed mixtures containing nitroguanidine (NGu) were prepared for GLP Study #85042 to provide dose levels of nitroguanidine ranging from 100 to 1000 mg/kg/day. Separate diets were prepared for male and female rats due to differences in food consumption and body weights. New diets were prepared for each week of the 90-day study to account for changes in food consumption and body weights due to growth. The target concentration of NGu in the feed mixtures ranged from 1.05 to 21.19 mg NGu/g diet. Samples of the feed mixtures were analyzed to determine the concentration and homogeneity of NGu in the mixtures. The method of analysis was an HPLC method in which methylnitroguanidine (MNGu) was used as an internal standard.

Materials

The nitroguanidine was obtained from the Sunflower Army Ammunition Plant, Desoto, Kansas (Lot Nos. SOW83H0001-004 and SOW84K010-A-001). The methylnitroguanidine was synthesized previously according to the method of McKay (1) using 1-methyl-3-nitro-1-nitrosoguanidine, 97% (MNNG, Lot No. 8228CK), and methylamine (40 wt % in water, Lot No. 0719AL) from the the Aldrich Chemical Company, St. Louis, MO. Certified Rodent Chow® #5002 (Lot Nos. FEB21852CMEAL, MAY22851EMEAL, JUNE06852BMEAL, and JULY12852DMEAL) was obtained from Ralston Purina, St. Louis, MO. HPLC grade methanol was obtained from J. T. Baker Chemical Co., Phillipsburg, NJ. The water used for the HPLC solvent was distilled and subsequently treated with UV light (to remove or oxidize trace organic compounds) using the Organicpure oxidizer (Sybron/Barnstead, Boston, MA).

Chromatographic analysis was performed using a Hewlett-Packard 1090 high pressure liquid chromatography (HPLC) system with diode array detector (Hewlett-Packard, Palo Alto, CA). Separations were obtained on a Brownlee RP-18 column (4.6 x 250 mm, Brownlee Labs, Inc., Santa Clara, CA).

Methods

Stock solutions of NGu (1 mg/ml water) and MNGu (1 mg/ml water) were prepared as the first step in making standards for the calibration plot. The standards were prepared by adding varying amounts of the stock solutions and water as described below.

Appendix C (cont.): ANALYSIS OF FEED MIXTURES

Tube#	Target Concentration NGu (mg/ml)	MNGu (mg/ml)	NGu Stock Soln. (ml)	MNGu Stock Soln. (ml)	Water (ml)
1	0.01	0.04	0.25	1.00	23.75
2	0.02	0.04	0.50	1.00	23.50
3	0.03	0.04	0.75	1.00	23.25
4	0.04	0.04	1.00	1.00	23.00
5	0.05	0.04	1.25	1.00	22.75
6	0.06	0.04	1.50	1.00	22.50
7	0.08	0.04	2.00	1.00	22.00

The standards were analyzed at the beginning and end of each run. The standard solutions prepared on 18 July 1985 were used throughout the 90-day study based on stability demonstrated in solutions prepared for the 14-day study (2). The solutions were held at approximately 4°C in screw cap test tubes with parafilm around the edge to prevent evaporation.

Samples from the feed mixtures and premix were prepared by adding varying amounts of water and the MNGu stock solution (1 mg/ml) as described below. The samples were stirred for an hour and then centrifuged at 3000g for 10 minutes. The supernatant from each tube was filtered through a Pasteur pipette with a tightly packed glass wool plug. The filtrate was then passed through a millipore filter (0.2 µM) using a syringe with a Swinney adapter. The filtrate from the ultrafiltration was subsequently analyzed using HPLC.

Appendix C (cont.): ANALYSIS OF FEED MIXTURES

Dose Level (mg/kg/day)	Gm of Diet Analyzed	Ml of MNGu Soln Added	Ml of Water Added	Total Volume (Dil. Factor)
100	1.00	1	24	25
316	1.00	4	96	100
1000	1.00	10	240	250
Premix (50 mg/g)	0.25	10	240	250

To determine the homogeneity of the feed mixtures, samples were removed from the top, middle, and bottom of the first batch of premix and from the feed mixtures for each dose level. Samples for testing homogeneity were collected during the 1st, 9th, and 13th weeks of the study. The samples were prepared for analysis as described above.

The analysis of NGu feed mixtures was accomplished under the following HPLC conditions: solvent, 10% methanol-90% water; solvent flow, 0.7 ml/min; injection volume, 10 µl; detector wavelength, 265 nm. The NGu was analyzed using methylnitroguanidine (MNGu) as an internal standard.

Calculations

The ratio of NGu to MNGu was calculated for all the standards and samples. The two peak area values for each standard from the beginning and the end of the run were averaged. Least squares linear regression analysis of the standard concentrations versus the peak area ratios was performed to obtain the equation of the best fitting line in the form of Equation 1

$$y = mx + b \qquad (1)$$

where y is the peak area ratio, m is the slope, x is the concentration (mg/ml) and b is the intercept. The concentration of each extract was calculated by substituting for y the peak area obtained from HPLC analysis and solving

Appendix C (cont.): ANALYSIS OF FEED MIXTURES

for x. To calculate the concentration in the diet in terms of mg of NGu per g diet, the concentration of the extract was multiplied by the dilution factor and divided by the weight of the diet sample extracted (Equation 2).

$$\text{Conc. in diet} = \frac{\text{Conc. of NGu in extract X Dilution factor}}{\text{Grams of diet extracted}} \quad (2)$$

Results

Under the conditions of the analysis NGu eluted with a retention time of approximately 5.23 minutes and MNGu eluted with a retention time of approximately 6.62 minutes. The plots of the NGu concentration versus peak area ratio were linear within the range of concentrations analyzed. The correlation coefficients for each of these runs were greater than 0.9994.

The results from the regression analysis for each run are shown in Table 1.

TABLE 1
Regression Analysis Values from Each Run

Date of Run	Y-intercept	Slope
27 Aug 85	-.02489	29.11279
5 Sep 85	-.00861	28.73926
16 Sep 85	-.01958	29.38840
19 Sep 85	-.00873	28.84340
27 Sep 85	-.01116	29.07656
3 Oct 85	-.01369	29.11586
5 Nov 85	-.00173	28.57906
6 Nov 85	.00861	28.39639
20 Nov 85	.01099	28.38848
27 Nov 85	.00709	28.54951

The results from the analysis of the diet mixtures are presented in Table 2.

Appendix C (cont.): ANALYSIS OF FEED MIXTURES

Table 2: Analysis of Diet Mixtures

Target Conc. (mg/g)	Date Prepared	Date Analyzed	Concentration Determined by Analysis (mg/g)	% of Target Conc.
50.00	19 Aug 85	27 Aug 85	50.16	100.3
50.00	20 Aug 85	''	51.99	104.0
1.05	21 Aug 85	''	1.01	96.2
3.51	''	''	3.57	101.7
10.05	''	''	9.93	98.8
1.25	23 Aug 85	5 Sep 85	1.18	94.4
3.67	''	27 Aug 85	3.50	95.4
11.39	''	5 Sep 85	10.79	94.7
50.00	27 Aug 85	''	48.67	97.3
1.20	28 Aug 85	''	1.21	100.8
3.77	''	''	3.55	94.2
12.15	''	''	11.68	96.1
1.28	30 Aug 85	''	1.24	96.9
4.09	''	''	4.33	105.9
12.74	''	''	13.02	102.2
50.00	3 Sep 85	16 Sep 85	52.12	104.2
1.34	4 Sep 85	''	1.30	97.0
4.52	''	''	4.63	102.4
13.70	''	''	14.00	102.2
1.32	6 Sep 85	''	1.28	97.0
4.17	''	''	4.21	101.0

Appendix C (cont.): ANALYSIS OF FEED MIXTURES

Table 2 (cont.): Analysis of Diet Mixtures

Target Conc. (mg/g)	Date Prepared	Date Analyzed	Concentration Determined by Analysis (mg/g)	% of Target Conc.
13.36	6 Sep 85	16 Sep 85	13.62	101.9
50.00	''	''	50.80	101.6
50.00	9 Sep 85	19 Sep 85	51.29	102.6
1.51	11 Sep 85	''	1.57	103.9
4.74	''	''	4.87	102.7
15.55	''	''	15.18	97.6
50.00	''	''	52.46	104.9
1.49	13 Sep 85	''	1.47	98.7
4.30	''	''	4.60	107.0
14.17	''	''	14.26	100.6
50.00	''	''	50.85	101.7
1.58	18 Sep 85	27 Sep 85	1.62	102.5
5.10	''	''	5.16	101.2
15.19	''	''	15.56	102.4
50.00	''	''	51.47	102.9
1.49	20 Sep 85	''	1.53	102.7
4.79	''	''	4.55	95.0
15.68	''	''	15.96	101.8
50.00	''	''	51.02	102.0
1.77	25 Sep 85	3 Oct 85	1.79	101.1
5.55	''	''	5.42	97.7

Appendix C (cont.): ANALYSIS OF FEED MIXTURES

Table 2 (cont.): Analysis of Diet Mixtures

Target Conc. (mg/g)	Date Prepared	Date Analyzed	Concentration Determined by Analysis (mg/g)	% of Target Conc.
17.66	25 Sep 85	3 Oct 85	17.71	100.3
50.00	''	''	51.23	102.5
1.47	27 Sep 85	''	1.54	104.8
4.85	''	''	4.76	98.1
15.53	''	''	15.65	100.8
50.00	''	5 Nov 85	50.76	101.5
1.84	2 Oct 85	''	1.87	101.6
6.12	''	''	5.83	95.3
18.08	''	''	18.87	104.4
50.00	''	''	52.59	105.2
1.71	4 Oct 85	''	1.82	106.4
5.91	''	''	5.87	99.3
17.14	''	''	18.20	106.2
1.91	9 Oct 85	20 Nov 85	1.86	97.4
6.26	''	5 Nov 85	6.24	99.7
19.66	''	''	20.45	104.0
50.00	''	''	50.87	101.7
1.72	11 Oct 85	''	1.74	101.2
5.75	''	''	5.90	102.6
17.46	''	''	18.21	104.3
50.00	''	''	52.59	105.2

Appendix C (cont.): ANALYSIS OF FEED MIXTURES

Table 2 (cont.): Analysis of Diet Mixtures

Target Conc. (mg/g)	Date Prepared	Date Analyzed	Concentration Determined by Analysis (mg/g)	% of Target Conc.
2.04	16 Oct 85	6 Nov 85	2.02	99.0
6.32	''	''	6.59	104.2
18.89	''	''	18.43	97.5
50.00	''	''	52.52	105.0
1.65	18 Oct 85	''	1.61	97.6
5.78	''	''	5.69	98.4
17.21	''	''	17.45	101.4
50.00	''	''	51.48	103.0
2.11	23 Oct 85	''	2.12	100.5
6.39	''	''	6.59	103.1
21.00	''	''	21.58	102.8
50.00	''	''	53.22	106.4
1.67	25 Oct 85	''	1.72	103.0
5.54	''	''	5.48	98.9
17.65	''	''	18.26	103.5
50.00	''	''	52.39	104.8
2.01	30 Oct 85	20 Nov 85	1.99	98.9
6.20	''	''	6.50	104.8
20.23	''	''	20.33	100.5
50.00	''	''	52.90	105.8

Appendix C (cont.): ANALYSIS OF FEED MIXTURES

Table 2 (cont.): Analysis of Diet Mixtures

Target Conc. (mg/g)	Date Prepared	Date Analyzed	Concentration Determined by Analysis (mg/g)	% of Target Conc.
1.74	1 Nov 85	20 Nov 85	1.74	100.0
5.59	''	''	5.58	99.8
17.50	''	27 Nov 85	18.30	104.6
1.97	6 Nov 85	20 Nov 85	1.98	100.5
6.41	''	''	6.56	102.3
21.19	''	27 Nov 85	21.15	99.8
50.00	7 Nov 85	20 Nov 85	52.58	105.2
1.82	8 Nov 85	''	1.71	94.0
5.86	''	''	6.03	102.9
17.53	''	''	18.47	105.4
50.00	12 Nov 85	''	49.91	99.8
2.19	13 Nov 85	27 Nov 85	2.21	101.1
6.59	''	20 Nov 85	6.90	104.6
20.78	''	''	19.08	91.8
50.00	''	''	53.07	106.1
1.88	15 Nov 85	''	1.76	93.6
5.63	''	''	5.93	105.3
17.03	''	''	17.85	104.8

Appendix C (cont.): ANALYSIS OF FEED MIXTURES

Table 3 contains the results for the determination of homogeneity in the diets and premix.

TABLE 3

Verification of Homogeneity of Mixtures

Target Conc. of NGu (mg/g)	Site of Sampling	Conc. Determined by Analysis (mg/g)	Mean Conc. (mg/g)	Absolute Deviation from Mean (%)
1.05	Top	1.00	1.01	1.0
	Middle	1.02		1.0
	Bottom	1.01		0.0
3.51	Top	3.52	3.57	1.4
	Middle	3.51		2.1
	Bottom	3.68		3.1
10.05	Top	9.73	9.93	2.0
	Middle	10.03		1.0
	Bottom	10.02		0.9
50.00 (Premix)	Top	49.68	50.16	1.0
	Middle	50.09		0.1
	Bottom	50.72		1.1
2.04	Top	2.02	2.02	0.0
	Middle	2.10		4.0
	Bottom	1.94		4.0
6.32	Top	6.55	6.59	0.6
	Middle	6.58		0.1
	Bottom	6.63		0.7
18.89	Top	15.74	18.43	14.6
	Middle	19.70		6.9
	Bottom	19.84		7.7
50.00 (Premix)	Top	51.42	52.52	2.1
	Middle	53.70		2.2
	Bottom	52.44		0.2

Appendix C (cont.): ANALYSIS OF FEED MIXTURES

TABLE 3 (cont.)

Verification of Homogeneity of Mixtures

Target Conc. of NGu (mg/g)	Site of Sampling	Conc. Determined by Analysis (mg/g)	Mean Conc. (mg/g)	Absolute Deviation from Mean (%)
2.19	Top	2.20	2.21	0.5
	Middle	2.22		0.5
	Bottom	2.22		0.5
6.59	Top	7.00	6.90	1.4
	Middle	6.90		0.0
	Bottom	6.79		1.6
20.78	Top	19.31	19.08	1.2
	Middle	19.36		1.5
	Bottom	18.56		2.7
50.00 (Premix)	Top	53.73	53.07	1.2
	Middle	52.92		0.3
	Bottom	52.56		1.0

Discussion

The concentration of NGu in the diet mixtures as determined by analysis was within 6.4% of the target concentrations.

Samples collected during the 1st, 9th and 13th weeks of the study demonstrate that the NGu was dispersed homogeneously through the feed over the range of concentrations tested, according to the EPA and NIH criteria for homogeneity (3). The only exception to this was in the high dose group during the 9th week of the study. The sample from the top of the mixing bowl in this group deviated 14.6% from the mean. While the cause is uncertain, we feel this is a random event and should not significantly affect the outcome of the study.

REFERENCES:

1. McKay AF, inventor; Honorary Advisory Council for Scientific and Industrial Research, Ottawa, assignee. 1-substituted-3-nitroguanidines. Can. patent 519,488. 1955 Dec 13. In: Chemical Abstracts, 1956; 50: 12107.

2. Morgan EW, Brown LD, Lewis CM, Dahlgren RR, Korte DW. Fourteen-Day Subchronic Oral Toxicity Study of Nitroguanidine in Rats. Toxicology Series 146. Presidio of San Francisco, CA: Letterman Army Institute of Research, June 1988, Institute Report No. 272.

3. EPA, GLP Standards, Final Rule (40 CFR part 160) as published in the Federal Register, 29 Nov 1983, Vol. 48, no. 230 pp 53955-53959.

Appendix D: HISTORICAL LISTING OF STUDY EVENTS

Date	Event
7 Aug 85	Animals arrived at LAIR. They were sexed, observed for illness, ear tagged, weighed and caged in the GLP Suite.
8-20 Aug 85	Animals were checked daily.
14,16 Aug 85	Animals were weighed and food and water consumption monitored (feeders and water bottles weighed) males (14 Aug), females (16 Aug).
21 Aug 85	Animals were removed from quarantine, males were weighed, dietary concentrations were calculated, and diet containing test compound was started. Thirteen baseline control males were submitted for necropsy, hematology, and serology.
21 Aug-21 Nov 85	Observations were conducted twice daily.
23 Aug 85	Females were weighed, dietary concentrations were calculated, and diet containing test compound was started. Eleven baseline control females were submitted for necropsy, hematology, and serology.
28 Aug, 4,11, 18,25 Sep, 2, 9,16,23,30 Oct, 6,13 Nov 85	Males were observed and weighed, and water bottles and feeders were weighed. Diet requirement was prepared. Feeders were changed to new mix.
30 Aug, 6,13 20, 27 Sep 4 11,18,25 Oct 1,8,15 Nov 85	Females were observed and weighed, and water bottles and feeders were weighed. Diet requirements were recalculated and new feed mixes prepared. Feeders were changed to new mix.
2,4 Oct 85	Five males and 5 females per group were submitted for necropsy,hematology, and serology.
20,22 Nov 85	Observed and weighed males and females. Submit for necropsy. Blood and tissue samples were taken for the measurements specified.

Appendix E: HEMATOLOGY/CLINICAL CHEMISTRY INDICES

The following are LAIR GLP SOPs for the Hematology measurements performed during the study:

1. Complete Blood Count - OP-PSG-40 (WBC, RBC, Hb, HCT, MCV, MCH, and MCHC).
2. Platelets - OP-PSG-39
3. WBC Differential - OP-PSG-26 (neutrophils, lymphocytes, eosinophils, and monocytes)

Counts for the neutrophils, lymphocytes, eosinophils, and monocytes are obtained by multiplying the WBC by the appropriate percentage obtained from the differential count.

The following are LAIR GLP SOPs for the Clinical Chemistry measurements performed during the study:

1. Calcium - OP-ACH-17
2. Sodium and Potassium - OP-ACH-19
3. Chloride - OP-ACH-20
4. Magnesium - OP-ACH-50
5. Phosphorus - OP-ACH-18
6. Glucose - OP-ACH-7
7. Cholesterol - OP-ACH-11
8. Triglycerides - OP-ACH-9
9. Creatinine - OP-ACH-15
10. Blood Urea Nitrogen - OP-ACH-16
11. Uric Acid - OP-ACH-14
12. Albumin - OP-ACH-12
13. Total Protein - OP-ACH-13
14. Total Bilirubin - OP-ACH-8
15. Serum Iron - OP-ACH-22
16. Aspartate Amino-Transferase - OP-ACH-4
17. Alanine Amino-Transferase - OP-ACH-3
18. Lactate Dehydrogenase - OP-ACH-5
19. Creatine Phosphokinase - OP-ACH-6
20. Alkaline Phosphatase - OP-ACH-10

Globulin values were calculated by subtracting the albumin values from the total protein values.

Appendix F: HISTOPATHOLOGY TISSUES

The following is a list of all tissues submitted for light microscopic examination following necropsy:

Cerebrum
Cerebellum
Trachea
Thyroid
Parathyroid
Esophagus
Salivary Gland
Harderian Gland
Exorbital Gland
Heart
Aorta
Lung
Thymus
Spleen
Mesenteric Lymph Node
Liver
Kidney
Urinary Bladder
Duodenum
Jejunum
Ileum
Pancreas
Cecum
Colon
Rectum
Stomach
Skeletal Muscle
Sciatic Nerve
Tongue
Skin
Mammary Gland
Nasal Region
Sternum
Femur
Vertebrae
Spinal Cord
Adrenals
Pituitary
Eye(s)
Middle Ear
Auditory Sebaceous Gland

MALE	FEMALE
Accessory Sex Glands	Uterus
Epididymis	Ovaries
Testes	

Appendix G: NITROGUANIDINE CONSUMPTION (mg/kg/day)

Group 1 Males

Animal# 85D00-	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
758	0	0	0	0	0	0	0	0	0	0	0	0	0
768	0	0	0	0	0	0	0	0	0	0	0	0	0
769	0	0	0	0	0	0	0	0	0	0	0	0	0
770	0	0	0	0	0	0	0	0	0	0	0	0	•
785	0	0	0	0	0	0	0	0	0	0	0	0	0
788*	0	0	0	0	0	0							
790*	0	0	0	0	0	0							
795	0	0	0	0	0	0	0	0	0	0	0	0	0
803*	0	0	0	0	0	0							
804	0	0	0	0	0	0	0	0	0	0	0	0	0
805	0	0	0	0	0	0	0	0	0	0	0	0	0
814	0	0	0	0	0	0	0	0	0	0	0	0	0
822	0	0	0	0	0	0	0	0	0	0	0	0	0
825*	0	0	0	0	0	0							
826*	0	0	0	0	0	0							
Mean	0	0	0	0	0	0	0	0	0	0	0	0	0
Std Dev													
SEM													

* Interim sacrifice animal.

Appendix G (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

Group 2 Males

Animal# 85D00-	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
759*	83	84	88	96	93	91							
760*	79	82	83	95	90	92							
761	81	88	82	99	92	97	96	84	98	89	98	88	117
764	87	112	90	96	95	94	112	114	99	116	106	87	100
771	91	90	67	97	94	99	82	91	94	94	101	91	107
783*	79	79	79	95	86	100							
786*	104	95	91	102	93	103							
791	86	87	88	102	89	82	104	79	114	109	89	84	122
792	82	82	86	101	92	106	97	109	95	112	98	90	102
793	80	81	93	95	89	100	95	86	97	99	101	94	104
799	84	87	86	110	95	98	95	74	99	107	104	97	133
808	102	•	120	75	99	96	108	92	109	108	98	98	107
809	74	88	83	111	81	107	95	98	102	95	99	88	123
811*	84	86	93	100	103	106							
815	79	81	80	85	87	94	93	88	•	127	117	89	117
Mean	85	87	87	97	92	98	98	91	101	106	101	91	113
Std Dev	8	8	11	9	5	7	9	12	7	12	7	4	11
SEM	2	2	3	2	1	2	3	4	2	4	2	1	3

* Interim sacrifice animal.
• Unable to calculate due to incomplete food consumption data.

Appendix G (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

Group 3 Males

Animal# 85D00-	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
773*	286	265	323	303	295	356							
776*	286	254	293	289	291	289							
787	284	247	257	290	290	279	277	361	299	305	329	298	335
796	284	245	301	257	292	282	254	278	325	368	318	320	372
801*	335	312	327	306	302	300							
802	319	246	301	437	291	284	304	376	315	307	306	359	318
812	282	245	291	365	285	278	279	304	292	284	317	386	367
817*	320	273	313	264	295	260							
819	281	247	280	338	289	287	288	343	354	311	314	294	405
821	274	255	281	399	283	293	316	330	312	306	305	284	324
823	291	247	296	263	279	269	271	•	409	334	331	323	346
824	287	262	313	352	300	296	343	314	325	327	303	283	310
828	284	258	292	303	298	270	302	342	302	448	338	285	331
829*	287	257	289	308	290	258							
831	309	277	306	361	325	260	315	341	333	358	341	319	368
Mean	294	259	298	322	293	284	295	332	326	335	320	315	348
Std Dev	18	18	18	52	11	24	26	30	34	47	14	35	30
SEM	5	5	5	13	3	6	8	10	11	15	4	11	9

* Interim sacrifice animal.
• Unable to calculate due to incomplete food consumption data.

Appendix G (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

Group 4 Males

Animal# 85D00-	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
762	780	790	893	959	905	1038	1014	1251	909	1163	1114	1060	825
763*	755	803	919	954	831	1006							
765	800	806	927	969	849	1040	953	1180	913	1087	1017	1009	959
774*	809	1024	1077	907	873	918							
778*	814	816	959	996	922	993							
782	747	•	1070	1059	899	968	908	1020	808	1018	927	930	855
784*	760	795	1080	901	869	950							
789	766	820	894	922	869	916	864	1021	804	1108	939	902	854
798	797	829	906	1076	870	999	984	1030	927	1060	1018	1296	1021
806	932	•	1310	895	1017	1119	1080	1154	922	1112	•	1183	929
807	739	759	846	1181	860	925	949	965	850	990	950	948	801
810	815	878	916	842	817	931	962	1099	835	1025	1027	944	1039
813	789	802	886	788	888	965	983	1088	933	1069	1038	979	898
816*	793	864	924	1142	904	1107							
818	792	794	835	928	857	906	919	1023	878	1021	997	939	878
Mean	793	829	963	968	882	985	962	1083	878	1065	1003	1019	906
Std Dev	45	66	124	108	47	67	60	89	50	53	58	127	80
SEM	12	18	32	28	12	17	19	28	16	17	19	40	25

* Interim sacrifice animal.
• Unable to calculate due to incomplete food consumption data.

Appendix G (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

Group 1 Females

Animal# 85D00-	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
837	0	0	0	0	0	0	0	0	0	0	0	0	0
840	0	0	0	0	0	0	0	0	0	0	0	0	0
843*	0	0	0	0	0	0							
845	0	0	0	0	0	0	0	0	0	0	0	0	0
850*	0	0	0	0	0	0							
853	0	0	0	0	0	0	0	0	0	0	0	0	0
854*	0	0	0	0	0	0							
855*	0	0	0	0	0	0							
860	0	0	0	0	0	0	0	0	0	0	0	0	0
864	0	0	0	0	0	0	0	0	0	0	0	0	0
876	0	0	0	0	0	0	0	0	0	0	0	0	0
877	0	0	0	0	0	0	0	0	0	0	0	0	0
896	0	0	0	0	0	0	0	0	0	0	0	0	0
901*	0	0	0	0	0	0							
903	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean	0	0	0	0	0	0	0	0	0	0	0	0	0
Std Dev													
SEM													

* Interim sacrifice animal.

Appendix G (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

Group 2 Females

Animal# 85D00-	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
836	90	101	92	99	105	82	103	101	93	107	98	91	83
838*	83	86	86	89	95	84							
839*	85	86	94	91	94	81							
846	87	84	88	91	93	89	103	98	92	95	95	86	99
847	91	94	83	97	98	85	108	102	85	91	90	86	87
848	84	94	89	99	100	87	105	103	94	103	99	110	108
851*	103	107	98	96	116	99							
873*	89	115	•	97	103	96							
886	95	62	•	93	96	97	102	99	99	93	93	86	83
888	89	52	•	102	90	81	92	100	99	103	97	88	86
893	88	90	•	108	113	93	109	101	96	98	98	90	97
894	88	75	•	102	97	93	102	95	95	104	96	89	101
895	76	135	•	100	113	95	107	108	89	90	96	93	97
899*	106	116	•	95	96	95							
904	113	126	•	123	150	96	125	148	121	102	93	95	100
Mean	91	95	90	99	104	90	106	106	96	99	96	91	94
Std Dev	10	23	5	8	15	6	8	15	10	6	3	7	9
SEM	2	6	2	2	4	2	3	5	3	2	1	2	3

* Interim sacrifice animal.
• Unable to calculate due to incomplete food consumption data.

Appendix G (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

Group 3 Females

Animal# 85D00-	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
832	249	311	276	304	280	•	339	•	367	312	321	364	310
833*	391	407	301	301	289	274							
841	260	308	281	306	274	283	319	329	296	299	303	311	324
844*	249	330	289	305	287	262							
849	267	364	309	329	306	277	335	351	316	310	•	414	321
856	254	303	297	307	303	277	325	336	301	327	313	334	308
863*	270	332	•	333	343	304							
865*	264	307	•	305	288	260							
870	257	215	•	284	289	267	321	409	304	313	328	339	310
871	253	472	•	278	282	253	330	309	306	286	303	324	298
872	273	245	•	297	311	269	302	361	307	271	315	339	309
874	282	227	•	294	308	290	307	311	321	299	301	306	298
883	252	201	•	297	296	265	326	•	406	365	355	355	357
887*	265	388	•	284	287	270							
902	341	460	•	339	304	294	325	376	339	329	314	316	401
Mean	275	325	292	304	297	275	323	348	326	311	317	340	324
Std Dev	39	83	13	18	17	14	11	34	35	26	17	32	32
SEM	10	21	5	5	4	4	4	12	11	8	6	10	10

* Interim sacrifice animal.
• Unable to calculate due to incomplete food consumption data.

Appendix G (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

Group 4 Females

Animal# 85D00-	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
835*	764	882	931	913	1026	952							
857	801	1091	917	968	992	876	1051	1018	975	1042	1133	1021	984
858	685	922	•	845	982	938	1020	1222	986	988	988	1037	1020
859	813	990	•	971	1084	999	1114	1119	1075	1127	1140	1223	1126
862	1035	904	•	900	1026	943	1059	1036	991	1013	1012	1081	933
868*	742	965	•	930	1067	884							
875*	711	1491	•	917	1061	953							
880*	781	1251	•	873	1066	927							
885	738	1386	•	843	968	830	1058	1000	896	1024	1021	1042	988
889	774	1181	•	890	1028	917	1014	1037	962	1000	1008	1061	956
891	771	1337	•	874	1003	918	1027	1054	860	1065	871	1017	1132
892	757	694	•	893	1031	922	1001	980	1021	1025	1060	973	1030
897	930	566	•	928	1045	845	1005	1005	1084	1069	1094	1272	1118
905*	984	1016	•	966	1009	942							
906	994	1019	•	927	1024	930	1069	1109	1018	1101	1057	1120	1010
Mean	819	1046	924	909	1027	918	1042	1058	987	1045	1039	1085	1030
Std Dev	111	252	10	41	33	44	35	73	70	45	79	95	72
SEM	29	65	7	11	9	11	11	23	22	14	25	30	23

* Interim sacrifice animal.
• Unable to calculate due to incomplete food consumption data.

Appendix H: FOOD CONSUMPTION (g)

Group 1 Males

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
758	177	140	169	165	175	204	176	155	129	166	168	172	154	182
768	158	151	174	166	164	126	159	139	142	181	142	157	182	214
769	167	171	179	175	180	158	167	171	148	163	157	184	175	193
770	121	173	174	180	181	236	180	210	148	179	167	180	164	spill
785	160	166	173	174	175	179	176	163	167	161	172	184	175	220
788*	159	176	180	171	174	170	179							
790*	171	185	185	187	185	153	177							
795	167	185	204	181	189	175	175	188	201	182	170	190	182	190
803*	184	178	174	180	128	157	161							
804	157	177	175	171	162	149	174	180	170	176	197	186	183	195
805	spill	151	157	157	206	154	143	161	155	159	160	176	168	186
814	153	158	159	158	185	102	142	148	145	128	176	188	185	185
822	160	160	153	153	173	136	143	158	145	148	154	168	154	165
825*	179	181	180	171	179	177	156							
826*	175	185	176	172	177	155	139							
Mean	163	169	174	171	176	162	163	167	155	164	166	178	172	192
Std Dev	15	14	12	10	17	32	15	21	20	17	15	10	12	17
SEM	4	4	3	2	4	8	4	7	6	5	5	3	4	5

[@] Quarantine week 2.

* Interim sacrifice animal.

Appendix H (cont.): FOOD CONSUMPTION (g)

Group 2 Males

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
759*	154	162	160	172	167	171	150							
760*	161	165	162	169	174	168	159							
761	168	168	172	160	169	159	153	150	135	151	131	162	141	178
764	166	174	204	167	157	162	148	178	189	152	176	176	146	151
771	104	172	166	134	172	177	173	134	162	158	153	188	177	186
783*	148	166	154	162	177	164	179							
786*	spill	155	148	149	151	144	148							
791	175	184	181	188	183	174	139	189	152	209	194	168	165	211
792	166	165	153	163	169	157	167	159	183	148	172	165	155	162
793	148	154	150	176	163	161	168	162	150	159	155	172	168	168
799	156	168	168	168	192	174	168	163	127	161	175	175	174	210
808	122	198	spill	201	120	169	158	175	150	172	172	168	171	172
809	157	149	169	164	197	142	172	154	169	168	145	169	152	201
811*	151	162	152	172	165	180	167							
815	151	163	160	160	152	162	164	162	157	spill	197	205	166	201
Mean	152	167	164	167	167	164	161	163	157	164	167	175	162	184
Std Dev	19	12	15	15	18	11	11	16	19	18	21	13	12	21
SEM	5	3	4	4	5	3	3	5	6	6	7	4	4	7

[@] Quarantine week 2.
* Interim sacrifice animal.

Appendix H (cont.): FOOD CONSUMPTION (g)

Group 3 Males

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
773*	179	167	175	180	167	167	182							
776*	162	162	167	161	164	169	163							
787	161	158	158	136	152	158	148	141	176	143	146	166	148	164
796	169	179	182	192	169	197	188	154	173	194	222	198	208	234
801*	93	157	186	173	174	177	172							
802	202	145	133	136	201	135	130	134	159	128	128	129	142	132
812	160	165	165	167	210	171	161	156	167	153	153	177	209	199
817*	133	170	166	163	138	155	136							
819	159	154	157	148	178	154	150	145	166	168	149	158	147	196
821	160	153	162	147	208	148	150	157	160	145	148	153	141	157
823	171	166	159	163	132	160	153	143	spill	183	157	166	167	183
824	151	156	168	171	183	170	163	183	160	161	170	159	151	160
828	160	160	165	153	160	160	138	150	168	139	218	171	140	163
829*	153	154	160	152	168	160	138							
831	177	182	191	179	210	198	145	177	187	177	199	194	180	204
Mean	159	162	166	161	174	165	154	154	168	159	169	167	163	179
Std Dev	24	10	14	16	25	17	17	16	9	21	33	20	27	30
SEM	6	3	4	4	6	4	4	5	3	7	10	6	8	9

[@] Quarantine week 2.

* Interim sacrifice animal.

Appendix H (cont.): FOOD CONSUMPTION (g)

Group 4 Males

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
762	166	160	153	158	169	169	176	167	194	162	183	191	180	168
763*	161	150	152	158	165	145	163							
765	170	163	154	164	172	152	171	152	183	163	177	181	177	206
774*	169	166	202	196	166	161	155							
778*	171	163	154	164	169	163	153							
782	155	149	spill	161	169	152	150	135	147	127	146	142	137	157
784*	167	151	150	188	152	154	148							
789	171	162	171	172	179	181	172	159	179	159	198	183	171	196
798	167	159	165	163	193	155	167	162	159	169	166	176	217	209
806	spill	132	spill	184	132	167	173	163	171	152	167	spill	179	177
807	156	148	146	148	201	154	148	151	149	146	149	154	150	154
810	167	166	170	164	148	150	156	156	173	144	159	173	155	200
813	154	153	147	144	125	151	148	143	153	152	154	163	150	170
816*	148	151	158	153	188	157	175							
818	165	163	157	152	163	155	150	148	160	155	161	170	155	177
Mean	163	156	160	165	166	158	160	154	167	153	166	170	167	181
Std Dev	7	9	15	15	21	9	11	10	16	12	16	15	23	20
SEM	2	2	4	4	5	2	3	3	5	4	5	5	7	6

[@] Quarantine week 2.
* Interim sacrifice animal.

Appendix H (cont.): FOOD CONSUMPTION (g)

Group 1 Females

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
837	126	129	124	117	spill	124	198	119	116	119	123	120	136	97
840	127	120	131	125	119	136	120	117	102	113	106	125	113	99
843*	103	112	112	107	120	114	113							
845	102	104	94	104	93	109	96	105	98	100	109	106	109	104
850*	103	106	98	103	98	110	97							
853	105	132	120	123	124	130	133	121	125	128	139	141	127	101
854*	124	124	127	119	129	132	116							
855*	129	130	155	129	119	122	122							
860	102	113	129	•	112	128	115	114	112	114	113	spill	spill	123
864	110	108	112	•	107	112	103	108	113	102	spill	119	103	119
876	107	121	69	•	104	140	124	122	126	110	173	119	118	117
877	138	119	132	•	113	125	121	112	112	116	103	120	121	117
896	112	95	132	•	101	112	97	101	94	107	106	114	107	108
901*	spill	131	116	•	116	120	119							
903	92	122	192	•	122	144	125	119	122	115	130	119	124	138
Mean	113	118	123	116	113	124	120	114	112	112	122	120	118	112
Std Dev	13	11	28	10	11	11	24	7	11	8	23	9	11	13
SEM	4	3	7	4	3	3	6	2	4	3	7	3	4	4

[@] Quarantine week 2.
* Interim sacrifice animal.
• Data lost.

Appendix H (cont.): FOOD CONSUMPTION (g)

Group 2 Females

Animal# 85D00-	QWK2@	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
836	130	122	139	134	126	135	102	117	122	123	134	129	122	108
838*	110	105	108	115	105	115	104							
839*	120	111	120	128	115	118	101							
846	107	106	98	109	101	105	96	99	100	102	104	107	94	106
847	130	121	129	124	125	131	112	126	131	120	126	121	123	123
848	113	105	108	110	111	112	97	95	103	105	114	108	131	125
851*	116	116	111	114	90	115	101							
873*	104	100	139	•	111	119	113							
886	133	128	82	•	119	122	123	115	121	129	113	116	111	102
888	124	124	72	•	143	120	111	108	131	147	149	141	129	126
893	109	105	103	•	117	127	106	111	111	111	115	114	106	114
894	122	117	101	•	132	119	118	113	111	122	132	125	119	130
895	111	94	165	•	115	135	114	114	123	107	104	112	112	114
899*	spill	118	131	•	102	98	102							
904	159	147	166	•	151	183	120	136	164	152	122	113	118	124
Mean	120	115	118	119	118	124	108	113	122	122	121	119	116	117
Std Dev	16	13	27	10	16	19	8	12	18	17	14	11	11	10
SEM	4	3	7	4	4	5	2	4	6	5	5	3	4	3

@ Quarantine week 2.
* Interim sacrifice animal.
• Data lost.

Appendix H (cont.): FOOD CONSUMPTION (g)

Group 3 Females

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
832	118	107	117	110	116	112	spill	110	spill	124	110	115	123	107
833*	156	165	148	114	113	116	104							
841	169	116	117	112	123	111	115	105	111	103	113	118	108	116
844*	116	110	119	125	119	122	106							
849	105	100	117	106	110	113	99	95	104	99	108	spill	121	99
856	125	115	118	122	119	126	110	109	114	104	121	117	118	114
863*	109	102	102	•	106	123	105							
865*	122	113	112	•	115	112	95							
870	110	113	78	•	106	113	99	103	132	102	112	120	116	111
871	119	112	183	•	114	121	101	115	109	112	110	119	115	110
872	125	123	96	•	113	133	112	102	126	113	105	121	124	118
874	132	136	92	•	126	140	133	116	116	129	130	132	123	125
883	102	104	67	•	104	112	95	100	spill	123	122	122	114	119
887*	124	120	151	•	115	120	112							
902	spill	133	160	•	126	121	112	102	124	115	121	114	106	141
Mean	124	118	118	115	115	120	107	106	117	112	115	120	117	116
Std Dev	19	17	31	7	7	8	10	7	10	10	8	5	6	11
SEM	5	4	8	3	2	2	3	2	3	3	2	2	2	4

[@] Quarantine week 2.
* Interim sacrifice animal.
• Data lost.

Appendix H (cont.): FOOD CONSUMPTION (g)

Group 4 Females

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
835*	126	107	100	112	99	108	103							
857	151	119	139	115	124	117	103	114	110	113	121	137	120	122
858	115	96	113	•	102	109	107	102	125	110	106	107	112	118
859	122	116	124	•	122	126	122	120	114	119	127	130	139	140
862	124	143	105	•	102	104	100	101	96	97	99	101	109	97
868*	122	105	123	•	115	124	106							
875*	114	95	174	•	104	108	104							
880*	120	113	152	•	105	122	109							
885	112	103	161	•	96	104	88	103	98	92	104	107	111	112
889	119	105	148	•	107	115	107	101	106	103	105	108	113	105
891	101	95	138	•	91	95	92	92	96	79	100	77	91	107
892	122	107	91	•	117	123	118	114	110	122	123	131	118	130
897	92	120	63	•	102	110	93	97	95	110	109	113	135	125
905*	60	113	106	•	110	104	99							
906	spill	120	114	•	106	106	104	109	113	105	119	114	121	116
Mean	114	110	123	114	107	112	104	105	106	105	111	112	117	117
Std Dev	20	12	29	2	9	9	9	9	10	13	10	17	14	13
SEM	5	3	8	2	2	2	2	3	3	4	3	6	4	4

[@] Quarantine week 2.
* Interim sacrifice animal.
• Data lost.

Appendix I: WATER CONSUMPTION (ml)

Group 1 Males

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
758	266	263	266	217	246	266	285	257	300	264	264	259	255	229
768	232	185	269	260	224	225	240	214	314	254	235	242	265	223
769	235	287	296	260	296	280	261	276	322	252	247	244	291	248
770	288	255	241	265	262	239	242	248	267	240	214	234	213	221
785	220	227	240	268	242	254	238	301	287	228	218	303	299	321
788*	249	271	297	280	280	275	330							
790*	250	270	249	257	263	228	272							
795	259	283	340	315	278	311	317	343	380	340	282	330	295	324
803*	228	298	298	318	260	282	269							
804	239	429	259	249	288	278	267	325	299	281	259	265	266	244
805	5[$]	248	282	234	234	261	198	234	275	240	233	231	265	217
814	206	197	210	218	213	213	206	214	214	194	221	235	199	208
822	235	231	229	248	333	247	245	257	252	223	251	245	211	231
825*	252	238	282	271	267	253	223							
826*	266	254	276	255	284	242	269							
Mean	245	262	269	261	265	257	258	267	291	252	242	259	256	247
Std Dev	21	56	33	29	31	26	36	44	44	39	22	33	36	42
SEM	6	14	8	7	8	7	9	14	14	12	7	10	12	13

[@] Quarantine week 2.
* Interim sacrifice animal.
[$] Erroneous value not included in group mean.

Appendix I (cont.): WATER CONSUMPTION (ml)

Group 2 Males

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
759*	252	302	335	347	343	356	328							
760*	241	242	266	247	252	277	279							
761	207	222	231	224	245	244	207	212	244	229	198	233	184	225
764	205	223	246	219	204	235	197	231	252	232	205	241	223	186
771	37	299	308	298	298	319	291	278	333	303	331	375	362	353
783*	225	236	242	223	248	240	256							
786*	102	301	265	231	242	235	241							
791	258	266	277	274	281	273	236	269	259	292	284	257	234	255
792	225	234	258	249	260	250	226	221	248	225	241	247	222	213
793	223	255	234	250	275	251	266	274	332	258	258	252	257	221
799	260	366	382	407	411	449	434	358	408	399	spill	406	spill	427
808	167	300	spill	334	350	305	306	325	285	306	310	286	290	266
809	228	258	298	308	304	242	271	245	382	262	318	251	242	319
811*	225	260	331	284	297	323	305							
815	215	220	237	246	235	262	228	230	239	28	358	275	265	254
Mean	205	266	279	276	283	284	271	264	298	253	278	282	253	272
Std Dev	61	41	46	54	53	59	59	47	62	95	56	60	51	74
SEM	16	11	12	14	14	15	15	15	20	30	19	19	17	23

[@] Quarantine week 2.
* Interim sacrifice animal.

Appendix I (cont.): WATER CONSUMPTION (ml)

Group 3 Males

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
773*	262	320	345	393	402	396	421							
776*	208	260	264	268	277	300	263							
787	228	260	276	244	265	287	283	260	283	246	264	288	261	280
796	245	299	321	306	367	346	353	330	382	396	374	374	326	313
801*	31	288	344	315	304	307	276							
802	79	244	237	245	251	243	246	250	274	235	231	235	249	224
812	205	256	262	253	256	257	258	245	269	252	251	265	272	282
817*	189	299	319	289	284	270	275							
819	251	278	359	387	404	418	326	169	spill	spill	404	spill	364	spill
821	203	232	252	243	310	245	250	266	280	249	227	253	240	230
823	247	268	254	266	273	264	259	232	4[$]	371	242	296	252	288
824	212	241	265	278	266	291	266	284	266	276	272	267	264	255
828	196	219	225	211	229	245	219	236	262	233	239	263	216	239
829*	207	263	266	263	278	spill	217							
831	274	335	353	330	spill	429	379	362	404	374	393	385	413	367
Mean	202	271	290	286	298	307	286	263	303	292	290	292	286	275
Std Dev	66	32	46	52	55	65	58	54	57	67	71	53	62	45
SEM	17	8	12	14	15	17	15	17	20	22	22	18	20	15

[@] Quarantine week 2.
* Interim sacrifice animal.
[$] Erroneous value not included in group mean.

Appendix I (cont.): WATER CONSUMPTION (ml)

Group 4 Males

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
762	229	302	297	325	341	344	436	372	391	354	357	396	364	377
763*	206	304	298	317	323	289	329							
765	230	308	328	378	346	366	418	413	315	408	411	346	342	375
774*	279	339	340	382	385	394	387							
778*	276	320	319	305	329	325	323							
782	217	276	spill	321	301	274	265	264	233	233	266	247	251	265
784*	237	274	257	265	274	261	263							
789	202	248	294	276	274	299	298	279	269	257	298	302	295	282
798	240	312	333	334	329	324	328	345	282	339	311	306	305	349
806	spill	323	153	380	390	370	372	369	313	290	347	180	spill	328
807	248	293	spill	304	270	293	294	314	271	282	305	320	272	288
810	211	291	313	275	287	278	292	284	324	307	293	329	295	276
813	225	280	284	281	288	271	281	305	319	301	287	273	300	283
816*	201	275	289	276	275	263	327							
818	214	296	261	286	291	275	246	260	282	285	263	291	292	284
Mean	230	296	290	314	314	308	324	320	300	306	314	299	302	311
Std Dev	25	23	48	40	40	43	57	52	43	50	46	58	34	43
SEM	7	6	13	10	10	11	15	16	14	16	14	18	11	14

[@] Quarantine week 2.

* Interim sacrifice animal.

Appendix I (cont.): WATER CONSUMPTION (ml)

Group 1 Females

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
837	174	241	253	192	187	203	196	212	215	209	209	185	169	141
840	154	167	195	270	151	203	162	149	153	156	141	163	178	146
843*	152	174	176	182	184	171	173							
845	143	151	130	141	131	176	130	167	142	141	163	156	161	171
850*	151	187	180	178	160	199	174							
853	142	190	191	200	167	192	182	192	180	188	180	188	177	154
854*	204	234	306	275	260	310	261							
855*	196	210	231	200	181	197	176							
860	177	196	221	232	181	229	230	280	307	171	195	75	198	201
864	165	176	199	143	162	155	164	183	200	135	166	177	134	175
876	153	195	210	196	166	213	187	172	181	168	178	181	153	179
877	164	167	177	179	141	153	155	140	139	160	211	159	151	150
896	spill	142	166	167	168	188	152	151	156	169	164	181	191	200
901*	57	196	217	209	187	201	187							
903	120	174	195	190	160	199	161	179	191	183	197	151	149	182
Mean	154	187	203	197	172	199	179	182	186	168	180	162	166	170
Std Dev	35	27	41	38	29	37	32	40	49	22	23	33	20	22
SEM	10	7	11	10	8	10	8	13	16	7	7	10	6	7

[@] Quarantine week 2.

* Interim sacrifice animal.

Appendix I (cont.): WATER CONSUMPTION (ml)

Group 2 Females

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
836	189	198	194	179	204	216	179	193	209	208	195	206	209	189
838*	140	147	203	197	179	196	178							
839*	165	179	207	200	215	180	176							
846	143	158	147	172	154	164	149	141	144	154	156	162	140	152
847	174	184	205	183	207	184	162	192	210	182	187	151	161	178
848	283	spill	spill	spill	spill	292	244	424	spill	248	spill	236	spill	spill
851*	141	177	140	174	144	195	180							
873*	145	174	168	154	159	154	194							
886	spill	224	199	281	233	222	228	207	236	199	215	223	209	184
888	162	190	186	225	205	195	177	168	208	245	266	228	179	208
893	162	153	162	147	171	180	167	155	175	164	167	168	160	185
894	175	170	203	172	189	169	175	151	169	173	163	160	158	164
895	159	162	222	223	191	217	170	181	202	155	165	164	161	152
899*	56	165	214	207	202	209	206							
904	139	164	160	152	160	168	155	147	145	158	160	145	156	151
Mean	160	175	186	190	187	196	183	196	189	189	186	184	170	174
Std Dev	47	20	26	36	26	34	26	83	32	36	36	35	24	20
SEM	13	5	7	10	7	9	7	26	11	11	12	11	8	7

[@] Quarantine week 2.

* Interim sacrifice animal.

Appendix I (cont.): WATER CONSUMPTION (ml)

Group 3 Females

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
832	186	196	277	238	248	240	209	206	78	262	265	265	273	256
833*	176	221	199	204	212	220	240							
841	164	219	204	192	215	189	187	180	191	177	189	194	158	171
844*	175	208	215	199	201	229	193							
849	154	spill	204	182	174	194	183	185	198	166	199	9[$]	236	176
856	166	212	203	188	181	193	182	189	201	179	212	176	184	201
863*	149	161	163	157	159	184	154							
865*	150	206	183	197	202	205	190							
870	176	207	186	195	162	197	161	196	237	196	217	199	198	185
871	spill	178	186	199	189	206	161	193	202	184	173	186	180	184
872	233	233	219	202	197	217	200	175	202	199	197	191	206	216
874	181	219	225	203	178	196	183	181	169	185	182	177	179	180
883	151	193	184	202	190	225	182	181	70	254	264	218	214	220
887*	186	225	209	212	185	204	203							
902	48	222	208	233	219	219	184	200	241	254	228	199	200	214
Mean	164	207	204	200	194	208	188	189	179	206	213	201	203	200
Std Dev	40	20	26	19	23	16	21	10	59	36	32	27	33	26
SEM	11	5	7	5	6	4	6	3	19	12	10	9	10	8

[@] Quarantine week 2.
* Interim sacrifice animal.
[$] Erroneous value not included in group mean.

Appendix I (cont.): WATER CONSUMPTION (ml)

Group 4 Females

Animal# 85D00-	QWK2[@]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
835*	194	236	209	253	214	237	205							
857	180	219	222	222	260	242	229	240	199	213	250	242	227	262
858	177	223	247	231	222	253	250	234	254	217	238	232	226	228
859	139	205	204	199	191	181	194	180	164	167	199	195	190	216
862	151	219	189	182	172	183	174	179	168	163	174	179	196	184
868*	170	218	262	229	213	239	209							
875*	167	219	238	230	224	226	222							
880*	146	223	179	211	175	209	178							
885	172	239	213	222	188	181	185	197	205	167	214	205	211	212
889	159	208	226	225	210	203	206	201	219	184	210	180	209	190
891	141	228	162	195	169	177	172	179	197	173	256	191	235	263
892	176	229	257	223	215	232	224	227	223	244	242	317	204	240
897	108	237	185	211	193	215	194	182	230	237	232	245	252	246
905*	54	229	209	195	197	179	170							
906	51	232	227	202	187	199	185	194	202	192	233	235	230	254
Mean	146	224	215	215	202	210	200	201	206	196	225	222	218	230
Std Dev	44	10	29	18	24	26	24	24	27	30	25	42	19	28
SEM	11	3	8	5	6	7	6	8	9	10	8	13	6	9

[@] Quarantine week 2.
* Interim sacrifice animal.

Appendix J: BODY WEIGHTS (g)

Group 1 Males

Animal# 85D00-	Rcpt[@]	QWK2[$]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
758	106	252	306	343	380	414	450	465	464	472	498	512	522	522	536
768	119	243	285	329	363	381	369	396	394	425	455	440	447	481	461
769	113	252	309	360	399	436	437	458	489	486	512	513	539	540	567
770	119	221	279	325	365	395	427	443	444	462	499	509	529	530	547
785	124	251	303	349	377	414	441	454	459	460	480	495	518	515	518
788*	119	242	304	343	374	400	432	439							
790*	111	246	307	350	392	425	431	450							
795	109	243	304	350	396	433	463	471	496	509	528	528	563	568	578
803*	109	219	277	321	349	374	403	409							
804	118	243	294	330	366	397	408	430	444	455	479	501	515	512	538
805	112	107	213	262	311	338	373	373	409	412	435	439	476	483	512
814	108	240	290	332	364	388	416	411	422	433	433	476	498	505	523
822	113	243	291	321	354	363	390	398	427	432	453	467	483	490	502
825*	108	237	281	327	350	379	410	439							
826*	116	250	307	351	387	413	409	435							
Mean	114	233	290	333	368	397	417	431	445	455	477	488	509	515	528
Std Dev	5	36	24	23	23	27	27	28	33	30	32	31	34	27	34
SEM	1	9	6	6	6	7	7	7	10	9	10	10	11	9	11

[@] Receipt.
[$] Quarantine week 2.
* Interim sacrifice animal.

Appendix J (cont.): BODY WEIGHTS (g)

Group 2 Males

Animal# 85D00-	Rcpt[@]	QWK2[$]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
759*	103	233	282	328	362	391	425	423							
760*	121	251	300	342	378	410	431	442							
761	113	250	299	337	363	383	401	403	419	425	443	447	468	452	480
764	106	234	287	315	344	367	395	403	424	442	444	458	472	476	476
771	111	184	272	320	369	397	435	445	436	475	484	495	531	550	550
783*	116	246	304	335	382	419	442	459							
786*	115	113	215	269	304	331	360	369							
791	109	255	308	358	397	404	452	431	485	513	527	538	535	553	545
792	117	241	291	322	354	377	396	403	437	446	449	466	479	489	502
793	112	232	278	321	352	384	421	428	455	462	473	474	485	504	510
799	115	234	288	334	363	391	424	437	458	455	468	497	478	509	498
808	116	211	279	232	312	358	397	419	431	431	456	483	487	495	507
809	114	234	289	332	366	398	406	410	432	460	476	463	485	490	515
811*	109	227	278	304	344	370	404	403							
815	128	241	297	340	373	401	432	447	466	474	369	470	499	529	541
Mean	114	226	284	319	358	385	415	422	444	458	459	479	492	505	512
Std Dev	6	36	22	32	25	22	24	23	21	25	40	26	23	32	26
SEM	2	9	6	8	6	6	6	6	7	8	13	8	7	10	8

[@] Receipt.
[$] Quarantine week 2.
* Interim sacrifice animal.

Appendix J (cont.): BODY WEIGHTS (g)

Group 3 Males

Animal# 85D00-	Rcpt@	QWK2$	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
773*	114	254	297	335	369	384	418	396							
776*	111	237	288	333	363	395	428	437							
787	111	234	283	324	350	365	402	410	424	435	450	451	469	465	483
796	119	260	321	376	422	458	498	516	504	554	562	568	578	610	620
801*	116	141	238	302	350	395	432	444							
802	108	178	231	274	299	320	342	355	367	377	382	392	391	371	409
812	114	242	298	341	380	400	443	448	465	489	494	507	518	507	535
817*	111	221	270	308	345	364	387	405							
819	114	237	279	323	349	366	393	405	419	432	447	451	467	469	477
821	113	236	284	322	346	363	386	397	414	432	438	456	466	466	477
823	116	246	290	327	364	349	423	440	439	319	421	443	465	485	521
824	118	232	276	325	361	362	418	426	445	454	467	490	487	500	508
828	120	238	287	324	346	367	396	396	414	438	434	458	470	461	485
829*	111	227	273	316	348	379	407	414							
831	111	247	300	350	387	405	449	432	468	489	501	523	528	529	547
Mean	114	229	281	325	359	378	415	421	436	442	460	474	484	486	506
Std Dev	3	31	23	23	26	31	35	36	38	64	50	50	50	60	56
SEM	1	8	6	6	7	8	9	9	12	20	16	16	16	19	18

@ Receipt.
$ Quarantine week 2.
* Interim sacrifice animal.

Appendix J (cont.): BODY WEIGHTS (g)

Group 4 Males

Animal# 85D00-	Rcpt@	QWK2$	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
762	118	248	291	323	354	382	415	429	444	453	469	485	498	513	519
763*	105	237	282	316	344	375	388	410							
765	118	247	289	319	354	385	398	416	430	453	470	502	517	530	548
774*	109	246	291	329	364	397	410	427							
778*	114	248	284	315	342	368	393	390							
782	125	243	283	237	301	346	376	392	401	421	414	442	445	445	468
784*	124	250	282	315	348	366	394	394							
789	116	251	300	348	385	421	463	475	496	512	521	551	566	573	585
798	112	239	283	332	360	389	396	423	444	451	480	483	502	506	522
806	117	108	201	211	281	320	365	391	407	433	434	463	435	457	486
807	111	239	284	321	350	369	398	405	429	451	452	464	471	478	490
810	110	237	289	323	358	381	408	424	437	460	454	478	489	496	491
813	110	232	275	306	325	344	378	388	392	411	429	444	456	463	483
816*	111	225	270	305	331	357	386	400							
818	114	242	292	330	364	381	402	419	434	457	465	486	495	499	514
Mean	114	233	280	309	344	372	398	412	431	450	459	480	487	496	511
Std Dev	6	35	23	36	26	24	22	23	29	27	30	31	38	38	35
SEM	1	9	6	9	7	6	6	6	9	9	10	10	12	12	11

@ Receipt.
$ Quarantine week 2.
* Interim sacrifice animal.

Appendix J (cont.): BODY WEIGHTS (g)

Group 1 Females

Animal# 85D00-	Rcpt[@]	QWK2[$]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
837	112	206	240	256	266	270	290	287	311	314	321	344	339	347	337
840	126	214	225	257	267	278	298	298	313	309	316	314	334	331	331
843*	118	188	211	232	232	248	258	270							
845	115	181	197	206	218	222	239	241	252	250	255	271	274	281	279
850*	105	192	200	216	239	242	264	270							
853	114	193	230	237	261	270	282	305	309	310	321	341	345	343	339
854*	117	210	225	245	258	274	286	291							
855*	118	217	244	249	271	280	288	304							
860	119	191	206	230	244	247	263	279	282	292	291	303	285	300	310
864	115	189	210	227	235	250	257	262	278	279	287	292	308	297	305
876	107	186	223	237	252	262	283	288	302	315	312	324	326	338	339
877	122	217	232	244	255	263	279	287	297	291	300	312	322	321	324
896	115	187	186	202	215	215	237	234	250	238	253	255	273	271	274
901*	115	154	192	207	233	237	249	248							
903	120	188	206	230	244	258	282	281	301	299	304	323	323	331	340
Mean	116	194	215	232	246	254	270	276	290	290	296	308	313	316	318
Std Dev	5	17	18	18	17	20	19	22	23	27	25	29	27	27	25
SEM	1	1	4	4	4	5	5	6	7	8	8	9	8	8	8

[@] Receipt.
[$] Quarantine week 2.
* Interim sacrifice animal.

Appendix J (cont.): BODY WEIGHTS (g)

Group 2 Females

Animal# 85D00-	Rcpt[@]	QWK2[$]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
836	115	208	228	244	265	267	281	273	294	301	305	307	326	326	327
838*	121	190	212	223	244	249	264	271							
839*	121	210	220	246	248	264	273	275							
846	115	182	205	206	226	233	246	238	249	254	256	268	279	268	270
847	114	205	225	243	273	271	292	291	303	319	323	339	334	349	355
848	108	190	210	204	227	235	244	245	236	248	257	273	270	292	292
851*	109	168	189	183	213	196	217	225							
873*	101	181	190	215	220	241	253	258							
886	119	204	226	235	253	270	277	278	294	303	301	300	311	316	310
888	120	212	234	246	286	294	293	300	304	325	340	356	362	357	367
893	103	181	201	202	205	228	246	250	264	272	267	288	290	287	295
894	119	204	225	240	255	271	267	279	289	290	294	312	323	327	325
895	105	187	208	216	239	241	261	263	276	283	276	284	289	295	294
899*	106	151	187	200	216	225	224	235							
904	120	198	220	234	238	258	266	274	282	276	290	295	301	304	311
Mean	113	191	212	222	241	250	260	264	279	287	291	302	308	312	315
Std Dev	7	17	15	20	23	25	22	21	23	26	28	28	28	28	30
SEM	2	4	4	5	6	6	6	6	7	8	9	9	9	9	9

[@] Receipt.
[$] Quarantine week 2.
* Interim sacrifice animal.

Appendix J (cont.): BODY WEIGHTS (g)

Group 3 Females

Animal# 85D00-	Rcpt@	QWK2$	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
832	133	206	215	233	240	251	260	262	272	235	275	276	286	291	292
833*	102	193	211	225	228	247	261	258							
841	123	195	223	235	240	264	263	276	276	284	283	296	310	299	303
844*	120	198	221	223	260	256	276	275							
849	111	179	187	199	206	220	240	243	238	250	255	273	202	252	261
856	106	207	226	241	247	255	270	270	281	286	281	290	298	304	314
863*	116	175	189	190	205	209	233	235							
865*	114	196	214	226	244	248	253	248							
870	117	198	220	224	243	245	254	252	269	272	273	280	292	295	303
871	110	207	221	240	263	269	279	272	292	297	298	301	313	306	313
872	110	201	225	242	255	250	278	283	283	294	299	303	306	315	324
874	122	211	241	251	277	282	295	312	317	314	327	340	349	346	355
883	111	177	206	206	227	230	246	244	257	242	246	262	274	277	282
887*	115	200	226	241	260	266	272	282							
902	115	154	195	215	234	244	259	259	263	278	276	288	289	289	298
Mean	115	193	215	226	242	249	263	265	275	275	281	291	292	297	304
Std Dev	8	16	15	17	20	19	16	20	21	26	23	22	38	24	25
SEM	2	4	4	4	5	5	4	5	7	8	7	7	12	8	8

@ Receipt.
$ Quarantine week 2.
* Interim sacrifice animal.

Appendix J (cont.): BODY WEIGHTS (g)

Group 4 Females

Animal# 85D00-	Rcpt[@]	QWK2[$]	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
835*	109	204	216	211	234	221	240	242							
857	113	207	229	237	244	261	269	263	282	281	289	303	316	310	316
858	109	200	216	228	246	246	253	255	260	266	278	280	283	285	295
859	129	191	220	233	249	256	265	273	280	265	276	294	298	300	317
862	117	190	213	216	217	231	231	237	248	241	244	255	261	266	265
868*	128	209	218	237	245	252	265	268							
875*	113	198	206	217	231	231	232	244							
880*	119	196	223	226	247	245	261	263							
885	118	200	215	216	234	232	245	237	253	255	256	265	274	281	289
889	122	203	209	233	243	245	255	261	259	266	267	274	280	281	280
891	115	178	190	192	211	212	216	224	233	237	229	245	231	236	241
892	123	208	218	244	253	267	272	286	296	292	298	313	323	320	322
897	110	171	199	207	224	224	240	246	251	246	253	266	270	280	285
905*	107	142	177	194	215	232	235	235							
906	109	148	186	208	222	233	236	250	265	265	257	282	282	285	293
Mean	116	190	209	220	234	239	248	252	263	261	265	278	282	284	290
Std Dev	7	21	15	16	14	16	17	17	19	17	21	21	27	23	25
SEM	2	5	4	4	4	4	4	4	6	6	7	7	8	7	8

[@] Receipt.
[$] Quarantine week 2.
* Interim sacrifice animal.

Appendix K: CLINICAL SIGNS

Coding for Clinical Signs

Symbol	Meaning
a	alopecia
ag	aggressive
d	dehydrated
di	diarrhea
e	emaciated
es	ear scab or bleeding
hy	hyperactive
i	irritable
ia	inactive
ir	increased respiratory rate
is	increased salivation
j	jumping
n	normal
sn	stain nose
snk	stain neck
sz	sneezing
t	twitching
tr	tremors
TS	terminal sacrifice

Appendix K (cont.): CLINICAL OBSERVATIONS IN RATS ADMINISTERED NITROGUANIDINE

Animal#	Day 0	7	14	21	28	35	42	49	56	63	70	77	84	TS	Total Signs
Male Control															
85D00758			t,sn							a	a	a	a	a,di	t,sn,a,di
85D00768							d,e		sn						d,e,sn
85D00769		es	sn,i												es,i,sn
85D00770		es			j,sn	i,sn			sn				sn		es,j,sn,i
85D00785			i,sn		i					sn			di	di	i,sn,di
85D00788		es	i		i	sn									es,i,sn
85D00790		es	sn			sn									es,sn
85D00795						sn									sn
85D00803		t	sn		sn	sn									t,sn
85D00804			sn	sn					sn	sn,a					sn,a
85D00805	e,d	es	sn,i		i										e,d,es,sn,i
85D00814			sn	sn	i	sn									sn,i
85D00822				sn		sn									sn
85D00825			sn	i	sn	sn	sn								sn,i
85D00826				sn											sn
Female Control															
85D00837					sn	sn,i						i			sn,i
85D00840				sn	sn	sn				sn					sn
85D00843		sn	sn		t	sn									sn,t
85D00845			sn,e,i			sn		sn	sn						sn,e,i
85D00850			sn			sn									sn
85D00853						sn			sn				sn		sn
85D00854			i	i	sn										sn,i
85D00855			sn			sn									sn
85D00960			sn,i			sn									sn,i
85D00864			i	i											i
85D00876			i	d											i,d
85D00877										ia,a					ia,a
85D00896															n
85D00901	e,d	sn				sn									e,d,sn
85D00903		sn				sn									sn

Appendix K (cont.): CLINICAL OBSERVATIONS IN RATS ADMINISTERED NITROGUANIDINE

Animal#	Day 0	7	14	21	28	35	42	49	56	63	70	77	84	TS	Total Signs
Male 100 mg/kg															
85D00759															n
85D00760			t												t
85D00761								tr							tr
85D00764		ir,is,sn													ir,is,sn
85D00771			i	sn	sn							sn	sn		i,sn
85D00783		es			is,sn										es,is,sn
85D00786	e,d	es			sn	sn									e,d,es,sn
85D00791				sn		sn									sn
85D00792					sn	sn									sn
85D00793			sn	sn					sn		sn				sn
85D00799			sn									sn			sn
85D00808		d	d,e			sn			sn		i				d,e,sn,i
85D00809		es	sn			sn									es,sn
85D00811		es		sn											es,sn
85D00815			sn	t		sn				d,e		i	sn		sn,t,d,e,i
Female 100 mg/kg															
85D00904	es	sn							sn						es,sn
85D00836												d,sn	sn	sn	d,sn
85D00838			sn			sn									sn
85D00839															n
85D00846			is							a					is,a
85D00847			di	ag	sn	sn			sn	sn			sn		di,ag,sn
85D00848						sn			sn	sn					sn
85D00851	es		e,sn		e										es,e,sn
85D00873		sn	sn	i		i,sn									i,sn
85D00886								sn		sn					sn
85D00888								a	a	a	a	a	a	a	a
85D00893			sn			hy									sn,hy
85D00894								a	a						a
85D00895			i		i			i		sn			sn	sn	i,sn
85D00899	d,e	sn													d,e,sn

Appendix K (cont.): CLINICAL OBSERVATIONS IN RATS ADMINISTERED NITROGUANIDINE

Animal#	Day 0	7	14	21	28	35	42	49	56	63	70	77	84	TS	Total Signs
Male 316 mg/kg															
85D00773		es	t												es,t
85D00776				i	i	sn									i,sn
85D00787						sn			sn						sn
85D00801	e,d		sn		i										e,d,i,sn
85D00802				sn					sn				sn		sn
85D00812		es	i,sn		sn	sn									es,i,sn
85D00817															n
85D00819													sn		sn
85D00821			sn		i								sn		sn,i
85D00823			sn		sn	sn,i			d,e				sn		sn,i,d,e
85D00824			sn			sn									sn
85D00828			sn		sn	sn				a					sn,a
85D00829			sn	sn		i,sn	sn								sn,i
85D00831				sn		sn							sn	sn	sn
85D00796		es	sn			snk,sn									es,snk,sn
Female 316 mg/kg															
85D00832					sn	sn			a	a,sn					sn,a
85D00833															n
85D00841						sn		sn	sn	sn			sn		sn
85D00844			sn	sn	sn										sn
85D00849			i,di		sn							d,e			i,d,di,sn,e
85D00856						hy	tr,ir,j								hy,tr,ir,j
85D00865			sn	i	sn										sn,i
85D00863			sn,i												sn,i
85D00871			i	i		i				sn,snk					i,sn,snk
85D00872									a	a,d			sn	sn	a,d,sn
85D00874			sn		sn	sn		a	a	a,sn	a	a	a	a	sn,a
85D00883									a						a
85D00887		sn				sn									sn
85D00902	d,e	sn				sn									d,e,sn
85D00870						sn,i									sn,i

Appendix K (cont.): CLINICAL OBSERVATIONS IN RATS ADMINISTERED NITROGUANIDINE

Animal#	Day 0	7	14	21	28	35	42	49	56	63	70	77	84	TS	Total Signs
Male 1000 mg/kg															
85D00762															n
85D00763					i	sn									i,sn
85D00765			sn												sn
85D00774		es			i	sn									es,i,sn
85D00778			i		i	sn									i,sn
85D00782		d	d,e		i	i			sn	a					d,e,i,sn,a
85D00784				sn											sn
85D00789			t			sn		sz							t,sn,sz
85D00798			sn		i	i					i				sn,i
85D00806	e,d		e,sn								e,d	e,d	sn		e,d,sn
85D00807		es													es
85D00810			sn		i	sn				sn					sn,i
85D00813		es						i,hy	i						es,i,hy
85D00816			sn	sn		sn									sn
85D00818			sn		is						sn		sn		sn,is
Female 1000 mg/kg															
85D00835					sn	sn									sn
85D00857						sn							sn		sn
85D00858	es		sn		sn				a	a					es,sn,a
85D00859						sn			sn				sn	sn	sn
85D00862			i					sn	a	a					i,sn,a
85D00868	es														es
85D00875			sn			hy,sn									sn,hy
85D00880	es					hy,sn									es,sn,hy
85D00885					sn	sn									sn
85D00889									a	sn					a,sn
85D00891						sn		sn		ia					sn,ia
85D00892			sn		sn	sn				sn			sn	sn	sn
85D00897						sn									sn
85D00905	e,d														e,d
85D00906	e,d				sn	sn		sn,i					sn		d,e,sn,i

Appendix L: SERUM CHEMISTRY

List of Serum Chemistry Abbreviations/Units

ALB	Albumin (g/dl)
ALKP	Alkaline Phosphokinase (U/L)
ALT	Alanine Amino-Transferase (U/L)
AST	Aspartate Amino-Transferase (U/L)
BUN	Blood Urea Nitrogen (mg/dl)
CAL	Calcium (mg/dl)
CHLO	Chloride (mMol/L)
CHOL	Cholesterol (mg/dl)
COP	Copper (µg/dl)
CPK	Creatine Phosphokinase (U/L)
CREA	Creatinine (mg/dl)
GLOB	Globulin (g/dl)
GLU	Glucose (mg/dl)
IRON	Iron (µg/dl)
LDH	Lactic Dehydrogenase (U/L)
MG	Magnesium (mg/dl)
"NT"	Not tabulated
PHOS	Phosphorus (mg/dl)
POT	Potassium (Meq/L)
SOD	Sodium (Meq/L)
TBIL	Total Bilirubin (mg/dl)
TPRO	Total Protein (g/dl)
TRIG	Triglyceride (mg/dl)
URIC	Uric Acid (mg/dl)

LETTERMAN ARMY INSTITUTE OF RESEARCH — Appendix L: SERUM CHEMISTRY
DIV OF TOXICOLOGY — STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 — SCHEDULED INPUT DATE: 02-OCT-85 DAY OF DOSAGE: 43

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	CPK	BUN	GLU	LDH	ALT	AST	ALKP	CHOL	CREA	TRIG	URIC	MG
85D0788/M	1/1	02-OCT-85	454.	15.8	219.1	566.9	36.5	97.0	125.	78.4	0.50	112.2	1.5	2.95
85D0790/M	1/1	02-OCT-85	234.	16.1	208.5	807.4	32.4	76.9	127.	65.7	0.54	94.4	1.5	2.99
85D0803/M	1/1	02-OCT-85	315.	20.5	255.5	677.9	37.1	90.0	197.	64.9	0.70	117.3	2.1	3.43
85D0825/M	1/1	02-OCT-85	380.	17.5	221.6	503.9	37.6	89.9	142.	59.3	0.52	228.3	1.4	2.81
85D0826/M	1/1	02-OCT-85	226.	14.9	234.2	451.3	26.2	63.7	100.	55.0	0.57	54.6	1.7	3.19
PARAMETER MEANS:			321.8	16.96	227.8	601.5	33.96	83.5	138.2	64.66	0.566	121.4	1.64	3.074
STANDARD DEVIATIONS:			97.2	2.19	18.	142.8	4.8	13.2	36.2	8.83	0.0792	64.6	0.279	0.241
85D0759/M	2/1	02-OCT-85	324.	15.8	208.9	850.1	29.0	117.3	156.	61.8	0.50	121.6	2.5	3.13
85D0760/M	2/1	02-OCT-85	265.	17.5	210.9	594.9	31.2	72.2	104.	59.4	0.69	80.7	2.5	3.02
85D0783/M	2/1	02-OCT-85	308.	19.6	223.1	659.2	31.5	69.7	182.	56.2	0.76	72.8	1.6	2.91
85D0786/M	2/1	02-OCT-85	156.	19.4	208.5	182.4	36.1	63.4	156.	58.2	0.77	64.4	1.6	2.84
85D0811/M	2/1	02-OCT-85	295.	17.5	244.6	405.7	39.6	82.9	167.	52.7	0.60	95.5	1.5	3.05
PARAMETER MEANS:			269.6	17.96	219.2	538.5	33.48	81.1	153.0	57.66	0.664	87.	1.94	2.99
STANDARD DEVIATIONS:			67.1	1.57	15.4	254.6	4.29	21.4	29.4	3.44	0.1141	22.5	0.513	0.115
85D0773/M	3/1	02-OCT-85	342.	20.8	205.6	1308.0	34.9	122.8	190.	60.7	0.66	59.4	2.0	3.35
85D0776/M	3/1	02-OCT-85	901.	15.1	223.1	1062.0	43.4	282.2	224.	71.1	0.42	160.3	3.6	3.32
85D0801/M	3/1	02-OCT-85	436.	16.4	195.6	479.6	30.1	90.8	124.	64.8	0.53	63.0	1.0	2.69
85D0817/M	3/1	02-OCT-85	259.	20.2	226.4	569.3	32.6	67.1	146.	66.2	0.60	64.8	1.7	3.00
85D0829/M	3/1	02-OCT-85	619.	14.5	226.0	817.3	34.7	153.4	116.	72.4	0.39	81.5	2.6	2.44
PARAMETER MEANS:			511.4	17.4	215.3	847.2	35.14	143.3	160.0	67.04	0.52	85.8	2.18	2.96
STANDARD DEVIATIONS:			255.7	2.92	14.0	343.4	5.01	84.2	45.9	4.77	0.1151	42.5	0.981	0.396
85D0763/M	4/1	02-OCT-85	224.	18.3	214.4	715.9	33.7	80.1	179.	83.3	0.71	93.4	3.5	3.12
85D0774/M	4/1	02-OCT-85	355.	17.8	211.6	855.0	34.1	87.6	131.	62.4	0.70	62.0	2.3	3.35
85D0778/M	4/1	02-OCT-85	212.	18.6	205.3	479.6	34.8	75.6	148.	85.5	0.78	79.4	1.2	2.46
85D0784/M	4/1	02-OCT-85	286.	20.8	194.4	891.3	36.7	111.3	159.	78.8	0.71	92.2	2.1	3.11
85D0816/M	4/1	02-OCT-85	414.	16.5	231.8	1135.8	37.4	106.0	162.	81.3	0.67	135.2	0.9	3.02
PARAMETER MEANS:			298.2	18.4	211.5	815.5	35.34	92.1	155.8	78.26	0.714	92.4	2.0	3.012
STANDARD DEVIATIONS:			86.2	1.56	13.7	241.2	1.63	15.8	17.8	9.2	0.0403	27.	1.025	0.332

LETTERMAN ARMY INSTITUTE OF RESEARCH — Appendix L: SERUM CHEMISTRY
DIV OF TOXICOLOGY — STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 — SCHEDULED INPUT DATE: 02-OCT-85 DAY OF DOSAGE: 43

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	TPRO	TBIL	CAL	PHOS	ALB	GLOB	SOD	POT	CHLO	IRON	COP
85D0788/M	1/1	02-OCT-85	5.85	1.2	11.2	9.49	3.63	2.22	166.	7.3	104.7	189.	108.
85D0790/M	1/1	02-OCT-85	5.88	0.5	10.8	8.92	3.87	2.01	164.	6.7	100.7	296.	102.
85D0803/M	1/1	02-OCT-85	5.93	0.6	11.4	8.83	3.31	2.61	168.	6.6	102.3	201.	99.
85D0825/M	1/1	02-OCT-85	5.82	1.1	11.3	10.78	3.19	2.63	164.	8.0	101.2	227.	93.
85D0826/M	1/1	02-OCT-85	5.36	0.4	10.6	8.90	3.02	2.34	168.	6.8	104.3	129.	90.
PARAMETER MEANS:			5.768	0.76	11.06	9.38	3.404	2.362	166.	7.08	102.6	208.4	98.4
STANDARD DEVIATIONS:			0.232	0.3647	0.34	0.82	0.343	0.264	2.	0.58	1.8	60.7	7.2
85D0759/M	2/1	02-OCT-85	5.71	1.0	10.3	7.88	3.04	2.67	159.	6.0	102.6	217.	96.
85D0760/M	2/1	02-OCT-85	5.87	0.5	10.3	8.26	3.20	2.66	157.	6.6	100.1	189.	120.
85D0783/M	2/1	02-OCT-85	5.79	0.5	10.9	7.46	3.92	1.87	161.	7.1	104.2	148.	102.
85D0786/M	2/1	02-OCT-85	5.64	0.5	11.1	10.28	3.53	2.11	164.	7.2	106.5	141.	102.
85D0811/M	2/1	02-OCT-85	5.68	0.6	11.0	10.85	2.98	2.70	167.	7.3	102.3	132.	102.
PARAMETER MEANS:			5.738	0.62	10.72	8.95	3.334	2.402	161.6	6.84	103.1	165.4	104.4
STANDARD DEVIATIONS:			0.092	0.2168	0.39	1.52	0.391	0.386	4.	0.541	2.4	36.2	9.1
85D0773/M	3/1	02-OCT-85	6.24	0.7	10.5	8.39	3.34	2.90	168.	6.2	109.0	163.	105.
85D0776/M	3/1	02-OCT-85	5.81"	"NT"	11.1	8.37	3.03	2.78	166.	7.3	106.7	131.	"NT"
85D0801/M	3/1	02-OCT-85	5.66	0.8	10.7	9.18	3.41	2.25	162.	6.0	101.9	151.	99.
85D0817/M	3/1	02-OCT-85	5.44	0.5	10.7	8.80	3.15	2.29	166.	6.7	101.5	145.	102.
85D0829/M	3/1	02-OCT-85	5.89	2.7	10.6	8.93	3.59	2.29	154.	8.7	104.1	125.	"NT"
PARAMETER MEANS:			5.808	1.175	10.72	8.73	3.304	2.502	163.2	6.98	104.6	143.	102.
STANDARD DEVIATIONS:			0.296	1.024	0.23	0.35	0..	0.312	5.6	1.085	3.2	15.3	3.
85D0763/M	4/1	02-OCT-85	6.06	0.6	10.5	8.75	3.24	2.82	155.	7.8	100.3	157.	123.
85D0774/M	4/1	02-OCT-85	5.84	0.5	10.3	7.59	2.97	2.87	164.	7.1	106.3	148.	99.
85D0778/M	4/1	02-OCT-85	5.62	0.5	10.6	6.98	2.94	2.68	163.	6.5	104.6	138.	102.
85D0784/M	4/1	02-OCT-85	5.66	0.6	10.8	7.47	3.59	2.07	162.	7.5	103.1	151.	105.
85D0816/M	4/1	02-OCT-85	5.60	0.5	11.1	10.86	2.75	2.84	166.	6.8	101.5	182.	87.
PARAMETER MEANS:			5.756	0.54	10.66	8.33	3.098	2.656	162.	7.14	103.3	155.2	103.2
STANDARD DEVIATIONS:			0.195	0.0548	0.3	1.56	0.326	0.336	4.2	0.522	2.2	16.5	13.

LETTERMAN ARMY INSTITUTE OF RESEARCH — Appendix L: SERUM CHEMISTRY
DIV OF TOXICOLOGY — STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 — SCHEDULED INPUT DATE: 04-OCT-85 — DAY OF DOSAGE: 45

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	CPK	BUN	GLU	LDH	ALT	AST	ALKP	CHOL	CREA	TRIG	URIC	MG
85D0843/F	1/1	04-OCT-85	284.	18.4	213.0	389.8	47.0	78.9	156.	76.3	0.71	116.8	3.5	3.45
85D0850/F	1/1	04-OCT-85	225.	15.6	204.1	358.0	32.6	70.4	157.	59.1	0.76	70.9	3.8	3.41
85D0854/F	1/1	04-OCT-85	240.	15.5	192.4	523.8	27.7	66.9	113.	74.0	0.59	94.1	2.8	3.36
85D0855/F	1/1	04-OCT-85	193.	20.3	216.4	434.8	32.3	65.8	119.	67.5	0.60	166.1	3.0	3.20
85D0901/F	1/1	04-OCT-85	573.	15.5	265.2	915.7	25.3	147.1	67.	81.4	0.65	80.2	1.9	3.35
PARAMETER MEANS:			303.	17.06	218.2	524.4	32.98	85.8	122.4	71.66	0.662	105.6	3.0	3.346
STANDARD DEVIATIONS:			154.4	2.196	27.9	227.5	8.427	34.7	37.1	8.62	0.0726	38.0	0.731	0.097
85D0838/F	2/1	04-OCT-85	190.	18.1	190.7	469.2	48.2	92.4	135.	79.8	0.67	110.8	3.5	3.16
85D0839/F	2/1	04-OCT-85	139.	14.5	261.1	546.4	32.2	62.2	64.	64.4	0.63	80.1	1.5	2.80
85D0851/F	2/1	04-OCT-85	190.	17.6	215.3	468.9	54.3	87.7	127.	70.9	0.71	140.6	3.6	3.05
85D0873/F	2/1	04-OCT-85	182.	15.3	250.2	278.3	28.3	61.7	79.	91.2	0.71	57.0	3.4	3.19
85D0899/F	2/1	04-OCT-85	272.	14.5	180.2	437.0	34.2	73.0	88.	74.1	0.64	59.0	2.7	3.60
PARAMETER MEANS:			194.6	16.0	219.5	439.9	39.44	75.4	98.6	76.08	0.672	89.5	2.94	3.16
STANDARD DEVIATIONS:			48.17	1.729	35.58	98.99	11.20	14.2	30.9	10.12	0.0377	35.8	0.879	0.3
85D0833/F	3/1	04-OCT-85	246.	16.7	218.0	758.8	36.9	84.7	109.	82.8	0.73	73.2	2.7	2.98
85D0844/F	3/1	04-OCT-85	208.	16.5	237.4	641.2	35.4	68.5	128.	80.4	0.62	90.7	3.9	3.40
85D0863/F	3/1	04-OCT-85	269.	15.1	257.2	869.0	88.9	107.4	123.	70.5	0.72	81.7	1.9	2.87
85D0865/F	3/1	04-OCT-85	280.	16.1	225.3	564.2	31.3	75.8	133.	71.9	0.68	56.4	3.1	3.33
85D0887/F	3/1	04-OCT-85	269.	12.4	216.8	422.0	30.5	71.8	152.	72.1	0.61	151.3	4.7	3.68
PARAMETER MEANS:			254.4	15.36	230.9	651.	44.6	81.6	129.	75.54	0.672	90.7	3.26	3.25
STANDARD DEVIATIONS:			28.8	1.77	16.8	172.6	24.91	15.6	15.7	5.63	0.0554	36.2	1.081	0.40
85D0835/F	4/1	04-OCT-85	262.	16.1	207.5	551.7	36.6	80.9	148.	61.9	0.63	120.1	3.0	2.88
85D0868/F	4/1	04-OCT-85	213.	19.0	233.1	474.7	43.9	81.1	92.	69.9	0.70	126.9	4.7	4.01
85D0875/F	4/1	04-OCT-85	293.	13.0	241.0	224.3	43.4	79.9	131.	75.4	0.71	92.4	4.9	3.80
85D0880/F	4/1	04-OCT-85	250.	17.1	207.2	830.0	27.9	74.1	67.	74.5	0.75	99.5	2.2	3.08
85D0905/F	4/1	04-OCT-85	366.	12.7	204.7	514.7	29.0	79.5	74.	66.7	0.63	53.2	1.4	2.51
PARAMETER MEANS:			276.8	15.58	218.7	519.1	36.16	79.1	102.4	69.68	0.684	98.4	3.24	3.27
STANDARD DEVIATIONS:			57.5	2.70	17.0	216.0	7.62	2.9	35.6	5.60	0.053	29.0	1.53	0.65

LETTERMAN ARMY INSTITUTE OF RESEARCH — Appendix L: SERUM CHEMISTRY
DIV OF TOXICOLOGY — STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 — SCHEDULED INPUT DATE: 04-OCT-85 DAY OF DOSAGE: 45

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	TPRO	TBIL	CAL	PHOS	ALB	GLOB	SOD	POT	CHLO	IRON	COP
85D0843/F	1/1	04-OCT-85	6.33	0.6	11.	9.15	3.52	2.81	185.	7.1	116.0	334.	156.
85D0850/F	1/1	04-OCT-85	6.59	0.5	10.9	6.08	3.67	2.92	184.	7.2	118.1	406.	138.
85D0854/F	1/1	04-OCT-85	6.21	0.5	10.2	7.97	3.37	2.84	177.	5.6	109.5	359.	138.
85D0855/F	1/1	04-OCT-85	6.24	0.7	10.8	7.32	3.45	2.79	178.	6.1	112.0	261.	108.
85D0901/F	1/1	04-OCT-85	6.28	0.6	"NT"	8.71	3.59	2.69	165.	6.1	111.6	277.	"NT"
PARAMETER MEANS:			6.33	0.58	10.72	7.846	3.52	2.81	177.8	6.42	113.4	327.4	135.
STANDARD DEVIATIONS:			0.15	0.0837	0.36	1.21	0.117	0.083	8.0	0.698	3.5	59.5	19.9
85D0838/F	2/1	04-OCT-85	6.77	0.5	10.8	7.55	4.08	2.69	181.	6.5	114.1	331.	195.
85D0839/F	2/1	04-OCT-85	6.35	0.4	10.8	5.22	3.54	2.81	181.	6.2	116.4	305.	153.
85D0851/F	2/1	04-OCT-85	6.99	0.6	11.3	8.00	4.13	2.87	180.	6.3	114.2	309.	168.
85D0873/F	2/1	04-OCT-85	6.43	0.4	10.5	9.42	3.61	2.82	185.	7.0	113.5	331.	132.
85D0899/F	2/1	04-OCT-85	6.62	0.5	10.3	10.08	3.49	3.13	179.	5.6	109.3	378.	153.
PARAMETER MEANS:			6.632	0.48	10.74	8.054	3.77	2.864	181.2	6.32	113.5	330.8	160.2
STANDARD DEVIATIONS:			0.259	0.0837	0.38	1.888	0.309	0.163	2.3	0.507	2.6	29.0	23.3
85D0833/F	3/1	04-OCT-85	6.04	0.4	10.4	6.10	3.12	2.92	167.	5.0	107.4	356.	144.
85D0844/F	3/1	04-OCT-85	6.36	0.5	11.0	7.73	3.51	2.85	186.	6.9	116.4	400.	114.
85D0863/F	3/1	04-OCT-85	5.85	0.4	10.3	8.97	3.23	2.62	183.	5.6	117.1	283.	132.
85D0865/F	3/1	04-OCT-85	6.09	0.4	10.2	9.06	3.22	2.87	180.	6.7	111.9	410.	129.
85D0887/F	3/1	04-OCT-85	6.48	0.6	11.1	9.53	3.51	2.97	187.	7.4	116.1	302.	114.
PARAMETER MEANS:			6.164	0.46	10.6	8.278	3.318	2.846	180.6	6.32	113.8	350.2	126.6
STANDARD DEVIATIONS:			0.254	0.0894	0.42	1.388	0.180	0.135	8.1	0.988	4.1	56.8	12.8
85D0835/F	4/1	04-OCT-85	6.02	0.7	10.6	5.28	3.24	2.78	166.	5.4	108.0	334.	132.
85D0868/F	4/1	04-OCT-85	6.68	0.6	11.1	8.20	3.69	2.99	172.	6.8	107.9	343.	135.
85D0875/F	4/1	04-OCT-85	6.16	0.7	10.8	9.33	3.21	2.97	190.	6.4	115.1	239.	117.
85D0880/F	4/1	04-OCT-85	6.56	0.5	9.9	7.32	3.78	2.78	165.	5.5	105.7	268.	144.
85D0905/F	4/1	04-OCT-85	5.59	0.4	9.9	7.30	2.98	2.61	167.	6.0	112.7	331.	126.
PARAMETER MEANS:			6.202	0.58	10.46	7.486	3.38	2.826	172.	6.02	109.9	303.	130.8
STANDARD DEVIATIONS:			0.4376	0.1304	0.54	1.487	0.341	0.157	10.4	0.593	3.9	46.6	10.1

LETTERMAN ARMY INSTITUTE OF RESEARCH — Appendix L: SERUM CHEMISTRY
DIV OF TOXICOLOGY — STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO C[illegible] SAN FRANCISCO, CA 94129 — SCHEDULED INPUT DATE: 20-NOV-85 DAY OF DOSAGE: 92

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	CPK	BUN	GLU	LDH	ALT	AST	ALKP	CHOL	CREA	TRIG	URIC	MG
85D0758/M	1/1	20-NOV-85	328.	18.5	260.0	1006.0	35.0	90.8	94.	79.3	0.74	122.7	1.6	2.60
85D0768/M	1/1	20-NOV-85	255.	17.6	168.1	839.3	31.7	93.6	74.	56.0	1.01	42.8	1.4	2.32
85D0769/M	1/1	20-NOV-85	258.	23.4	221.4	918.5	31.9	92.8	111.	72.4	0.76	159.3	2.7	2.65
85D0770/M	1/1	20-NOV-85	355.	22.8	284.2	606.6	31.9	66.6	148.	76.0	0.86	161.4	1.4	2.51
85D0785/M	1/1	20-NOV-85	420.	19.4	204.9	777.6	47.6	112.0	111.	62.8	1.05	135.8	2.0	2.86
85D0795/M	1/1	20-NOV-85	259.	17.6	228.8	693.3	31.9	80.7	100.	56.1	0.66	119.7	1.7	2.56
85D0804/M	1/1	20-NOV-85	218.	15.9	229.8	1533.0	50.2	444.5	102.	77.7	0.40	266.0	3.1	2.33
85D0805/M	1/1	20-NOV-85	198.	15.1	255.5	145.4	32.9	59.2	159.	72.5	0.81	126.1	3.1	2.75
85D0814/M	1/1	20-NOV-85	267.	17.1	214.8	821.7	35.0	75.4	101.	60.0	0.68	124.9	1.1	2.39
85D0822/M	1/1	20-NOV-85	229.	15.0	188.6	691.1	30.7	68.5	86.	67.0	0.49	103.5	2.1	2.87
PARAMETER MEANS:			278.7	18.24	225.6	803.2	35.88	118.4	108.6	67.98	0.746	136.2	2.02	2.584
STANDARD DEVIATIONS:			68.6	2.92	34.6	347.1	7.03	115.6	26.2	8.84	0.2045	56.3	0.722	0.202
85D0761/M	2/1	20-NOV-85	408.	20.2	268.6	616.9	34.9	71.9	119.	61.3	0.96	128.4	1.6	2.67
85D0764/M	2/1	20-NOV-85	168.	20.6	229.9	513.6	37.8	62.1	109.	63.4	0.69	206.6	1.6	2.43
85D0771/M	2/1	20-NOV-85	177.	26.3	280.5	435.1	65.7	83.4	131.	79.3	0.89	109.1	1.3	2.58
85D0791/M	2/1	20-NOV-85	185.	23.3	172.1	289.7	23.8	69.0	55.	62.3	0.78	46.0	1.9	2.34
85D0792/M	2/1	20-NOV-85	736.	20.0	239.6	797.3	79.1	188.2	123.	68.5	0.64	258.2	2.6	2.69
85D0793/M	2/1	20-NOV-85	254.	18.3	212.9	837.9	33.5	74.2	150.	78.9	0.71	126.5	2.1	2.57
85D0799/M	2/1	20-NOV-85	170.	28.4	170.5	635.3	25.4	64.6	52.	48.1	0.57	45.1	1.4	2.21
85D0808/M	2/1	20-NOV-85	290.	14.4	207.0	802.7	29.3	82.6	91.	59.0	0.58	76.4	1.3	2.49
85D0809/M	2/1	20-NOV-85	439.	19.6	252.2	545.7	31.9	74.4	163.	68.2	0.80	121.5	1.6	2.42
85D0815/M	2/1	20-NOV-85	400.	14.7	272.1	136.3	32.1	58.5	100.	75.7	0.73	114.9	3.9	2.48
PARAMETER MEANS:			322.7	20.58	230.5	561.1	39.35	82.9	109.3	66.47	0.735	123.3	1.93	2.488
STANDARD DEVIATIONS:			179.8	4.48	39.6	229.0	18.19	37.9	36.4	9.76	0.1264	66.4	0.80	0.148

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ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	CPK	BUN	GLU	LDH	ALT	AST	ALKP	CHOL	CREA	TRIG	URIC	MG
85D0787/M	3/1	20-NOV-85	278.	17.8	325.1	172.5	43.8	67.5	152.	67.7	0.80	89.1	4.0	2.67
85D0796/M	3/1	20-NOV-85	344.	17.0	258.5	468.5	30.0	79.9	82.	82.3	0.81	86.0	1.5	1.91
85D0802/M	3/1	20-NOV-85	383.	13.9	268.1	619.3	38.9	92.6	108.	64.8	0.64	106.5	2.6	2.87
85D0812/M	3/1	20-NOV-85	569.	17.5	283.3	555.9	38.9	118.1	114.	73.7	0.63	150.3	2.0	2.62
85D0819/M	3/1	20-NOV-85	366.	20.7	252.9	441.9	45.8	117.4	111.	63.3	0.59	112.8	3.2	3.33
85D0821/M	3/1	20-NOV-85	416.	14.7	248.9	623.5	35.4	73.3	110.	64.9	0.55	115.3	1.7	2.80
85D0823/M	3/1	20-NOV-85	199.	14.3	196.5	456.2	39.5	79.2	71.	81.5	0.61	106.9	2.3	2.39
85D0824/M	3/1	20-NOV-85	399.	15.7	219.6	643.3	32.6	118.1	70.	78.5	0.53	74.5	2.2	2.64
85D0828/M	3/1	20-NOV-85	320.	13.7	281.7	310.2	34.8	71.3	89.	73.1	0.62	126.9	3.8	2.89
85D0831/M	3/1	20-NOV-85	156.	21.2	289.4	192.8	31.7	57.8	116.	71.7	0.72	99.0	2.9	2.76
PARAMETER MEANS:			343.	16.65	262.4	448.4	37.14	87.5	102.3	72.15	0.65	106.7	2.62	2.688
STANDARD DEVIATIONS:			116.5	2.7	36.5	173.4	5.17	22.8	24.9	6.98	0.0966	21.7	0.848	0.366
85D0762/M	4/1	20-NOV-85	373.	19.6	253.1	1527.0	44.6	122.3	122.	92.2	0.85	170.8	2.0	2.91
85D0765/M	4/1	20-NOV-85	230.	19.1	268.6	768.6	36.3	69.5	145.	77.2	0.84	162.6	2.1	2.58
85D0782/M	4/1	20-NOV-85	170.	18.9	263.0	374.6	50.4	78.2	157.	91.4	0.75	112.3	1.5	2.41
85D0789/M	4/1	20-NOV-85	145.	18.4	235.9	94.1	28.7	52.8	134.	86.1	0.72	194.1	1.4	2.35
85D0798/M	4/1	20-NOV 35	317.	15.1	266.4	638.7	38.1	74.3	162.	82.8	0.65	148.9	2.0	2.56
85D0806/M	4/1	20-NOV-85	239.	15.6	222.3	516.2	34.3	72.4	110.	89.1	0.70	112.4	1.9	2.20
85D0807/M	4/1	20-NOV-85	532.	20.3	276.3	893.7	36.8	102.0	161.	72.8	0.86	59.7	1.6	2.69
85D0810/M	4/1	20-NOV-85	305.	18.0	252.8	841.5	28.3	72.0	75.	82.2	0.68	60.9	3.0	2.78
85D0813/M	4/1	20-NOV-85	333.	16.9	233.0	711.2	32.9	66.9	151.	67.3	0.71	87.3	1.0	2.37
85D0818/M	4/1	20-NOV-85	367.	18.3	217.8	791.5	52.3	94.9	149.	78.2	0.71	94.6	2.2	2.78
PARAMETER MEANS:			301.1	18.02	248.9	715.7	38.27	80.5	136.6	81.93	0.747	120.4	1.87	2.563
STANDARD DEVIATIONS:			112.8	1.68	20.5	374.6	8.34	20.2	27.5	8.15	0.0757	46.8	0.544	0.228

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ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	TPRO	TBIL	CAL	PHOS	ALB	GLOB	SOD	POT	CHLO	IRON	COP
85D0758/M	1/1	20-NOV-85	5.49	0.7	10.1	5.46	2.65	2.84	155.	6.2	103.5	213.	110.
85D0768/M	1/1	20-NOV-85	5.68	0.4	10.3	8.55	2.73	2.95	158.	6.2	100.7	98.	112.
85D0769/M	1/1	20-NOV-85	6.15	0.6	11.0	7.02	2.84	3.31	162.	7.6	103.3	160.	114.
85D0770/M	1/1	20-NOV-85	5.83	0.7	11.1	6.75	3.10	2.73	159.	6.5	101.5	174.	122.
85D0785/M	1/1	20-NOV-85	5.93	0.5	10.8	9.47	3.52	2.41	166.	6.4	105.9	207.	92.
85D0795/M	1/1	20-NOV-85	5.73	0.6	9.4	6.93	3.09	2.64	149.	5.7	93.3	187.	94.
85D0804/M	1/1	20-NOV-85	5.82	3.0	9.6	11.13	2.86	3.13	169.	9.5	109.3	207.	"NT"
85D0805/M	1/1	20-NOV-85	5.95	0.6	10.9	9.38	3.00	2.95	156.	5.9	100.4	193.	140.
85D0814/M	1/1	20-NOV-85	5.43	0.4	10.7	8.54	4.03	1.40	157.	6.0	102.8	160.	120.
85D0822/M	1/1	20-NOV-85	5.69	0.5	10.4	7.76	3.84	1.84	160.	6.0	99.6	233.	130.
PARAMETER MEANS:			5.77	0.8	10.43	8.099	3.169	2.62	159.1	6.6	102.	183.2	114.9
STANDARD DEVIATIONS:			0.216	0.7803	0.59	1.651	0.47	0.592	5.7	1.145	4.2	38.	15.5
85D0761/M	2/1	20-NOV-85	5.61	0.8	10.1	6.95	2.88	2.73	156.	6.0	98.8	177.	108.
85D0764/M	2/1	20-NOV-85	5.93	0.7	10.8	5.55	2.88	3.05	164.	6.0	103.1	147.	96.
85D0771/M	2/1	20-NOV-85	5.71	0.6	10.9	5.89	2.99	2.71	153.	5.8	100.4	207.	128.
85D0791/M	2/1	20-NOV-85	5.63	0.6	9.9	7.25	2.85	2.78	160.	6.6	100.6	160.	102.
85D0792/M	2/1	20-NOV-85	5.94	1.6	10.8	8.36	3.23	2.71	166.	6.8	103.2	216.	114.
85D0793/M	2/1	20-NOV-85	6.00	0.6	10.0	8.18	3.15	2.85	156.	5.9	94.6	197.	120.
85D0799/M	2/1	20-NOV-85	5.76	0.4	9.1	8.35	3.26	2.50	149.	5.4	92.3	157.	112.
85D0808/M	2/1	20-NOV-85	5.39	0.5	10.5	8.48	2.97	2.42	162.	6.4	101.7	187.	100.
85D0809/M	2/1	20-NOV-85	5.69	0.5	10.7	8.31	2.95	2.74	154.	6.4	99.6	174.	110.
85D0815/M	2/1	20-NOV-85	5.92	0.4	10.6	9.25	4.10	1.81	158.	8.3	99.7	134.	134.
PARAMETER MEANS:			5.758	0.67	10.34	7.65	3.126	2.63	157.8	6.36	99.4	175.6	112.4
STANDARD DEVIATIONS:			0.191	0.3498	0.56	1.217	0.373	0.34	5.3	0.798	4.0	26.6	12.1

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ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	TPRO	TBIL	CAL	PHOS	ALB	GLOB	SOD	POT	CHLO	IRON	COP
85D0787/M	3/1	20-NOV-85	5.68	0.5	9.5	7.82	2.90	2.78	163.	9.7	100.9	108.	94.
85D0796/M	3/1	20-NOV-85	5.53	0.6	8.7	8.20	2.87	2.66	162.	7.1	99.9	170.	110.
85D0802/M	3/1	20-NOV-85	5.48	0.7	10.3	7.41	2.92	2.56	161.	7.2	100.0	147.	106.
85D0812/M	3/1	20-NOV-85	5.36	0.8	10.7	8.99	2.55	2.80	160.	6.9	103.2	236.	"NT"
85D0819/M	3/1	20-NOV-85	5.71	0.6	10.4	8.06	3.49	2.22	160.	7.5	96.6	210.	138.
85D0821/M	3/1	20-NOV-85	5.38	0.4	10.2	8.47	3.31	2.07	161.	7.5	99.0	207.	124.
85D0823/M	3/1	20-NOV-85	5.27	0.6	9.9	8.37	2.79	2.48	155.	6.5	97.2	177.	132.
85D0824/M	3/1	20-NOV-85	5.65	0.8	10.8	9.25	4.10	1.55	162.	6.3	105.8	200.	"NT"
85D0828/M	3/1	20-NOV-85	5.45	0.6	11.1	8.74	2.91	2.54	159.	6.7	101.3	190.	118.
85D0831/M	3/1	20-NOV-85	5.40	0.6	11.0	7.93	2.99	2.40	158.	7.0	101.6	187.	98.
PARAMETER MEANS:			5.491	0.62	10.26	8.324	3.083	2.406	160.1	7.24	100.6	183.2	115.
STANDARD DEVIATIONS:			0.149	0.1229	0.74	0.56	0.443	0.378	2.3	0.949	2.7	35.9	15.8
85D0762/M	4/1	20-NOV-85	5.85	0.6	11.7	6.59	2.73	3.12	186.	7.0	113.6	154.	98.
85D0765/M	4/1	20-NOV-85	5.86	0.8	10.7	8.94	2.64	3.22	155.	6.9	100.5	164.	122.
85D0782/M	4/1	20-NOV-85	5.86	0.9	11.5	5.31	2.96	2.9	169.	6.2	109.5	223.	114.
85D0789/M	4/1	20-NOV-85	5.54	0.6	11.5	5.38	3.03	2.51	174.	6.6	109.6	203.	110.
85D0798/M	4/1	20-NOV-85	5.87	0.5	10.8	7.47	2.93	2.94	163.	6.9	99.6	177.	112.
85D0806/M	4/1	20-NOV-85	5.27	0.5	9.0	5.31	3.03	2.23	141.	5.1	87.1	147.	124.
85D0807/M	4/1	20-NOV-85	5.50	0.5	10.4	7.23	3.13	2.37	154.	7.3	98.4	213.	110.
85D0810/M	4/1	20-NOV-85	5.62	0.4	10.5	11.25	3.15	2.47	151.	7.7	100.3	190.	132.
85D0813/M	4/1	20-NOV-85	5.75	0.4	10.4	6.26	4.00	1.75	157.	5.4	102.8	174.	120.
85D0818/M	4/1	20-NOV-85	5.63	0.4	10.7	7.47	4.01	1.62	161.	6.3	104.9	180.	122.
PARAMETER MEANS:			5.675	0.56	10.72	7.121	3.16	2.513	161.1	6.54	102.6	182.5	116.4
STANDARD DEVIATIONS:			0.2002	0.1713	0.77	1.863	0.473	0.546	12.8	0.813	7.4	24.9	9.6

LETTERMAN ARMY INSTITUTE OF RESEARCH — Appendix L: SERUM CHEMISTRY
DIV OF TOXICOLOGY — STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 — SCHEDULED INPUT DATE: 22-NOV-85 DAY OF DOSAGE: 94

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	CPK	BUN	GLU	LDH	ALT	AST	ALKP	CHOL	CREA	TRIG	URIC	MG
85D0837/F	1/1	22-NOV-85	224.	19.5	274.2	467.5	32.4	93.9	65.	56.4	0.88	101.3	2.0	3.40
85D0840/F	1/1	22-NOV-85	236.	15.4	249.8	403.2	22.8	79.9	43.	74.2	0.72	109.3	2.4	3.28
85D0845/F	1/1	22-NOV-85	139.	17.1	214.3	221.0	33.8	58.0	119.	84.4	0.65	97.7	2.5	3.52
85D0853/F	1/1	22-NOV-85	208.	13.8	217.2	640.9	46.2	102.3	38.	85.0	0.64	74.6	2.6	3.25
85D0860/F	1/1	22-NOV-85	378.	17.4	208.5	648.1	81.2	154.5	97.	68.3	0.64	125.7	2.7	3.34
85D0864/F	1/1	22-NOV-85	170.	18.3	214.8	392.9	25.5	65.1	42.	71.5	0.71	77.1	1.6	2.66
85D0876/F	1/1	22-NOV-85	570.	13.3	224.9	432.6	29.5	125.5	48.	91.1	0.53	208.0	2.1	2.90
85D0877/F	1/1	22-NOV-85	441.	15.3	265.7	379.5	32.3	151.1	76.	78.9	0.59	120.6	3.0	3.34
85D0896/F	1/1	22-NOV-85	271.	13.4	198.3	361.1	26.0	89.2	78.	99.5	0.69	99.0	1.8	3.20
85D0903/F	1/1	22-NOV-85	172.	14.2	274.2	302.3	27.0	62.1	44.	69.0	0.79	131.8	3.1	3.63
PARAMETER MEANS:			280.9	15.77	234.2	424.9	35.67	98.2	65.	77.83	0.684	114.5	2.38	3.252
STANDARD DEVIATIONS:			138.9	2.19	28.9	134.4	17.27	35.2	27.29	12.57	0.0996	37.9	0.498	0.285
85D0836/F	2/1	22-NOV-85	159.	18.0	235.8	636.9	28.3	72.2	62.	82.2	0.70	117.6	2.6	3.03
85D0846/F	2/1	22-NOV-85	156.	23.3	264.8	176.9	31.9	57.7	77.	65.8	0.74	85.9	5.0	4.07
85D0847/F	2/1	22-NOV-85	238.	19.0	236.9	587.6	45.9	86.0	65.	95.2	0.82	125.5	2.1	3.24
85D0848/F	2/1	22-NOV-85	190.	12.3	218.3	415.5	24.4	75.6	47.	70.9	0.61	51.2	1.1	2.79
85D0886/F	2/1	22-NOV-85	301.	13.8	226.2	306.3	24.7	91.5	54.	100.2	0.61	70.4	2.5	3.35
85D0888/F	2/1	22-NOV-85	344.	13.0	210.1	439.8	23.5	75.4	73.	67.7	0.62	67.2	1.5	2.78
85D0893/F	2/1	22-NOV-85	273.	11.9	202.4	601.9	31.4	99.1	79.	74.3	0.60	77.9	2.9	3.16
85D0894/F	2/1	22-NOV-85	224.	10.7	294.7	318.8	30.2	91.1	42.	76.9	0.74	68.3	2.0	3.50
85D0895/F	2/1	22-NOV-85	141.	13.3	249.6	341.5	31.1	72.6	59.	66.4	0.70	52.0	2.7	3.34
85D0904/F	2/1	22-NOV-85	131.	10.3	227.9	280.3	33.2	61.1	32.	81.7	0.68	109.4	2.6	3.43
PARAMETER MEANS:			215.7	14.56	236.7	410.5	30.46	78.2	59.	78.13	0.682	82.54	2.5	3.269
STANDARD DEVIATIONS:			72.9	4.19	27.4	154.8	6.43	13.5	15.46	11.9	0.0726	26.52	1.046	0.376

LETTERMAN ARMY INSTITUTE OF RESEARCH — Appendix L: SERUM CHEMISTRY
DIV OF TOXICOLOGY — STUDY NUMBER: GLP85042 — SPECIES: RAT/SPRAGUE-DAWLEY — STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 — SCHEDULED INPUT DATE: 22-NOV-85 — DAY OF DOSAGE: 94

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	CPK	BUN	GLU	LDH	ALT	AST	ALKP	CHOL	CREA	TRIG	URIC	MG
85D0832/F	3/1	22-NOV-85	411.	19.8	281.1	505.9	29.2	103.7	49.	97.4	0.68	132.6	2.9	2.94
85D0841/F	3/1	22-NOV-85	315.	19.7	260.0	480.2	36.5	105.6	41.	85.5	0.84	93.5	3.3	3.40
85D0849/F	3/1	22-NOV-85	377.	16.1	294.8	329.3	31.5	103.1	165.	80.5	0.72	152.6	5.5	3.88
85D0856/F	3/1	22-NOV-85	136.	15.6	299.4	297.1	32.9	67.7	72.	59.6	0.92	77.7	1.9	3.37
85D0870/F	3/1	22-NOV-85	621.	13.8	257.2	598.2	40.5	189.4	64.	79.1	0.55	93.2	4.1	2.77
85D0871/F	3/1	22-NOV-85	309.	14.1	234.2	311.1	25.7	97.2	62.	76.4	0.74	75.4	2.7	2.99
85D0872/F	3/1	22-NOV-85	384.	15.5	235.9	299.0	34.7	96.6	45.	85.0	0.70	94.8	3.6	3.30
85D0874/F	3/1	22-NOV-85	226.	14.9	244.3	537.3	32.1	83.2	54.	70.2	0.85	132.9	2.0	3.54
85D0883/F	3/1	22-NOV-85	174.	15.8	247.8	313.9	27.3	79.3	57.	96.4	0.59	84.6	1.6	2.94
85D0902/F	3/1	22-NOV-85	196.	11.9	223.8	333.4	25.0	74.6	42.	70.5	0.72	95.7	2.6	3.38
PARAMETER MEANS:			314.9	15.72	257.9	400.5	31.54	100.	65.1	80.06	0.731	103.3	3.02	3.251
STANDARD DEVIATIONS:			143.6	2.46	26.1	116.1	4.91	34.1	36.52	11.75	0.1146	26.4	1.171	0.338
85D0857/F	4/1	22-NOV-85	135.	16.3	207.2	85.6	30.6	69.1	50.	81.7	0.68	59.9	1.1	2.59
85D0858/F	4/1	22-NOV-85	208.	17.9	288.6	137.8	33.4	70.3	86.	77.0	0.80	84.7	4.7	4.21
85D0859/F	4/1	22-NOV-85	205.	19.8	216.2	234.0	46.9	115.9	62.	92.0	0.67	109.6	2.0	2.87
85D0862/F	4/1	22-NOV-85	149.	13.9	198.1	607.1	27.6	66.0	36.	77.0	0.69	77.7	3.8	3.56
85D0885/F	4/1	22-NOV-85	959.	13.7	205.8	609.5	38.1	150.3	98.	86.6	0.45	98.2	3.7	3.25
85D0889/F	4/1	22-NOV-85	165.	15.1	222.5	392.6	40.4	80.1	59.	82.6	0.71	54.4	2.7	3.31
85D0891/F	4/1	22-NOV-85	500.	17.2	196.1	339.1	40.7	167.4	51.	77.5	0.48	61.3	3.5	2.75
85D0892/F	4/1	22-NOV-85	184.	12.1	314.0	196.5	25.4	56.9	42.	76.7	0.74	86.6	5.4	3.65
85D0897/F	4/1	22-NOV-85	1898.	13.3	248.1	944.0	39.6	224.6	54.	76.5	0.46	90.1	2.7	2.67
85D0906/F	4/1	22-NOV-85	235.	15.5	226.7	101.9	40.1	97.0	55.	87.2	0.76	98.2	2.8	2.94
PARAMETER MEANS:			463.8	15.48	232.3	364.8	36.28	109.8	59.3	81.48	0.644	82.07	3.24	3.18
STANDARD DEVIATIONS:			564.	2.36	39.8	278.8	6.77	54.9	19.04	5.52	0.1307	18.49	1.26	0.516

LETTERMAN ARMY INSTITUTE OF RESEARCH — Appendix L: SERUM CHEMISTRY
DIV OF TOXICOLOGY — STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 — SCHEDULED INPUT DATE: 22-NOV-85 DAY OF DOSAGE: 94

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	TPRO	TBIL	CAL	PHOS	ALB	GLOB	SOD	POT	CHLO	IRON	COP
85D0837/F	1/1	22-NOV-85	6.11	0.6	11.6	7.17	3.41	2.70	150.	4.7	101.2	245.	200.
85D0840/F	1/1	22-NOV-85	6.58	0.8	11.0	5.80	3.78	2.79	162.	5.5	107.6	289.	160.
85D0845/F	1/1	22-NOV-85	7.58	0.7	11.5	5.62	4.39	3.19	162.	5.4	108.2	421.	180.
85D0853/F	1/1	22-NOV-85	6.26	0.5	10.8	7.18	3.45	2.81	170.	6.1	112.6	230.	164.
85D0860/F	1/1	22-NOV-85	6.29	1.0	10.6	7.94	3.40	2.89	150.	5.4	104.7	443.	142.
85D0864/F	1/1	22-NOV-85	6.62	0.5	11.1	5.63	4.10	2.52	164.	4.9	110.7	384.	144.
85D0876/F	1/1	22-NOV-85	6.43	1.8	9.5	6.99	3.55	2.88	155.	5.5	105.2	241.	"NT"
85D0877/F	1/1	22-NOV-85	5.88	1.4	9.3	8.66	3.00	2.87	159.	6.5	108.3	322.	"NT"
85D0896/F	1/1	22-NOV-85	5.93	0.6	10.9	9.45	3.48	2.45	174.	5.6	111.6	483.	"NT"
85D0903/F	1/1	22-NOV-85	5.90	0.7	10.4	9.32	3.40	2.50	158.	6.2	106.7	388.	134.
PARAMETER MEANS:			6.358	0.86	10.67	7.376	3.596	2.76	160.4	5.58	107.7	344.6	160.6
STANDARD DEVIATIONS:			0.507	0.4274	0.76	1.449	0.397	0.225	7.8	0.559	3.5	91.6	23.3
85D0836/F	2/1	22-NOV-85	6.33	0.6	10.0	5.77	3.30	3.00	159.	5.6	105.7	219.	154.
85D0846/F	2/1	22-NOV-85	6.95	0.8	11.7	7.42	4.05	2.90	166.	9.0	112.7	523.	"NT"
85D0847/F	2/1	22-NOV-85	6.76	0.6	11.4	6.45	3.92	2.84	170.	5.8	113.5	252.	164.
85D0848/F	2/1	22-NOV-85	5.90	0.5	10.2	5.59	3.67	2.23	152.	5.6	104.3	274.	120.
85D0886/F	2/1	22-NOV-85	6.10	0.9	10.5	8.08	3.41	2.69	161.	5.7	110.8	251.	"NT"
85D0888/F	2/1	22-NOV-85	5.83	0.6	10.5	9.04	2.84	2.99	155.	5.6	105.4	274.	114.
85D0893/F	2/1	22-NOV-85	6.32	0.7	10.6	7.65	2.82	3.49	158.	5.9	109.2	326.	180.
85D0894/F	2/1	22-NOV-85	6.77	0.5	11.6	10.64	3.59	3.18	154.	5.9	102.7	337.	166.
85D0895/F	2/1	22-NOV-85	6.11	0.5	10.4	9.38	3.90	2.21	168.	6.5	104.3	304.	142.
85D0904/F	2/1	22-NOV-85	6.84	0.5	10.9	"NT"	3.42	3.42	147.	4.8	107.8	267.	172.
PARAMETER MEANS:			6.391	0.62	10.78	7.78	3.492	2.895	159.	6.04	107.6	302.7	151.5
STANDARD DEVIATIONS:			0.411	0.1398	0.6	1.702	0.425	0.433	7.4	1.121	3.8	85.3	24.2

LETTERMAN ARMY INSTITUTE OF RESEARCH — Appendix L: SERUM CHEMISTRY
DIV OF TOXICOLOGY — STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 — SCHEDULED INPUT DATE: 22-NOV-85 DAY OF DOSAGE: 94

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	TPRO	TBIL	CAL	PHOS	ALB	GLOB	SOD	POT	CHLO	IRON	COP
85D0832/F	3/1	22-NOV-85	6.70	1.2	9.2	6.01	3.81	2.89	154.	6.4	105.6	289.	"NT"
85D0841/F	3/1	22-NOV-85	7.18	0.8	11.5	6.01	4.04	3.14	157.	6.0	105.7	296.	200.
85D0849/F	3/1	22-NOV-85	6.71	1.1	11.7	7.67	3.69	3.02	170.	6.4	110.3	296.	"NT"
85D0856/F	3/1	22-NOV-85	6.06	0.5	10.8	6.79	3.47	2.58	151.	6.4	101.8	274.	140.
85D0870/F	3/1	22-NOV-85	6.60	1.5	9.4	7.76	3.74	2.86	159.	8.0	106.2	383.	"NT"
85D0871/F	3/1	22-NOV-85	6.27	0.7	10.7	8.32	3.55	2.72	159.	5.6	106.9	296.	160.
85D0872/F	3/1	22-NOV-85	6.39	0.6	10.7	8.20	3.49	2.90	162.	6.0	107.8	267.	156.
85D0874/F	3/1	22-NOV-85	6.30	0.6	11.2	7.90	3.50	2.80	161.	4.7	107.6	311.	148.
85D0883/F	3/1	22-NOV-85	6.21	0.9	10.9	8.48	3.20	3.00	155.	5.0	104.1	395.	160.
85D0902/F	3/1	22-NOV-85	6.48	0.6	10.3	9.31	3.35	3.13	165.	5.8	106.0	362.	170.
PARAMETER MEANS:			6.49	0.85	10.64	7.645	3.584	2.904	159.3	6.03	106.2	316.9	162.
STANDARD DEVIATIONS:			0.323	0.324	0.82	1.074	0.242	0.177	5.6	0.904	2.3	45.9	19.3
85D0857/F	4/1	22-NOV-85	6.04	0.5	10.0	5.99	3.36	2.68	156.	5.2	105.1	311.	130.
85D0858/F	4/1	22-NOV-85	6.43	0.7	11.3	8.66	3.61	2.82	157.	7.4	105.8	307.	132.
85D0859/F	4/1	22-NOV-85	7.07	0.6	11.2	5.59	4.26	2.80	153.	5.1	102.0	282.	148.
85D0862/F	4/1	22-NOV-85	6.13	0.5	10.3	6.09	3.44	2.69	164.	5.9	110.8	304.	182.
85D0885/F	4/1	22-NOV-85	6.07	2.3	10.6	9.40	3.15	2.92	156.	6.2	104.1	443.	168.
85D0889/F	4/1	22-NOV-85	5.75	0.5	11.0	8.96	3.11	2.63	161.	5.4	108.2	285.	124.
85D0891/F	4/1	22-NOV-85	5.97	1.2	9.1	8.22	3.22	2.74	163.	7.2	110.7	163.	"NT"
85D0892/F	4/1	22-NOV-85	6.11	0.5	9.0	9.77	2.97	3.14	153.	7.9	105.9	326.	164.
85D0897/F	4/1	22-NOV-85	5.19	1.7	10.0	9.68	2.66	2.52	171.	7.0	114.0	301.	"NT"
85D0906/F	4/1	22-NOV-85	6.46	0.5	11.3	8.46	4.06	2.39	183.	5.9	106.8	428.	180.
PARAMETER MEANS:			6.122	0.9	10.38	8.082	3.384	2.733	161.7	6.32	107.3	315.	153.5
STANDARD DEVIATIONS:			0.488	0.6342	0.86	1.597	0.487	0.208	9.3	0.992	3.6	78.	23.2

Appendix M: HEMATOLOGY

List of Hematology Abbreviations/Units

ATL	Atypical Lymphocytes (%)
BAN	Immature Neutrophils (%)
BAS	Basophils (%)
EOS	Eosinophils (%)
HCT	Hematocrit (%)
HGB	Hemoglobin (g/dl)
LYM	Lymphocytes (%)
MCH	Mean Corpuscular Hemoglobin (picograms)
MCHC	Mean Corpuscular Hemoglobin Concentration (g/dl)
MCV	Mean Corpuscular Volume (femtoliters)
MON	Monocytes (%)
PLT	Platelets ($x10^4/\mu l$)
RBC	Erythrocytes ($x10^6/\mu l$)
SEG	Polymorphonuclear Granulocytes (%)
WBC	Total Leukocyte Count ($x10^3/\mu l$)

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix M: HEMATOLOGY
DIV OF TOXICOLOGY STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 SCHEDULED INPUT DATE: 04-OCT-85 DAY OF DOSAGE: 45

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	RBC	HGB	HCT	MCV	MCH	MCHC	PLT
85D0788/M	1/1	04-OCT-85	7.52	14.60	45.40	60.00	19.40	32.20	95.60
85D0790/M	1/1	04-OCT-85	8.35	15.20	48.40	58.00	18.20	31.50	99.40
85D0803/M	1/1	04-OCT-85	8.56	15.10	48.70	57.00	17.70	31.20	104.20
85D0825/M	1/1	04-OCT-85	8.34	14.60	47.30	56.00	17.50	30.90	95.40
85D0826/M	1/1	04-OCT-85	7.69	13.50	43.70	57.00	17.70	31.00	106.80
	PARAMETER MEANS:		8.09	14.60	46.70	57.60	18.10	31.36	100.30
	STANDARD DEVIATIONS:		0.46	0.67	2.12	1.52	0.77	0.52	5.11
85D0759/M	2/1	04-OCT-85	8.20	15.20	50.10	61.00	18.60	30.50	99.60
85D0760/M	2/1	04-OCT-85	8.51	14.90	46.90	55.00	17.50	31.90	101.20
85D0783/M	2/1	04-OCT-85	8.37	15.10	47.90	57.00	18.10	31.60	97.40
85D0786/M	2/1	04-OCT-85	8.15	15.20	47.30	58.00	18.70	32.20	86.40
85D0811/M	2/1	04-OCT-85	8.53	15.50	48.00	56.00	18.20	32.30	103.80
	PARAMETER MEANS:		8.35	15.18	48.04	57.40	18.22	31.70	97.68
	STANDARD DEVIATIONS:		0.17	0.22	1.24	2.30	0.48	0.72	6.72
85D0773/M	3/1	04-OCT-85	9.99	17.10	56.80	57.00	17.20	30.30	115.40
85D0776/M	3/1	04-OCT-85	"NT"	"NT"	"NT"	"NT"	"NT"	"NT"	"NT"
85D0801/M	3/1	04-OCT-85	7.21	13.70	43.90	60.00	19.00	31.30	118.20
85D0817/M	3/1	04-OCT-85	8.35	15.30	47.60	57.00	18.40	32.20	108.80
85D0829/M	3/1	04-OCT-85	8.19	15.20	46.50	56.00	18.70	32.90	99.00
	PARAMETER MEANS:		8.44	15.33	48.70	57.50	18.33	31.68	110.40
	STANDARD DEVIATIONS:		1.15	1.39	5.62	1.73	0.79	1.13	8.53
85D0763/M	4/1	04-OCT-85	8.53	14.40	47.40	56.00	16.90	30.20	103.80
85D0774/M	4/1	04-OCT-85	8.41	14.70	47.20	56.00	17.60	31.20	102.40
85D0778/M	4/1	04-OCT-85	8.05	14.60	45.40	56.00	18.20	32.10	102.00
85D0784/M	4/1	04-OCT-85	8.09	15.20	47.40	58.00	18.90	32.20	91.00
85D0816/M	4/1	04-OCT-85	8.11	15.00	45.90	56.00	18.50	32.80	94.80
	PARAMETER MEANS:		8.24	14.78	46.66	56.40	18.02	31.70	98.80
	STANDARD DEVIATIONS:		0.22	0.32	0.94	0.89	0.79	1.02	5.59

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix M: HEMATOLOGY
DIV OF TOXICOLOGY STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 SCHEDULED INPUT DATE: 04-OCT-85 DAY OF DOSAGE: 45

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	SEG	BAN	LYM	ATL	MON	EOS	BAS
85D0788/M	1/1	04-OCT-85	5.30	2.00	0.00	94.00	0.00	2.00	2.00	0.00
85D0790/M	1/1	04-OCT-85	5.60	8.00	0.00	89.00	0.00	1.00	2.00	0.00
85D0803/M	1/1	04-OCT-85	8.20	3.00	0.00	96.00	0.00	1.00	0.00	0.00
85D0825/M	1/1	04-OCT-85	7.40	7.00	0.00	92.00	0.00	0.00	1.00	0.00
85D0826/M	1/1	04-OCT-85	8.20	9.00	0.00	91.00	0.00	0.00	0.00	0.00
		PARAMETER MEANS:	6.94	5.80	0.00	92.40	0.00	0.80	1.00	0.00
		STANDARD DEVIATIONS:	1.40	3.11	0.00	2.70	0.00	0.84	1.00	0.00
85D0759/M	2/1	04-OCT-85	8.10	9.00	0.00	90.00	0.00	1.00	0.00	0.00
85D0760/M	2/1	04-OCT-85	7.20	16.00	0.00	88.00	0.00	0.00	2.00	0.00
85D0783/M	2/1	04-OCT-85	5.50	12.00	0.00	85.00	0.00	2.00	1.00	0.00
85D0786/M	2/1	04-OCT-85	7.80	4.00	0.00	95.00	0.00	0.00	1.00	0.00
85D0811/M	2/1	04-OCT-85	7.00	6.00	0.00	94.00	0.00	0.00	0.00	0.00
		PARAMETER MEANS:	7.12	9.40	0.00	90.40	0.00	0.60	0.80	0.00
		STANDARD DEVIATIONS:	1.01	4.78	0.00	4.16	0.00	0.89	0.84	0.00
85D0773/M	3/1	04-OCT-85	4.60	8.00	0.00	91.00	0.00	0.00	1.00	0.00
85D0776/M	3/1	04-OCT-85	"NT"	"NT"	"NT"	"NT"	"NT"	"NT"	"NT"	"NT"
85D0801/M	3/1	04-OCT-85	3.60	14.00	0.00	84.00	0.00	1.00	1.00	0.00
85D0817/M	3/1	04-OCT-85	8.90	2.00	0.00	97.00	0.00	0.00	1.00	0.00
85D0829/M	3/1	04-OCT-85	7.90	13.00	0.00	86.00	0.00	1.00	0.00	0.00
		PARAMETER MEANS:	6.25	9.25	0.00	89.50	0.00	0.50	0.75	0.00
		STANDARD DEVIATIONS:	2.55	5.50	0.00	5.80	0.00	0.58	0.50	0.00
85D0763/M	4/1	04-OCT-85	6.90	12.00	0.00	86.00	0.00	1.00	1.00	0.00
85D0774/M	4/1	04-OCT-85	8.10	9.00	0.00	90.00	0.00	0.00	1.00	0.00
85D0778/M	4/1	04-OCT-85	4.80	7.00	0.00	90.00	0.00	2.00	1.00	0.00
85D0784/M	4/1	04-OCT-85	6.40	9.00	0.00	89.00	0.00	1.00	1.00	0.00
85D0816/M	4/1	04-OCT-85	6.60	11.00	0.00	88.00	0.00	1.00	0.00	0.00
		PARAMETER MEANS:	6.56	9.60	0.00	88.60	0.00	1.00	0.80	0.00
		STANDARD DEVIATIONS:	1.18	1.95	0.00	1.67	0.00	0.71	0.45	0.00

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix M: HEMATOLOGY
DIV OF TOXICOLOGY STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 SCHEDULED INPUT DATE: 04-OCT-85 DAY OF DOSAGE: 45

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	RBC	HGB	HCT	MCV	MCH	MCHC	PLT
85D0843/F	1/1	04-OCT-85	7.74	14.00	46.10	59.00	18.10	30.40	106.60
85D0850/F	1/1	04-OCT-85	8.29	14.10	47.20	57.00	17.20	30.00	99.00
85D0854/F	1/1	04-OCT-85	7.81	14.20	48.20	61.00	18.30	29.60	105.60
85D0855/F	1/1	04-OCT-85	8.19	14.30	45.90	56.00	17.40	31.10	105.20
85D0901/F	1/1	04-OCT-85	8.25	15.00	46.50	56.00	18.20	32.30	123.40
		PARAMETER MEANS:	8.06	14.32	46.78	57.80	17.84	30.68	107.96
		STANDARD DEVIATIONS:	0.26	0.40	0.94	2.17	0.50	1.06	9.13
85D0838/F	2/1	04-OCT-85	7.35	13.00	42.20	57.00	17.80	30.90	79.40
85D0839/F	2/1	04-OCT-85	7.61	13.30	44.60	58.00	17.50	29.90	92.00
85D0851/F	2/1	04-OCT-85	7.50	13.90	43.20	57.00	18.50	32.10	96.40
85D0873/F	2/1	04-OCT-85	8.24	14.80	46.80	56.00	18.00	31.70	99.40
85D0899/F	2/1	04-OCT-85	8.30	14.50	46.40	55.00	17.50	31.30	87.80
		PARAMETER MEANS:	7.80	13.90	44.64	56.60	17.86	31.18	91.00
		STANDARD DEVIATIONS:	0.44	0.77	1.99	1.14	0.42	0.84	7.83
85D0833/F	3/1	04-OCT-85	7.37	13.50	45.00	61.00	18.40	30.10	106.80
85D0844/F	3/1	04-OCT-85	7.86	13.80	45.90	58.00	17.70	30.20	110.00
85D0863/F	3/1	04-OCT-85	7.27	13.40	42.80	58.00	18.40	31.30	86.40
85D0865/F	3/1	04-OCT-85	7.88	14.30	46.30	58.00	18.20	31.00	88.20
85D0887/F	3/1	04-OCT-85	8.60	15.70	50.20	58.00	18.30	31.30	115.00
		PARAMETER MEANS:	7.80	14.14	46.04	58.60	18.20	30.78	101.30
		STANDARD DEVIATIONS:	0.53	0.94	2.70	1.34	0.30	0.59	13.11
85D0835/F	4/1	04-OCT-85	7.56	13.30	43.50	57.00	17.60	30.50	113.20
85D0868/F	4/1	04-OCT-85	7.82	13.60	45.60	58.00	17.40	29.80	101.20
85D0875/F	4/1	04-OCT-85	8.15	14.80	47.70	58.00	18.30	31.20	115.40
85D0880/F	4/1	04-OCT-85	6.65	13.10	41.90	54.00	17.10	31.30	101.40
85D0905/F	4/1	04-OCT-85	7.87	14.00	44.00	55.00	17.80	31.80	94.20
		PARAMETER MEANS:	7.61	13.76	44.54	56.40	17.64	30.92	105.10
		STANDARD DEVIATIONS:	0.58	0.67	2.21	1.82	0.45	0.78	8.94

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix M: HEMATOLOGY
DIV OF TOXICOLOGY STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 SCHEDULED INPUT DATE: 04-OCT-85 DAY OF DOSAGE: 45

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	SEG	BAN	LYM	ATL	MON	EOS	BAS
85D0843/F	1/1	04-OCT-85	4.00	5.00	0.00	94.00	0.00	0.00	1.00	0.00
85D0850/F	1/1	04-OCT-85	2.90	5.00	0.00	92.00	0.00	2.00	1.00	0.00
85D0854/F	1/1	04-OCT-85	5.10	6.00	0.00	93.00	0.00	0.00	1.00	0.00
85D0855/F	1/1	04-OCT-85	6.90	4.00	0.00	94.00	0.00	1.00	1.00	0.00
85D0901/F	1/1	04-OCT-85	5.40	8.00	0.00	91.00	0.00	1.00	0.00	0.00
		PARAMETER MEANS:	4.86	5.60	0.00	92.80	0.00	0.80	0.80	0.00
		STANDARD DEVIATIONS:	1.51	1.52	0.00	1.30	0.00	0.84	0.45	0.00
85D0838/F	2/1	04-OCT-85	3.90	3.00	0.00	96.00	0.00	1.00	0.00	0.00
85D0839/F	2/1	04-OCT-85	3.90	4.00	0.00	95.00	0.00	1.00	0.00	0.00
85D0851/F	2/1	04-OCT-85	4.90	8.00	0.00	90.00	0.00	1.00	1.00	0.00
85D0873/F	2/1	04-OCT-85	3.20	3.00	0.00	94.00	0.00	1.00	2.00	0.00
85D0899/F	2/1	04-OCT-85	3.80	4.00	0.00	94.00	0.00	1.00	1.00	0.00
		PARAMETER MEANS:	3.94	4.40	0.00	93.80	0.00	1.00	0.80	0.00
		STANDARD DEVIATIONS:	0.61	2.07	0.00	2.28	0.00	0.00	0.84	0.00
85D0833/F	3/1	04-OCT-85	5.70	12.00	0.00	86.00	0.00	1.00	1.00	0.00
85D0844/F	3/1	04-OCT-85	3.70	7.00	0.00	91.00	0.00	1.00	1.00	0.00
85D0863/F	3/1	04-OCT-85	2.70	5.00	0.00	95.00	0.00	0.00	0.00	0.00
85D0865/F	3/1	04-OCT-85	3.90	7.00	0.00	90.00	0.00	2.00	1.00	0.00
85D0887/F	3/1	04-OCT-85	2.90	4.00	0.00	94.00	0.00	1.00	1.00	0.00
		PARAMETER MEANS:	3.78	7.00	0.00	91.20	0.00	1.00	0.80	0.00
		STANDARD DEVIATIONS:	1.19	3.08	0.00	3.56	0.00	0.71	0.45	0.00
85D0835/F	4/1	04-OCT-85	4.40	7.00	0.00	91.00	0.00	1.00	1.00	0.00
85D0868/F	4/1	04-OCT-85	2.50	3.00	0.00	96.00	0.00	1.00	0.00	0.00
85D0875/F	4/1	04-OCT-85	7.00	7.00	0.00	92.00	0.00	1.00	0.00	0.00
85D0880/F	4/1	04-OCT-85	6.00	6.00	0.00	93.00	0.00	0.00	1.00	0.00
85D0905/F	4/1	04-OCT-85	3.50	6.00	0.00	91.00	0.00	1.00	2.00	0.00
		PARAMETER MEANS:	4.68	5.80	0.00	92.60	0.00	0.80	0.80	0.00
		STANDARD DEVIATIONS:	1.83	1.64	0.00	2.07	0.00	0.45	0.84	0.00

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix M: HEMATOLOGY
DIV OF TOXICOLOGY STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 SCHEDULED INPUT DATE: 20-NOV-85 DAY OF DOSAGE: 92

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	RBC	HGB	HCT	MCV	MCH	MCHC	PLT
85D0758/M	1/1	22-NOV-85	8.12	13.80	47.20	58.00	17.10	29.40	104.80
85D0768/M	1/1	22-NOV-85	9.37	15.30	49.60	53.00	16.40	30.90	107.00
85D0769/M	1/1	22-NOV-85	8.77	14.60	48.10	55.00	16.70	30.50	109.20
85D0770/M	1/1	22-NOV-85	8.16	13.90	44.70	54.00	17.10	31.20	118.60
85D0785/M	1/1	22-NOV-85	8.95	14.50	49.00	54.00	16.30	29.70	105.00
85D0795/M	1/1	22-NOV-85	8.72	14.50	47.00	54.00	16.70	30.90	104.40
85D0804/M	1/1	22-NOV-85	1.89	4.200	10.50	53.00	22.00	40.10	39.60
85D0805/M	1/1	22-NOV-85	7.86	14.40	48.10	54.00	16.40	30.10	125.40
85D0814/M	1/1	22-NOV-85	8.89	14.70	47.70	53.00	16.60	30.90	93.00
85D0822/M	1/1	22-NOV-85	6.85	14.90	47.10	53.00	16.90	31.80	103.40
		PARAMETER MEANS:	7.76	13.48	43.90	54.10	17.22	31.55	101.00
		STANDARD DEVIATIONS:	2.18	3.29	11.81	1.52	1.70	3.09	23.31
85D0761/M	2/1	22-NOV-85	7.58	14.50	49.40	57.00	16.90	29.50	84.20
85D0764/M	2/1	22-NOV-85	8.80	14.70	47.30	53.00	16.80	31.20	97.80
85D0771/M	2/1	22-NOV-85	8.63	14.80	47.30	54.00	17.20	31.30	111.00
85D0791/M	2/1	22-NOV-85	7.71	13.80	42.90	55.00	17.90	32.20	102.40
85D0792/M	2/1	22-NOV-85	8.70	14.50	48.60	56.00	16.80	29.90	35.60
85D0793/M	2/1	22-NOV-85	8.78	14.50	46.90	53.00	16.60	31.00	119.40
85D0799/M	2/1	22-NOV-85	7.39	15.70	51.10	54.00	16.80	30.80	123.40
85D0808/M	2/1	22-NOV-85	7.90	13.60	43.20	54.00	17.30	31.50	107.80
85D0809/M	2/1	22-NOV-85	8.91	14.40	46.40	52.00	16.30	31.10	113.00
85D0815/M	2/1	22-NOV-85	8.99	14.30	46.90	52.00	16.00	30.50	124.60
		PARAMETER MEANS:	8.34	14.48	47.00	54.00	16.86	30.90	101.90
		STANDARD DEVIATIONS:	.62	0.57	2.52	1.63	0.53	0.78	26.35

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix M: HEMATOLOGY
DIV OF TOXICOLOGY STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 SCHEDULED INPUT DATE: 20-NOV-85 DAY OF DOSAGE: 92

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	RBC	HGB	HCT	MCV	MCH	MCHC	PLT
85D0787/M	3/1	22-NOV-85	8.70	14.70	49.80	57.00	17.00	29.70	95.40
85D0796/M	3/1	22-NOV-85	9.04	14.90	49.10	54.00	16.60	30.40	110.80
85D0802/M	3/1	22-NOV-85	8.19	13.50	45.50	55.00	16.70	29.80	96.60
85D0812/M	3/1	22-NOV-85	6.18	13.20	44.10	54.00	16.20	30.10	59.60
85D0819/M	3/1	22-NOV-85	6.91	14.90	49.40	55.00	16.80	30.30	112.40
85D0821/M	3/1	22-NOV-85	8.28	14.10	47.00	56.00	17.20	30.10	105.60
85D0823/M	3/1	22-NOV-85	7.52	14.00	45.00	59.00	18.60	31.30	99.40
85D0824/M	3/1	22-NOV-85	6.58	12.70	39.90	52.00	16.70	31.80	34.40
85D0828/M	3/1	22-NOV-85	9.04	15.00	48.20	53.00	16.60	31.10	56.00
85D0831/M	3/1	22-NOV-85	8.08	13.70	44.60	55.00	17.00	30.80	128.20
		PARAMETER MEANS:	7.85	14.07	46.26	55.00	16.94	30.54	89.84
		STANDARD DEVIATIONS:	1.02	0.80	3.07	2.00	0.65	0.69	29.76
85D0762/M	4/1	22-NOV-85	8.57	14.20	45.50	53.00	16.60	31.20	115.40
85D0765/M	4/1	22-NOV-85	8.57	13.90	46.50	54.00	16.40	30.00	110.60
85D0782/M	4/1	22-NOV-85	8.44	14.50	45.80	54.00	17.20	31.70	95.00
85D0789/M	4/1	22-NOV-85	8.45	15.10	49.10	58.00	18.00	30.90	102.20
85D0798/M	4/1	22-NOV-85	8.59	14.10	47.10	54.00	16.60	30.10	105.60
85D0806/M	4/1	22-NOV-85	8.21	14.00	46.70	57.00	17.20	30.10	109.00
85D0807/M	4/1	22-NOV-85	8.60	14.10	47.00	54.00	16.50	30.10	122.80
85D0810/M	4/1	22-NOV-85	7.14	15.30	51.00	55.00	16.80	30.10	99.60
85D0813/M	4/1	22-NOV-85	7.78	14.10	44.40	57.00	18.10	31.80	104.60
85D0818/M	4/1	22-NOV-85	7.63	13.80	45.10	59.00	18.10	30.70	108.80
		PARAMETER MEANS:	8.19	14.31	46.82	55.50	17.15	30.67	107.40
		STANDARD DEVIATIONS:	0.51	0.51	1.96	2.07	0.69	0.70	7.95

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix M: HEMATOLOGY
DIV OF TOXICOLOGY STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 SCHEDULED INPUT DATE: 20-NOV-85 DAY OF DOSAGE: 92

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	SEG	BAN	LYM	ATL	MON	EOS	BAS
85D0758/M	1/1	20-NOV-85	6.50	14.00	0.00	86.00	0.00	0.00	0.00	0.00
85D0768/M	1/1	20-NOV-85	11.50	5.00	0.00	94.00	0.00	1.00	0.00	0.00
85D0769/M	1/1	20-NOV-85	6.10	11.00	0.00	89.00	0.00	0.00	0.00	0.00
85D0770/M	1/1	20-NOV-85	5.40	13.00	0.00	83.00	0.00	2.00	2.00	0.00
85D0785/M	1/1	20-NOV-85	5.00	8.00	0.00	91.00	0.00	0.00	1.00	0.00
85D0795/M	1/1	20-NOV-85	6.80	16.00	0.00	83.00	0.00	0.00	1.00	0.00
85D0804/M	1/1	20-NOV-85	1.50	25.00	0.00	73.00	0.00	1.00	1.00	0.00
85D0805/M	1/1	20-NOV-85	8.30	18.00	0.00	79.00	0.00	1.00	2.00	0.00
85D0814/M	1/1	20-NOV-85	6.90	7.00	0.00	92.00	0.00	1.00	0.00	0.00
85D0822/M	1/1	20-NOV-85	6.60	11.00	0.00	87.00	0.00	1.00	1.00	0.00
		PARAMETER MEANS:	6.46	12.80	0.00	85.70	0.00	0.70	0.80	0.00
		STANDARD DEVIATIONS:	2.52	5.88	0.00	6.41	0.00	0.68	0.79	0.00
85D0761/M	2/1	20-NOV-85	2.90	8.00	0.00	90.00	0.00	2.00	0.00	0.00
85D0764/M	2/1	20-NOV-85	5.90	12.00	0.00	86.00	0.00	2.00	0.00	0.00
85D0771/M	2/1	20-NOV-85	7.10	14.00	0.00	86.00	0.00	0.00	0.00	0.00
85D0791/M	2/1	20-NOV-85	5.10	12.00	0.00	87.00	0.00	1.00	0.00	0.00
85D0792/M	2/1	20-NOV-85	4.90	11.00	0.00	87.00	0.00	1.00	1.00	0.00
85D0793/M	2/1	20-NOV-85	6.80	15.00	0.00	84.00	0.00	1.00	0.00	0.00
85D0799/M	2/1	20-NOV-85	5.70	12.00	0.00	85.00	0.00	1.00	2.00	0.00
85D0808/M	2/1	20-NOV-85	6.20	9.00	0.00	90.00	0.00	1.00	0.00	0.00
85D0809/M	2/1	20-NOV-85	6.10	13.00	0.00	87.00	0.00	0.00	0.00	0.00
85D0815/M	2/1	20-NOV-85	4.20	11.00	0.00	88.00	0.00	0.00	1.00	0.00
		PARAMETER MEANS:	5.49	11.70	0.00	87.00	0.00	0.90	0.40	0.00
		STANDARD DEVIATIONS:	1.26	2.11	0.00	1.94	0.00	0.74	0.70	0.00

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix M: HEMATOLOGY
DIV OF TOXICOLOGY STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 SCHEDULED INPUT DATE: 20-NOV-85 DAY OF DOSAGE: 92

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	SEG	BAN	LYM	ATL	MON	EOS	BAS
85D0787/M	3/1	20-NOV-85	7.50	13.00	0.00	87.00	0.00	0.00	0.00	0.00
85D0796/M	3/1	20-NOV-85	8.10	9.00	0.00	91.00	0.00	0.00	0.00	0.00
85D0802/M	3/1	20-NOV-85	3.80	14.00	0.00	83.00	0.00	3.00	0.00	0.00
85D0812/M	3/1	20-NOV-85	4.30	13.00	0.00	85.00	0.00	0.00	2.00	0.00
85D0819/M	3/1	20-NOV-85	6.20	10.00	0.00	88.00	0.00	0.00	2.00	0.00
85D0821/M	3/1	20-NOV-85	6.60	15.00	0.00	82.00	0.00	2.00	1.00	0.00
85D0823/M	3/1	20-NOV-85	6.60	10.00	0.00	90.00	0.00	0.00	0.00	0.00
85D0824/M	3/1	20-NOV-85	5.80	14.00	0.00	84.00	0.00	2.00	0.00	0.00
85D0828/M	3/1	20-NOV-85	5.70	13.00	0.00	87.00	0.00	0.00	0.00	0.00
85D0831/M	3/1	20-NOV-85	5.60	13.00	0.00	86.00	0.00	1.00	0.00	0.00
		PARAMETER MEANS:	6.02	12.40	0.00	86.30	0.00	0.80	0.50	0.00
		STANDARD DEVIATIONS:	1.31	2.01	0.00	2.91	0.00	1.14	0.85	0.00
85D0762/M	4/1	20-NOV-85	8.60	11.00	0.00	87.00	0.00	1.00	1.00	0.00
85D0765/M	4/1	20-NOV-85	6.10	8.00	0.00	90.00	0.00	1.00	1.00	0.00
85D0782/M	4/1	20-NOV-85	6.40	16.00	0.00	83.00	0.00	0.00	1.00	0.00
85D0789/M	4/1	20-NOV-85	6.90	8.00	0.00	92.00	0.00	0.00	0.00	0.00
85D0798/M	4/1	20-NOV-85	8.90	11.00	0.00	87.00	0.00	1.00	1.00	0.00
85D0806/M	4/1	20-NOV-85	6.40	15.00	0.00	84.00	0.00	1.00	0.00	0.00
85D0807/M	4/1	20-NOV-85	4.30	12.00	0.00	88.00	0.00	0.00	0.00	0.00
85D0810/M	4/1	20-NOV-85	5.60	10.00	0.00	89.00	0.00	0.00	1.00	0.00
85D0813/M	4/1	20-NOV-85	7.00	8.00	0.00	92.00	0.00	0.00	0.00	0.00
85D0818/M	4/1	20-NOV-85	8.70	13.00	0.00	85.00	0.00	0.00	2.00	0.00
		PARAMETER MEANS:	6.89	11.20	0.00	87.70	0.00	0.40	0.70	0.00
		STANDARD DEVIATIONS:	1.48	2.86	0.00	3.13	0.00	0.52	0.68	0.00

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix M: HEMATOLOGY
DIV OF TOXICOLOGY STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 SCHEDULED INPUT DATE: 20-NOV-85 DAY OF DOSAGE: 92

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	RBC	HGB	HCT	MCV	MCH	MCHC	PLT
85D0837/F	1/1	22-NOV-85	8.09	13.60	45.90	56.00	16.90	29.80	86.20
85D0840/F	1/1	22-NOV-85	7.94	14.10	46.60	58.00	17.80	30.40	97.00
85D0845/F	1/1	22-NOV-85	8.41	14.40	47.30	56.00	17.20	30.60	37.00
85D0853/F	1/1	22-NOV-85	7.76	13.50	45.10	58.00	17.50	30.10	102.20
85D0860/F	1/1	22-NOV-85	8.29	14.10	45.70	55.00	17.10	30.80	80.60
85D0864/F	1/1	22-NOV-85	8.21	13.60	44.30	54.00	16.60	30.80	105.20
85D0876/F	1/1	22-NOV-85	8.35	14.30	47.30	56.00	17.20	30.30	75.60
85D0877/F	1/1	22-NOV-85	8.41	14.30	48.10	57.00	17.10	29.90	98.40
85D0896/F	1/1	22-NOV-85	8.13	14.80	47.30	58.00	18.20	31.30	107.60
85D0903/F	1/1	22-NOV-85	8.26	14.20	47.40	57.00	17.30	30.10	109.60
		PARAMETER MEANS:	8.19	14.09	46.50	56.50	17.29	30.41	89.94
		STANDARD DEVIATIONS:	0.21	0.41	1.21	1.35	0.45	0.47	21.89
85D0836/F	2/1	22-NOV-85	7.62	13.40	43.00	56.00	17.50	31.10	91.40
85D0846/F	2/1	22-NOV-85	8.12	14.40	46.50	57.00	17.80	31.10	102.80
85D0847/F	2/1	22-NOV-85	7.72	13.00	43.40	56.00	16.90	30.10	82.00
85D0848/F	2/1	22-NOV-85	7.28	13.10	41.60	57.00	18.10	31.60	97.60
85D0886/F	2/1	22-NOV-85	8.24	15.20	49.30	59.00	18.50	30.90	89.60
85D0888/F	2/1	22-NOV-85	7.19	13.40	44.30	61.00	18.70	30.30	106.20
85D0893/F	2/1	22-NOV-85	8.13	14.20	45.90	56.00	17.50	31.00	113.00
85D0894/F	2/1	22-NOV-85	8.12	14.10	46.70	57.00	17.50	30.40	101.80
85D0895/F	2/1	22-NOV-85	8.76	15.00	48.60	55.00	17.20	30.90	109.00
85D0904/F	2/1	22-NOV-85	8.28	13.70	45.60	55.00	16.50	30.00	110.80
		PARAMETER MEANS:	7.95	13.95	45.49	56.90	17.62	30.74	100.40
		STANDARD DEVIATIONS:	0.49	0.76	2.45	1.85	0.68	0.51	10.14

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix M: HEMATOLOGY
DIV OF TOXICOLOGY STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 SCHEDULED INPUT DATE: 20-NOV-85 DAY OF DOSAGE: 92

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	RBC	HGB	HCT	MCV	MCH	MCHC	PLT
85D0832/F	3/1	22-NOV-85	6.94	12.30	40.80	58.00	17.80	30.30	38.60
85D0841/F	3/1	22-NOV-85	7.43	14.30	47.60	56.00	17.00	30.20	86.80
85D0849/F	3/1	22-NOV-85	7.63	13.50	46.60	61.00	17.70	29.10	107.00
85D0856/F	3/1	22-NOV-85	7.50	13.10	42.80	57.00	17.50	30.60	101.80
85D0870/F	3/1	22-NOV-85	8.31	15.30	48.00	57.00	18.50	31.90	92.20
85D0871/F	3/1	22-NOV-85	7.48	13.90	43.00	57.00	18.60	32.50	80.40
85D0872/F	3/1	22-NOV-85	8.44	13.90	46.60	55.00	16.50	29.80	101.00
85D0874/F	3/1	22-NOV-85	8.03	13.50	45.10	56.00	16.90	30.10	90.80
85D0883/F	3/1	22-NOV-85	7.85	14.40	45.60	58.00	18.50	31.80	123.00
85D0902/F	3/1	22-NOV-85	8.26	14.40	46.20	56.00	17.50	31.20	104.80
		PARAMETER MEANS:	7.79	13.86	45.23	57.10	17.65	30.75	92.64
		STANDARD DEVIATIONS:	0.48	0.83	2.33	1.66	0.72	1.07	22.45
85D0857/F	4/1	22-NOV-85	7.80	13.70	43.40	55.00	17.60	31.70	94.00
85D0858/F	4/1	22-NOV-85	7.84	13.60	44.70	57.00	17.40	30.50	111.00
85D0859/F	4/1	22-NOV-85	6.74	12.90	41.60	53.00	16.80	31.10	93.00
85D0862/F	4/1	22-NOV-85	7.78	13.10	42.80	55.00	17.00	30.80	82.00
85D0885/F	4/1	22-NOV-85	7.99	13.60	45.80	57.00	17.10	29.80	100.80
85D0889/F	4/1	22-NOV-85	8.24	14.00	47.10	57.00	17.00	29.70	94.80
85D0891/F	4/1	22-NOV-85	7.85	13.50	44.20	56.00	17.30	30.80	117.00
85D0892/F	4/1	22-NOV-85	7.77	13.10	44.80	57.00	17.00	29.40	101.20
85D0897/F	4/1	22-NOV-85	7.89	14.10	45.60	57.00	18.00	31.00	91.80
85D0906/F	4/1	22-NOV-85	7.40	12.60	41.00	55.00	17.00	30.70	87.40
		PARAMETER MEANS:	7.73	13.42	44.10	55.90	17.22	30.55	97.30
		STANDARD DEVIATIONS:	0.41	0.48	19.16	1.37	0.36	0.71	10.55

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix M: HEMATOLOGY
DIV OF TOXICOLOGY STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 SCHEDULED INPUT DATE: 20-NOV-85 DAY OF DOSAGE: 92

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	SEG	BAN	LYM	ATL	MON	EOS	BAS
85D0837/F	1/1	20-NOV-85	4.80	14.00	0.00	86.00	0.00	0.00	0.00	0.00
85D0840/F	1/1	20-NOV-85	4.60	21.00	0.00	77.00	0.00	1.00	1.00	0.00
85D0845/F	1/1	20-NOV-85	2.60	14.00	0.00	83.00	0.00	2.00	1.00	0.00
85D0853/F	1/1	20-NOV-85	3.90	15.00	0.00	85.00	0.00	0 00	0.00	0.00
85D0860/F	1/1	20-NOV-85	3.30	9.00	0.00	91.00	0.00	0.00	0.00	0.00
85D0864/F	1/1	20-NOV-85	3.80	19.00	0.00	80.00	0.00	1.00	0.00	0.00
85D0876/F	1/1	20-NOV-85	2.30	7.00	0.00	92.00	0.00	1.00	0.00	0.00
85D0877/F	1/1	20-NOV-85	2.00	12.00	0.00	88.00	0.00	0.00	0.00	0.00
85D0896/F	1/1	20-NOV-85	3.30	10.00	0.00	90.00	0.00	0.00	0.00	0.00
85D0903/F	1/1	20-NOV-85	4.10	12.00	0.00	86.00	0.00	0.00	2.00	0.00
		PARAMETER MEANS:	3.47	13.30	0.00	85.80	0.00	0.50	0.40	0.00
		STANDARD DEVIATIONS:	0.95	4.32	0.00	4.80	0.00	0.71	0.70	0.00
85D0836/F	2/1	20-NOV-85	3.60	11.00	0.00	88.00	0.00	0.00	1.00	0.00
85D0846/F	2/1	20-NOV-85	4.00	13.00	0.00	85.00	0.00	1.00	1.00	0.00
85D0847/F	2/1	20-NOV-85	4.70	11.00	0.00	87.00	0.00	2.00	0.00	0.00
85D0848/F	2/1	20-NOV-85	3.00	13.00	0.00	86.00	0.00	0.00	1.00	0.00
85D0886/F	2/1	20-NOV-85	3.90	11.00	0.00	86.00	0.00	1.00	2.00	0.00
85D0888/F	2/1	20-NOV-85	4.30	13.00	0.00	85.00	0.00	1.00	1.00	0.00
85D0893/F	2/1	20-NOV-85	2.60	14.00	0.00	84.00	0.00	2.00	0.00	0.00
85D0894/F	2/1	20-NOV-85	2.40	12.00	0.00	85.00	0.00	1.00	2.00	0.00
85D0895/F	2/1	20-NOV-85	3.80	16.00	0.00	92.00	0.00	1.00	1.00	0.00
85D0904/F	2/1	20-NOV-85	4.50	9.00	0.00	91.00	0.00	0.00	0.00	0.00
		PARAMETER MEANS:	3.68	12.30	0.00	85.90	0.00	0.90	0.90	0.00
		STANDARD DEVIATIONS:	0.78	1.95	0.00	2.42	0.00	0.74	0.74	0.00

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix M: HEMATOLOGY
DIV OF TOXICOLOGY STUDY NUMBER: GLP85042 SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85
PRESIDIO OF SAN FRANCISCO, CA 94129 SCHEDULED INPUT DATE: 20-NOV-85 DAY OF DOSAGE: 92

ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	SEG	BAN	LYM	ATL	MON	EOS	BAS
85D0832/F	3/1	20-NOV-85	3.30	12.00	0.00	87.00	0.00	1.00	0.00	0.00
85D0841/F	3/1	20-NOV-85	6.30	7.00	0.00	92.00	0.00	1.00	0.00	0.00
85D0849/F	3/1	20-NOV-85	5.20	9.00	0.00	90.00	0.00	1.00	0.00	0.00
85D0856/F	3/1	20-NOV-85	4.70	17.00	0.00	82.00	0.00	1.00	0.00	0.00
85D0870/F	3/1	20-NOV-85	3.60	14.00	0.00	86.00	0.00	0.00	0.00	0.00
85D0871/F	3/1	20-NOV-85	4.90	29.00	0.00	71.00	0.00	0.00	0.00	0.00
85D0872/F	3/1	20-NOV-85	2.80	8.00	0.00	91.00	0.00	1.00	0.00	0.00
85D0874/F	3/1	20-NOV-85	4.60	14.00	0.00	84.00	0.00	1.00	1.00	0.00
85D0883/F	3/1	20-NOV-85	4.60	18.00	0.00	79.00	0.00	2.00	1.00	0.00
85D0902/F	3/1	20-NOV-85	5.00	14.00	0.00	86.00	0.00	0.00	0.00	0.00
		PARAMETER MEANS:	4.50	14.20	0.00	84.80	0.00	0.80	0.20	0.00
		STANDARD DEVIATIONS:	1.02	6.35	0.00	6.30	0.00	0.63	0.42	0.00
85D0857/F	4/1	20-NOV-85	3.60	12.00	0.00	86.00	0.00	1.00	1.00	0.00
85D0858/F	4/1	20-NOV-85	4.00	13.00	0.00	84.00	0.00	1.00	2.00	0.00
85D0859/F	4/1	20-NOV-85	5.30	12.00	0.00	85.00	0.00	2.00	1.00	0.00
85D0862/F	4/1	20-NOV-85	3.30	9.00	0.00	89.00	0.00	1.00	1.00	0.00
85D0885/F	4/1	20-NOV-85	2.10	8.00	0.00	91.00	0.00	0.00	1.00	0.00
85D0889/F	4/1	20-NOV-85	3.00	14.00	0.00	85.00	0.00	1.00	0.00	0.00
85D0891/F	4/1	20-NOV-85	1.40	12.00	0.00	87.00	0.00	0.00	1.00	0.00
85D0892/F	4/1	20-NOV-85	3.80	15.00	0.00	83.00	0.00	1.00	1.00	0.00
85D0897/F	4/1	20-NOV-85	6.20	17.00	0.00	81.00	0.00	2.00	0.00	0.00
85D0906/F	4/1	20-NOV-85	3.80	16.00	0.00	81.00	0.00	2.00	1.00	0.00
		PARAMETER MEANS:	3.65	12.80	0.00	85.20	0.00	1.10	0.90	0.00
		STANDARD DEVIATIONS:	1.39	2.86	0.00	3.22	0.00	0.74	0.57	0.00

LETTERMAN ARMY INSTITUTE OF RESEARCH
DIV OF RES SUPP, PATH SERV GP
PRESIDIO OF SAN FRANCISCO, CA 94129
SPECIES: RAT/SPRAGUE-DAWLEY

SUMMARY STATISTICS FOR ABSOLUTE ORGAN WEIGHTS (GMS)
STUDY NUMBER: GLP85042
REPORT FOR INTERIM SACRIFICE NUMBER 2
STUDY START DATE: 21-AUG-85

PRINTED: 28-OCT-88
PAGE: 1
STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY	TESTES
788/M	1/1	439.00	15.255	1.562	1.864	0.944	0.062	3.102	3.299
790/M	1/1	450.00	15.139	1.378	2.137	0.823	0.062	3.427	3.042
803/M	1/1	409.00	13.123	1.180	2.025	0.734	0.049	2.585	2.710
825/M	1/1	439.00	14.099	1.170	2.040	0.680	0.058	2.800	2.533
826/M	1/1	435.00	12.782	1.364	2.107	0.849	0.061	3.076	3.357
		M E A N:	14.080	1.331	2.035	0.806	0.058	2.998	2.988
	STANDARD	DEVIATION:	1.129	0.162	0.106	0.103	0.006	0.320	0.361
759/M	2/1	423.00	14.112	1.414	2.017	0.833	0.054	2.917	2.979
760/M	2/1	442.00	14.239	1.291	2.040	0.803	0.060	3.201	3.068
783/M	2/1	459.00	15.498	1.391	2.135	0.849	0.057	3.095	3.070
786/M	2/1	369.00	11.414	1.279	1.995	0.794	0.055	2.644	2.730
811/M	2/1	403.00	13.077	1.640	2.056	0.766	0.050	2.899	2.828
		M E A N:	13.668	1.403	2.049	0.809	0.055	2.951	2.935
	STANDARD	DEVIATION:	1.525	0.145	0.054	0.033	0.004	0.213	0.151
773/M	3/1	396.00	12.047	1.552	2.009	0.597	0.047	2.853	2.908
776/M	3/1	437.00	15.914	1.461	1.865	0.684	0.045	2.767	2.717
801/M	3/1	444.00	16.036	1.680	2.008	0.969	0.052	3.282	3.096
817/M	3/1	405.00	13.033	1.247	1.899	0.580	0.056	2.818	3.291
829/M	3/1	414.00	11.688	1.280	2.059	0.652	0.049	2.640	2.946
		M E A N:	13.744	1.444	1.968	0.696	0.050	2.872	2.992
	STANDARD	DEVIATION:	2.096	0.183	0.082	0.158	0.004	0.243	0.215
763/M	4/1	410.00	14.877	1.173	2.014	0.755	0.060	2.834	2.670
774/M	4/1	427.00	13.872	1.237	1.867	0.897	0.063	2.796	3.016
778/M	4/1	390.00	12.362	1.226	2.017	0.571	0.060	2.833	2.577
784/M	4/1	394.00	12.690	1.297	1.892	0.848	0.048	2.688	2.985
816/M	4/1	400.00	13.292	1.275	1.996	0.777	0.060	2.870	3.117
		M E A N:	13.419	1.242	1.957	0.770	0.058	2.804	2.873
	STANDARD	DEVIATION:	0.999	0.048	0.072	0.125	0.006	0.070	0.235

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SPECIES: RAT/SPRAGUE-DAWLEY

SUMMARY STATISTICS FOR ABSOLUTE ORGAN WEIGHTS (GMS)
STUDY NUMBER: GLP85042
REPORT FOR FINAL SACRIFICE
STUDY START DATE: 21-AUG-85

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PAGE: 1
STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY	TESTES
758/M	1/1	536.00	17.876	3.434	2.384	3.829	0.055	3.547	3.765
768/M	1/1	461.00	10.398	1.419	2.225	3.638	0.044	4.712	3.623
769/M	1/1	567.00	22.303	1.908	1.850	0.856	0.052	3.834	3.560
770/M	1/1	547.00	18.400	1.679	1.997	0.820	0.074	3.184	3.158
785/M	1/1	518.00	9.480	2.985	1.882	0.896	0.063	3.247	3.988
795/M	1/1	578.00	17.594	2.742	2.800	0.920	0.479	3.499	2.847
804/M	1/1	538.00	17.979	1.592	1.979	0.668		3.660	2.944
805/M	1/1	512.00	17.142	1.799	2.149	0.696	0.052	3.439	2.713
814/M	1/1	523.00	15.154	2.318	2.114	0.724	0.040	3.733	3.501
822/M	1/1	502.00	15.879	1.580	2.017	0.707	0.053	3.312	3.210
		M E A N:	16.221	2.146	2.140	1.375	0.101	3 617	3.331
		STANDARD DEVIATION:	3.814	0.691	0.282	1.247	0.142	0.438	0.421
761/M	2/1	480.00	15.906	2.147	2.183	0.720	0.065	3.197	3.409
764/M	2/1	476.00	15.422	1.403	1.980	0.811	0.047	3.064	3.016
771/M	2/1	550.00	18.407	1.570	2.094	0.829	0.468	3.244	2.727
791/M	2/1	545.00	12.829	1.972	2.016	0.839	0.061	4.061	3.521
792/M	2/1	502.00	20.175	2.721	1.917	0.771	0.049	3.486	4.548
793/M	2/1	510.00	17.171	1.731	2.189	0.815	0.133	3.698	3.968
799/M	2/1	498.00	12.667	1.474	2.026	0.789	0.052	3.397	3.141
808/M	2/1	507.00	15.077	2.901	3.053	0.803	0.054	4.790	3.135
809/M	2/1	515.00	16.300	1.573	2.094	0.721	0.045	3.360	3.297
815/M	2/1	541.00	17.405	1.638	2.055	0.815	0.038	3.213	3.393
		M E A N:	16.136	1.913	2.161	0.791	0.101	3.551	3.416
		STANDARD DEVIATION:	2.329	0.525	0.325	0.042	0.132	0.522	0.517
787/M	3/1	483.00	15.833	1.521	2.149	0.946	0.080	3.300	6.568
796/M	3/1	620.00	18.319	2.115	2.170	1.050	0.061	3.969	3.423
802/M	3/1	409.00	12.494	1.241	1.935	0.641	0.027	2.576	2.654
812/M	3/1	535.00	16.040	1.863	2.099	0.818	0.072	3.185	3.406
819/M	3/1	477.00	14.690	1.732	2.040	0.687	0.036	2.830	2.753
821/M	3/1	477.00	15.805	1.498	2.037	0.742	0.066	4.514	3.112
823/M	3/1	521.00	15.311	1.505	1.960	1.212	0.042	2.962	3.268
824/M	3/1	508.00	13.848	1.801	3.687	0.791	0.044	3.191	3.640
828/M	3/1	485.00	13.518	2.129	2.197	0.779	0.057	2.997	3.164
831/M	3/1	547.00	15.687	1.925	1.726	1.030	0.044	3.466	3.508
		M E A N:	15.155	1.733	2.200	0.870	0.053	3.299	3.550
		STANDARD DEVIATION:	1.622	0.290	0.541	0.183	0.017	0.570	1.106

LETTERMAN ARMY INSTITUTE OF RESEARCH
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PRINTED: 28-OCT-88
PAGE: 2

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ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY	TESTES
762/M	4/1	519.00	18.105	1.442	1.794	0.734	0.068	3.856	3.227
765/M	4/1	548.00	17.905	1.838	1.973	1.967	0.047	3.517	2.688
782/M	4/1	468.00	14.491	1.676	1.903	0.612	0.050	4.763	3.058
789/M	4/1	585.00	17.302	2.329	4.730	0.860	0.033	5.772	3.678
798/M	4/1	522.00	18.006	1.699	1.932	0.876	0.057	3.749	3.350
806/M	4/1	486.00	16.326	1.436	2.094	1.612	0.047	2.999	3.298
807/M	4/1	490.00	15.678	1.370	2.341	0.812	0.184	4.953	3.318
810/M	4/1	491.00	13.838	1.730	2.015	0.902	0.043	3.483	3.535
813/M	4/1	483.00	15.922	1.405	2.109	0.810	0.049	3.098	3.698
818/M	4/1	514.00	15.289	1.511	2.050	0.784	0.057	3.449	3.271
		M E A N:	16.286	1.644	2.294	0.997	0.064	3.964	3.312
	STANDARD DEVIATION:		1.514	0.289	0.868	0.434	0.043	0.902	0.298

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SUMMARY STATISTICS FOR ABSOLUTE ORGAN WEIGHTS (GMS)
STUDY NUMBER: GLP85042
REPORT FOR INTERIM SACRIFICE NUMBER 3
STUDY START DATE: 21-AUG-85

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PAGE: 1
STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	OVARIES	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY
843/F	1/1	270.00	0.149	9.926	0.892	1.942	0.580	0.074	1.737
850/F	1/1	270.00	0.136	9.383	0.839	1.972	0.604	0.070	1.784
854/F	1/1	291.00	0.176	11.447	0.992	1.960	0.568	0.078	2.129
855/F	1/1	304.00	0.157	11.180	0.825	1.844	0.641	0.059	1.907
901/F	1/1	248.00	0.208	8.579	0.880	1.857	0.491	0.071	1.636
		M E A N:	0.165	10.103	0.886	1.915	0.577	0.070	1.839
	STANDARD	DEVIATION:	0.028	1.208	0.066	0.060	0.055	0.007	0.189
838/F	2/1	271.00	0.130	10.972	1.171	1.954	0.576	0.055	2.055
839/F	2/1	275.00	0.153	10.108	0.960	1.895	0.564	0.074	2.003
851/F	2/1	225.00	0.100	8.502	0.760	1.876	0.362	0.062	1.508
873/F	2/1	258.00	0.129	8.602	0.860	1.834	0.496	0.069	1.655
899/F	2/1	235.00	0.118	8.034	0.750	1.818	0.479	0.061	1.564
		M E A N:	0.126	9.244	0.900	1.875	0.495	0.064	1.757
	STANDARD	DEVIATION:	0.019	1.241	0.174	0.054	0.086	0.007	0.254
833/F	3/1	258.00	0.124	8.965	0.814	1.877	0.508	0.061	1.671
844/F	3/1	275.00	0.124	9.125	1.060	1.799	0.464	0.055	1.780
863/F	3/1	235.00	0.122	8.159	0.808	1.809	0.474	0.072	1.658
865/F	3/1	248.00	0.142	8.280	0.877	1.953	0.543	0.071	1.789
887/F	3/1	282.00	0.133	10.772	1.013	1.917	0.544	0.072	1.858
		M E A N:	0.129	9.060	0.914	1.871	0.507	0.066	1.751
	STANDARD	DEVIATION:	0.008	1.045	0.116	0.067	0.037	0.008	0.085
835/F	4/1	242.00	0.133	8.557	0.786	1.802	0.387	0.068	1.607
868/F	4/1	268.00	0.137	11.014	1.079	1.810	0.628	0.061	2.171
875/F	4/1	244.00	0.122	8.365	0.750	1.800	0.468	0.084	1.700
880/F	4/1	263.00	0.149	9.509	0.883	1.848	0.561	0.055	1.950
905/F	4/1	235.00	0.133	7.259	0.877	1.794	0.530	0.073	1.586
		M E A N:	0.135	8.941	0.875	1.811	0.515	0.068	1.803
	STANDARD	DEVIATION:	0.010	1.408	0.128	0.022	0.092	0.011	0.252

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837/F	1/1	347.00	0.156	9.879	1.050	1.741	0.535	0.060	1.930
840/F	1/1	331.00	0.090	10.572	1.066	1.818	0.655	0.070	2.140
845/F	1/1	279.00	0.102	9.682	1.019	1.841	0.503	0.033	1.803
853/F	1/1	339.00	0.133	10.318	1.239	1.701	0.519	0.075	2.187
860/F	1/1	310.00	0.098	9.560	0.896	1.987	0.605	0.068	1.892
864/F	1/1	305.00	0.102	9.731	0.907	1.564	0.461	0.075	1.942
876/F	1/1	339.00	0.113	11.153	1.122	1.679	0.538	0.062	2.000
877/F	1/1	324.00	0.139	10.782	1.142	1.929	0.566	0.066	1.885
896/F	1/1	274.00	0.131	11.616	0.951	1.977	0.992	0.076	3.085
903/F	1/1	340.00	0.189	10.240	1.099	1.840	0.528	0.136	2.152
		M E A N:	0.125	10.353	1.049	1.808	0.590	0.072	2.102
		STANDARD DEVIATION:	0.031	0.681	0.109	0.137	0.151	0.026	0.369
836/F	2/1	327.00	0.133	10.678	1.086	1.873	0.457	0.091	1.963
846/F	2/1	270.00	0.137	8.831	0.994	1.804	0.487	0.104	2.121
847/F	2/1	355.00	0.111	11.356	1.065	1.844	0.446	0.065	2.054
848/F	2/1	292.00	0.155	9.111	0.911	1.564	0.427	0.061	1.806
886/F	2/1	310.00	0.162	9.689	1.045	1.733	0.504	0.102	2.047
888/F	2/1	367.00	0.136	10.930	0.974	1.868	0.607	0.072	2.157
893/F	2/1	295.00	0.118	7.179	1.746	1.816	0.476	0.063	1.906
894/F	2/1	325.00	0.152	9.764	1.071	1.774	0.501	0.100	1.983
895/F	2/1	294.00	0.329	5.990	1.041	1.954	0.482		3.712
904/F	2/1	311.00	0.117	10.215	1.020	1.838	0.450	0.075	1.875
		M E A N:	0.155	9.374	1.095	1.807	0.484	0.081	2.162
		STANDARD DEVIATION:	0.063	1.688	0.235	0.104	0.050	0.018	0.555
832/F	3/1	292.00	0.138	10.025	1.040	1.958	0.428	0.082	1.867
841/F	3/1	303.00	0.116	9.594	1.069	1.916	0.549	0.067	2.593
849/F	3/1	261.00	0.117	8.565	0.910	1.748	0.436	0.053	1.646
856/F	3/1	314.00	0.216	9.492	1.289	1.862	0.510	0.119	1.965
870/F	3/1	303.00	0.125	9.418	0.976	1.902	0.386	0.059	1.850
871/F	3/1	313.00	0.116	9.811	0.957	1.906	0.500	0.066	1.856
872/F	3/1	324.00	0.161	10.674	1.128	1.957	0.518	0.036	1.897
874/F	3/1	355.00	0.166	11.188	1.280	1.929	0.442	0.098	2.238
883/F	3/1	282.00	0.112	10.035	1.013	1.554	0.549	0.061	1.814
902/F	3/1	298.00	0.099	9.637	1.026	1.879	0.416	0.057	1.862
		M E A N:	0.137	9.844	1.069	1.861	0.473	0.070	1.959
		STANDARD DEVIATION:	0.035	0.716	0.129	0.124	0.059	0.024	0.267

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857/F	4/1	316.00	0.135	9.679	0.946	1.910	0.510	0.066	1.889
858/F	4/1	295.00	0.113	10.023	1.129	1.967	0.598	0.051	1.907
859/F	4/1	317.00	0.112	10.912	1.069	1.724	0.523	0.057	1.957
862/F	4/1	265.00	0.140	9.149	0.921	1.756	0.507	0.073	1.960
885/F	4/1	289.00	0.164	9.845	0.995	1.944	0.554	0.065	1.973
889/F	4/1	280.00	0.139	8.443	0.797	1.819	0.475	0.071	1.789
891/F	4/1	241.00	0.123	7.359	0.863	1.731	0.439	0.052	1.600
892/F	4/1	322.00	1.446	10.193	0.681	2.052	0.537		2.119
897/F	4/1	285.00	0.113	8.299	1.055	1.825	0.524	0.058	1.767
906/F	4/1	293.00	0.103	9.868	0.900	1.791	0.445	0.075	1.920
		M E A N:	0.259	9.377	0.936	1.852	0.511	0.063	1.888
	STANDARD	DEVIATION:	0.418	1.062	0.135	0.111	0.049	0.009	0.141

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SUMMARY STATISTICS FOR % ORGAN TO BODY WEIGHT RATIO
STUDY NUMBER: GLP85042
REPORT FOR INTERIM SACRIFICE NUMBER 2
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PAGE: 1

STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY	TESTES
788/M	1/1	439.00	3.475	0.356	0.425	0.215	0.014	0.707	0.751
790/M	1/1	450.00	3.364	0.306	0.475	0.183	0.014	0.762	0.676
803/M	1/1	409.00	3.209	0.289	0.495	0.179	0.012	0.632	0.663
825/M	1/1	439.00	3.212	0.267	0.465	0.155	0.013	0.638	0.577
826/M	1/1	435.00	2.938	0.314	0.484	0.195	0.014	0.707	0.772
		M E A N:	3.240	0.306	0.469	0.185	0.013	0.689	0.688
	STANDARD DEVIATION:		0.202	0.033	0.027	0.022	0.001	0.054	0.078
759/M	2/1	423.00	3.336	0.334	0.477	0.197	0.013	0.690	0.704
760/M	2/1	442.00	3.221	0.292	0.462	0.182	0.014	0.724	0.694
783/M	2/1	459.00	3.376	0.303	0.465	0.185	0.012	0.674	0.669
786/M	2/1	369.00	3.093	0.347	0.541	0.215	0.015	0.717	0.740
811/M	2/1	403.00	3.245	0.407	0.510	0.190	0.012	0.719	0.702
		M E A N:	3.254	0.337	0.491	0.194	0.013	0.705	0.702
	STANDARD DEVIATION:		0.110	0.045	0.034	0.013	0.001	0.022	0.025
773/M	3/1	396.00	3.042	0.392	0.507	0.151	0.012	0.720	0.734
776/M	3/1	437.00	3.642	0.334	0.427	0.157	0.010	0.633	0.622
801/M	3/1	444.00	3.612	0.378	0.452	0.218	0.012	0.739	0.697
817/M	3/1	405.00	3.218	0.308	0.469	0.143	0.014	0.696	0.813
829/M	3/1	414.00	2.823	0.309	0.497	0.157	0.012	0.638	0.712
		M E A N:	3.267	0.344	0.471	0.165	0.012	0.685	0.716
	STANDARD DEVIATION:		0.357	0.039	0.033	0.030	0.001	0.048	0.069
763/M	4/1	410.00	3.629	0.286	0.491	0.184	0.015	0.691	0.651
774/M	4/1	427.00	3.249	0.290	0.437	0.210	0.015	0.655	0.706
778/M	4/1	390.00	3.170	0.314	0.517	0.146	0.015	0.726	0.661
784/M	4/1	394.00	3.221	0.329	0.480	0.215	0.012	0.682	0.758
816/M	4/1	400.00	3.323	0.319	0.499	0.194	0.015	0.717	0.779
		M E A N:	3.318	0.308	0.485	0.190	0.014	0.694	0.711
	STANDARD DEVIATION:		0.182	0.019	0.030	0.027	0.001	0.029	0.057

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ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY	TESTES
758/M	1/1	536.00	3.335	0.641	0.445	0.714	0.010	0.662	0.702
768/M	1/1	461.00	2.256	0.308	0.483	0.789	0.010	1.022	0.786
769/M	1/1	567.00	3.934	0.337	0.326	0.151	0.009	0.676	0.628
770/M	1/1	547.00	3.364	0.307	0.365	0.150	0.014	0.582	0.577
785/M	1/1	518.00	1.830	0.576	0.363	0.173	0.012	0.627	0.770
795/M	1/1	578.00	3.044	0.474	0.484	0.159	0.083	0.605	0.493
804/M	1/1	538.00	3.342	0.296	0.368	0.124		0.680	0.547
805/M	1/1	512.00	3.348	0.351	0.420	0.136	0.010	0.672	0.530
814/M	1/1	523.00	2.898	0.443	0.404	0.138	0.008	0.714	0.669
822/M	1/1	502.00	3.163	0.315	0.402	0.141	0.011	0.660	0.639
		M E A N:	3.051	0.405	0.406	0.268	0.018	0.690	0.634
		STANDARD DEVIATION:	0.605	0.124	0.053	0.256	0.024	0.123	0.100
761/M	2/1	480.00	3.314	0.447	0.455	0.150	0.014	0.666	0.710
764/M	2/1	476.00	3.240	0.295	0.416	0.170	0.010	0.644	0.634
771/M	2/1	550.00	3.347	0.285	0.381	0.151	0.085	0.590	0.496
791/M	2/1	545.00	2.354	0.362	0.370	0.154	0.011	0.745	0.646
792/M	2/1	502.00	4.019	0.542	0.382	0.154	0.010	0.694	0.906
793/M	2/1	510.00	3.367	0.339	0.429	0.160	0.026	0.725	0.778
799/M	2/1	498.00	2.544	0.296	0.407	0.158	0.010	0.682	0.631
808/M	2/1	507.00	2.974	0.572	0.602	0.158	0.011	0.945	0.618
809/M	2/1	515.00	3.165	0.305	0.407	0.140	0.009	0.652	0.640
815/M	2/1	541.00	3.217	0.303	0.380	0.151	0.007	0.594	0.627
		M E A N:	3.154	0.375	0.423	0.155	0.019	0.694	0.669
		STANDARD DEVIATION:	0.461	0.108	0.068	0.008	0.024	0.101	0.110
787/M	3/1	483.00	3.278	0.315	0.445	0.196	0.017	0.683	1.360
796/M	3/1	620.00	2.955	0.341	0.350	0.169	0.010	0.640	0.552
802/M	3/1	409.00	3.055	0.303	0.473	0.157	0.007	0.630	0.649
812/M	3/1	535.00	2.998	0.348	0.392	0.153	0.013	0.595	0.637
819/M	3/1	477.00	3.080	0.363	0.428	0.144	0.008	0.593	0.577
821/M	3/1	477.00	3.313	0.314	0.427	0.156	0.014	0.946	0.652
823/M	3/1	521.00	2.939	0.289	0.376	0.233	0.008	0.569	0.627
824/M	3/1	508.00	2.726	0.355	0.726	0.156	0.009	0.628	0.717
828/M	3/1	485.00	2.787	0.439	0.453	0.161	0.012	0.618	0.652
831/M	3/1	547.00	2.868	0.352	0.316	0.188	0.008	0.634	0.641
		M E A N:	3.000	0.342	0.439	0.171	0.010	0.654	0.706
		STANDARD DEVIATION:	0.191	0.042	0.112	0.027	0.003	0.107	0.234

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY	TESTES
762/M	4/1	519.00	3.488	0.278	0.346	0.141	0.013	0.743	0.622
765/M	4/1	548.00	3.267	0.335	0.360	0.359	0.009	0.642	0.491
782/M	4/1	468.00	3.096	0.358	0.407	0.131	0.011	1.018	0.653
789/M	4/1	585.00	2.958	0.398	0.809	0.147	0.006	0.987	0.629
798/M	4/1	522.00	3.449	0.325	0.370	0.168	0.011	0.718	0.642
806/M	4/1	486.00	3.359	0.295	0.431	0.332	0.010	0.617	0.679
807/M	4/1	490.00	3.200	0.280	0.478	0.166	0.038	1.011	0.677
810/M	4/1	491.00	2.818	0.352	0.410	0.184	0.009	0.709	0.720
813/M	4/1	483.00	3.296	0.291	0.437	0.168	0.010	0.641	0.766
818/M	4/1	514.00	2.975	0.294	0.399	0.153	0.011	0.671	0.636
		M E A N:	3.191	0.321	0.445	0.195	0.013	0.776	0.651
	STANDARD DEVIATION:		0.224	0.040	0.134	0.081	0.009	0.163	0.072

LETTERMAN ARMY INSTITUTE OF RESEARCH
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SPECIES: RAT/SPRAGUE-DAWLEY

SUMMARY STATISTICS FOR % ORGAN TO BODY WEIGHT RATIO
STUDY NUMBER: GLP85042
REPORT FOR INTERIM SACRIFICE NUMBER 3
STUDY START DATE: 21-AUG-85

PRINTED: 28-OCT-88
PAGE: 1

STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	OVARIES	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY
843/F	1/1	270.00	0.055	3.676	0.330	0.719	0.215	0.027	0.643
850/F	1/1	270.00	0.050	3.475	0.311	0.730	0.224	0.026	0.661
854/F	1/1	291.00	0.060	3.934	0.341	0.674	0.195	0.027	0.732
855/F	1/1	304.00	0.052	3.678	0.271	0.607	0.211	0.019	0.627
901/F	1/1	248.00	0.084	3.459	0.355	0.749	0.198	0.029	0.660
		M E A N:	0.060	3.644	0.322	0.696	0.209	0.026	0.665
	STANDARD	DEVIATION:	0.014	0.193	0.032	0.057	0.012	0.004	0.040
838/F	2/1	271.00	0.048	4.049	0.432	0.721	0.213	0.020	0.758
839/F	2/1	275.00	0.056	3.676	0.349	0.689	0.205	0.027	0.728
851/F	2/1	225.00	0.044	3.779	0.338	0.834	0.161	0.028	0.670
873/F	2/1	258.00	0.050	3.334	0.333	0.711	0.192	0.027	0.641
899/F	2/1	235.00	0.050	3.419	0.319	0.774	0.204	0.026	0.666
		M E A N:	0.050	3.651	0.354	0.746	0.195	0.025	0.693
	STANDARD	DEVIATION:	0.004	0.287	0.045	0.058	0.020	0.003	0.049
833/F	3/1	258.00	0.048	3.475	0.316	0.728	0.197	0.024	0.648
844/F	3/1	275.00	0.045	3.318	0.385	0.654	0.169	0.020	0.647
863/F	3/1	235.00	0.052	3.472	0.344	0.770	0.202	0.031	0.706
865/F	3/1	248.00	0.057	3.339	0.354	0.787	0.219	0.029	0.721
887/F	3/1	282.00	0.047	3.820	0.359	0.680	0.193	0.026	0.659
		M E A N:	0.050	3.485	0.352	0.724	0.196	0.026	0.676
	STANDARD	DEVIATION:	0.005	0.201	0.025	0.057	0.018	0.004	0.035
835/F	4/1	242.00	0.055	3.536	0.325	0.745	0.160	0.028	0.664
868/F	4/1	268.00	0.051	4.110	0.403	0.675	0.234	0.023	0.810
875/F	4/1	244.00	0.050	3.428	0.307	0.738	0.192	0.034	0.697
880/F	4/1	263.00	0.057	3.616	0.336	0.703	0.213	0.021	0.741
905/F	4/1	235.00	0.057	3.089	0.373	0.763	0.226	0.031	0.675
		M E A N:	0.054	3.556	0.349	0.725	0.205	0.027	0.717
	STANDARD	DEVIATION:	0.003	0.369	0.039	0.035	0.030	0.006	0.060

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STUDY NUMBER: GLP85042
REPORT FOR FINAL SACRIFICE
STUDY START DATE: 21-AUG-85

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PAGE: 1
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ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	OVARIES	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY
837/F	1/1	347.00	0.045	2.847	0.303	0.502	0.154	0.017	0.556
840/F	1/1	331.00	0.027	3.194	0.322	0.549	0.198	0.021	0.647
845/F	1/1	279.00	0.037	3.470	0.365	0.660	0.180	0.012	0.646
853/F	1/1	339.00	0.039	3.044	0.365	0.502	0.153	0.022	0.645
860/F	1/1	310.00	0.032	3.084	0.289	0.641	0.195	0.022	0.610
864/F	1/1	305.00	0.033	3.190	0.297	0.513	0.151	0.025	0.637
876/F	1/1	339.00	0.033	3.290	0.331	0.495	0.159	0.018	0.590
877/F	1/1	324.00	0.043	3.328	0.352	0.595	0.175	0.020	0.582
896/F	1/1	274.00	0.048	4.239	0.347	0.722	0.362	0.028	1.126
903/F	1/1	340.00	0.056	3.012	0.323	0.541	0.155	0.040	0.633
	M E A N:		0.039	3.270	0.330	0.572	0.188	0.023	0.667
	STANDARD DEVIATION:		0.009	0.384	0.028	0.079	0.064	0.007	0.164
836/F	2/1	327.00	0.041	3.265	0.332	0.573	0.140	0.028	0.600
846/F	2/1	270.00	0.051	3.271	0.368	0.668	0.180	0.039	0.786
847/F	2/1	355.00	0.031	3.199	0.300	0.519	0.126	0.018	0.579
848/F	2/1	292.00	0.053	3.120	0.312	0.536	0.146	0.021	0.618
886/F	2/1	310.00	0.052	3.125	0.337	0.559	0.163	0.033	0.660
888/F	2/1	367.00	0.037	2.978	0.265	0.509	0.165	0.020	0.588
893/F	2/1	295.00	0.040	2.434	0.592	0.616	0.161	0.021	0.646
894/F	2/1	325.00	0.047	3.004	0.330	0.546	0.154	0.031	0.610
895/F	2/1	294.00	0.112	2.037	0.354	0.665	0.164		1.263
904/F	2/1	311.00	0.038	3.285	0.328	0.591	0.145	0.024	0.603
	M E A N:		0.050	2.972	0.352	0.578	0.154	0.026	0.695
	STANDARD DEVIATION:		0.023	0.413	0.089	0.056	0.016	0.007	0.208
832/F	3/1	292.00	0.047	3.433	0.356	0.671	0.147	0.028	0.639
841/F	3/1	303.00	0.038	3.166	0.353	0.632	0.181	0.022	0.856
849/F	3/1	261.00	0.045	3.282	0.349	0.670	0.167	0.020	0.631
856/F	3/1	314.00	0.069	3.023	0.411	0.593	0.162	0.038	0.626
870/F	3/1	303.00	0.041	3.108	0.322	0.628	0.127	0.019	0.611
871/F	3/1	313.00	0.037	3.135	0.306	0.609	0.160	0.021	0.593
872/F	3/1	324.00	0.050	3.294	0.348	0.604	0.160	0.011	0.585
874/F	3/1	355.00	0.047	3.152	0.361	0.543	0.125	0.028	0.630
883/F	3/1	282.00	0.040	3.559	0.359	0.551	0.195	0.022	0.643
902/F	3/1	298.00	0.033	3.234	0.344	0.631	0.140	0.019	0.625
	M E A N:		0.045	3.239	0.351	0.613	0.156	0.023	0.644
	STANDARD DEVIATION:		0.010	0.161	0.027	0.043	0.022	0.007	0.077

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REPORT FOR FINAL SACRIFICE
STUDY START DATE: 21-AUG-85

STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	OVARIES	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY
857/F	4/1	316.00	0.043	3.063	0.299	0.604	0.161	0.021	0.598
858/F	4/1	295.00	0.038	3.398	0.383	0.667	0.203	0.017	0.646
859/F	4/1	317.00	0.035	3.442	0.337	0.544	0.165	0.018	0.617
862/F	4/1	265.00	0.053	3.452	0.348	0.663	0.191	0.028	0.740
885/F	4/1	289.00	0.057	3.407	0.344	0.673	0.192	0.022	0.683
889/F	4/1	280.00	0.050	3.015	0.285	0.650	0.170	0.025	0.639
891/F	4/1	241.00	0.051	3.054	0.358	0.718	0.182	0.022	0.664
892/F	4/1	322.00	0.449	3.166	0.211	0.637	0.167		0.658
897/F	4/1	285.00	0.040	2.912	0.370	0.640	0.184	0.020	0.620
906/F	4/1	293.00	0.035	3.368	0.307	0.611	0.152	0.026	0.655
		M E A N:	0.085	3.228	0.324	0.641	0.177	0.022	0.652
		STANDARD DEVIATION:	0.128	0.206	0.051	0.047	0.016	0.003	0.040

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SPECIES: RAT/SPRAGUE-DAWLEY

SUMMARY STATISTICS FOR % ORGAN TO BRAIN WEIGHT RATIO
STUDY NUMBER: GLP85042
REPORT FOR INTERIM SACRIFICE NUMBER 2
STUDY START DATE: 21-AUG-85

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PAGE: 1

STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY	TESTES
788/M	1/1	439.00	818.401	83.798	100.000	50.644	3.326	166.416	176.985
790/M	1/1	450.00	708.423	64.483	100.000	38.512	2.901	160.365	142.349
803/M	1/1	409.00	648.049	58.272	100.000	36.247	2.420	127.654	133.827
825/M	1/1	439.00	691.128	57.353	100.000	33.333	2.843	137.255	124.167
826/M	1/1	435.00	606.644	64.737	100.000	40.294	2.895	145.990	159.326
	MEAN:		694.529	65.728	100.000	39.806	2.877	147.536	147.331
	STANDARD DEVIATION:		79.738	10.663	0.000	6.594	0.321	16.003	21.018
759/M	2/1	423.00	699.653	70.104	100.000	41.299	2.677	144.621	147.695
760/M	2/1	442.00	697.990	63.284	100.000	39.363	2.941	156.912	150.392
783/M	2/1	459.00	725.902	65.152	100.000	39.766	2.670	144.965	143.794
786/M	2/1	369.00	572.130	64.110	100.000	39.799	2.757	132.531	136.842
811/M	2/1	403.00	636.041	79.767	100.000	37.257	2.432	141.002	137.549
	MEAN:		666.343	68.484	100.000	39.497	2.695	144.006	143.254
	STANDARD DEVIATION:		62.155	6.841	0.000	1.453	0.183	8.783	6.013
773/M	3/1	396.00	599.652	77.252	100.000	29.716	2.339	142.011	144.749
776/M	3/1	437.00	853.298	78.338	100.000	36.676	2.413	148.365	145.684
801/M	3/1	444.00	798.606	83.665	100.000	48.257	2.590	163.446	154.183
817/M	3/1	405.00	686.309	65.666	100.000	30.542	2.949	148.394	173.302
829/M	3/1	414.00	567.654	62.166	100.000	31.666	2.380	128.218	143.079
	MEAN:		701.104	73.418	100.000	35.371	2.534	146.087	152.199
	STANDARD DEVIATION:		123.480	9.091	0.000	7.694	0.251	12.726	12.554
763/M	4/1	410.00	738.679	58.242	100.000	37.488	2.979	140.715	132.572
774/M	4/1	427.00	743.010	66.256	100.000	48.045	3.374	149.759	161.543
778/M	4/1	390.00	612.891	60.783	100.000	28.309	2.975	140.456	127.764
784/M	4/1	394.00	670.719	68.552	100.000	44.820	2.537	142.072	157.770
816/M	4/1	400.00	665.932	63.878	100.000	38.928	3.006	143.788	156.162
	MEAN:		686.246	63.542	100.000	39.518	2.974	143.358	147.162
	STANDARD DEVIATION:		54.785	4.131	0.000	7.598	0.297	3.815	15.728

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ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY	TESTES
758/M	1/1	536.00	749.832	144.044	100.000	160.612	2.307	148.784	157.928
768/M	1/1	461.00	467.326	63.775	100.000	163.506	1.978	211.775	162.831
769/M	1/1	567.00	1205.568	103.135	100.000	46.270	2.811	207.243	192.432
770/M	1/1	547.00	921.382	84.076	100.000	41.062	3.706	159.439	158.137
785/M	1/1	518.00	503.719	158.608	100.000	47.609	3.348	172.529	211.902
795/M	1/1	578.00	628.357	97.929	100.000	32.857	17.107	124.964	101.679
804/M	1/1	538.00	908.489	80.445	100.000	33.754		184.942	148.762
805/M	1/1	512.00	797.673	83.713	100.000	32.387	2.420	160.028	126.245
814/M	1/1	523.00	716.840	109.650	100.000	34.248	1.892	176.585	165.610
822/M	1/1	502.00	787.258	78.334	100.000	35.052	2.628	164.204	159.147
	M E A N:	768.645	100.371	100.000	62.736	4.244	171.049	158.467	
	STANDARD DEVIATION:	215.683	30.117	0.000	52.637	4.860	26.071	30.618	
761/M	2/1	480.00	728.630	98.351	100.000	32.982	2.978	146.450	156.161
764/M	2/1	476.00	778.889	70.859	100.000	40.960	2.374	154.747	152.323
771/M	2/1	550.00	879.035	74.976	100.000	39.589	22.350	154.919	130.229
791/M	2/1	545.00	636.359	97.817	100.000	41.617	3.026	201.438	174.653
792/M	2/1	502.00	1052.426	141.941	100.000	40.219	2.556	181.847	237.246
793/M	2/1	510.00	784.422	79.077	100.000	37.232	6.076	168.936	181.270
799/M	2/1	498.00	625.222	72.754	100.000	38.944	2.567	167.670	155.035
808/M	2/1	507.00	493.842	95.021	100.000	26.302	1.769	156.895	102.686
809/M	2/1	515.00	778.414	75.119	100.000	34.432	2.149	160.458	157.450
815/M	2/1	541.00	846.959	79.708	100.000	39.659	1.849	156.350	165.109
	M E A N:	760.420	88.562	100.000	37.194	4.769	164.971	161.216	
	STANDARD DEVIATION:	154.132	21.524	0.000	4.735	6.297	16.146	34.835	
787/M	3/1	483.00	736.761	70.777	100.000	44.020	3.723	153.560	305.631
796/M	3/1	620.00	844.194	97.465	100.000	48.387	2.811	182.903	157.742
802/M	3/1	409.00	645.685	64.134	100.000	33.127	1.395	133.127	137.158
812/M	3/1	535.00	764.173	88.757	100.000	38.971	3.430	151.739	162.268
819/M	3/1	477.00	720.098	84.902	100.000	33.676	1.765	138.725	134.951
821/M	3/1	477.00	775.896	73.540	100.000	36.426	3.240	221.600	152.774
823/M	3/1	521.00	781.173	76.786	100.000	61.837	2.143	151.122	166.735
824/M	3/1	508.00	375.590	48.847	100.000	21.454	1.193	86.547	98.725
828/M	3/1	485.00	615.294	96.905	100.000	35.457	2.594	136.413	144.015
831/M	3/1	547.00	908.865	111.530	100.000	59.676	2.549	200.811	203.244
	M E A N:	716.773	81.364	100.000	41.303	2.484	155.655	166.324	
	STANDARD DEVIATION:	147.269	18.337	0.000	12.468	0.857	38.167	55.723	

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PRINTED: 28-OCT-88
PAGE: 2
STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY	TESTES
762/M	4/1	519.00	1009.197	80.379	100.000	40.914	3.790	214.939	179.877
765/M	4/1	548.00	907.501	93.158	100.000	99.696	2.382	178.256	136.239
782/M	4/1	468.00	761.482	88.071	100.000	32.160	2.627	250.289	160.694
789/M	4/1	585.00	365.793	49.239	100.000	18.182	0.698	122.030	77.759
798/M	4/1	522.00	931.988	87.940	100.000	45.342	2.950	194.048	173.395
806/M	4/1	486.00	779.656	68.577	100.000	76.982	2.245	143.219	157.498
807/M	4/1	490.00	669.714	58.522	100.000	34.686	7.860	211.576	141.734
810/M	4/1	491.00	686.749	85.856	100.000	44.764	2.134	172.854	175.434
813/M	4/1	483.00	754.955	66.619	100.000	38.407	2.323	146.894	175.344
818/M	4/1	514.00	745.805	73.707	100.000	38.244	2.780	168.244	159.561
	M E A N:		761.284	75.207	100.000	46.938	2.979	180.235	153.754
	STANDARD DEVIATION:		177.311	14.386	0.000	23.743	1.882	38.524	30.417

LETTERMAN ARMY INSTITUTE OF RESEARCH
DIV OF RES SUPP, PATH SERV GP
PRESIDIO OF SAN FRANCISCO, CA 94129
SPECIES: RAT/SPRAGUE-DAWLEY

SUMMARY STATISTICS FOR % ORGAN TO BRAIN WEIGHT RATIO
STUDY NUMBER: GLP85042
REPORT FOR INTERIM SACRIFICE NUMBER 3
STUDY START DATE: 21-AUG-85

PRINTED: 28-OCT-88
PAGE: 1
STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	OVARIES	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY
843/F	1/1	270.00	7.673	511.123	45.932	100.000	29.866	3.811	89.444
850/F	1/1	270.00	6.897	475.811	42.546	100.000	30.629	3.550	90.467
854/F	1/1	291.00	8.980	584.031	50.612	100.000	28.980	3.980	108.622
855/F	1/1	304.00	8.514	606.291	44.740	100.000	34.761	3.200	103.416
901/F	1/1	248.00	11.201	461.982	47.388	100.000	26.440	3.823	88.099
		M E A N:	8.653	527.847	46.244	100.000	30.135	3.673	96.010
		STANDARD DEVIATION:	1.633	64.490	3.018	0.000	3.029	0.306	9.359
838/F	2/1	271.00	6.653	561.515	59.928	100.000	29.478	2.815	105.169
839/F	2/1	275.00	8.074	533.404	50.660	100.000	29.763	3.905	105.699
851/F	2/1	225.00	5.330	453.198	40.512	100.000	19.296	3.305	80.384
873/F	2/1	258.00	7.034	469.029	46.892	100.000	27.045	3.762	90.240
899/F	2/1	235.00	6.491	441.914	41.254	100.000	26.348	3.355	86.029
		M E A N:	6.716	491.812	47.849	100.000	26.386	3.428	93.504
		STANDARD DEVIATION:	0.990	52.650	7.938	0.035	4.233	0.429	11.440
833/F	3/1	258.00	6.606	477.624	43.367	100.000	27.064	3.250	89.025
844/F	3/1	275.00	6.893	507.226	58.922	100.000	25.792	3.057	98.944
863/F	3/1	235.00	6.744	451.023	44.666	100.000	26.202	3.980	91.653
865/F	3/1	248.00	7.271	423.963	44.905	100.000	27.803	3.635	91.603
887/F	3/1	282.00	6.938	561.920	52.843	100.000	28.378	3.756	96.922
		M E A N:	6.890	484.351	48.941	100.000	27.048	3.536	93.629
		STANDARD DEVIATION:	0.250	53.251	6.717	0.035	1.076	0.376	4.132
835/F	4/1	242.00	7.381	474.861	43.618	100.000	21.476	3.774	89.179
868/F	4/1	268.00	7.569	608.508	59.613	100.000	34.696	3.370	119.945
875/F	4/1	244.00	6.778	464.722	41.667	100.000	26.000	4.667	94.444
880/F	4/1	263.00	8.063	514.556	47.781	100.000	30.357	2.976	105.519
905/F	4/1	235.00	7.414	404.626	48.885	100.000	29.543	4.069	88.406
		M E A N:	7.441	493.455	48.313	100.000	28.414	3.771	99.499
		STANDARD DEVIATION:	0.460	75.406	6.974	-0.001	4.962	0.649	13.317

LETTERMAN ARMY INSTITUTE OF RESEARCH
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PRESIDIO OF SAN FRANCISCO, CA 94129
SPECIES: RAT/SPRAGUE-DAWLEY

SUMMARY STATISTICS FOR % ORGAN TO BRAIN WEIGHT RATIO
STUDY NUMBER: GLP85042
REPORT FOR FINAL SACRIFICE
STUDY START DATE: 21-AUG-85

PRINTED: 27-OCT-88
PAGE: 1
STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	OVARIES	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY
837/F	1/1	347.00	8.960	567.432	60.310	100.000	30.729	3.446	110.856
840/F	1/1	331.00	4.950	581.518	58.636	100.000	36.029	3.850	117.712
845/F	1/1	279.00	5.540	525.910	55.350	100.000	27.322	1.793	97.936
853/F	1/1	339.00	7.819	606.584	72.840	100.000	30.511	4.409	128.571
860/F	1/1	310.00	4.932	481.127	45.093	100.000	30.448	3.422	95.219
864/F	1/1	305.00	6.522	622.187	57.992	100.000	29.476	4.795	124.169
876/F	1/1	339.00	6.730	664.264	66.825	100.000	32.043	3.693	119.119
877/F	1/1	324.00	7.206	558.942	59.202	100.000	29.342	3.421	97.719
896/F	1/1	274.00	6.626	587.557	48.103	100.000	50.177	3.844	156.045
903/F	1/1	340.00	10.272	556.522	59.728	100.000	28.696	7.391	116.957
	M E A N:		6.956	575.205	58.408	100.000	32.477	4.007	116.430
	STANDARD DEVIATION:		1.709	50.848	8.015	0.000	6.640	1.426	18.132
836/F	2/1	327.00	7.101	570.101	57.982	100.000	24.399	4.859	104.805
846/F	2/1	270.00	7.594	489.523	55.100	100.000	26.996	5.765	117.572
847/F	2/1	355.00	6.020	615.835	57.755	100.000	24.187	3.525	111.388
848/F	2/1	292.00	9.910	582.545	58.248	100.000	27.302	3.900	115.473
886/F	2/1	310.00	9.348	559.088	60.300	100.000	29.083	5.886	118.119
888/F	2/1	367.00	7.281	585.118	52.141	100.000	32.495	3.854	115.471
893/F	2/1	295.00	6.498	395.319	96.145	100.000	26.211	3.469	104.956
894/F	2/1	325.00	8.568	550.395	60.372	100.000	28.241	5.637	111.781
895/F	2/1	294.00	16.837	306.551	53.275	100.000	24.667		189.969
904/F	2/1	311.00	6.366	555.767	55.495	100.000	24.483	4.081	102.013
	M E A N:		8.552	521.024	60.681	100.000	26.806	4.553	119.155
	STANDARD DEVIATION:		3.183	97.526	12.761	-0.002	2.643	0.993	25.520
832/F	3/1	292.00	7.048	512.002	53.115	100.000	21.859	4.188	95.352
841/F	3/1	303.00	6.054	500.731	55.793	100.000	28.653	3.497	135.334
849/F	3/1	261.00	6.693	489.989	52.059	100.000	24.943	3.032	94.165
856/F	3/1	314.00	11.600	509.774	69.227	100.000	27.390	6.391	105.532
870/F	3/1	303.00	6.572	495.163	51.314	100.000	20.294	3.102	97.266
871/F	3/1	313.00	6.086	514.743	50.210	100.000	26.233	3.463	97.377
872/F	3/1	324.00	8.227	545.427	57.639	100.000	26.469	1.840	96.934
874/F	3/1	355.00	8.605	579.990	66.356	100.000	22.913	5.080	116.019
883/F	3/1	282.00	7.207	645.753	65.187	100.000	35.328	3.925	116.731
902/F	3/1	298.00	5.269	512.879	54.604	100.000	22.139	3.034	99.095
	M E A N:		7.336	530.645	57.550	100.000	25.622	3.755	105.380
	STANDARD DEVIATION:		1.800	48.375	6.884	0.000	4.347	1.257	13.360

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SUMMARY STATISTICS FOR % ORGAN TO BRAIN WEIGHT RATIO
STUDY NUMBER: GLP85042
REPORT FOR FINAL SACRIFICE
STUDY START DATE: 21-AUG-85

STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	OVARIES	LIVER	HEART	BRAIN	SPLEEN	ADRENAL	KIDNEY
857/F	4/1	316.00	7.068	506.754	49.529	100.000	26.702	3.455	98.901
858/F	4/1	295.00	5.745	509.558	57.397	100.000	30.402	2.593	96.950
859/F	4/1	317.00	6.497	632.947	62.007	100.000	30.336	3.306	113.515
862/F	4/1	265.00	7.973	521.014	52.449	100.000	28.872	4.157	111.617
885/F	4/1	289.00	8.436	506.430	51.183	100.000	28.498	3.344	101.492
889/F	4/1	280.00	7.642	464.156	43.815	100.000	26.113	3.903	98.351
891/F	4/1	241.00	7.106	425.130	49.856	100.000	25.361	3.004	92.432
892/F	4/1	322.00	70.468	496.735	33.187	100.000	26.170		103.265
897/F	4/1	285.00	6.192	454.740	57.808	100.000	28.712	3.178	96.822
906/F	4/1	293.00	5.751	550.977	50.251	100.000	24.846	4.188	107.203
		M E A N:	13.288	506.844	50.748	100.000	27.601	3.459	102.055
	STANDARD DEVIATION:		20.112	57.130	8.048	0.000	2.018	0.535	6.837

GLP Study #85042

Principle Investigator: CPT Morgan APC# LLE0

I. INTRODUCTION

Study: 90-Day Subchronic Oral Toxicity Study in Rats, Nitroguanidine.
Animal: Rat, Albino, Sprague-Dawley, 5 weeks old, male and female.
Dosage Group: Group 1 - Controls 0 mg/kg
Group 2 - 100 mg/kg
Group 3 - 316 mg/kg
Group 4 - 1000 mg/kg
Group 5 - Baseline
(Sacrificed day one of study)
Reference: SOP-OP-STX-74.

II. SUMMARY OF PROCEDURES

Euthanasia: Sodium Pentobarbital, IP
Fixative: 10% buffered formalin
Histopathology: Routine
Clinical Lab: Hematology/serology
Other procedures: Organ weights.

III. GROSS FINDINGS: Listed are animals from all groups with recorded lesions.

ANIMAL ID#	SEX	DOSE GROUP	SACRIFICE STATUS	OBSERVATION
85D0758	M	1	Final	Lungs - Multifocal white foci
85D0788	M	1	Interim	Urinary bladder - Mass free in lumen
85D0903	F	1	Final	Uterus - Dilated
85D0847	F	2	Final	Lungs - Multifocal white foci
85D0761	M	2	Final	Lungs - Multifocal white foci
85D0791	M	2	Final	Kidney - Dilated pelvis
85D0793	M	2	Final	Kidney - Dilated pelvis
85D0799	M	2	Final	Kidney - Dilated pelvis
85D0894	F	2	Final	Liver - Diffuse pallor
85D0856	F	3	Final	Lungs - Multifocal white foci
85D0872	F	3	Final	Lungs - Multifocal white foci
85D0816	M	4	Interim	Urinary bladder - Mass free in lumen
85D0777	M	5	Baseline	Liver - Pinpoint white foci
85D0781	M	5	Baseline	Kidney - Dilated pelvis

Pathology Report
GLP Study 85042

Correlation of gross and microscopic findings are listed in table 1.

Incidence summary reports for gross necropsy observations for final, interim, and baseline sacrifices are listed in tables 2, 3, and 4, respectively.

IV. MICROSCOPIC FINDINGS: Tissues taken for microscopic observation from all groups were: Brain, trachea, thyroid and parathyroid glands, esophagus, exorbital lacrimal glands, harderian glands, mandibular, parotid, and sublingual salivary glands, heart, aorta, lungs, thymus, spleen, liver, kidneys, urinary bladder, uterus, epididymus, testes, accessory sex organs, ovaries, duodenum, jejunum, ileum, pancreas, cecum, rectum, colon, stomach, skeletal muscle, sciatic nerve, tongue, skin, mammary glands, nasal turbinates, sternum, femur, vertebrae, spinal cord, adrenal glands, pituitary glands, eyes, middle ears, and mesenteric lymph nodes.

All tissues were examined in control, high dose, and baseline groups (groups 1, 4, and 5). Heart, lung, liver, and kidneys were examined from groups 2 and 3.

Tables 5, 6, and 7 list the incidence summary (with %) of microscopic observations of tissues with recorded findings from the final, interim, and baseline sacrifices, respectively. Statistically compared microscopic lesions between groups of final and intermediate sacrifice groups at the 0.95 level of significance using the Kolmogorov-Smirnov two-tailed test are listed in tables 8 and 9, respectively.

V. SUMMARY COMMENTS: Compound related/induced gross or microscopic lesions were not present. All gross and microscopic lesions were minimal to mild in severity and considered to be incidental findings, commonly observed in aging Sprague-Dawley rats. There were no microscopic lesions that were significantly different in severity from the control using the Kolmogorov-Smirnov two-tailed test. Baseline animals (group 5) were treated as a separate group and not compared to other groups. All gross and microscopic lesions noted in this group were also considered to be insignificant incidental findings, commonly observed in Sprague-Dawley rats.

Charles 3 Clifford, DVM, PhD
Dplmt ACVP

for G. TRACY MAKOVEC, DVM
MAJ, VC
Diplomate, ACVP
Comparative Pathology Branch

Glossary of Microscopic Findings

Accessory Sex Glands

Mixed inflammatory cell infiltrates - Consists of focal interstitial and perivascular infiltrates of lymphocytes, plasma cells, and macrophages randomly distributed through prostate, seminal vesicle, or coagulating gland parenchyma. An occasional glandular structure is also infiltrated by inflammatory cells.

Exorbital Lacrimal and Harderian Glands

Lymphocytic infiltrates, interstitial - Consists of focal interstitial infiltrates of lymphocytes randomly distributed through parenchyma.

Mixed inflammatory cell infiltrates - Characterized by focal interstitial infiltrates of macrophages, lymphocytes and occasional neutrophils randomly distributed through parenchyma.

Heart

Mixed inflammatory cell infiltrates/Histiocytic aggregates, myocardium - Consists of focal interstitial infiltrates of either histiocytes or histiocytes and lymphocytes randomly distributed through the myocardium. Occasional histiocytes contain dark brown granular material. Fibrosis sometimes replaces myocardium.

Kidney

Interstitial fibrosis with mixed inflammatory cell infiltrates and tubular atrophy and dilitation - Characterized by a well demarcated linear area of interstitial fibrosis containing infiltrates of macrophages and lymphocytes, atrophic and dilated cortical tubules and a few glomeruli. Affected area extends from cortical surface into the medulla. The cortical surface is depressed.

Lymphocytic and histiocytic interstitial infiltrates - Consists of focal interstitial infiltrates of lymphocytes randomly distributed through the renal cortex.

Dilated renal pelvis - Self-explanatory.

Mineralization, intratubular, microfocal - Small mineralized foci present in the lumen of medullary collecting tubules.

Liver

Mixed inflammatory cell infiltrates and individual hepatocyte necrosis - Consists of small focal random infiltrates of lymphocytes and

macrophages often associated with one or more swollen eosinophilic hepatocytes with karyorrhectic or karyolytic nuclei.

Necrosis, hepatocellular - Characterized by small focal areas of coagulative necrosis of hepatocytes associated with mild infiltrates of macrophages, neutrophils, and lymphocytes.

Perivascular mixed inflammatory cell infiltrates - Perivascular spaces, often associated with portal triads, contain minimum to mild numbers of macrophages and lymphocytes.

Clear cell focus - appears as an area of clear pale cells sharply delineated from surrounding parenchyma. The hepatocytes have an empty zone around the nucleus which contains glycogen. Cells may be enlarged or of normal cell size. Foci are no larger than a liver lobule.

Lung

Foam cell aggregates, intra-alveolar - Consists of intra-alveolar aggregates of large macrophages with abundant foamy cytoplasm. Location is often subpleural, but can be random throughout lung parenchyma. Alveolar duct interstitium is occasionally thickened by infiltrates of macrophages.

Pancreas

Mixed inflammatory cell infiltrates - consists of focal, interstitial infiltrates of macrophages and lymphocytes in parenchyma and/or around blood vessels or ducts.

Lobular atrophy - characterized by lobules of pancreas with atrophic acinar cells which are gradually replaced by fibrous tissue. Exocrine ducts remain and may appear to be increased in numbers.

Salivary Glands

Mixed inflammatory cell infiltrate - Consists of focal interstitial infiltrates of macrophages and lymphocytes randomly distributed through glandular parenchyma.

Trachea; Laryngeal Area

Mixed inflammatory cell infiltrates - Characterized by diffuse infiltrates of neutrophils, macrophages, lymphocytes, and occasional plasma cells in the mucosa and submucosal lamina propria.

Urinary Bladder

Coagulated seminal ejaculate - Consists of globular, amorphic, eosinophilic masses of material in the urinary bladder.

Uterine Horns and Body

Dilated lumen - Luminal space is prominent. Endometrium is not remarkable.

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CORRELATION OF GROSS AND MICROSCOPIC FINDINGS
STUDY NUMBER: GLP85042
PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
STUDY START DATE: 21-AUG-85

PRINTED: 28-OCT-88
PAGE: 1

STUDY TYPE:

ANIMAL NUMBER: 85D0758 SEX: MALE DOSE GROUP: 1 SACRIFICE STATUS: FINAL SACRIFICE
DATE OF DEATH: 20-NOV-85 STUDY DAY OF DEATH: 92 STUDY WEEK OF DEATH: 14 TERMINAL BODY WEIGHT: 536.00 (GMS)

<< P A T H O L O G Y O B S E R V A T I O N S >>

ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
LUNGS		
*GROSS:	DISCOLORATION	MULTIFOCAL, WHITE, .1-.2CM DIAMETER, ON PLEURAL SURFACE.
*MICRO:	MULTI-FOCAL(TRACE)	FOAM CELL AGGREGATES, INTRA-ALVEOLAR

Table 1

ANIMAL NUMBER: 85D0788 SEX: MALE DOSE GROUP: 1 SACRIFICE STATUS: INTERIM SACRIFICE 2
DATE OF DEATH: 02-OCT-85 STUDY DAY OF DEATH: 43 STUDY WEEK OF DEATH: 7 TERMINAL BODY WEIGHT: 439.00 (GMS)

<< P A T H O L O G Y O B S E R V A T I O N S >>

ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
URINARY BLADDER		
*GROSS:	IRREGULAR SHAPED MASS	FIRM, WHITE, MEASURING 4 X 2MM INSIDE BLADDER, NOT ATTACHED. COAGULATED SEMINAL EJACULATE
*MICRO:	NOT SPECIFIED (PRESENT)	

Table 1 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH — CORRELATION OF GROSS AND MICROSCOPIC FINDINGS — PRINTED: 27-OCT-88
DIV OF RES SUPP, PATH SERV GP — STUDY NUMBER: GLP85042 — PAGE: 1
PRESIDIO OF SAN FRANCISCO, CA 94129 — PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY — STUDY START DATE: 21-AUG-85 — STUDY TYPE:

ANIMAL NUMBER: 85D0903 SEX: FEMALE DOSE GROUP: 1 SACRIFICE STATUS: FINAL SACRIFICE
DATE OF DEATH: 22-NOV-85 STUDY DAY OF DEATH: 94 STUDY WEEK OF DEATH: 14 TERMINAL BODY WEIGHT: 340.00 (GMS)

<< P A T H O L O G Y O B S E R V A T I O N S >>

ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
UTERUS		
*GROSS:	(TRACE) DILATED	
*MICRO:	NOT SPECIFIED (PRESENT)	DIALATED LUMEN

Table 1 (continued)

ANIMAL NUMBER: 85D0761 SEX: MALE DOSE GROUP: 2 SACRIFICE STATUS: FINAL SACRIFICE
DATE OF DEATH: 20-NOV-85 *STUDY DAY OF DEATH: 92* STUDY WEEK OF DEATH: 14 TERMINAL BODY WEIGHT: 480.00 (GMS)

ORGAN NAME	<< PATHOLOGY OBSERVATIONS >> KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
LUNGS		
*GROSS:	DISCOLORATION	MULTIFOCAL, WHITE, .1-.2CM DIAMETER
*MICRO:	MULTI-FOCAL(TRACE)	FOAM CELL AGGREGATES, INTRA-ALVEOLAR

Table 1 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH
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PRESIDIO OF SAN FRANCISCO, CA 94129
SPECIES: RAT/SPRAGUE-DAWLEY

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS
STUDY NUMBER: GLP85042
PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
STUDY START DATE: 21-AUG-85

PRINTED: 28-OCT-88
PAGE: 23

STUDY TYPE:

ANIMAL NUMBER: 85D0791 SEX: MALE DOSE GROUP: 2 SACRIFICE STATUS: FINAL SACRIFICE
DATE OF DEATH: 20-NOV-85 STUDY DAY OF DEATH: 92 STUDY WEEK OF DEATH: 14 TERMINAL BODY WEIGHT: 545.00 (GMS)

<< P A T H O L O G Y O B S E R V A T I O N S >>

ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
KIDNEY		
*GROSS:	(MILD) DIALATED RENAL PELVIS.	RIGHT DIALATED RENAL PELVIS, UNILATERAL
*MICRO:	NOT SPECIFIED(MILD) FOCAL(TRACE)	INTERSTITIAL FIBROSIS WITH MIXED INFLAMITORY CELL INFILTRATES AND TUBULAR ATROPHY AND DILITATION.

Table 1 (continued)

ANIMAL NUMBER: 85D0793 SEX: MALE DOSE GROUP: 2 SACRIFICE STATUS: FINAL SACRIFICE
DATE OF DEATH: 20-NOV-85 STUDY DAY OF DEATH: 92 STUDY WEEK OF DEATH: 14 TERMINAL BODY WEIGHT: 510.00 (GMS)

ORGAN NAME	<< PATHOLOGY OBSERVATIONS >> KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
KIDNEY		
*GROSS:	(MILD) DIALATED RENAL PELVIS.	RIGHT
*MICRO:	NOT SPECIFIED(MILD)	DIALATED RENAL PELVIS, UNILATERAL

Table 1 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH — CORRELATION OF GROSS AND MICROSCOPIC FINDINGS — PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP — STUDY NUMBER: GLP85042 — PAGE: 26
PRESIDIO OF SAN FRANCISCO, CA 94129 — PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY — STUDY START DATE: 21-AUG-85 — STUDY TYPE:

ANIMAL NUMBER: 85D0799 — SEX: MALE — DOSE GROUP: 2 — SACRIFICE STATUS: FINAL SACRIFICE
DATE OF DEATH: 20-NOV-85 — STUDY DAY OF DEATH: 92 — STUDY WEEK OF DEATH: 14 — TERMINAL BODY WEIGHT: 498.00 (GMS)

<< P A T H O L O G Y O B S E R V A T I O N S >>

ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
KIDNEY		
*GROSS:	(TRACE) DIALATED RENAL PELVIS.	RIGHT
*MICRO:	NONE	

Table 1 (continued)

ANIMAL NUMBER: 85D0816 SEX: MALE DOSE GROUP: 4 SACRIFICE STATUS: INTERIM SACRIFICE 2
DATE OF DEATH: 02-OCT-85 STUDY DAY OF DEATH: 43 STUDY WEEK OF DEATH: 7 TERMINAL BODY WEIGHT: 400.00 (GMS)

<< P A T H O L O G Y O B S E R V A T I O N S >>

ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
URINARY BLADDER		
*GROSS:	IRREGULAR SHAPED MASS	FIRM, WHITE
*MICRO:	NOT SPECIFIED (PRESENT)	COAGULATED SEMINAL EJACULATE

Table 1 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH — CORRELATION OF GROSS AND MICROSCOPIC FINDINGS — PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP — STUDY NUMBER: GLP85042 — PAGE: 66
PRESIDIO OF SAN FRANCISCO, CA 94129 — PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY — STUDY START DATE: 21-AUG-85 — STUDY TYPE:

ANIMAL NUMBER: 85D0777 — SEX: MALE — DOSE GROUP: 5 — SACRIFICE STATUS: INTERIM SACRIFICE 1
DATE OF DEATH: 21-AUG-85 — STUDY DAY OF DEATH: 1 — STUDY WEEK OF DEATH: 1 — TERMINAL BODY WEIGHT: 264.00 (GMS)

<< P A T H O L O G Y O B S E R V A T I O N S >>

ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
LIVER		
*GROSS:	(TRACE) PINPOINT WHITE FOCI.	DIAPHRAGMATIC SURFACE OF LEFT LATERAL LOBE.
*MICRO:	MULTI-FOCAL(TRACE)	HEPATOCYTIC NECROSIS

Table 1 (continued)

ANIMAL NUMBER: 85D0781 SEX: MALE DOSE GROUP: 5 SACRIFICE STATUS: INTERIM SACRIFICE 1
DATE OF DEATH: 21-AUG-85 STUDY DAY OF DEATH: 1 STUDY WEEK OF DEATH: 1 TERMINAL BODY WEIGHT: 254.00 (GMS)

ORGAN NAME	<< PATHOLOGY OBSERVATIONS >> KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
KIDNEY		
*GROSS:	(MILD) DIALATED RENAL PELVIS.	DIALATED RENAL PELVIS, UNILATERAL
*MICRO:	NOT SPECIFIED(MODERATE)	

Table 1 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH — CORRELATION OF GROSS AND MICROSCOPIC FINDINGS — PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP — STUDY NUMBER: GLP85042 — PAGE: 93
PRESIDIO OF SAN FRANCISCO, CA 94129 — PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY — STUDY START DATE: 21-AUG-85 — STUDY TYPE:

ANIMAL NUMBER: 85D0847 — SEX: FEMALE — DOSE GROUP: 2 — SACRIFICE STATUS: FINAL SACRIFICE
DATE OF DEATH: 22-NOV-85 — STUDY DAY OF DEATH: 94 — STUDY WEEK OF DEATH: 14 — TERMINAL BODY WEIGHT: 355.00 (GMS)

<< P A T H O L O G Y O B S E R V A T I O N S >>

ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
LUNGS		
*GROSS:	DISCOLORATION	MULTIFOCAL, WHITE, .1-.2CM DIAMETER
*MICRO:	MULTI-FOCAL(TRACE)	FOAM CELL AGGREGATES, INTRA-ALVEOLAR

Table 1 (continued)

ANIMAL NUMBER: 85D0894 SEX: FEMALE DOSE GROUP: 2 SACRIFICE STATUS: FINAL SACRIFICE
DATE OF DEATH: 22-NOV-85 STUDY DAY OF DEATH: 94 STUDY WEEK OF DEATH: 14 TERMINAL BODY WEIGHT: 325.00 (GMS)

<< P A T H O L O G Y O B S E R V A T I O N S >>

ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
LIVER		
*GROSS:	DISCOLORATION	PALE
*MICRO:	NONE	

Table 1 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH — CORRELATION OF GROSS AND MICROSCOPIC FINDINGS — PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP — STUDY NUMBER: GLP85042 — PAGE: 109
PRESIDIO OF SAN FRANCISCO, CA 94129 — PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY — STUDY START DATE: 21-AUG-85 — STUDY TYPE:

ANIMAL NUMBER: 85D0856 — SEX: FEMALE — DOSE GROUP: 3 — SACRIFICE STATUS: FINAL SACRIFICE
DATE OF DEATH: 22-NOV-85 — STUDY DAY OF DEATH: 94 — STUDY WEEK OF DEATH: 14 — TERMINAL BODY WEIGHT: 314.00 (GMS)

<< P A T H O L O G Y O B S E R V A T I O N S >>

ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
LUNGS		
*GROSS:	DISCOLORATION	MULTIFOCAL, WHITE, .1-.2CM DIAMETER, ON PLEURAL SURFACE.
*MICRO:	MULTI-FOCAL(MILD)	FOAM CELL AGGREGATES, INTRA-ALVEOLAR

Table 1 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH — CORRELATION OF GROSS AND MICROSCOPIC FINDINGS — PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP — STUDY NUMBER: GLP85042 — PAGE: 114
PRESIDIO OF SAN FRANCISCO, CA 94129 — PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY — STUDY START DATE: 21-AUG-85 — STUDY TYPE:

ANIMAL NUMBER: 85D0872 SEX: FEMALE DOSE GROUP: 3 SACRIFICE STATUS: FINAL SACRIFICE
DATE OF DEATH: 22-NOV-85 STUDY DAY OF DEATH: 94 STUDY WEEK OF DEATH: 14 TERMINAL BODY WEIGHT: 324.00 (GMS)

<< P A T H O L O G Y O B S E R V A T I O N S >>

ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS
LUNGS		
*GROSS:	DISCOLORATION	MULTIFOCAL, WHITE, .1-.2CM DIAMETER
*MICRO:	MULTI-FOCAL(MILD)	FOAM CELL AGGREGATES, INTRA-ALVEOLAR

Table 1 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH
DIV OF RES SUPP, PATH SERV GP
PRESIDIO OF SAN FRANCISCO, CA 94129
SPECIES: RAT/SPRAGUE-DAWLEY

INCIDENCE SUMMARY REPORT FOR GROSS NECROPSY OBSERVATIONS
STUDY NUMBER: GLP85042
REPORT FOR FINAL SACRIFICE
STUDY START DATE: 21-AUG-85

PRINTED: 28-OCT-88
PAGE: 1

STUDY TYPE:

NOTE: CTLS = CONTROLS ANIMAL SEX:
FROM GROUP(S): 1 GROUP:
NO. IN GROUP:

	-- MALES --				-- FEMALES --			
	CTLS	2	3	4	CTLS	2	3	4
	10	10	10	10	10	10	10	10
WHOLE BODY								
NO GROSS LESIONS RECOGNIZED.	9	6	10	10	9	8	8	10
TOTAL:	9	6	10	10	9	8	8	10
KIDNEY								
DIALATED RENAL PELVIS.	0	3	0	0	0	0	0	0
TOTAL:	0	3	0	0	0	0	0	0
LIVER								
DISCOLORATION	0	0	0	0	0	1	0	0
TOTAL:	0	0	0	0	0	1	0	0
LUNGS								
DISCOLORATION	1	1	0	0	0	1	2	0
TOTAL:	1	1	0	0	0	1	2	0
UTERUS								
DILATED					1	0	0	0
TOTAL:	0	0	0	0	1	0	0	0

Table 2

LETTERMAN ARMY INSTITUTE OF RESEARCH
DIV OF RES SUPP, PATH SERV GP
PRESIDIO OF SAN FRANCISCO, CA 94129
SPECIES: RAT/SPRAGUE-DAWLEY

INCIDENCE SUMMARY REPORT FOR GROSS NECROPSY OBSERVATIONS
STUDY NUMBER: GLP85042
REPORT FOR INTERIM SACRIFICE NUMBER 2
STUDY START DATE: 21-AUG-85

PRINTED: 28-OCT-88
PAGE: 1

STUDY TYPE:

NOTE: CTLS = CONTROLS

ANIMAL SEX:	-- MALES --				
FROM GROUP(S): 1 GROUP:	CTLS	2	3	4	5
NO. IN GROUP:	5	5	5	5	0
WHOLE BODY					
NO GROSS LESIONS RECOGNIZED.	4	5	5	4	0
TOTAL:	4	5	5	4	0
URINARY BLADDER					
IRREGULAR SHAPED MASS	1	0	0	1	0
TOTAL:	1	0	0	1	0

LETTERMAN ARMY INSTITUTE OF RESEARCH
DIV OF RES SUPP, PATH SERV GP
PRESIDIO OF SAN FRANCISCO, CA 94129
SPECIES: RAT/SPRAGUE-DAWLEY

INCIDENCE SUMMARY REPORT FOR GROSS NECROPSY OBSERVATIONS
STUDY NUMBER: GLP85042
REPORT FOR INTERIM SACRIFICE NUMBER 3
STUDY START DATE: 21-AUG-85

PRINTED: 28-OCT-88
PAGE: 1

STUDY TYPE:

NOTE: CTLS = CONTROLS

ANIMAL SEX:	-- FEMALES --				
FROM GROUP(S): 1 GROUP:	CTLS	2	3	4	5
NO. IN GROUP:	5	5	5	5	0
WHOLE BODY					
NO GROSS LESIONS RECOGNIZED.	5	5	5	5	0
TOTAL:	5	5	5	5	0

Table 3

LETTERMAN ARMY INSTITUTE OF RESEARCH
DIV OF RES SUPP, PATH SERV GP
PRESIDIO OF SAN FRANCISCO, CA 94129
SPECIES: RAT/SPRAGUE-DAWLEY

INCIDENCE SUMMARY REPORT FOR GROSS NECROPSY OBSERVATIONS
STUDY NUMBER: GLP85042
REPORT FOR INTERIM SACRIFICE NUMBER 1
STUDY START DATE: 21-AUG-85

PRINTED: 28-OCT-88
PAGE: 1

STUDY TYPE:

NOTE: CTLS = CONTROLS
FROM GROUP(S): 1

ANIMAL SEX:	-- MALES --					-- FEMALES --				
GROUP:	CTLS	2	3	4	5	CTLS	2	3	4	5
NO. IN GROUP:	0	0	0	0	13	0	0	0	0	11
WHOLE BODY										
NO GROSS LESIONS RECOGNIZED.	0	0	0	0	11	0	0	0	0	11
TOTAL:	0	0	0	0	11	0	0	0	0	11
KIDNEY										
DIALATED RENAL PELVIS.	0	0	0	0	1	0	0	0	0	0
TOTAL:	0	0	0	0	1	0	0	0	0	0
LIVER										
PINPOINT WHITE FOCI.	0	0	0	0	1	0	0	0	0	0
TOTAL:	0	0	0	0	1	0	0	0	0	0

Table 4

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP85042 PAGE: 1
PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85 STUDY TYPE:

NOTES: ANIMALS = FINAL SACRIFICE
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X: / DOSAGE GROUP: / NO. IN GROUP:	-- A N I M A L S A F F E C T E D -- -- MALES -- CTLS	3	4	-- FEMALES -- CTLS	3	4
BRAIN	NUMBER EXAMINED:	10	0	10	10	0	10
TRACHEA	NUMBER EXAMINED:	10	0	10	10	0	10
-MIXED INFLAMMARORY CELL INFILTRATES, LARYNGEAL AREA		0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%
THYROID GLANDS	NUMBER EXAMINED:	10	0	10	10	0	10
PARATHYROID	NUMBER EXAMINED:	10	0	5	7	0	7
ESOPHAGUS	NUMBER EXAMINED:	10	0	10	10	0	10
EXORBITAL LACRIM	NUMBER EXAMINED:	9	0	7	10	0	10
-MIXED INFLAMMATORY CELL INFILTRATES		0	0	0	2	0	0
		0%	0%	0%	20%	0%	0%
HEART	NUMBER EXAMINED:	10	10	10	10	10	10
-MIXED INFLAMMATORY CELL INFILTRATES		2	2	1	2	0	0
		20%	20%	10%	20%	0%	0%
-HISTIOCYTIC AGGREGATE, MYOCARDIUM		0	3	0	0	1	0
		0%	30%	0%	0%	10%	0%
AORTA	NUMBER EXAMINED:	10	0	10	10	0	10
LUNGS	NUMBER EXAMINED:	10	10	10	10	10	10
-FOAM CELL AGGREGATES, INTRA-ALVEOLAR		5	4	5	1	4	4
		50%	40%	50%	10%	40%	40%
THYMUS	NUMBER EXAMINED:	10	0	9	10	0	10
SPLEEN	NUMBER EXAMINED:	10	0	10	10	0	10
LIVER	NUMBER EXAMINED:	10	10	10	10	10	10
-PERIVASCULAR MIXED INFLAMMATORY CELL INFILTRATES		3	2	2	3	2	3
		30%	20%	20%	30%	20%	30%

Table 5

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP85042 PAGE: 2
PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85 STUDY TYPE:

NOTES: ANIMALS = FINAL SACRIFICE
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X:	-- ANIMALS AFFECTED -- MALES				-- FEMALES			
	DOSAGE GROUP:	CTLS	2	3	4	CTLS	2	3	4
	NO. IN GROUP:	10	10	10	10	10	10	10	10
LIVER	NUMBER EXAMINED:	10	10	10	10	10	10	10	10
-HEPATOCYTIC NECROSIS		0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%
-MIXED INFLAMMATORY CELL INFILTRATES AND INDIVIDUAL HEPATOCYTIC NECROSIS		2	0	0	1	1	0	0	2
		20%	0%	0%	10%	10%	0%	0%	20%
-PERIVASCULAR AND RANDOM MIXED INFLAMMATORY CELL INFILTRATES		0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%
-CLEAR CELL FOCUS		0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%
KIDNEY	NUMBER EXAMINED:	10	10	10	10	10	10	10	10
-DIALATED RENAL PELVIS, UNILATERAL		1	4	0	0	0	0	0	0
		10%	40%	0%	0%	0%	0%	0%	0%
-INTERSTITIAL FIBROSIS WITH MIXED INFLAMITORY CELL INFILTRATES AND TUBULAR ATROPHY AND DILITATION.		0	1	0	0	0	0	0	0
		0%	10%	0%	0%	0%	0%	0%	0%
-MINERALIZATION, INTRATUBULAR, MICROFOCAL, MEDULLA		0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%
-LYMPHOCYTIC AND HISTIOCYTIC INTERSTITIAL INFILTRATES		0	0	1	0	0	1	0	1
		0%	0%	10%	0%	0%	10%	0%	10%
URINARY BLADDER	NUMBER EXAMINED:	10	0	0	10	9	0	0	9
-COAGULATED SEMINAL EJACULATE		0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%
UTERUS	NUMBER EXAMINED:					10	0	0	10
-DIALATED LUMEN						1	0	0	0
						10%	0%	0%	0%
EDIDIDYMIS	NUMBER EXAMINED:	10	0	0	10				

Table 5 (continued)

NOTES: ANIMALS = FINAL SACRIFICE
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X: / DOSAGE GROUP: / NO. IN GROUP:	A N I M A L S A F F E C T E D -- -- MALES -- CTLS	2	3	4	-- FEMALES -- CTLS	2	3	4
TESTES	NUMBER EXAMINED:	10	0	0	10				
OVARIES	NUMBER EXAMINED:					10	0	0	10
DUODENUM	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
JEJUNUM	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
ILEUM	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
PANCREAS	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
-LOBULAR ATROPHY		2	0	0	0	1	0	0	0
		20%	0%	0%	0%	10%	0%	0%	0%
-MIXED INFLAMMATORY CELL INFILTRATES		1	0	0	0	0	0	0	0
		10%	0%	0%	0%	0%	0%	0%	0%
CECUM	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
RECTUM	NUMBER EXAMINED:	10	0	0	9	10	0	0	10
COLON	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
STOMACH	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
SKELETAL MUSCLE	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
SCIATIC NERVE	NUMBER EXAMINED:	9	0	0	10	8	0	0	9
TONGUE	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
SKIN	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
MAMMARY GLANDS	NUMBER EXAMINED:					8	0	0	9
NOSE/TURBINATES	NUMBER EXAMINED:	10	0	0	10	9	0	0	10
BONE, STERNUM	NUMBER EXAMINED:	10	0	0	10	9	0	0	10

Table 5 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP85042 PAGE: 4
PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85 STUDY TYPE:

NOTES: ANIMALS = FINAL SACRIFICE
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X:	-- ANIMALS -- MALES -- CTLS	2	3	4	AFFECTED -- FEMALES -- CTLS	2	3	4
	DOSAGE GROUP:								
	NO. IN GROUP:	10	10	10	10	10	10	10	10
BONE, FEMUR	NUMBER EXAMINED:	10	0	0	10	9	0	0	9
BONE VERT	NUMBER EXAMINED:	10	0	0	10	9	0	0	10
SPINAL CORD	NUMBER EXAMINED:	10	0	0	10	9	0	0	10
ADRENAL	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
PITUITARY GLAND	NUMBER EXAMINED:	8	0	0	9	10	0	0	10
EYES & OPTIC N.	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
EAR	NUMBER EXAMINED:	10	0	0	7	10	0	0	10
ACCESSORY SEX OR	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
-MIXED INFLAMMARORY CELL INFILTRATE		7	0	0	3	0	0	0	0
		70%	0%	0%	30%	0%	0%	0%	0%
HARDERIAN GLAND	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
-MIXED INFLAMMATORY CELL INFILTRATE		1	0	0	4	0	0	0	0
		10%	0%	0%	40%	0%	0%	0%	0%
-INTERSTITIAL LYMPHOCYTIC INFILTRATES		1	0	0	0	1	0	0	1
		10%	0%	0%	0%	10%	0%	0%	10%
MESENTERIC LYM N	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
MANDIBULAR GLAND	NUMBER EXAMINED:	10	0	0	9	10	0	0	10
-MIXED INFLAMMATORY CELL INFILTRATE		0	0	0	1	0	0	0	0
		0%	0%	0%	11%	0%	0%	0%	0%
PAROTID GLAND	NUMBER EXAMINED:	10	0	0	8	8	0	0	9
-MIXED INFLAMMATORY CELL INFILTRATE		0	0	0	0	1	0	0	0
		0%	0%	0%	0%	12%	0%	0%	0%
SUB-LINGUAL GLND	NUMBER EXAMINED:	10	0	0	9	10	0	0	10

Table 5 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP85042 PAGE: 1
PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85 STUDY TYPE:

NOTES: ANIMALS = ALL DEAD FROM 02-OCT-85 TO 04-OCT-85
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X:	-- A N I M A L S A F F E C T E D --							
		-- MALES --				-- FEMALES --			
	DOSAGE GROUP:	CTLS	2	3	4	CTLS	2	3	4
	NO. IN GROUP:	5	5	5	5	5	5	5	5
BRAIN	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
TRACHEA	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
-MIXED INFLAMMARORY CELL INFILTRATES, LARYNGEAL AREA		0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%
THYROID GLANDS	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
PARATHYROID	NUMBER EXAMINED:	4	0	0	4	3	0	0	4
ESOPHAGUS	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
EXORBITAL LACRIM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
-MIXED INFLAMMATORY CELL INFILTRATES		0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%
HEART	NUMBER EXAMINED:	5	5	5	5	5	5	5	5
-MIXED INFLAMMATORY CELL INFILTRATES		1	0	1	0	0	0	0	0
		20%	0%	20%	0%	0%	0%	0%	0%
-HISTIOCYTIC AGGREGATE, MYOCARDIUM		0	0	0	0	0	0	0	1
		0%	0%	0%	0%	0%	0%	0%	20%
AORTA	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
LUNGS	NUMBER EXAMINED:	5	5	5	5	5	5	5	5
-FOAM CELL AGGREGATES, INTRA-ALVEOLAR		0	0	0	1	0	0	0	2
		0%	0%	0%	20%	0%	0%	0%	40%
THYMUS	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
SPLEEN	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
LIVER	NUMBER EXAMINED:	5	5	5	5	5	5	5	5
-PERIVASCULAR MIXED INFLAMMATORY CELL INFILTRATES		1	1	1	1	0	2	1	0
		20%	20%	20%	20%	0%	40%	20%	0%

Table 6

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP85042 PAGE: 2
PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85 STUDY TYPE:

NOTES: ANIMALS = ALL DEAD FROM 02-OCT-85 TO 04-OCT-85
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X: / DOSAGE GROUP: / NO. IN GROUP:	-- A N I M A L S A F F E C T E D --							
		-- MALES --				-- FEMALES --			
		CTLS	2	3	4	CTLS	2	3	4
		5	5	5	5	5	5	5	5
LIVER	NUMBER EXAMINED:	5	5	5	5	5	5	5	5
-HEPATOCYTIC NECROSIS		0	0	1	0	0	0	0	0
		0%	0%	20%	0%	0%	0%	0%	0%
-MIXED INFLAMMATORY CELL INFILTRATES AND INDIVIDUAL HEPATOCYTIC NECROSIS		0	0	0	0	1	1	0	1
		0%	0%	0%	0%	20%	20%	0%	20%
-PERIVASCULAR AND RANDOM MIXED INFLAMMATORY CELL INFILTRATES		0	0	0	0	0	0	0	1
		0%	0%	0%	0%	0%	0%	0%	20%
-CLEAR CELL FOCUS		0	0	0	0	0	1	0	0
		0%	0%	0%	0%	0%	20%	0%	0%
KIDNEY	NUMBER EXAMINED:	5	5	5	5	5	5	5	5
-DIALATED RENAL PELVIS, UNILATERAL		1	0	0	0	0	0	0	0
		20%	0%	0%	0%	0%	0%	0%	0%
-INTERSTITIAL FIBROSIS WITH MIXED INFLAMITORY CELL INFILTRATES AND TUBULAR ATROPHY AND DILITATION.		0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%
-MINERALIZATION, INTRATUBULAR, MICROFOCAL, MEDULLA		0	0	0	0	0	0	0	1
		0%	0%	0%	0%	0%	0%	0%	20%
-LYMPHOCYTIC AND HISTIOCYTIC INTERSTITIAL INFILTRATES		0	0	0	0	1	0	2	0
		0%	0%	0%	0%	20%	0%	40%	0%
URINARY BLADDER	NUMBER EXAMINED:	5	0	0	5	4	0	0	5
-COAGULATED SEMINAL EJACULATE		1	0	0	1	0	0	0	0
		20%	0%	0%	20%	0%	0%	0%	0%
UTERUS	NUMBER EXAMINED:					5	0	0	5
-DIALATED LUMEN						0	0	0	0
						0%	0%	0%	0%
EDIDIDYMIS	NUMBER EXAMINED:	5	0	0	5				

Table 6 (continued)

NOTES: ANIMALS = ALL DEAD FROM 02-OCT-85 TO 04-OCT-85
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X:	-- A N I M A L S A F F E C T E D -- -- MALES --				-- FEMALES --			
	DOSAGE GROUP:	CTLS	2	3	4	CTLS	2	3	4
	NO. IN GROUP:	5	5	5	5	5	5	5	5
TESTES	NUMBER EXAMINED:	5	0	0	5				
OVARIES	NUMBER EXAMINED:					5	0	0	5
DUODENUM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
JEJUNUM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
ILEUM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
PANCREAS	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
-LOBULAR ATROPHY		0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%
-MIXED INFLAMMATORY CELL INFILTRATES		0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%
CECUM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
RECTUM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
COLON	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
STOMACH	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
SKELETAL MUSCLE	NUMBER EXAMINED:	5	0	0	5	4	0	0	5
SCIATIC NERVE	NUMBER EXAMINED:	5	0	0	5	4	0	0	5
TONGUE	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
SKIN	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
MAMMARY GLANDS	NUMBER EXAMINED:					5	0	0	5
NOSE/TURBINATES	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
BONE, STERNUM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5

Table 6 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP85042 PAGE: 4
PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85 STUDY TYPE:

NOTES: ANIMALS = ALL DEAD FROM 02-OCT-85 TO 04-OCT-85
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X: / DOSAGE GROUP: / NO. IN GROUP:	-- A N I M A L S A F F E C T E D -- -- MALES -- CTLS	2	3	4	-- FEMALES -- CTLS	2	3	4
BONE, FEMUR	NUMBER EXAMINED:	5	0	0	5	5	0	0	4
BONE VERT	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
SPINAL CORD	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
ADRENAL	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
PITUITARY GLAND	NUMBER EXAMINED:	4	0	0	5	5	0	0	5
EYES & OPTIC N.	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
EAR	NUMBER EXAMINED:	4	0	0	5	5	0	0	5
ACCESSORY SEX OR	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
-MIXED INFLAMMARORY CELL INFILTRATE		1	0	0	0	0	0	0	0
		20%	0%	0%	0%	0%	0%	0%	0%
HARDERIAN GLAND	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
-MIXED INFLAMMATORY CELL INFILTRATE		0	0	0	0	1	0	0	0
		0%	0%	0%	0%	20%	0%	0%	0%
-INTERSTITIAL LYMPHOCYTIC INFILTRATES		0	0	0	2	0	0	0	1
		0%	0%	0%	40%	0%	0%	0%	20%
MESENTERIC LYM N	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
MANDIBULAR GLAND	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
-MIXED INFLAMMAIORY CELL INFILTRATE		0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%
PAROTID GLAND	NUMBER EXAMINED:	5	0	0	5	4	0	0	5
-MIXED INFLAMMATORY CELL INFILTRATE		1	0	0	0	0	0	0	0
		20%	0%	0%	0%	0%	0%	0%	0%
SUB-LINGUAL GLND	NUMBER EXAMINED:	2	0	0	5	4	0	0	5

Table 6 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP85042 PAGE: 1
PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85 STUDY TYPE:

NOTES: ANIMALS = INTERIM SACRIFICE 1
CTLS = CONTROLS FROM GROUP(S): 5

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X: / DOSAGE GROUP: / NO. IN GROUP:	-- A N I M A L S A F F E C T E D -- -- MALES -- CTLS 13	-- FEMALES -- CTLS 11
BRAIN	NUMBER EXAMINED:	13	11
TRACHEA	NUMBER EXAMINED:	13	11
-MIXED INFLAMMARORY CELL INFILTRATES, LARYNGEAL AREA		1 7%	0 0%
THYROID GLANDS	NUMBER EXAMINED:	13	11
PARATHYROID	NUMBER EXAMINED:	8	10
ESOPHAGUS	NUMBER EXAMINED:	13	11
EXORBITAL LACRIM	NUMBER EXAMINED:	13	11
-MIXED INFLAMMATORY CELL INFILTRATES		0 0%	0 0%
HEART	NUMBER EXAMINED:	13	11
-MIXED INFLAMMATORY CELL INFILTRATES		0 0%	0 0%
-HISTIOCYTIC AGGREGATE, MYOCARDIUM		0 0%	0 0%
AORTA	NUMBER EXAMINED:	13	11
LUNGS	NUMBER EXAMINED:	13	11
-FOAM CELL AGGREGATES, INTRA-ALVEOLAR		0 0%	0 0%
THYMUS	NUMBER EXAMINED:	13	11
SPLEEN	NUMBER EXAMINED:	13	11
LIVER	NUMBER EXAMINED:	13	11
-PERIVASCULAR MIXED INFLAMMATORY CELL INFILTRATES		1 7%	0 0%

Table 7

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP85042 PAGE: 2
PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85 STUDY TYPE:

NOTES: ANIMALS = INTERIM SACRIFICE 1
CTLS = CONTROLS FROM GROUP(S): 5

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X: / DOSAGE GROUP: / NO. IN GROUP:	-- A N I M A L S A F F E C T E D -- -- MALES -- CTLS 13	-- FEMALES -- CTLS 11
LIVER	NUMBER EXAMINED:	13	11
-HEPATOCYTIC NECROSIS		1	0
		7%	0%
-MIXED INFLAMMATORY CELL INFILTRATES AND INDIVIDUAL HEPATOCYTIC NECROSIS		0	0
		0%	0%
-PERIVASCULAR AND RANDOM MIXED INFLAMMATORY CELL INFILTRATES		0	0
		0%	0%
-CLEAR CELL FOCUS		0	0
		0%	0%
KIDNEY	NUMBER EXAMINED:	13	11
-DIALATED RENAL PELVIS, UNILATERAL		1	0
		7%	0%
-INTERSTITIAL FIBROSIS WITH MIXED INFLAMITORY CELL INFILTRATES AND TUBULAR ATROPHY AND DILITATION.		0	1
		0%	9%
-MINERALIZATION, INTRATUBULAR, MICROFOCAL, MEDULLA		0	1
		0%	9%
-LYMPHOCYTIC AND HISTIOCYTIC INTERSTITIAL INFILTRATES		0	0
		0%	0%
URINARY BLADDER	NUMBER EXAMINED:	13	11
-COAGULATED SEMINAL EJACULATE		0	0
		0%	0%
UTERUS	NUMBER EXAMINED:		11
-DIALATED LUMEN			0
			0%
EDIDIDYMIS	NUMBER EXAMINED:	13	

Table 7 (continued)

NOTES: ANIMALS = INTERIM SACRIFICE 1
CTLS = CONTROLS FROM GROUP(S): 5

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X: / DOSAGE GROUP: / NO. IN GROUP:	-- A N I M A L S A F F E C T E D -- -- MALES -- CTLS	-- FEMALES -- CTLS
TESTES	NUMBER EXAMINED:	13	
OVARIES	NUMBER EXAMINED:		11
DUODENUM	NUMBER EXAMINED:	13	11
JEJUNUM	NUMBER EXAMINED:	13	11
ILEUM	NUMBER EXAMINED:	13	11
PANCREAS	NUMBER EXAMINED:	13	11
-LOBULAR ATROPHY		0	0
		0%	0%
-MIXED INFLAMMATORY CELL INFILTRATES		0	0
		0%	0%
CECUM	NUMBER EXAMINED:	13	11
RECTUM	NUMBER EXAMINED:	13	11
COLON	NUMBER EXAMINED:	13	11
STOMACH	NUMBER EXAMINED:	13	11
SKELETAL MUSCLE	NUMBER EXAMINED:	13	11
SCIATIC NERVE	NUMBER EXAMINED:	13	11
TONGUE	NUMBER EXAMINED:	13	11
SKIN	NUMBER EXAMINED:	13	11
MAMMARY GLANDS	NUMBER EXAMINED:		10
NOSE/TURBINATES	NUMBER EXAMINED:	13	11
BONE, STERNUM	NUMBER EXAMINED:	13	11

Table 7 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP85042 PAGE: 4
PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY STUDY START DATE: 21-AUG-85 STUDY TYPE:

NOTES: ANIMALS = INTERIM SACRIFICE 1
CTLS = CONTROLS FROM GROUP(S): 5

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X: / DOSAGE GROUP: / NO. IN GROUP:	-- A N I M A L S A F F E C T E D -- -- MALES -- CTLS 13	-- FEMALES -- CTLS 11
BONE, FEMUR	NUMBER EXAMINED:	13	11
BONE VERT	NUMBER EXAMINED:	13	11
SPINAL CORD	NUMBER EXAMINED:	13	11
ADRENAL	NUMBER EXAMINED:	13	11
PITUITARY GLAND	NUMBER EXAMINED:	13	10
EYES & OPTIC N.	NUMBER EXAMINED:	13	11
EAR	NUMBER EXAMINED:	13	11
ACCESSORY SEX OR	NUMBER EXAMINED:	13	11
-MIXED INFLAMMARORY CELL INFILTRATE		4	0
		30%	0%
HARDERIAN GLAND	NUMBER EXAMINED:	13	11
-MIXED INFLAMMATORY CELL INFILTRATE		0	1
		0%	9%
-INTERSTITIAL LYMPHOCYTIC INFILTRATES		0	0
		0%	0%
MESENTERIC LYM N	NUMBER EXAMINED:	13	11
MANDIBULAR GLAND	NUMBER EXAMINED:	13	11
-MIXED INFLAMMATORY CELL INFILTRATE		0	0
		0%	0%
PAROTID GLAND	NUMBER EXAMINED:	13	11
-MIXED INFLAMMATORY CELL INFILTRATE		0	0
		0%	0%
SUB-LINGUAL GLND	NUMBER EXAMINED:	12	11

Table 7 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH
DIV OF RES SUPP, PATH SERV GP
PRESIDIO OF SAN FRANCISCO, CA 94129
SPECIES: RAT/SPRAGUE-DAWLEY

INCIDENCE SUMMARY OF MICROSCOPIC OBSERVATIONS(ALL FINDING)
STUDY NUMBER: GLP85042
PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
STUDY START DATE: 21-AUG-85

PRINTED: 28-OCT-88
PAGE: 1
STUDY TYPE:

NOTES: ANIMALS = FINAL SACRIFICE
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X:	-- ANIMALS AFFECTED -- MALES				-- ANIMALS AFFECTED -- FEMALES			
	DOSAGE GROUP:	CTLS	2	3	4	CTLS	2	3	4
	NO. IN GROUP:	10	10	10	10	10	10	10	10
BRAIN	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
TRACHEA	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
-MIXED INFLAMMARORY CELL INFILTRATES, LARYNGEAL AREA		0	0	0	0	0	0	0	0
THYROID GLANDS	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
PARATHYROID	NUMBER EXAMINED:	10	0	0	5	7	0	0	7
ESOPHAGUS	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
EXORBITAL LACRIM	NUMBER EXAMINED:	9	0	0	7	10	0	0	10
-MIXED INFLAMMATORY CELL INFILTRATES		0	0	0	0	2	0	0	0
HEART	NUMBER EXAMINED:	10	10	10	10	10	10	10	10
-MIXED INFLAMMATORY CELL INFILTRATES		2	3	2	1	2	1	0	0
-HISTIOCYTIC AGGREGATE, MYOCARDIUM		0	0	3	0	0	0	1	0
AORTA	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
LUNGS	NUMBER EXAMINED:	10	10	10	10	10	10	10	10
-FOAM CELL AGGREGATES, INTRA-ALVEOLAR		5	4	4	5	1	2	4	4
THYMUS	NUMBER EXAMINED:	10	0	0	9	10	0	0	10
SPLEEN	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
LIVER	NUMBER EXAMINED:	10	10	10	10	10	10	10	10
-PERIVASCULAR MIXED INFLAMMATORY CELL INFILTRATES		3	1	2	2	3	0	2	3
-HEPATOCYTIC NECROSIS		0	0	0	0	0	0	0	0
-MIXED INFLAMMATORY CELL INFILTRATES AND INDIVIDUAL HEPATOCYTIC NECROSIS		2	0	0	1	1	0	0	2
-PERIVASCULAR AND RANDOM MIXED INFLAMMATORY CELL INFILTRATES		0	0	0	0	0	0	0	0
-CLEAR CELL FOCUS		0	0	0	0	0	0	0	0
KIDNEY	NUMBER EXAMINED:	10	10	10	10	10	10	10	10
-DIALATED RENAL PELVIS, UNILATERAL		1	4	0	0	0	0	0	0
-INTERSTITIAL FIBROSIS WITH MIXED INFLAMITORY CELL INFILTRATES AND TUBULAR ATROPHY AND DILITATION.		0	1	0	0	0	0	0	0
-MINERALIZATION, INTRATUBULAR, MICROFOCAL, MEDULLA		0	0	0	0	0	0	0	0
-LYMPHOCYTIC AND HISTIOCYTIC INTERSTITIAL INFILTRATES		0	0	1	0	0	1	0	1

Table 8

LETTERMAN ARMY INSTITUTE OF RESEARCH — INCIDENCE SUMMARY OF MICROSCOPIC OBSERVATIONS(ALL FINDING) — PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP — STUDY NUMBER: GLP85042 — PAGE: 2
PRESIDIO OF SAN FRANCISCO, CA 94129 — PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY — STUDY START DATE: 21-AUG-85 — STUDY TYPE:

NOTES: ANIMALS = FINAL SACRIFICE
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X:	-- ANIMALS AFFECTED -- MALES				-- ANIMALS AFFECTED -- FEMALES			
	DOSAGE GROUP:	CTLS	2	3	4	CTLS	2	3	4
	NO. IN GROUP:	10	10	10	10	10	10	10	10
URINARY BLADDER	NUMBER EXAMINED:	10	0	0	10	9	0	0	9
-COAGULATED SEMINAL EJACULATE		0	0	0	0	0	0	0	0
UTERUS	NUMBER EXAMINED:					10	0	0	10
-DIALATED LUMEN						1	0	0	0
EDIDIDYMIS	NUMBER EXAMINED:	10	0	0	10				
TESTES	NUMBER EXAMINED:	10	0	0	10				
OVARIES	NUMBER EXAMINED:					10	0	0	10
DUODENUM	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
JEJUNUM	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
ILEUM	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
PANCREAS	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
-LOBULAR ATROPHY		2	0	0	0	1	0	0	0
-MIXED INFLAMMATORY CELL INFILTRATES		1	0	0	0	0	0	0	0
CECUM	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
RECTUM	NUMBER EXAMINED:	10	0	0	9	10	0	0	10
COLON	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
STOMACH	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
SKELETAL MUSCLE	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
SCIATIC NERVE	NUMBER EXAMINED:	9	0	0	10	8	0	0	9
TONGUE	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
SKIN	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
MAMMARY GLANDS	NUMBER EXAMINED:					8	0	0	9

Table 8 (continued)

NOTES: ANIMALS = FINAL SACRIFICE
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X:	-- ANIMALS AFFECTED -- MALES --				-- ANIMALS AFFECTED -- FEMALES --			
	DOSAGE GROUP:	CTLS	2	3	4	CTLS	2	3	4
	NO. IN GROUP:	10	10	10	10	10	10	10	10
NOSE/TURBINATES	NUMBER EXAMINED:	10	0	0	10	9	0	0	10
BONE, STERNUM	NUMBER EXAMINED:	10	0	0	10	9	0	0	10
BONE, FEMUR	NUMBER EXAMINED:	10	0	0	10	9	0	0	9
BONE VERT	NUMBER EXAMINED:	10	0	0	10	9	0	0	10
SPINAL CORD	NUMBER EXAMINED:	10	0	0	10	9	0	0	10
ADRENAL	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
PITUITARY GLAND	NUMBER EXAMINED:	8	0	0	9	10	0	0	10
EYES & OPTIC N.	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
EAR	NUMBER EXAMINED:	10	0	0	7	10	0	0	10
ACCESSORY SEX GR	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
-MIXED INFLAMMARORY CELL INFILTRATE		7	0	0	3	0	0	0	0
HARDERIAN GLAND	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
-MIXED INFLAMMATORY CELL INFILTRATE		1	0	0	4	0	0	0	0
-INTERSTITIAL LYMPHOCYTIC INFILTRATES		1	0	0	0	1	0	0	1
MESENTERIC LYM N	NUMBER EXAMINED:	10	0	0	10	10	0	0	10
MANDIBULAR GLAND	NUMBER EXAMINED:	10	0	0	9	10	0	0	10
-MIXED INFLAMMATORY CELL INFILTRATE		0	0	0	1	0	0	0	0
PAROTID GLAND	NUMBER EXAMINED:	10	0	0	8	8	0	0	9
-MIXED INFLAMMATORY CELL INFILTRATE		0	0	0	0	1	0	0	0
SUB-LINGUAL GLND	NUMBER EXAMINED:	10	0	0	9	10	0	0	10

Table 8 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH — INCIDENCE SUMMARY OF MICROSCOPIC OBSERVATIONS(ALL FINDING) — PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP — STUDY NUMBER: GLP85042 — PAGE: 1
PRESIDIO OF SAN FRANCISCO, CA 94129 — PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY — STUDY START DATE: 21-AUG-85 — STUDY TYPE:

NOTES: ANIMALS = ALL DEAD FROM 02-OCT-85 TO 04-OCT-85
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X:	-- ANIMALS AFFECTED -- MALES				-- ANIMALS AFFECTED -- FEMALES			
	DOSAGE GROUP:	CTLS	2	3	4	CTLS	2	3	4
	NO. IN GROUP:	5	5	5	5	5	5	5	5
BRAIN	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
TRACHEA	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
-MIXED INFLAMMARORY CELL INFILTRATES, LARYNGEAL AREA		0	0	0	0	0	0	0	0
THYROID GLANDS	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
PARATHYROID	NUMBER EXAMINED:	4	0	0	4	3	0	0	4
ESOPHAGUS	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
EXORBITAL LACRIM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
-MIXED INFLAMMATORY CELL INFILTRATES		0	0	0	0	0	0	0	0
HEART	NUMBER EXAMINED:	5	5	5	5	5	5	5	5
-MIXED INFLAMMATORY CELL INFILTRATES		1	0	1	0	0	0	0	0
-HISTIOCYTIC AGGREGATE, MYOCARDIUM		0	0	0	0	0	0	0	1
AORTA	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
LUNGS	NUMBER EXAMINED:	5	5	5	5	5	5	5	5
-FOAM CELL AGGREGATES, INTRA-ALVEOLAR		0	0	0	1	0	0	0	2
THYMUS	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
SPLEEN	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
LIVER	NUMBER EXAMINED:	5	5	5	5	5	5	5	5
-PERIVASCULAR MIXED INFLAMMATORY CELL INFILTRATES		1	1	1	1	0	2	1	0
-HEPATOCYTIC NECROSIS		0	0	1	0	0	0	0	0
-MIXED INFLAMMATORY CELL INFILTRATES AND INDIVIDUAL HEPATOCYTIC NECROSIS		0	0	0	0	1	1	0	1
-PERIVASCULAR AND RANDOM MIXED INFLAMMATORY CELL INFILTRATES		0	0	0	0	0	0	0	1
-CLEAR CELL FOCUS		0	0	0	0	0	1	0	0
KIDNEY	NUMBER EXAMINED:	5	5	5	5	5	5	5	5
-DIALATED RENAL PELVIS, UNILATERAL		1	0	0	0	0	0	0	0
-INTERSTITIAL FIBROSIS WITH MIXED INFLAMITORY CELL INFILTRATES AND TUBULAR ATROPHY AND DILITATION.		0	0	0	0	0	0	0	0
-MINERALIZATION, INTRATUBULAR, MICROFOCAL, MEDULLA		0	0	0	0	0	0	0	1
-LYMPHOCYTIC AND HISTIOCYTIC INTERSTITIAL INFILTRATES		0	0	0	0	1	0	2	0

Table 9

NOTES: ANIMALS = ALL DEAD FROM 02-OCT-85 TO 04-OCT-85
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X:	-- ANIMALS AFFECTED -- MALES				-- ANIMALS AFFECTED -- FEMALES			
	DOSAGE GROUP:	CTLS	2	3	4	CTLS	2	3	4
	NO. IN GROUP:	5	5	5	5	5	5	5	5
URINARY BLADDER	NUMBER EXAMINED:	5	0	0	5	4	0	0	5
-COAGULATED SEMINAL EJACULATE		1	0	0	1	0	0	0	0
UTERUS	NUMBER EXAMINED:					5	0	0	5
-DIALATED LUMEN						0	0	0	0
EDIDIDYMIS	NUMBER EXAMINED:	5	0	0	5				
TESTES	NUMBER EXAMINED:	5	0	0	5				
OVARIES	NUMBER EXAMINED:					5	0	0	5
DUODENUM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
JEJUNUM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
ILEUM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
PANCREAS	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
-LOBULAR ATROPHY		0	0	0	0	0	0	0	0
-MIXED INFLAMMATORY CELL INFILTRATES		0	0	0	0	0	0	0	0
CECUM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
RECTUM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
COLON	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
STOMACH	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
SKELETAL MUSCLE	NUMBER EXAMINED:	5	0	0	5	4	0	0	5
SCIATIC NERVE	NUMBER EXAMINED:	5	0	0	5	4	0	0	5
TONGUE	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
SKIN	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
MAMMARY GLANDS	NUMBER EXAMINED:					5	0	0	5

Table 9 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH — INCIDENCE SUMMARY OF MICROSCOPIC OBSERVATIONS(ALL FINDING) — PRINTED: 28-OCT-88
DIV OF RES SUPP, PATH SERV GP — STUDY NUMBER: GLP85042 — PAGE: 3
PRESIDIO OF SAN FRANCISCO, CA 94129 — PATHOLOGIST(S): MAKOVEC, GEORGE T., JOHNSON, TOM
SPECIES: RAT/SPRAGUE-DAWLEY — STUDY START DATE: 21-AUG-85 — STUDY TYPE:

NOTES: ANIMALS = ALL DEAD FROM 02-OCT-85 TO 04-OCT-85
CTLS = CONTROLS FROM GROUP(S): 1

T I S S U E S W I T H F I N D I N G S	ANIMAL S E X: / DOSAGE GROUP: / NO. IN GROUP:	-- A N I M A L S A F F E C T E D -- MALES				FEMALES			
		CTLS	2	3	4	CTLS	2	3	4
		5	5	5	5	5	5	5	5
NOSE/TURBINATES	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
BONE, STERNUM	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
BONE, FEMUR	NUMBER EXAMINED:	5	0	0	5	5	0	0	4
BONE VERT	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
SPINAL CORD	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
ADRENAL	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
PITUITARY GLAND	NUMBER EXAMINED:	4	0	0	5	5	0	0	5
EYES & OPTIC N.	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
EAR	NUMBER EXAMINED:	4	0	0	5	5	0	0	5
ACCESSORY SEX OR	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
-MIXED INFLAMMARORY CELL INFILTRATE		1	0	0	0	0	0	0	0
HARDERIAN GLAND	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
-MIXED INFLAMMATORY CELL INFILTRATE		0	0	0	0	1	0	0	0
-INTERSTITIAL LYMPHOCYTIC INFILTRATES		0	0	0	2	0	0	0	1
MESENTERIC LYM N	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
MANDIBULAR GLAND	NUMBER EXAMINED:	5	0	0	5	5	0	0	5
-MIXED INFLAMMATORY CELL INFILTRATE		0	0	0	0	0	0	0	0
PAROTID GLAND	NUMBER EXAMINED:	5	0	0	5	4	0	0	5
-MIXED INFLAMMATORY CELL INFILTRATE		1	0	0	0	0	0	0	0
SUB-LINGUAL GLND	NUMBER EXAMINED:	2	0	0	5	4	0	0	5

Table 9 (continued)

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Aberdeen Proving Ground, MD 21010

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United States Army
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Preventive Medicine Division (HSHA-IPM)
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