

AD-A176 250

COMPARATIVE INHALATION TOXICOLOGY OF SELECTED MATERIALS  
(U) LOVELACE BIOMEDICAL AND ENVIRONMENTAL RESEARCH INST  
ALBUQUERQUE NM INHALATION TOXICOLOGY RESEARCH INST

3/3

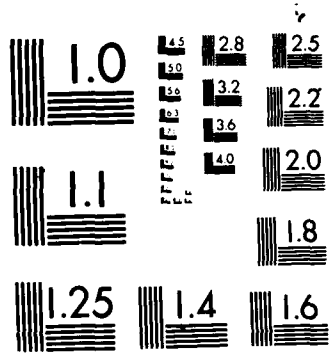
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M B SNIPES ET AL SEP 86

F/G 6/20

ML





MICROCOPY RESOLUTION TEST CHART  
 NATIONAL BUREAU OF STANDARDS-1963-A

EXPERIMENT 4160: NOSE-ONLY EXPOSURE TO CU-ZN METAL POWDER.

ANIMAL NUMBER	DAY OF STUDY	LUNG	LIVER	KIDNEY	SPLEEN	ADRENAL	THYROID	TURBINATES
025	2	Multifocal necrotic terminal bronchiolitis with extension into alveoli.	NSL	Hyaline casts	NSL	NSL	NSL	Multifocal acute necrotic ulcerative and erosive rhinitis with epithelial regeneration.
026	2	Multifocal terminal bronchiolitis.	NSL	Occasional hyaline casts.	NSL	NSL	NSL	Moderately severe acute necrotic ulcerative & erosive rhinitis.
033	5	Bronchiolitis with extension into alveoli.	NSL	Occasional hyaline casts; NSL	NSL	NSL	Slight lymphoid depletion.	Acute mild rhinitis.
037	2	Mild patchy acute bronchiolitis with extension into alveoli.	NSL	NSL	NSL	NSL	NSL	Acute multifocal relatively severe erosive to ulcerative rhinitis.
039	2	Multifocal necrotic terminal bronchiolitis with extension into alveoli.	NSL	Occasional hyaline casts.	NSL	NSL	NSL	Acute multifocal relatively severe erosive to ulcerative rhinitis.

040	5	Perivascular and peribronchiolar fibrosis; multifocal necrotic bronchiolitis with extension into alveoli; fibrin.	NSL	Hyaline casts; NSL	NSL	NSL	Lymphoid depletion.	Acute multifocal relatively severe erosive to ulcerative rhinitis.
046	2	Perivascular fibrosis multifocal necrotic bronchiolitis.	NSL	NSL	NSL	NSL	NSL	Acute multifocal relatively severe erosive to ulcerative rhinitis.
048	5	Multifocal necrotic bronchiolitis with extension into alveoli; hemorrhage; fibrin.	NSL	NSL	NSL	NSL	Lymphoid depletion.	Acute multifocal relatively severe erosive to ulcerative rhinitis.
050	5	Multifocal necrotic bronchiolitis with extension into alveoli; hemorrhage; fibrin.	NSL	Moderate hyaline casts.	NSL	NSL	Lymphoid depletion.	Acute multifocal moderately severe erosive to ulcerative rhinitis.
052	5	Multifocal necrotic bronchiolitis with extension into alveoli; hemorrhage; fibrin.	NSL	NSL	NSL	NSL	Lymphoid depletion.	Acute multifocal moderately severe erosive to ulcerative rhinitis.

C. EXPERIMENT 4181: WHOLE-BODY EXPOSURE TO T102

ANIMAL NUMBER	DAY OF STUDY	LUNG	LIVER	KIDNEY	SPLEEN	ADRENAL	THYROID	TURBINATES
055	5	NSL	NSL	NSL	NSL	NSL	NSL	NSL
056	5	NSL	NSL	Occasional hyaline casts; NSL.	NSL	NSL	NSL	Congested
060	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
063	5	NSL	NSL	Occasional Hyaline casts; NSL.	NSL	NSL	NSL	Congested Focal hemor-rhage into cavity; NSL.
065	5	NSL	NSL	NSL	NSL	NSL	NSL	NSL
067	5	NSL	NSL	NSL	NSL	NSL	NSL	NSL
069	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
073	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
075	2	NSL	NSL	Occasional hyaline casts; NSL.	NSL	NSL	NSL	NSL
076	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL

D. EXPERIMENT 4182: NOSE-ONLY EXPOSURE TO 1102

ANIMAL NUMBER	DAY OF STUDY	LUNG	LIVER	KIDNEY	SPLEEN	ADRENAL	THYROID	TURBINATES
077	5	NSL	NSL	Occasional hyaline casts; NSL.	NSL	NSL	NSL	NSL
080	5	NSL	NSL	NSL	NSL	NSL	NSL	Multifocal rhinitis with squamous (acute) metaplasia in one section.
084	2	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	NSL
085	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
090	2	NSL	NSL	NSL	NSL	NSL	NSL	Rhinitis with lymphocytes and neutrophils in submucosa; nasal exudate and inhaled hair with some ulceration.
095	2	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	Mild multifocal rhinitis; submucosal infiltrate.
096	5	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	NSL

097	2	NSL	NSL	Few hyaline casts; NSL.	NSL	NSL	NSL	NSL	NSL
098	5	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
100	5	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL

Congested; slight increase in submucosal neutrophils.

E. EXPERIMENT 4183: SHAM WHOLE-BODY EXPOSURES

ANIMAL NUMBER	DAY OF STUDY	LUNG	LIVER	KIDNEY	SPLEEN	ADRENAL	THYROID	TURBINATES
105	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
108	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
114	5	NSL	NSL	NSL	NSL	NSL	NSL	NSL
117	5	NSL	NSL	NSL	NSL	NSL	NSL	NSL
118	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
122	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
124	5	NSL	NSL	NSL	NSL	NSL	NSL	NSL
125	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
126	5	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	NSL
128	5	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	NSL

F. EXPERIMENT 416A: SWM NOSE-ONLY EXPOSURES

ANIMAL NUMBER	DAY OF STUDY	LUNG	LIVER	KIDNEY	SPLEEN	ADRENAL	THYROID	TURBINATES
128	5	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	NSL
132	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
133	2	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	NSL
135	5	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	Very mild rhinitis; neutrophils in submucosa.
137	5	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	NSL
138	5	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	NSL
140	2	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	Very mild rhinitis; neutrophils in submucosa.
149	5	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	NSL
150	2	NSL	NSL	Moderate hyaline casts.	NSL	NSL	NSL	NSL
151	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL

G. EXPERIMENT 4185: SHELF CONTROLS

ANIMAL NUMBER	DAY OF STUDY	LUNG	LIVER	KIDNEY	SPLEEN	ADRENAL	THYROID	TURBINATES
158	2	NSL	NSL	Occasional hyaline casts.	NSL	NSL	NSL	NSL
160	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
162	5	NSL	NSL	NSL	NSL	NSL	NSL	NSL
163	5	NSL	NSL	Occasional hyaline casts.	NSL	NSL	NSL	NSL
167	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
169	2	NSL	NSL	NSL	NSL	NSL	NSL	NSL
172	2	NSL	NSL	Occasional hyaline casts.	NSL	NSL	NSL	NSL
173	5	NSL	NSL	NSL	NSL	NSL	NSL	NSL
179	5	NSL	NSL	NSL	NSL	NSL	NSL	NSL
180	5	NSL	NSL	Occasional hyaline casts.	NSL	NSL	NSL	NSL

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\* Not significant lesion.

## APPENDIX J. MISCELLANEOUS

This appendix contains example data sheets for analyses of Wayne Certified Rodent Blox Pellets done by Continental Grain Company, Libertyville, Illinois. Results for this lot of feed (P06185-1) are typical for this kind of feed, which was used in Phase I of this project.

CONTINENTAL GRAIN COMPANY

P. O. BOX 459  
LIBERTYVILLE, ILLINOIS 60048  
312-362-1334

RESEARCH AND DEVELOPMENT CENTER  
WORLD MILLING INDUSTRIES GROUP

September 4, 1985

Dr. Charles Hobbs  
Assistant Director  
ITRI  
P.O. Box 5980  
Albuquerque, New Mexico 87185

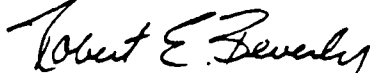
Dear Dr. Hobbs,

Please find enclosed our raw data on the following lots of  
Wayne Certified Rodent Blox Pellets.

P061851  
P061852  
P072651  
P072652

Please contact me if you have any questions.

Sincerely,



Robert E. Beverly  
Quality Assurance Manager  
Animal Health/Pet Products

REB/jw

Enclosure

*Handwritten initials*  
9-28-85

Continental Grain Co.

**CERTIFICATE OF FEED ANALYSIS**

PLANT NO. 010/738

FEED NO. 2722-00 CATEGORY NO. Cat. Rodent  
Blot

ROUTINE  SPECIAL STUDY  NON-ROUTINE

DATE MFG. 6-18-85 RUN OR BATCH NO. P06185-1

ANALYSIS:

LAB NO. 4934

*9-28-85*  
*9-28-85*

	GUAR.	CALC.	ASSAY
PROT.			25.1
MOIST.			9.21
ASH			7.11
FAT			4.30
FIBER			4.02
Ca			1.41
P			0.99
SALT			0.74
N.P.N.			
VIT A			
THIAMINE			

*Flour ground*  
*1-5 lb*  
*1-1 lb*

REMARKS:

ANALYST *[Signature]*

DATE RECEIVED 6/24/85

DATE COMPLETED 6/24/85

RES-19C

RECEIPT

SPECIMEN  
R 4934 CONTINENTAL GRAIN

SPECIMEN I.D NUMBER  
159371

ACCESSION #  
15937

REFERRING CLIENT  
CONTINENTAL GRAIN CO.

DATE COLLECTED 07/01/85  
TIME COLLECTED 00:00  
CLIENT LAB NO. 00000

RECEIVED 07/01/85  
REPORTED 00/00/

TEST	RESULT	REFERENCE LIMITS	UNITS
FEED SCREEN			
ARSENIC	0.24		PPM
CADMIUM	0.32		PPM
LEAD	0.31		PPM
MERCURY	<0.07		PPM
SELENIUM	0.53		PPM
AFLATOXIN B1	<0.01	DL <0.01	PPM
AFLATOXIN B2	<0.01	DL <0.01	PPM
AFLATOXIN G1	<0.01	DL <0.01	PPM
AFLATOXIN G2	<0.01	DL <0.01	PPM
ALDRIN	<0.01	DL <0.01	PPM
DIELDRIN	<0.01	DL <0.01	PPM
ENDRIN	<0.01	DL <0.01	PPM
HEPTACHLOR	<0.01	DL <0.01	PPM
HEPTACHLOREPOXIDE	<0.01	DL <0.01	PPM
LINDANE	<0.01	DL <0.01	PPM
CHLORDANE	<0.01	DL <0.01	PPM
DDT RELATED SUBS.	<0.10		
TOXAPHENE	<0.10	DL <0.10	PPM
PCBS	<0.10	DL <0.10	PPM
DIAZINON	<0.10		PPM
DISULFATON	<0.10	DL <0.10	PPM
ETHION	<0.10	DL <0.10	PPM
MALATHION	0.12	DL <0.10	PPM
METHYL PARATHION	<0.10	DL <0.10	PPM
PARATHION	<0.10	DL <0.10	PPM
THIMET	<0.10	DL <0.10	PPM
THIODAN	<0.10	DL <0.10	PPM
TRITHION	<0.10	DL <0.10	PPM
CAROTENE	1.85		PPM
NITROGEN, NITRATE	0.60		PPM
NITROGEN, NITRITE	<0.01		PPM
STANDARD PLATE COUNT	10500		
COLIFORMS, FECAL	0		COL/ML
E. COLI	0		MPN
BHA	<0.10	DL <0.01	PPM
BHT	<0.10	DL <0.01	PPM
NITROSAMINES	<0.10		MCG/L
ALPHA BHC	<0.01		PPM

*GLA*  
*9/25/85*

SPECIMEN  
R 4934 CONTINENTAL GRAIN

SPECIMEN I.D. NUMBER  
159371 JUL 10 1985

ACCESSION NO  
159371

REFERRING CLIENT  
CONTINENTAL GRAIN CO.

DATE COLLECTED 07/01/85 TIME COLLECTED 00:00  
CLIENT LAB NO. 00000

RECEIVED 07/01/85  
REPORTED 00/00/00

TEST	RESULT	REFERENCE LIMITS	UNITS
BETA BHC	<0.01		PPM
DELTA BHC	<0.01		PPM
4,4'DDE	<0.10		PPM
4,4'DDD	<0.10		PPM
HCB	<0.10	DL <0.01	PPM
MIREX	<0.10	DL <0.01	PPM
METHOXYCHLOR	<0.10	DL <0.01	PPM
TELODRIN	<0.10	DL <0.01	PPM
RONNEL	<0.10	DL <0.01	PPM
ETHYL PARATHION	<0.10	DL <0.10	PPM
ALPHA ENDOSULFAN	<0.10		PPM
BETA ENDOSULFAN	<0.10		PPM
ENDOSULFAN SULFATE	<0.10		PPM

*Lab but*  
9-28-85

APPROVED BY PED LAB MGR: *DES* 28-AUG-85  
 ASSAY DONE  
 DISTRIBUTE TO ROB HEVERLY  
 ASSAY = R4934  
 DATE AS FED

PLANT	PROD	TYPE	MFG	BATCH	COMMENT	COMMENT
010		872800	SPECIAL	850613	P05135-1	CONTINENT BLOX

TEST	UNITS	RESULT	C-VALUE	GUAR-VALUE

XI. LIST OF PUBLICATIONS

Snipes, M. B., A. G. Harmsen, J. A. Pickrell, F. F. Hahn, H. C. Yeh and  
F. A. Seiler. Inhalation of Cu-Zn Alloy and  $TiO_2$  by Rats: Exposure  
Stress Evaluation. Proceedings of the Smoke/Obскурants Symposium X,  
Harry Diamond Laboratories, Adelphi, MD, 22-24 April 1986.

## XII. PERSONNEL SUPPORTED BY PROJECT

<u>Name</u>	<u>Duty</u>
<b>A. <u>Professional</u></b>	
Snipes, M. B.; Ph.D.	Principal investigator responsible for coordination of activities in the project.
Harmsen, A. G.; Ph.D.	Immunologist responsible for activities related to animal stress evaluation.
Damon, E. G.; Ph.D.	Data management in Path/Tox Data Base System.
Eidson, A. F.; Ph.D.	Coordinate activities associated with analytical techniques used in this project.
Hahn, F. F.; D.V.M., Ph.D.	Pathology evaluations.
Harris, D. L.; M.S.	Quality Assurance.
Hobbs, C. H.; D.V.M.	Veterinarian for project and member of the ITRI directorate in charge of this research.
Lopez, J. A.; B.S., Ch.E.	Responsible for maintaining facilities.
Pickrell, J. A.; D.V.M., Ph.D.	Blood chemistry evaluations.
Seiler, F. A.; Ph.D.	Statistician for project.
Thompson, J. J.; Ph.D.	Health protection and safety.
Yeh, H. C.; Ph.D.	Responsible for aerosol science activities.
<b>B. <u>Technical</u></b>	
Brodbeck, R. D.	Construct, test and operate aerosol generation and animal inhalation exposure apparatus.
Ferris, A. A.	Conduct blood chemistry evaluations.
Luckey, M. J.	Conduct atomic absorption analyses.
Salas, E. J.	Animal handling and assistance with exposures and necropsies.
Vigil, W. J. E.	Construct, test and operate aerosol generation and animal inhalation exposure apparatus.

XIII. DISTRIBUTION LIST

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END

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