

FINAL STUDY REPORT

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD® (Sprague Dawley) Rats

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**RTI International is a trade name of Research Triangle Institute.*

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I. INTRODUCTION

The purpose of this study is to establish doses and determine concentrations in maternal and fetal tissue for a follow-on developmental toxicity study to characterize the effects of *in utero* exposure to dietary sodium molybdate dihydrate on the organogenesis and prenatal development of the CD[®] rat. Maternal animals will be exposed to a 15-day dosing regimen via the diet during the embryonic and fetal periods (gestational days [GD] 6 through 20). The test system (pregnant rat and *in utero* offspring) and the route of administration (*ad libitum* in the diet) were requested by the Sponsor. The rat is the surrogate of choice for evaluating risk to the pregnant mother and her *in utero* offspring in humans.

II. MATERIALS AND METHODS

See [Appendix A](#) for additional information.

A. Chemistry

1. Test Article

Chemical Name:	Sodium molybdate dihydrate (SMD)
CAS No.:	10102-40-6
Batch No.:	43006L
Appearance:	White crystals
Purity:	99.9%
Supplier:	Climax Molybdenum, Phoenix, Arizona
Storage Conditions:	Ambient, closed container, dry
Stability:	Sponsor correspondence indicates until March 2013.
Safety Precautions:	See Attachment (MSDS)
Disposition:	Unused test item was retained for subsequent studies at RTI by the Sponsor.
Vehicle	Certified Purina 5002 Meal

2. Dosed Diet Analysis

a. Dose Concentration and Homogeneity Assessment

Analysis of the test chemical in the dosed feed formulations was conducted at Michigan State University. Homogeneity of the dosed feed formulations was evaluated using the same batch size as required for the animal study and at the lowest and highest proposed dietary concentrations. Samples for analysis were collected from left, right, and bottom blender ports for each formulation. A sample of the blank feed was also sent for analysis.

b. Frequency of Analysis

- Dose concentration analysis for all formulation (once).
- Homogeneity on the dose formulations for low and high dietary concentrations (once).

c. Location of Analysis

- Samples (≥ 100 g) were shipped to Justin A. Zyskowski, DCPAH at Michigan State University, 4125 Beaumont Road, Lansing, Michigan 48910-8104. E-mail zyskowski@dcpah.msu.edu. Phone: 517.432.2027.

B. Husbandry

Species and Strain:	Rat, CD IGS Sprague-Dawley, and the nomenclature is CrI:CD(SD).
Source:	Charles River Laboratories, Raleigh, NC
Age:	~ 8 to 10 weeks upon arrival on GD 1 or 2
Weight:	~ 200-250 g on GD 3 (day of randomization into groups at RTI)
Number and Sex:	50 timed-mated females; 10 timed-mated (presumed pregnant) females per group and 5 groups
Mating:	Mated at the vendor over 2 days to produce 25 timed-mated females/day. The date of detecting a positive vaginal smear was designated gestational day (GD) 0.
Identification:	Microchipped (Bio Medic Data Systems, Seaford, DE) upon arrival at RTI.
Husbandry:	All animals were used in compliance with the NRC Guide for the Care and Use of Laboratory Animals (2011) .
Housing:	RTI Animal Research Facility (ARF) nonbarrier rooms Solid-bottom, polycarbonate caging Acclimation and gestation: Singly

Enrichment:	Nestlets (sample were sent to Michigan State University for analysis of Mo content)
Bedding:	Sani-Chips [®] cage litter (P.J. Murphy Forest Products, Montville, NJ) (samples were sent to Michigan State University for analysis of Mo content)
Diet:	Purina Certified Rodent Chow No. 5002 (Purina Mills, Inc., Richmond, IN) Analysis: Provided by supplier Storage: 60-70°F in ARF Expiration: 6 months after milling date
Water:	Tap water available <i>ad libitum</i> via an automatic water delivery system (Edstrom Industries, Inc., Waterford, WI) Source: City of Durham, NC Analysis reports: City of Durham annually Twice yearly, independent laboratory analyses per RTI SOP (sample of tap water were sent to Michigan State University for analysis for Mo)
Temperature:	72°F ± 3°F
Relative Humidity:	50 ± 20% RH
Light Cycle:	12-hour light:12-hour dark
Air Changes:	10-15 per hour, except during scheduled maintenance
Acclimation Period:	At least 3 ± 1 days under RTI Animal Research Facility (ARF) conditions. Release by RTI veterinarian for use on study approximately 72 hours after arrival.
Animal Welfare:	Animals were not subjected to undue pain or distress.
Assignment to Dose Group:	Timed-mated females were assigned to treatment groups in Provantis [™] automated data collection system by stratified randomization, by body weight on GD 3, to provide uniform mean body weights across dose groups.
Sentinels:	None; the in-life length of the study was less than 30 days, so sentinels were not required.

C. Study Design

1. Group Designation

This study was conducted with 4 treatment groups and a vehicle control group, each comprised of 10 timed-mated females ([Table II-1](#)).

Table II-1. Number of Animals Assigned to Study Groups

Group Number	Number of Females	Rx/Color Code	Dietary ppm ^a	Requested Chemical Intake of Mo (mg/kg bw/day) ^b
1	10	Yellow	0	0
2	10	Blue	37.5	1
3	10	Green	187	5
4	10	White	375	10
5	10	Red	750	20

^a A concentration of sodium molybdate dihydrate (SMD) in the diet in parts per million (ppm; mg/kg/feed) to provide requested molybdenum intakes (2.5 mg SMD is approximately equal to 1 mg Mo).

^b Expressed as mg Mo/kg body weight/day, based on a 300 g female ingesting 20 g feed/day.

2. Dosing Regimen

a. Route

On GD 6 through 20, sodium molybdate dihydrate in the feed or blank feed was administered.

b. Dose Levels

The dose levels were chosen by the Sponsor.

c. Frequency

Dosed feed or vehicle was available *ad libitum* 7 days/week beginning on GD 6, with changes of feed jars on GD 12 and 18.

3. Clinical Observations

Clinical observations (cage-side) were conducted and recorded at least once daily. Clinical observations were done out of cage on body weigh days. Clinical observation records included the time the clinical observation was observed and the severity (if applicable) and duration (if applicable) of the observations.

4. Body Weight

Body weights: were recorded on GD 3, 6, 9, 12, 15, 18, and 20. Weight change calculations were done for GD 3-6 (pre-treatment period), 6-9, 9-12, 12-15, 15-18, 18-20, 3-20 (gestation), and 6-20 (exposure period).

5. Food Consumption

Feed weights were recorded on GD 3, 6, 9, 12, 15, 18, and 20.

Feed consumption calculations were done on GD 3-6 (pretreatment period), 6-9, 9-12, 12-15, 15-18, 18-20, 6-20 (treatment period), and GD 3-20 (gestation period), expressed as grams/animal/day and as grams/kg body weight/day. The test material intake in mg Mo/kg bw/day was also calculated from the feed consumption and body weight data.

6. Morbidity/Mortality

Morbidity/mortality checks were done every day, twice per day, at least 6 hours apart, beginning the day after receipt.

D. Necropsy

1. Scheduled Terminations

a. Maternal

- GD 20 euthanasia by CO₂ asphyxiation
- Final body weight (g)
- Blood collection in serum tubes via cardiac puncture. Blood was centrifuged and sera stored at -80°C until shipment.
- Organ weights: uterus, liver, paired kidneys
- Organ retention: Liver and kidneys were collected and frozen individually in liquid nitrogen and stored at -80°C until shipment.
- Ovarian corpora lutea counts
- Placental weight and disposition: Placentas from each dam were pooled, weighed and frozen individually in liquid nitrogen and stored at -80°C until shipment.
- Uterine implantation sites were classified as live, dead, early, late, or full resorption
- Dead fetuses (died *in utero*) were recorded as dead and frozen for analysis.

b. Fetal

Euthanasia:	Live fetuses were dissected from the uterus and immediately placed on a moist paper towel over a tray of ice, a procedure that induces anesthesia and subsequent death by lowering the core body temperature below 25°C (Lumb and Jones, 1973; Blair, 1979).
Fetal Weight and Sex:	For all live fetuses
External Exam (including examination for cleft palate):	On 100% live fetuses and dead fetuses if near term.
Fetal Tissue Disposition:	Livers were collected and pooled by sex/litter/dose; they were flash freeze in liquid nitrogen prior to storage at -80°C. Livers from dead fetuses were frozen and stored separately. Fetal carcasses (minus the liver) were pooled by sex/litter/dose; they were flash frozen in liquid nitrogen prior to storage at -80°C. Carcasses of dead fetuses were frozen and stored separately.

All non-retained maternal organs and maternal carcasses were destroyed by incineration.

E. Shipment and Analysis of Maternal Sera, and Fetal and Maternal Biological Samples

All maternal and fetal biological specimens were shipped on dry ice to Michigan State University for metal analysis. The results were reported directly to the Study Director and the Sponsor.

F Data Analysis**1. Statistical**

Quantitative:	Maternal and fetal body weights, maternal organ weights, fetal liver weights, and maternal feed consumption
Frequency:	Incidence of pregnancy, resorptions, spontaneous abortion, early delivery, litters with resorptions, and litters with external malformations and variations

G. Statistical Analysis

With the exception of the blood and tissue mineral data from MSU which were not analysed by RTI, all data were collected on the validated RTI Instem Provantis™ System, and all statistical

analyses were performed using Provantis™ software, except for fetal external findings (see below). For all statistical tests, $p \leq 0.05$ was used as the criterion for significance.

Quantitative continuous data (e.g., maternal body weights and weight gains, feed consumption in g/kg and g/kg body weight/day) were subjected to the Provantis™ generalized ANOVA/ANCOVA test. This decision tree included analysis of variance (ANOVA) and covariance, nonparametric analysis of variance, pairwise tests ([Dunnett, 1955; 1964](#)) for parametric and nonparametric data, and Levene's test ([Levene, 1960](#)) for homogeneity of variance. For each variable analyzed, where there was evidence of difference between groups, the methodology identified those groups which differed from the control group.

The uterine weight and uterine implant data (i.e., data presented in the Uterine Implantation Data Table) were subject to the Kruskal-Wallis nonparametric analysis of variance, which is the default technique used by Provantis™ ([Kruskal and Wallis, 1952; Conover, 1971](#)). When there was evidence of a significant group effect, pairwise comparisons of each treated group with the control group was performed using Dunnett's test on the ranks.

The fetal weight and sex ratios (i.e., data presented in the Group Mean Cesarean-Fetal Data Table) were subjected to a 1-way mixed ANOVA, which is the default technique used by Provantis™. When there was evidence of a significant group effect, pairwise comparisons of each treated group with the control group was performed using Dunnett's test on group least square means. The percent fetuses malformed (or percent fetuses with variations) per litter was analyzed by ANOVA with Dunnett's pairwise comparison test and Levene's test (1960) for homogeneity of variance.

III. RESULTS

[Summary data tables](#) are presented at the end of this report, and individual animal data tables are presented in [Appendix B](#).

A. Analytical Chemistry

The prestudy chemistry provided by the Sponsor indicated that the dose formulation was stable for 55 days at room temperature. Analysis of the single formulation of all doses (formulated at RTI and analyzed by the Sponsor) determined that the dietary dose formulations of SMD in feed at 0, 37.5, 187, 375, and 750 ppm were accurate (all dietary samples were within 95-102% of the target concentration of molybdenum), and homogeneous. The dose formulations were therefore

made once and used throughout this study, with *ad libitum* exposure to the maternal animals from GD 6 through scheduled necropsy on GD 20. The results of the analyses of the dose feed formulation ([Table III-1](#) and [Appendix C](#)) were received by the RTI Study Director from the Sponsor's Study Monitor. Samples identified as A, B, C, D represent homogeneity test samples from the same batch. The same batches of feed were analyzed a month later (May) in order to demonstrate the stability of the test diets, and the results as received by the RTI Study Director from the Sponsor's Study Monitor are presented in [Appendix C](#).

Table III-1

RTI/MOA (Dev Tox RF)										
Sample Label	Concentration (ppm)	Dilution:	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
lot DEC09112A		50.005	89.57	74025	137.15	337	11.49	76.425	278.95	2000.5
032612-A-02-1A	0	50	89.74	83790	162.9	314.65	11.0875	76.075	272	2006.5
032612-A-02-2A	37.5	50.035	89.47	78255	168.85	301.35	12.88	76.2	288.8	16790
032612-A-02-2B	37.5	49.99	89.89	75340	182.2	348.85	12.375	73.845	295.9	16145
032612-A-02-2C	37.5	50.96	88.98	78320	204.25	357.7	11.82	94.5	307	17099
032612-A-02-2D	37.5	49.965	89.14	71705	150.55	369	11.89	80.26	286.35	16645
032612-A-02-3A	187	49.94	89.47	91065	187.25	329.15	10.4	86.13	298.8	75645
032612-A-02-4A	375	49.955	89.17	87265	191.45	326.15	11.005	85.375	295.25	150950
032612-A-02-5A	750	49.985	89.37	86330	235.45	344.65	12.295	75.01	310.2	298200
032612-A-02-5B	750	49.965	88.87	80710	187.15	339.3	13.055	88.64	302.6	299200
032612-A-02-5C	750	49.955	89.54	76855	184.65	303.8	12.535	77.845	294.5	298950
032612-A-02-5D	750	49.96	88.97	82085	179.05	361.85	11.49	73.735	300.55	299350
Sample Label		Dilution:	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
NIST 1568a		50.01	N/A	19110	7.098	17.03	2.43	19.13	348.2	1421
NIST 1568a		50.01	N/A	19290	7.055	17.74	2.507	19.01	344.5	1416
NIST 1568a		50.01	N/A	20050	7.283	16.96	2.589	19.47	350.8	1421
NIST 1568a			Expected range(+/-)	20000	7.4	18	2.4	19.4	0.38	1.46
				1600	0.9	N/A	0.3	0.5	0.04	0.08

B. Maternal Results

Of the 50 sperm/plug positive CD (Sprague Dawley) female rats, 1 in the 0 ppm group was not pregnant; all other 49 rats were pregnant. Therefore, there were 9, 10, 10, 10, and 10 actual timed-pregnant females at 0, 37.5, 187, 375, and 750 ppm. All of the females survived to scheduled termination on GD 20 (there were no unscheduled deaths). One of the females at the low dose had only one fetus which was dead at C-section ([Table 1](#)).

Mean maternal body weights (including only the 49 pregnant females) were all statistically and biologically equivalent across all groups on GD 3 when they were assigned to groups and on GD 6, 9, 12, 15, 18, and 20 during their gestational exposure period ([Table 2](#)). Mean maternal body

weight gains across all groups were statistically and biologically equivalent on GD 3-6 (prior to start of exposures), 6-9, 9-12, 12-15, 15-18, 18-20, 6-20 (exposure period), and 3-20 (on study) (Table 3).

Mean maternal feed consumption in g/animal/day was equivalent across all groups for all intervals (corresponding to the body weight gain intervals). Mean maternal feed consumption in g/kg body weight/day for the same gestational intervals was statistically and biologically equivalent across all groups for GD 3-6, 6-9, 9-12, 15-18, and 18-20 (Table 4).

Maternal calculated intake in mg/kg body weight/day of molybdenum (not sodium molybdate dehydrate) exhibited the anticipated increases across groups. For the 3-day intervals, the ranges were 0 mg/kg/day at 0 ppm, 0.900 - 1.283 at 37.5 ppm, 4.328 – 5.876 at 187 ppm, 9.545 – 12.347 at 375 ppm and 17.555 to 26.403 ppm at 750 ppm. For overall intake on GD 6-20, the mean values were 0.0 ± 0.0 , 1.151 ± 0.037 , 5.480 ± 0.175 , 11.663 ± 0.269 and 22.930 ± 0.655 ppm at 0, 37.5, 187, 375, and 750 ppm, respectively. The anticipated intakes were 0, 1.0, 5.0, 10.0, and 20.0 ppm (Table 4).

Maternal clinical observations were minimal and uneventful, with 1 female at 375 ppm with sores and/or scabs throughout the gestational period, and no maternal clinical observational findings at 0, 37.5, 187, or 750 ppm (Table 5).

Maternal gravid uterine weight, terminal body weight, terminal (GD 20) body weight minus gravid uterine weight, and body weight changes from GD 3-20, were all statistically equivalent across all groups (Table 6). Maternal liver and paired kidney weights at scheduled necropsy, both absolute and relative to terminal body weights, were also equivalent at 0, 37.5, 187, 375, and 750 ppm (Table 11).

C. Developmental Toxicity Results

All maternal females had one or more live fetuses at scheduled necropsy on GD 20 at 187 through 750 ppm. One female in the control group was non-pregnant and one female at 37.5 ppm had only 1 fetus which was dead at C-section. The mean number of ovarian corpora lutea (representing the number of eggs ovulated) and the numbers of uterine implantations (representing the number of conceptuses which implanted) per female were equivalent across all groups. Preimplantation loss/female (number of ovarian corpora lutea minus number of uterine implantation sites) and percent postimplantation loss/female (number of uterine implantation sites minus the number of live fetuses) were both low and equivalent across all groups (Table 7).

The uterine implantation data indicated no full litter resorptions in any female at any dose. There was only 1 dead fetus in 1 female at 37.5 ppm. The incidence of early resorptions and postimplantation loss were low and equivalent across all groups ([Table 7](#)). The mean numbers of live fetuses/litter were equivalent across all groups (11.2, 11.4, 12.4, 12.2, and 11.8 at 0, 37.5, 187, 375, and 750 ppm, respectively; [Table 7](#)). The percentages of implantations which were live fetuses at term were high and equivalent across all groups (95.28, 97.44, 96.88, 96.83, and 95.93% at 0, 37.5, 187, 375, and 750 ppm, respectively; [Table 7](#)).

There were 101, 114, 124, 122, and 118 live fetuses/group at 0, 37.5, 187, 375, and 750 ppm, respectively. Fetal body weights, expressed as total litter weight, fetal weight per litter (both sexes), and male and female fetal body weight/litter were all equivalent across all groups. The percent of male fetuses, relative to the total number of fetuses, were also equivalent across groups 0 through 375 ppm (52.48, 46.49, 56.45, and 51.64%) and higher, but not statistically significantly, at 750 ppm (57.63%) ([Table 8](#)).

[Table 9](#) presents the fetal external findings by total per dose group. All fetuses in all litters and groups were examined for external malformations and variations. There were no differences across groups for the litter or fetal incidences of external malformations or variations. [Table 10](#) presents the summary of fetal defects by classification.

The results of analyses by MSU indicated that the amounts of Mo found in the Nestlets and Sanichip bedding were much lower than the added amounts of molybdenum added to the feed and ingested by the study animals, according to the Sponsor's Consultant. The results of the tissue analyses by MSU ([Appendix C](#)) clearly show a dose-related increase in molybdenum concentrations in both the dams (i.e., serum, liver, kidneys and placenta) and fetuses (i.e., fetal liver and carcass). At increasing concentrations of molybdenum in the diet, there was also an increase in copper levels, particularly in maternal kidney, placenta, maternal serum and fetal carcass; among the 750 ppm group, the increases in copper levels compared to controls were approximately 3-fold, 2-fold, 1.5-fold and 1.5-fold in the maternal kidney, placenta, maternal serum, and fetal carcass, respectively.

IV. DISCUSSION AND CONCLUSIONS

Administration of sodium molybdate dihydrate in the diet, available ad libitum to pregnant rats from GD 6 to term necropsy on GD 20 was not associated with any treatment- or dose-related maternal findings at any Mo dose (0.1–20 mg/kg/day) or any time during gestation or at scheduled necropsy, including no effects on maternal body weights, weight gains, feed consumption in g/day or g/kg/day, clinical observations, pregnancy indices or organ weights. There were no treatment- or dose-related developmental toxicity findings at any dose, including no effects on pre- or postimplantation loss, fetal numbers, sex ratio, body weights, or fetal external malformations or variations. There were no fetal external malformations or variations found in this study; this is comparable to our historical control database which indicates 17 fetuses with external malformations/variations out of 14,352 fetuses, approximately 0.12%.

V. REFERENCES

- Blair, E. (1979). Hypothermia (Chapter 38). In: *Textbook of Veterinary Anesthesia* (L. Soma, Ed.), Williams and Wilkins Co., Baltimore, MD.
- Conover, W.J. (1971). *Practical Nonparametric Statistics*. John Wiley & Sons, NY.
- Dunnett, C.W. (1955). A multiple comparison procedure for comparing several treatments with a control. *J. Am. Stat. Assoc.* **50**, 1096-1121.
- Dunnett, C.W. (1964). New tables for multiple comparisons with a control. *Biometrics* **20**, 482-491.
- Kruskal, W.H. and Wallis, W.A. (1952). Use of ranks in on-criterion variance analysis. *J. Am. Stat. Assoc.* **47**, 583-621.
- Levene, H. (1960). Robust tests for the equality of variance. In: *Contributions to Probability and Statistics* (I. Olkin, S.G. Ghurye, W. Hoeffding, W.G. Madow, and H.B. Mann, Eds.), Palo Alto, CA, Stanford University Press, pp. 278-292.
- Lumb, W.V. and Jones, E.W. (1973). *Veterinary Anesthesia*, p. 452. Lea and Febiger, Philadelphia, PA.
- NRC (2011). National Research Council. *Guide for the Care and Use of Laboratory Animals*, National Academies Press, Washington, DC, ISBN: 0-309-15401-4. 248 pp.

- Tyl, R.W. and Marr, M.C. (2012). Chapter 7. Developmental Toxicity Testing – Methodology. In *Developmental and Reproductive Toxicology, A Practical Approach*, Third Edition, R.D. Hood, Editor. Informa Healthcare, pp 139-183.
- Salewski, E. (1964). Farbemethode zum makroskopischen Nachweis von Implantationsstellen am Uterus der Ratte. *Naunyn-Schmiedebergs Arch. Exp. Pathol. Pharmacol.* **247**, 367.

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Table 1. Summary of Female Performance

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

	0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
	-----	-----	-----	-----	-----
Number of animals in group	10	10	10	10	10
Not Pregnant (%)	1 (10.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Died/Killed	0	0	0	0	0
Survived to scheduled kill	1	0	0	0	0
Pregnant (%)	9 (90.0)	10(100.0)	10(100.0)	10(100.0)	10(100.0)
Died/Killed/Aborted	0	0	0	0	0
with total resorption	0	0	0	0	0
with live foetus at scheduled kill	9	9	10	10	10

Figures in brackets are percentages

Table 2. Summary of Female Body Weights During Gestation

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Body Weight (g)

Sex: Female						
Day(s) Relative to Mating		0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
3	Mean	218.36	217.83	218.30	219.71	220.75
	SEM	5.76	3.69	4.42	4.26	4.62
	N	9	10	10	10	10
6	Mean	239.11	237.37	234.93	238.19	240.76
	SEM	5.46	4.38	3.65	4.57	4.88
	N	9	10	10	10	10
9	Mean	258.11	254.08	252.07	256.13	257.32
	SEM	5.86	5.20	4.18	5.97	5.12
	N	9	10	10	10	10
12	Mean	276.94	272.65	269.94	274.96	274.85
	SEM	6.19	6.89	5.52	6.33	5.69
	N	9	10	10	10	10
15	Mean	294.97	293.99	290.61	294.45	299.27
	SEM	7.26	7.96	6.73	6.58	7.03
	N	9	10	10	10	10
18	Mean	333.13	329.53	329.39	339.10	340.89
	SEM	8.69	10.13	7.15	7.59	7.79
	N	9	10	10	10	10
20	Mean	365.18	362.87	362.75	370.87	372.04
	SEM	9.78	13.54	9.73	8.19	8.68
	N	9	10	10	10	10

Statistical Test: Generalised Anova/Ancova Test Transformation: Identity (No Transformation)

Table 3. Summary of Female Body Weight Changes During Gestation

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Absolute Weight Gain (g)

Sex: Female						
Day(s) Relative to Mating		0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
3 → 6	Mean	20.76	19.54	16.63	18.48	20.01
	SEM	1.41	1.29	1.61	2.31	2.64
	N	9	10	10	10	10
6 → 9	Mean	19.00	16.71	17.14	17.94	16.56
	SEM	1.58	2.49	1.75	2.10	1.53
	N	9	10	10	10	10
9 → 12	Mean	18.83	18.57	17.87	18.83	17.53
	SEM	1.54	3.12	3.09	1.88	1.51
	N	9	10	10	10	10
12 → 15	Mean	18.02	21.34	20.67	19.49	24.42
	SEM	1.61	3.21	1.95	1.85	2.36
	N	9	10	10	10	10
15 → 18	Mean	38.17	35.54	38.78	44.65	41.62
	SEM	4.70	3.03	1.59	3.13	1.03
	N	9	10	10	10	10
18 → 20	Mean	32.04	33.34	33.36	31.77	31.15
	SEM	2.58	3.72	3.12	3.01	2.42
	N	9	10	10	10	10
6 → 20	Mean	126.07	125.50	127.82	132.68	131.28
	SEM	7.88	11.33	7.07	4.91	5.12
	N	9	10	10	10	10

Statistical Test: Generalised Anova/Ancova Test Transformation: Identity (No Transformation)

Table 4. Summary of Female Feed Consumption During Gestation

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Feed Consumption (g/day)

Sex: Female						
Day(s) Relative to Mating		0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
3 → 6	Mean	21.02	19.59	18.46	19.36	18.14
	SEM	1.27	0.94	1.11	0.90	1.06
	N	9	10	10	10	10
6 → 9	Mean	20.86	20.36	19.35	20.56	20.02
	SEM	1.31	1.42	1.05	0.94	0.97
	N	9	10	10	10	10
9 → 12	Mean	22.53	22.55	21.54	23.53	23.69
	SEM	1.14	0.97	1.06	1.27	1.21
	N	9	10	10	10	10
12 → 15	Mean	23.62	22.85	21.65	21.80	23.92
	SEM	1.84	1.35	1.30	1.03	1.32
	N	9	10	10	10	10
15 → 18	Mean	25.21	25.10	24.23	27.14	25.68
	SEM	1.41	1.29	1.12	0.95	1.14
	N	9	10	10	10	10
18 → 20	Mean	20.81	20.99	20.41	22.77	21.23
	SEM	2.47	1.76	1.82	1.10	1.71
	N	9	10	10	10	10
6 → 20	Mean	22.73	22.47	21.51	23.19	23.03
	SEM	1.35	1.08	0.91	0.88	0.99
	N	9	10	10	10	10

Statistical Test: Generalised Anova/Ancova Test Transformation: Identity (No Transformation)

Table 4. Summary of Female Feed Consumption During Gestation (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Feed Consumption (g/kg/day)

Sex: Female						
Day(s) Relative to Mating		0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
3 → 6	Mean	92.259	85.864	81.712	84.339	78.363
	SEM	5.883	3.177	4.867	3.121	3.582
	N	9	10	10	10	10
6 → 9	Mean	83.724	82.524	79.408	82.865	80.242
	SEM	4.351	4.974	3.899	2.568	3.001
	N	9	10	10	10	10
9 → 12	Mean	84.136	85.504	82.241	88.268	88.900
	SEM	3.522	2.877	2.898	3.285	3.960
	N	9	10	10	10	10
12 → 15	Mean	82.573	80.858	76.853	76.345	83.348
	SEM	6.157	4.941	3.295	2.564	4.227
	N	9	10	10	10	10
15 → 18	Mean	80.043	80.186	78.484	85.590	80.006
	SEM	3.115	2.313	3.990	1.768	2.155
	N	9	10	10	10	10
18 → 20	Mean	58.987	60.031	58.484	64.063	59.109
	SEM	5.857	3.831	4.592	2.431	3.796
	N	9	10	10	10	10
6 → 20	Mean	77.013	76.757	74.049	78.277	77.206
	SEM	3.592	2.437	2.360	1.803	2.205
	N	9	10	10	10	10

Statistical Test: Generalised Anova/Ancova Test Transformation: Identity (No Transformation)

Table 4. Summary of Female Feed Consumption During Gestation (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Molybdenum Intake (mg/kg/day)

Sex: Female						
Day(s) Relative to Mating		0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
6 → 9	Mean	0.000	1.238	5.876	12.347	23.832
	SEM	0.000	0.075	0.289	0.383	0.891
	N	9	10	10	10	10
9 → 12	Mean	0.000	1.283	6.086	13.152	26.403
	SEM	0.000	0.043	0.214	0.489	1.176
	N	9	10	10	10	10
12 → 15	Mean	0.000	1.213	5.687	11.375	24.754
	SEM	0.000	0.074	0.244	0.382	1.256
	N	9	10	10	10	10
15 → 18	Mean	0.000	1.203	5.808	12.753	23.762
	SEM	0.000	0.035	0.295	0.263	0.640
	N	9	10	10	10	10
18 → 20	Mean	0.000	0.900	4.328	9.545	17.555
	SEM	0.000	0.057	0.340	0.362	1.127
	N	9	10	10	10	10
6 → 20	Mean	0.000	1.151	5.480	11.663	22.930
	SEM	0.000	0.037	0.175	0.269	0.655
	N	9	10	10	10	10

Table 5. Summary of Female Clinical Observations During Gestation

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group	Sex	Clinical Sign	Severity	Day numbers relative to Mating Date																	
				3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	f	ANIMALS ALIVE		9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
		ANIMALS NORMAL		9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
2	f	ANIMALS ALIVE		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		ANIMALS NORMAL		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
3	f	ANIMALS ALIVE		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		ANIMALS NORMAL		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
4	f	ANIMALS ALIVE		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		ANIMALS NORMAL		9	9	9	9	9	9	9	9	9	9	8	8	8	8	8	8	8	10
		Scab(s)	Present	.	.	.	.	.	.	1	1	1	1	1	1	1	1	1	1	1	.
		TOTAL		.	.	.	.	.	.	1	1	1	1	1	1	1	1	1	1	1	.
		Sore(s) on Body	Present	1	1	1	1	1	1	.	.	.	.	1	1	1	1	1	1	1	.
		TOTAL		1	1	1	1	1	1	.	.	.	.	1	1	1	1	1	1	1	.
5	f	ANIMALS ALIVE		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		ANIMALS NORMAL		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

Group 1 - 0 ppm

Group 2 - 37.5 ppm

Group 3 - 187 ppm

Group 4 - 375 ppm

Group 5 - 750 ppm

Table 6. Summary of Female Gravid Uterine Weight and Corrected Body Weight Change

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group		Gravid Uterus g Identity	Terminal BW g Identity	Net BW g Identity	Corrected BW Change From Day 3 g Identity
1 0 ppm	Mean	70.177	363.56	295.941	71.070
	SEM	5.872	10.23	8.951	7.198
	N	9	7 ^a	7	7

2 37.5 ppm	Mean	71.044	355.07	284.026	66.196
	SEM	8.871	13.91	7.765	4.914
	N	10	10	10	10

3 187 ppm	Mean	76.584	352.96	276.376	58.076
	SEM	4.052	9.91	7.851	4.957
	N	10	10	10	10

4 375 ppm	Mean	77.857	361.53	283.673	63.963
	SEM	2.857	7.74	7.109	4.566
	N	10	10	10	10

5 750 ppm	Mean	76.983	360.25	283.267	62.517
	SEM	2.885	8.15	5.662	2.141
	N	10	10	10	10

^aTerminal body weight was inadvertently not recorded for female 6 and the terminal body weight was unrealistic so it was excluded for female 8.

Statistics Test: Dunnett Test: * - 5% significance level;

 ** - 1% significance level;

Arithmetic Mean Values Presented

Table 7. Summary of Uterine Implantation Data

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

		0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
Number of females with live fetuses at scheduled kill		9	9	10	10	10
Number of corpora lutea		122	154	145	166	151
Number of corpora lutea per female	Mean	13.6	15.4	14.5	16.6	15.1
	SEM	0.5	0.7	1.4	1.2	0.7
	N	9	10	10	10	10
Number of implantations		106	117	128	126	123
Number of implantations per female	Mean	11.8	11.7	12.8	12.6	12.3
	SEM	0.9	1.5	0.6	0.5	0.5
	N	9	10	10	10	10
Pre-implantation loss		18	38	21	41	28
Rate per female Including total resorptions	Mean	0.16	0.28	0.16	0.25	0.18
	SEM	0.07	0.10	0.04	0.05	0.04
	N	8	9	7	9	10
Rate per female Excluding total resorptions	Mean	0.16	0.28	0.16	0.25	0.18
	SEM	0.07	0.10	0.04	0.05	0.04
	N	8	9	7	9	10
% loss Including total resorptions		16.22	27.14	18.26	26.97	18.54
Excluding total resorptions		16.22	27.14	18.26	26.97	18.54
Number of Intra-Uterine Deaths - Dead Fetus		0	1	0	0	0
Number per female Including total resorptions	Mean	0.0	0.1	0.0	0.0	0.0
	SEM	0.0	0.1	0.0	0.0	0.0
	N	9	10	10	10	10
Number per female Excluding total resorptions	Mean	0.0	0.1	0.0	0.0	0.0
	SEM	0.0	0.1	0.0	0.0	0.0
	N	9	10	10	10	10

Statistics Test: Kruskal Wallis: * - 5% significance level; ** - 1% significance level;

Calculated values do not include animals which either, were not pregnant, did not survive to the scheduled kill, aborted or are marked for exclusion
Indices, which compare Implantations with Corpora Lutea, do not include animals, with an Implantation count > Corpora Lutea Count.
Indices, which compare Fetuses with Implantations, do not include animals, with a Fetus count > Implantation Count.

Table 7. Summary of Uterine Implantation Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

		0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
Number of Intra-Uterine Deaths - Late Resorption		0	0	0	1	0
Number per female Including total resorptions	Mean	0.0	0.0	0.0	0.1	0.0
	SEM	0.0	0.0	0.0	0.1	0.0
	N	9	10	10	10	10
Number per female Excluding total resorptions	Mean	0.0	0.0	0.0	0.1	0.0
	SEM	0.0	0.0	0.0	0.1	0.0
	N	9	10	10	10	10
Number of Intra-Uterine Deaths - Early Resorption		5	2	4	3	5
Number per female Including total resorptions	Mean	0.6	0.2	0.4	0.3	0.5
	SEM	0.3	0.1	0.2	0.2	0.2
	N	9	10	10	10	10
Number per female Excluding total resorptions	Mean	0.6	0.2	0.4	0.3	0.5
	SEM	0.3	0.1	0.2	0.2	0.2
	N	9	10	10	10	10
Post-implantation loss		5	3	4	4	5
Rate per female Including total resorptions	Mean	0.06	0.11	0.03	0.03	0.04
	SEM	0.03	0.10	0.02	0.02	0.01
	N	9	10	10	10	10
Rate per female Excluding total resorptions	Mean	0.06	0.11	0.03	0.03	0.04
	SEM	0.03	0.10	0.02	0.02	0.01
	N	9	10	10	10	10
% loss Including total resorptions		4.72	2.56	3.13	3.17	4.07
Excluding total resorptions		4.72	2.56	3.13	3.17	4.07

Statistics Test: Kruskal Wallis: * - 5% significance level; ** - 1% significance level;

Calculated values do not include animals which either, were not pregnant, did not survive to the scheduled kill, aborted or are marked for exclusion
Indices, which compare Implantations with Corpora Lutea, do not include animals, with an Implantation count > Corpora Lutea Count.
Indices, which compare Fetuses with Implantations, do not include animals, with a Fetus count > Implantation Count.

Table 7. Summary of Uterine Implantation Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

		0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
Number of live fetuses		101	114	124	122	118
Number per female Including total resorptions	Mean	11.2	11.4	12.4	12.2	11.8
	SEM	1.0	1.6	0.7	0.4	0.4
	N	9	10	10	10	10
Number per female Excluding total resorptions	Mean	11.2	11.4	12.4	12.2	11.8
	SEM	1.0	1.6	0.7	0.4	0.4
	N	9	10	10	10	10
% of implantations Including total resorptions		95.28	97.44	96.88	96.83	95.93
Excluding total resorptions		95.28	97.44	96.88	96.83	95.93

Statistics Test: Kruskal Wallis: * - 5% significance level; ** - 1% significance level;

Calculated values do not include animals which either, were not pregnant, did not survive to the scheduled kill, aborted or are marked for exclusion
Indices, which compare Implantations with Corpora Lutea, do not include animals, with an Implantation count > Corpora Lutea Count.
Indices, which compare Fetuses with Implantations, do not include animals, with a Fetus count > Implantation Count.

Table 8. Summary of Fetal Weights

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

		0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
Number of live fetuses		101	114	124	122	118
Number of live male fetuses		53	53	70	63	68
Number of live female fetuses		48	61	54	59	50
Number of live hermaphrodite fetuses		0	0	0	0	0
Number of live unsexed fetuses		0	0	0	0	0
% of live male fetuses		52.48	46.49	56.45	51.64	57.63
Litter weight (g)	Mean	44.2878	49.5546	48.6219	49.8832	48.5162
	SEM	3.91989	4.31819	2.59719	1.99824	1.90609
	N	9	9	10	10	10
Fetal weight (g)	Mean	3.95256	3.90735	3.92810	4.09003	4.11084
	SEM	0.08092	0.06128	0.09140	0.07672	0.06374
	N	9	9	10	10	10
Male fetal weight (g)	Mean	4.06690	4.00283	3.99589	4.12205	4.21617
	SEM	0.08182	0.06768	0.10312	0.08558	0.07094
	N	9	9	10	10	10
Female fetal weight (g)	Mean	3.82210	3.81622	3.83566	4.03789	3.98339
	SEM	0.09057	0.06070	0.08547	0.07761	0.05985
	N	9	9	10	10	10

Statistics Test: 1 Way Mixed Analysis of Variance: * - 5% significance level; ** - 1% significance level;

Calculated values do not include animals which either, were not pregnant, did not survive to the scheduled kill, had a total litter loss, aborted or are marked for exclusion.

Table 9. Summary of Individual Fetal Defects

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Classification	0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
Total number of fetuses examined	101	114	124	122	118
External Defects: Number of Fetuses Examined	101	114	124	122	118
: Number of Litters Examined	9	9	10	10	10
No Abnormalities Detected	101 (100) 9 (100)	114 (100) 9 (100)	124 (100) 10 (100)	122 (100) 10 (100)	118 (100) 118 (100)

Upper line denotes number of affected fetuses

Lower line denotes number of affected litters

Figures in parenthesis denote percentage incidence

Calculated values do not include animals which either, were not pregnant, did not survive to the scheduled kill, had a total litter loss, aborted or are marked for exclusion.

Table 10. Summary of Fetal Defects by Classifications
Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

	0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
Total number of fetuses examined	101	114	124	122	118
Total number of litters examined	9	9	10	10	10
External defects					
Number of fetuses examined	101	114	124	122	118
Number showing Variation	0	0	0	0	0
% of fetuses examined	0	0	0	0	0
Number of litters affected	0	0	0	0	0
Number showing Malformation	0	0	0	0	0
% of fetuses examined	0	0	0	0	0
Number of litters affected	0	0	0	0	0

Calculated values do not include animals which either, were not pregnant, did not survive to the scheduled kill, had a total litter loss, aborted or are marked for exclusion.

Table 11. Summary of Female Organ Weights and Relative Organ Weights Dose

Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female		0 ppm	37.5 ppm	187 ppm	375 ppm	750 ppm
Terminal Body Weight (g)	Mean	363.56	355.07	352.96	361.53	360.25
	SEM	10.23	13.91	9.91	7.74	8.15
	N	7 ^a	10	10	10	10
Liver (g)	Mean	16.84875	16.01900	15.45600	15.93100	15.83400
	SEM	0.83723	0.74882	0.73908	0.56213	0.55940
	N	8 ^b	10	10	10	10
Kidneys (g)	Mean	2.10444	2.04700	2.00700	2.09400	2.03500
	SEM	0.08293	0.06263	0.07171	0.07125	0.05478
	N	9	10	10	10	10
Liver Ratio (%)	Mean	4.69561	4.50218	4.36412	4.39748	4.38950
	SEM	0.13076	0.06459	0.11626	0.08002	0.08657
	N	7 ^a	10	10	10	10
Kidneys Ratio (%)	Mean	0.57850	0.58247	0.56826	0.57907	0.56589
	SEM	0.02626	0.02521	0.01064	0.01455	0.01358
	N	7 ^a	10	10	10	10

Statistical Test: Generalised Anova/Ancova Test Transformation: Identity (No Transformation)

^aTerminal body weight was inadvertently not recorded for female 6 and the terminal body weight was unrealistic so it was excluded for female 8.

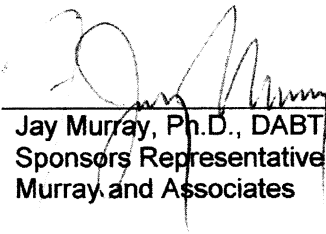
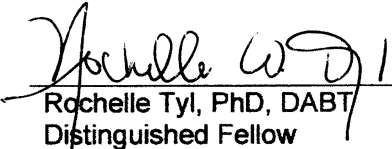
^bLiver weight was inadvertently not recorded for female 8

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Appendix A:

Protocol

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RTI Project No.:	0213350.001	
RTI Study Code:	Rt12-IMOR	
TITLE:	Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD® (Sprague Dawley) Rats	
SPONSOR:	International Molybdenum Association (IMOA) 4 Heathfield Terrace Chiswick, London, W4 4JE	
TESTING FACILITY:	RTI International* Pharmacology and Toxicology P.O. Box 12194 3040 Cornwallis Road Research Triangle Park, NC 27709-2194	
PROPOSED IN-LIFE STUDY DATES:	April-May 2012	
APPROVED BY:		
 Jay Murray, Ph.D., DABT Sponsors Representative Murray and Associates	4/10/12 Date	 Rochelle Tyl, PhD, DABT Distinguished Fellow Study Director RTI International
04/10/2012 Date		
*RTI International is a trade name of Research Triangle Institute.		

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1.0 STUDY TITLE Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD [®] (Sprague Dawley) Rats		
2.0 SPONSOR Sponsor's Technical Representative:	Jay Murray, Ph.D., DABT Murray and Associates 5529 Perugia Circle San Jose, CA 95138 Telephone: 408.239.0669 E-mail: jmurray2@sbcglobal.net	
3.0 TEST FACILITY Study Director: Laboratory Animal Sciences Director: Data Specialist: Study Coordinator: Materials Handling Facility Manager:	Rochelle Tyl, Ph.D., DABT RTI International 124 Hermann P.O. Box 12194 3040 Cornwallis Road Research Triangle Park, NC 27709-2194 Telephone: 919.541-5972 Fax: 919.541.5956 E-mail: rti@rti.org Alyssa McIntyre, D.V.M., DACLAM Telephone: 919.316.3354 E-mail: amcintyre@rti.org Christina Myers, M.S. Telephone: 919.541.8822 E-mail: cbm@rti.org Melissa C. Marr, B.A., RLATG Telephone: 919.541.5835 E-mail: mcm@rti.org Donna Browning, B.S. Telephone: 919.541.6270 E-mail: dbrowning@rti.org	

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3.1 ANALYTICAL LABORATORY Justin A. Zyskowski DCPAH at Michigan State University 4125 Beaumont Road Lansing, Michigan 48910-8104 Telephone: 517.432.2027 E-mail: zyskowski@dcpah.msu.edu		
4.0 OBJECTIVE The purpose of this study is to establish doses for a follow-on developmental toxicity study to characterize the effects of <i>in utero</i> exposure to dietary sodium molybdate dihydrate on the organogenesis and prenatal development of the CD[®] rat. Maternal animals will be exposed to a 15-day dosing regimen via the diet during the embryonic and fetal periods (gestational days [GD] 6 through 20). The test system (pregnant rat and <i>in utero</i> offspring) and the route of administration (<i>ad libitum</i> in the diet) were requested by the Sponsor. The rat is the surrogate of choice for evaluating risk to the pregnant mother and her <i>in utero</i> offspring in humans.		
5.0 TEST ARTICLE Chemical Name: Sodium molybdate dihydrate (SMD) CAS No.: 10102-40-6 Batch No.: 43006L Appearance: White crystals Purity: 99.9% Supplier: Climax Molybdenum, Phoenix, Arizona Storage Conditions: Ambient, closed container, dry Stability: Sponsor correspondence indicates until March 2013. Safety Precautions: See Attachment (MSDS)		

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Disposition:	Unused test item will be retained for subsequent studies at RTI by the Sponsor, then returned to the Supplier or disposed of by the Test Facility, as designated by the Sponsor.	
Vehicle	Certified Purina 5002 Meal	
6.0 DOSED DIET PREPARATION		
6.1 Method		
A premix will be prepared by mixing chemical over a small portion of blank feed. The formulation will be prepared by layering additional blank feed, the premix, and more blank feed in a twin-shell V-blender and mixing for approximately 15 minutes.		
6.2 Frequency of Preparation		
Based on correspondence from the Sponsor, one formulation will be prepared.		
6.3 Conditions for Storage and Use		
The formulations will be stored at ambient temperature. The dosed feed in the jars will be changed at least once per week during conduct of the study.		
7.0 DOSED DIET ANALYSIS		
7.1 Dose Concentration and Homogeneity Assessment		
Analysis of the test chemical in the dosed feed formulations will be conducted at Michigan State University. Homogeneity of the dosed feed formulations will be evaluated using the same batch size as required for the animal study and at the lowest and highest proposed dietary concentrations. Samples for analysis will be collected from left, right, and bottom blender ports for each formulation. A sample of the blank feed will also be sent for analysis.		
7.2 Frequency of Analysis		
- Dose concentration analysis for all formulation (once). - Homogeneity once on the dose formulations for low and high dietary concentrations.		

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7.3 Location of Analysis - Samples (≥ 100 g) will be shipped to Justin A. Zyskowski, DCPAH at Michigan State University, 4125 Beaumont Road, Lansing, Michigan 48910-8104. E-mail zyskowski@dcpah.msu.edu. Phone: 517.432.2027. 7.4 Disposition of Samples Not Used on Study - Per RTI International SOPs for disposal of hazardous waste. 8.0 TEST SYSTEM AND HUSBANDRY Species and Strain: Rat, CD IGS Sprague-Dawley, and the nomenclature is Crl:CD(SD). Source: Charles River Laboratories, Raleigh, NC Age: ~ 8 to 10 weeks upon arrival on GD 1 or 2 Weight: ~ 200-250 g on GD 3 (day of randomization into groups at RTI) Number and Sex: 50 timed-mated females; 10 timed-mated (presumed pregnant) females per group and 5 groups Mating: Mated at the vendor over 2 days to produce 25 timed-mated females/day; The date of detecting a positive vaginal smear is designated gestational day (GD) 0. Identification: Microchipped (Bio Medic Data Systems, Seaford, DE) upon arrival at RTI Husbandry: All animals will be used in compliance with the NRC Guide for the Care and Use of Laboratory Animals (2011). Housing: RTI Animal Research Facility (ARF) nonbarrier rooms Solid-bottom, polycarbonate caging Acclimation and gestation: Singly Enrichment: Nestlets (sample to be sent to Michigan State University for analysis of Mo content) Bedding: Sani-Chips[®] cage litter (P.J. Murphy Forest Products, Montville, NJ) (sample to be sent to Michigan State University for analysis of Mo content) Diet: Purina Certified Rodent Chow No. 5002 (Purina Mills, Inc., Richmond, IN) Analysis : Provided by supplier Storage: 60-70°F in ARF		

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	Expiration: 6 months after milling date Water: Tap water available <i>ad libitum</i> via an automatic water delivery system (Edstrom Industries, Inc., Waterford, WI) Source: City of Durham, NC Analysis reports : City of Durham annually Twice yearly, independent laboratory analyses per RTI SOP (sample of tap water to be sent to Michigan State University for analysis for Mo) Temperature: 72°F ± 3°F Relative Humidity: 50 ± 20% RH Light Cycle: 12-hour light:12-hour dark Air Changes: 10-15 per hour, except during scheduled maintenance Acclimation Period: At least 3 ± 1 days under RTI Animal Research Facility (ARF) conditions. Release by RTI veterinarian for use on study at least 48 hours after arrival. Animal Welfare: Humane termination by CO₂ asphyxiation if moribund or evidence of spontaneous abortion or premature delivery. Animals will not be subjected to undue pain or distress. Exclusion From Assignment to Study: Adverse clinical signs or weight loss during acclimation at the discretion of the Study Director and/or Veterinarian. Assignment to Dose Group: Timed-mated females will be assigned to treatment groups in Provantis™ by stratified randomization, by body weight on GD 3, to provide uniform mean body weights across dose groups (± 10%). Sentinels: None; the in-life length of the study is less than 30 days, so sentinels are not required.	
9.0 PROPOSED STUDY SCHEDULE Animals bred by supplier (GD 0): Animals arrive at RTI (GD 1 or 2 in 1 shipment): Experimental start date (GD 6; first dietary exposure date):	April 17, 18, 2012 April 19, 2012 April 23, 2012	

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Scheduled sacrifice (GD 20):	May 7, 8, 2012
Submission of draft report to Sponsor:	Within 30 days of final sacrifice
Return of Sponsor's comments to RTI:	Within 30 days of receipt of report
Final report issue date:	Within 30 days of receipt of comments from the Sponsor's Technical Representative

10.0 EXPERIMENTAL DESIGN

10.1 Group Designation

This study will be conducted with 4 treatment groups and a vehicle control group, each comprised of 10 timed-mated females ([Table 1](#)).

Table 1. Number of Animals Assigned to Study Groups

Group Number	Number of Females	Rx/Color Code	Dietary ppm ^a	Requested Chemical Intake of Mo (mg/kg bw/day) ^b
1	10	Yellow	0	0
2	10	Blue	37.5	1
3	10	Green	187	5
4	10	White	375	10
5	10	Red	750	20

^a A concentration of sodium molybdate dihydrate (SMD) in the diet in parts per million (ppm; mg/kg/feed) to provide requested intakes.

^b Expressed as mg Mo/kg body weight/day, based on a 300 g female ingesting 20 g feed/day.

10.2 Justification of Treatment Regimen

Route. On GD 6 through 20, sodium molybdate dihydrate in vehicle or vehicle alone will be administered in the feed.

Dose Levels. The dose levels were chosen by the Sponsor.

Frequency. Dosed feed or vehicle will be available *ad libitum* 7 days/week beginning on GD 6, with changes of feed jars on GD 12 and 18.

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11.0 IN-LIFE 11.1 Clinical Observations Clinical observations (cage-side) will be conducted and recorded at least once daily. Clinical observations will be done out of cage on body weigh days. Clinical observation records will include the time the clinical observation was observed and the severity (if applicable) and duration (if applicable) of the observations. 11.2 Body Weight Body weights: GD 3, 6, 9, 12, 15, 18, and 20 Weight change calculations: GD 3-6 (pre-treatment period), 6-9, 9-12, 12-15, 15-18, 18-20, 3-20 (gestation), and 6-20 (exposure period). 11.3 Food Consumption Feed weights: GD 3, 6, 9, 12, 15, 18, and 20 Feed consumption calculations: GD 3-6 (pretreatment period), 6-9, 9-12, 12-15, 15-18, 18-20, 6-20 (treatment period), and GD 3-20 (gestation period), expressed as grams/animal/day and as grams/kg body weight/day. The test material intake in mg Mo/kg bw/day will also be calculated from the feed consumption data. 11.4 Morbidity/Mortality Daily morbidity/mortality checks will be done twice per day, at least 6 hours apart, beginning the day after receipt. 12.0 NECROPSY 12.1 Unscheduled Deaths Any maternal animals that die or are euthanized moribund during the course of the study will be necropsied in an attempt to determine cause of morbidity/death. Uteri which present no visible implantation sites will be stained with ammonium sulfide (10%) to visualize any implantation sites that may have undergone very early resorption (Salewski, 1964). Females showing signs of abortion or premature delivery will be euthanized, as described below, and subjected to a thorough macroscopic examination, and if at GD 18 or later, blood, liver, kidneys, placentae and fetuses will be collected for shipment as below.		

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12.2 Scheduled Terminations		
12.2.1 Maternal		
• GD 20 euthanasia by CO₂ asphyxiation • Final body weight (g) • Blood collection in serum tubes via cardiac puncture. Blood will be centrifuged and sera stored at -80°C until shipment. • Organ weights: uterus, liver, paired kidneys • Organ retention: Collect liver and kidneys and freeze individually in liquid nitrogen and stored at -80°C until shipment. • Ovarian corpora lutea counts • Placental weight and disposition: Pool placentas from each dam and weigh; freeze individually in liquid nitrogen and store at -80°C until shipment. • Uterine implantation sites classified as live, dead, early, late, or full resorption • Dead fetuses (died <i>in utero</i>) will be recorded as dead and frozen for analysis.		
12.2.2 Fetal		
Euthanasia:	Live fetuses will be dissected from the uterus and immediately placed on a moist paper towel over a tray of ice, a procedure that induces anesthesia and subsequent death by lowering the core body temperature below 25°C (Lumb and Jones, 1973 ; Blair, 1979).	
Fetal Weight and Sex:	All live fetuses	
External Exam (including examination for cleft palate):	100% live fetuses and dead fetuses if near term.	
Fetal Tissue Disposition:	Collect livers and pool by sex/litter/dose; flash freeze in liquid nitrogen prior to storage at -80°C. Livers from dead fetuses will be frozen and stored separately.	
	Pool fetal carcasses (minus the liver) by sex/litter/dose; flash freeze in liquid nitrogen prior to storage at -80°C. Carcasses of dead fetuses will be frozen and stored separately.	

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Malformations will be documented with photographs and/or sketches if an abnormality is unusual and/or a written description alone is inadequate, and/or if they appear to be treatment or dose related (Tyl and Marr, 2012). All non-retained maternal organs and maternal carcasses will be destroyed by incineration. 12.3 Shipment of Maternal Sera, and Fetal and Maternal Biological Samples All maternal and fetal biological specimens will be shipped on dry ice (Monday – Wednesday) to Michigan State University for metal analysis. The results will be reported directly to the Study Director and the Sponsor and included in the final report. Contact information: Justin Zyskowski, DCPAH at Michigan State University, 4125 Beaumont Road, Lansing, Michigan 48910-8104. E-mail: zyskowski@dcpah.msu.edu. Telephone: 517.432.2027. 12.4 Analysis of Biological Samples The results of the analyses of the biological samples will be reported to the Sponsor and to the RTI Study Director, and will be included in the final report. 13.0 DATA ANALYSIS AND REPORTING 13.1 Data to be Statistically Analyzed Quantitative: Maternal and fetal body weights, organ weights, and maternal feed consumption Frequency: Incidence of pregnancy, resorptions, spontaneous abortion, early delivery, litters with resorptions, and external malformations and variations 13.2 Statistical Analysis All data will be collected on the validated RTI Instem Provantis™ System, and all statistical analyses will be performed using Provantis™ software, except for fetal external findings (see below). For all statistical tests, $p \leq 0.05$ will be used as the criterion for significance. Quantitative continuous data (e.g., maternal body weights and weight gains, feed consumption in g/kg and g/kg body weight/day) will be subject to the Provantis™ generalized ANOVA/ANCOVA test. This decision tree includes analysis of variance (ANOVA) and covariance, nonparametric analysis of variance, pairwise tests (Dunnett, 1955; 1964) for parametric and nonparametric data, and Levene's test (Levene, 1960) for homogeneity of variance. For each variable analyzed, where there is evidence of		

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difference between groups, the methodology will also identify those groups which differ from the control group. The uterine weight and uterine implant data (i.e., data presented in the Uterine Implantation Data Table) will be subject to the Kruskal-Wallis nonparametric analysis of variance, which is the default technique used by Provantis™ (Kruskal and Wallis, 1952; Conover, 1971). When there is evidence of a significant group effect, pairwise comparisons of each treated group with the control group will be performed using Dunnett's test on the ranks. The fetal weight and sex ratio (i.e., data presented in the Group Mean Cesarean-Fetal Data Table) will be subject to a 1-way mixed ANOVA, which is the default technique used by Provantis™. When there is evidence of a significant group effect, pairwise comparisons of each treated group with the control group will be performed using Dunnett's test on group least square means. The percent fetuses malformed (or percent fetuses with variations) per litter will be analyzed by ANOVA with Dunnett's pairwise comparison test and Levene's test (1960) for homogeneity of variance. The analytical results from Michigan State University will also be subjected to statistical analysis at RTI. 13.3 Reporting The final report will include an abstract, objectives, materials and methods, results (narrative and tabular), discussion, conclusions, references, and appendices: individual maternal animal data, individual embryo/fetal data by litter and uterine location, and the protocol and any amendments. Data in the final report will be summarized in tabular form, showing the following for each dose group: the number of animals at the start of test, the number of pregnant animals, the number and percentages of live fetuses/litter, and the number of fetuses/litter with any external, visceral or skeletal abnormalities. The findings will be evaluated in terms of the observed effects and the exposure levels (doses) producing effects. In addition, specific information will be reported on toxic response data by concentration, including species and strain employed, date of onset and duration of each abnormal sign and its subsequent course, maternal feed, body weight, and uterine weight data, and fetal data (live/dead; sex; body weight; external defects, and resorptions). The intake of Mo in mg/kg body weight/day will also be calculated and reported as part of the study. A draft final report with summary tables will be submitted to the Sponsor's Study Monitor within 30 days of the last sacrifice date. Within 30 days of receiving the Sponsor's comments, one unbound hard		

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copy and a PDF file of the final report will be submitted to the Sponsor. The cost includes the issuance of an initial draft final report, one cycle of client comments and revisions, and issuance of a signed final report. 14.0 COMPLIANCE WITH APPLICABLE REGULATIONS, STORAGE OF STUDY MATERIALS, AND RECORD RETENTION 14.1 Compliance with Applicable Regulations The RTI Animal Research Facility is fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC) International. 14.2 Storage of Study Materials All original study records will be stored in the RTI Archives, under the control of the RTI Corporate Records and Compliance Services. All data collected on the Instem Provantis system will be maintained within the system itself. Any biological samples collected during the course of the study will be transferred to the Sponsor or their designee and will become the responsibility of the Sponsor. Copies of the final study report will be filed with RTI's Discovery Sciences Unit, as well as with the Sponsor. All study records, data, and reports will be maintained in storage at RTI. These records and samples may be released to the Sponsor upon written request. 14.3 Retention of Records and Specimens All data documenting experimental details, study procedures, and observations will be recorded and maintained as raw data. At the completion of the study, all raw data, correspondence, documentation, records, reports, and preserved specimens will be maintained in the Testing Facility's archives for a period of 1 year after the submission of the signed final report. The Sponsor will be contacted to determine the final disposition of these materials and is responsible for all costs associated with the storage of these materials beyond 1 year from the issuance of the final report and for any costs associated with the shipment of these materials to the Sponsor or to any other facility designated by the Sponsor. No study-related materials will be destroyed or discarded without written authorization from the Sponsor. 15.0 REFERENCES Blair, E. (1979). Hypothermia (Chapter 38). In: <i>Textbook of Veterinary Anesthesia</i> (L. Soma, Ed.), Williams and Wilkins Co., Baltimore, MD. Conover, W.J. (1971). <i>Practical Nonparametric Statistics</i>. John Wiley & Sons, NY.		

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Dunnett, C. W. (1955). A multiple comparison procedure for comparing several treatments with a control. <i>J. Am. Stat. Assoc.</i> 50, 1096-1121. Dunnett, C.W. (1964). New tables for multiple comparisons with a control. <i>Biometrics</i> 20, 482-491. Kruskal, W.H. and Wallis, W.A. (1952). Use of ranks in on-criterion variance analysis. <i>J. Am. Stat. Assoc.</i> 47, 583-621. Levene, H. (1960). Robust tests for the equality of variance. In: <i>Contributions to Probability and Statistics</i> (I. Olkin, S.G. Ghurye, W. Hoeffding, W.G. Madow, and H.B. Mann, Eds.), Palo Alto, CA, Stanford University Press, pp. 278-292. Lumb, W.V., and E.W. Jones (1973). <i>Veterinary Anesthesia</i>, p. 452. Lea and Febiger, Philadelphia, PA. NRC (2011). National Research Council. <i>Guide for the Care and Use of Laboratory Animals</i>, National Academies Press, Washington, DC, ISBN: 0-309-15401-4. 248 pp. Tyl, R.W. and M.C. Marr (2012). Chapter 7. Developmental Toxicity Testing – Methodology. In <i>Developmental and Reproductive Toxicology, A Practical Approach</i>, Third Edition, R.D. Hood, Editor. Informa Healthcare, pp 139-183. Salewski, E. (1964). Farbemethode zum makroskopischen Nachweis von Implantationsstellen am Uterus der Ratte. <i>Naunyn-Schmiedebergs Arch. Exp. Pathol. Pharmacol.</i> 247, 367.		

Attachment

Certificate of Analysis and Material Safety Data

Sheet (MSDS)

Test Substance Data Sheet
Sodium Molybdate Dihydrate

Substance Information:

Substance name: Sodium Molybdate Dihydrate
CAS-No.: 10102-40-6
Molecular Formula: $\text{Na}_2\text{MoO}_4 \cdot 2 \text{H}_2\text{O}$
Molecular Weight: 241.95

Appearance: white crystals
Purity: 99.9 % (calculated based on the molecular weight of 241.95 g/mol for the dihydrate form and based on an analysed Molybdenum content of - 39.6 % as determined by the producer)
Chemical Analysis: see attached Assay/Weight Certificate (overleaf)

Producer: Climax Molybdenum
One North Central Avenue
Phoenix
Arizona 85004
USA

Batch No.: 43006L

Stability: at least until March 2013
Storage: ambient temperature, closed container, dry

Physico-chemical data:

Melting point: 687 °C (anhydrous compounds) [MSDS provided by the producer]

Water solubility: 654.2 g/L at 20±5°C [unpublished study report for the International Molybdenum Association (IMO): "Water Solubility of Sodium Molybdate Dihydrate (OECD guideline 105)", eurofins-GAB GmbH, Niefern-Öschelbronn, Germany, Report No. 20071507/01-PCSB, August 2008]

Rel. density: 2.59 [unpublished study report for the International Molybdenum Association (IMO): "Sodium Molybdate Dihydrate Batch No.: 43006L - Relative Density A.3. (OECD 109)", Siemens Prozess-Sicherheit, Frankfurt, Germany, Report No. 20070330.01, September 2007]

Particle size: Volume- and mass-based particle size distribution:
L10 = 34.5 µm
L50 (median) = 143.2 µm
L90 = 295.9 µm

[unpublished study report for the International Molybdenum Association (IMO): "Sodium Molybdate Dihydrate Batch No.: 43006L - Particle Size Distribution OECD 110", Siemens Prozess-Sicherheit, Frankfurt, Germany, Report No. 20070330.02, September 2007]

Printing date: 27/03/2012

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Test Substance Data Sheet
Sodium Molybdate Dihydrate

Assay/Weight Certificate, provided by the producer

Climax Molybdenum Marketing Corporation
Assay/Weight Certificate
August 15, 2007

Shipping Point: CLIMAX MOLYBDENUM COMPANY
Order: ST0 4400000870 BOL 524 OBD 800004521
Customer Name:
Customer P.O.:
Material: 1. SODIUM MOLYBDATE CRYSTALLINE 25 KG VALVE PAK NET BAG

Weight In Kilograms

<u>Lot Number</u>	<u>Material Number</u>	<u>Containers</u>	<u>Net Weight</u>	<u>Mo Weight</u>
43006L	1.	24	600.00	237.60
	Totals:	24	600.00	237.60

Assay Analysis

<u>Lot Number</u>	<u>MO</u>	<u>H/105</u>	<u>SO4</u>	<u>CL</u>	<u>PO4</u>
43006L	39.60 %	14.31 %	.022 %	< .01 %	< .01 %

<u>Lot Number</u>	<u>SIO2</u>	<u>FE</u>	<u>M/H2O</u>	<u>BKDEN</u>
43006L	< .01 %	< .01 %	2 NTU	65 LB/FT3

Assay Test Legend

<u>Test</u>	<u>Description</u>	<u>Test</u>	<u>Description</u>
MO	MOLYBDENUM	H/105	PERCENT H2O AT 105 DEGREES C
SO4	SULFATE	CL	CHLORIDE
PO4	PHOSPHATE	SIO2	SILICA
FE	IRON	M/H2O	MISCIBILITY WITH WATER
BKDEN	BULK DENSITY		

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FM NaMo

Safety Data Sheet

30 June 2011

Section 1	Substance Identification and Company/Undertaking
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(1.1)

Product identifier**Substance name:** disodium molybdate dihydrate**Chemical formula:** $\text{Na}_2\text{MoO}_4 \cdot 2 \text{H}_2\text{O}$ **Synonyms/trade names:** sodium molybdate dihydrate; disodium molybdate dihydrate; sodium molybdate.**Index No. (Regulation (EC) No 1272/2008):** None, because not classified.**CAS Numbers:** 10102-40-6 (for dihydrate); 7631-95-0 (for anhydrous Na_2MoO_4)**EC No.:** 231-551-7 (assumed to cover both dihydrate and anhydrous form)**REACH Registration number:** 01-2119489495-21-0000

(1.2.1)

Product Use: The production of micronutrient in manufacture and use of fertilizers; micronutrient in feed additives; corrosion inhibitor; manufacture of pigments; industrial detergent for metal surface treatment; cleaning & maintenance material; as coolant/anti-freeze/heat transfer fluid; metal working fluids; industrial formulation & use of lubrication additives, lubricants and greases; manufacture of enamels frits, ceramics; manufacture & use of water treatments chemicals, inc. water softener; polymer preparations & compounds; industrial chemical products such as pH regulator, flocculants, precipitants, neutralization agents; extraction agents; photochemicals manufacture and use of catalysts, including regeneration & recycling

(1.2.2)

Sales restricted to commercial users.

(1.3)

Company/supplier:

Climax Molybdenum
333 North Central Avenue
Phoenix, Arizona 85004, USA

(1.4)

Emergency Information:

Contact: 1-602-366-8100 (**Days only**)
CHEMTREC: 1-800-424-9300 (**USA**)
FAX: 1-602-366-7309
E-mail: robert_stepp@fmi.com

(1.4.1)

Other Emergency numbers – For List of EU Poison Centres see Section 16.7.1

Section 2	Hazard Identification
------------------	------------------------------

(2.1)

EU Regulation (EC) No. 1272/2008 [CLP]

(2.1.1)

Classification according to Regulation (EC) No. 1272/2008 (CLP): Not classified. Local codes may apply.

(2.1.2)

Classification according to Directive 67/548/EEC: Not classified. Local codes may apply.

(2.2)

Label elements

(2.2.1)

Labelling according to Regulation (EC) No. 1272/2008 (CLP): Sodium molybdate (dihydrate) is not classified in the CLP regulation and must be self classified. Local codes may apply.

(2.2.2)

Labelling according to Directive 67/548/EEC: Sodium molybdate (dihydrate) is not classified in the CLP regulations and must be self classified. Local codes may apply.

(2.3)

Other hazards: The substance does not meet the criteria for a PBT or vPvB substance. No environmental, toxicological or physico-chemical hazards identified.

Section 3	Composition/Information on Ingredients
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(3.1)

Substance

Content: 100%



FM NaMo

Safety Data Sheet

30 June 2011

Chemical name: disodium molybdate dihydrate
Chemical formula: $\text{Na}_2\text{MoO}_4 \cdot 2 \text{H}_2\text{O}$
CAS Numbers.: 10102-40-6 (dihydrate) and 7631-95-0 (for the anhydrous Na_2MoO_4)
EC No.: 231-551-7 (assumed to cover the dihydrate and anhydrous form)

Section 4 First Aid Measures

(4.1)

Description of first aid measures

Note: The following generic first aid measures should be applied as usual when handling any chemical substance.

(4.1.1)

General Advice: First-aid responders should wear suitable personal protective equipment in case of insufficient ventilation or possible inhalation or eye contact.

(4.1.2)

Following Inhalation: Remove patient from exposure and bring to fresh air. If breathing has stopped, perform artificial respiration and get medical advice/attention immediately.

(4.1.3)

Following skin contact: Wash skin with water and soap, and rinse thoroughly. If skin irritation occurs, get medical advice/attention.

(4.1.4)

Following eye contact: Check for and remove any contact lenses. Immediately flush eyes with plenty of water, occasionally lifting upper and lower eyelids, for several minutes. If irritation occurs, get medical advice/attention.

(4.1.5)

After ingestion: Seek medical advice/attention if feeling unwell.

(4.2)

Most important symptoms and effects, both acute and delayed: Acute or delayed effects are not anticipated for sodium molybdate.

(4.3)

Indication of any immediate medical attention and special treatment needed: No specific treatment expected to be required.

Section 5 Fire Fighting Measures

Note: Sodium molybdate is not flammable / combustible and it does not support fires (no oxidizing properties). Nevertheless, below some general fire fighting measures are given, which should be adjusted to the surroundings (e.g. other, hazardous chemicals involved, packaging materials...).

(5.1)

Extinguishing media

(5.1.1)

Suitable extinguishing media: Standard extinguishing media such as water, sand, foam. Use fire fighting measures that suit the location and surroundings. Sodium molybdate is not considered flammable or combustible.

(5.1.2)

Unsuitable extinguishing media: None. Use fire fighting measures that suit the location and surroundings.

(5.2)

Special hazards arising from the substance or mixture: None.

(5.3)

Advice for fire fighters: Standard extinguishing media such as water, sand, foam. Use fire fighting measures that suit the location and surroundings. Sodium molybdate is not considered flammable or combustible.

Section 6 Accidental Release Measures

Note: The following generic accidental release measures should be applied as usual when handling any chemical substance.



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(6.1)

Personal precautions, protective equipment and emergency procedures

(6.1.1)

For non-emergency personnel: Avoid formation and inhalation of dust. Seek to ensure ventilation that maintains airborne concentrations below Occupational Exposure Limits. Keep unprotected persons away. Although the substance has no acute toxicity, it is advised to avoid contact with skin, eyes, and clothing – wear suitable protective equipment.

(6.1.2)

For emergency responders: Avoid formation and inhalation of dust. Seek to ensure ventilation that maintains airborne concentrations below Occupational Exposure Limits. Keep unprotected persons away. Although the substance has no acute toxicity, it is advised to avoid contact with skin, eyes, and clothing – wear suitable protective equipment.

(6.2)

Environmental precautions: Although the substance is not classified as dangerous to the environment, it is advised that in the event of an accidental release the product should be prevented from reaching the sewage system or any water course, and from penetrating the ground/soil. Dispose of spilled material in accordance with the relevant local regulations. See Section 13 for disposal considerations.

(6.3)

Methods and material for containment and cleaning up: Avoid formation and inhalation of dust. Use an appropriate industrial vacuum cleaner, equipped with ULPA or HEPA filters. Collect spilled material in suitable containers or bags for recovery or disposal. In the case of disposal, spilled material or contaminated material should be disposed of as waste as described in Section 13.

(6.4)

Reference to other sections: For more information on exposure controls/personal protection or disposal considerations, check Sections 8 and 13 of this Data Sheet.

Section 7**Handling and Storage**

Note: The following generic advice on handling and storage should be followed as for any chemical substance.

(7.1)

Precautions for safe handling

(7.1.1)

Protective measures: Avoid formation of dust, inhalation and ingestion. General occupational hygiene practice should always be followed (see 7.1.2 below).

(7.1.2)

Advice on general occupational hygiene: Avoid formation of dust, inhalation and ingestion. General occupational hygiene measures are required to ensure safe handling of the substance. These measures involve good personal and housekeeping practices (i.e. regular cleaning with suitable cleaning devices), no eating, drinking and smoking at the workplace and wearing standard working clothes and shoes unless otherwise stated. Wash hands after contact with the powder or fume. Remove contaminated clothing and protective equipment before entering eating areas. Shower and change clothes at end of work shift. Do not wear contaminated clothing home. Do not blow dust off with compressed air.

(7.2)

Conditions for safe storage, including any incompatibilities: Store in closed container in a dry area. Do not store in open, inadequate or miss-labelled packaging.

(7.3)

Specific end use(s): See the Identified Uses in Section 1.2 of this Data Sheet.

Section 8**Exposure Controls / Personal Protection**

(8.1)

Control parameters:

(8.1.1)

US OSHA PEL control parameter for soluble molybdenum compounds is an 8-hour TWA of 5.0 mg/m³. This is only one of many country control limits that are in use worldwide for soluble molybdenum compounds but not the most restrictive. It's recommended that you consider as a control measure the OEL used in your locality. **Additional country and agency control limits are listed in Section 16.7, Other Information.**



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The appropriate collection method is also country OEL related and you must follow the local country's protocols on collection and analysis which change from time to time and may not be codified.

(8.1.2)

PNECs and DNELs

Exposure pattern	Route	Descriptor	DNEL / PNEC
Long-term - systemic effects	Inhalation	DNEL (Derived No Effect Level)	11.17 mg Mo/m ³ Corresponding to 28 mg Na ₂ MoO ₄ · 2H ₂ O / m ³ Note: derived for formal reasons in the REACH registration dossier; based on mass molybdenum per m ³ . <i>This value is usually superseded by lower national occupational exposure limits for (soluble) molybdenum compounds or general nuisance dust limits.</i>
Long-term - chronic effects	Freshwater	PNEC (Predicted No Effect Concentration)	12.7 mg Mo/L, equivalent to 32.0 mg Na ₂ MoO ₄ · 2 H ₂ O/L
Long-term - chronic effects	Marine	PNEC (Predicted No Effect Concentration)	1.9 mg Mo/L, equivalent to 4.8 mg Na ₂ MoO ₄ · 2 H ₂ O/L
Long-term - chronic effects	Freshwater sediment	PNEC (Predicted No Effect Concentration)	22.6 g Mo/kg dw, equivalent to 57.0 g Na ₂ MoO ₄ · 2 H ₂ O/kg dw
Long-term - chronic effects	Marine sediment	PNEC (Predicted No Effect Concentration)	1.98 g Mo/kg dw, equivalent to 4.99 g Na ₂ MoO ₄ · 2 H ₂ O/kg dw
Long-term - chronic effects	Soil	PNEC (Predicted No Effect Concentration)	11.8-188 mg Mo/kg dw, equivalent to 29.8 - 474 mg Na ₂ MoO ₄ · 2 H ₂ O/ kg dw (dependent upon soil type)
Long-term - chronic effects	STP	PNEC (Predicted No Effect Concentration)	21.7 mg Mo/L, equivalent to 54.7 mg Na ₂ MoO ₄ · 2 H ₂ O/L

(8.2)

Exposure controls: In some circumstances, high airborne dust concentrations may require local or general ventilation to control worker exposure. Where natural or mechanical ventilation is unable to control the workplace dust levels to below the OEL, then respirator controls must be used. Exposure controls specific to this substance may not be required, other than good hygiene practice and adherence to national and regional provisions with regards to exposure to dusts in the workplace. National, regional or local provisions or limit values may also apply for emissions to air or water. The generic advice on accidental release measures or handling and storage is given in sections 6 and 7 and should be followed to minimize release/exposure.

(8.2.1)

Engineering Controls: Provide local exhaust ventilation as needed to stay below the OEL. If risk of overexposure exists to excessive dust or fume, then wear a properly fitted approved respirator.

(8.2.2)

PPG/PPE protection and selection (4)

(8.2.2.1)

Eye and Face: To avoid eye and face contact, use a full-face shield (20 cm, 8 in minimum) but never use as primary eye protection. Alternatively, a full-face respirator may replace both eye glasses and face shields. (4)

(8.2.2.2)

Skin, Hand and Feet: Sodium molybdate may cause slight skin irritation over a prolonged time. Wear cloth or leatherwork gloves, and safety boots.

Other: Use overalls with cloth apron for light duty. Use a disposable protective suit if there is a high potential for skin contact. Where there is a high potential for eye contact, an eyewash station/unit should be readily available within a 10-second walk.

(8.2.2.3)

Respirator: If dust generation is excessive, use an appropriate dust-filtering respirator that is properly fit tested to the user. (4)

Respirator Protection factor up to 50 mg/m³:



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- (APF = 25) Any supplied-air respirator operated in a continuous-flow mode.
 (APF = 25) Any powered, air-purifying respirator with high-efficiency particulate filter.
 (APF = 50) Any respirator with a full facepiece and N100, R100, or P100 filters.
 (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back mounted canister having an N100, R100, or P100 filter.
 (APF = 50) Any self-contained breathing apparatus with a full facepiece.
 (APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

- (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
 (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Escape:

- (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back mounted canister having an N100, R100, or P100 filter. Any appropriate escape-type, self-contained breathing apparatus.

(8.2.2.4)

Thermal Hazards: None

Section 9	Physical and Chemical Properties
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(9.1)

Information about basic physical and chemical properties

(a) Appearance	Solid, crystalline, white, odourless, inorganic.
(b) Odour	Odourless.
(c) Odour threshold	Not applicable as odourless.
(d) pH	Not applicable.
(e) Melting point	Sodium molybdate dihydrate decomposes at ca. 100 °C (loss of water of crystallisation). For the anhydrous form, a melting point of 687 °C has been reported [25].
(f) Initial boiling point and boiling range	Not available
(g) Flash point	Not applicable as only relevant for liquids or low melting point solids.
(h) Evaporation rate	Negligible at ambient temperatures.
(i) Flammability (solid, gas)	Not flammable.
(j) Upper/lower flammability or explosive limits	Not explosive.
(k) Vapour pressure	Low to negligible.
(l) Vapour density	Not applicable (there are no sodium molybdate vapours).
(m) Relative density	2.59 at 20 °C [26]
(n) Solubility(ies)	654 g/L in water at 20 °C [27].
(o) Partition coefficient n-octanol/water	Not applicable for inorganic substances.
(p) Auto-ignition temperature	Not applicable (sodium molybdate is not combustible/flammable and thus does not auto-ignite).
(q) Decomposition temperature	Sodium molybdate dihydrate decomposes at ca. 100 °C (loss of water of crystallisation, formation of anhydrous sodium molybdate).
(r) Viscosity	Not applicable. (Solid).
(s) Explosive properties	Non explosive.
(t) Oxidising properties	Not oxidising. Read-across from study with pure molybdenum trioxide (MoO ₃), which also contains molybdenum in its highest oxidation state (+VI) [28].

(9.2)

Other information: Not applicable.



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Section 10 Stability and Reactivity

(10.1)

Reactivity: Stable under ambient temperatures and pressures.

(10.2)

Chemical stability: Stable under ambient temperatures and pressures.

(10.3)

Possibility of hazardous reactions: According to "Bretherick's Handbook" [39] molybdates react violently or explosively when reduced to molybdenum by heating with zirconium. Furthermore, in the preparation of dyestuffs from aniline, nitrobenzene (as oxidant), hydrochloric acid and sodium hydroxide, ferric chloride is often used as catalyst, but sodium molybdate was substituted as a more effective catalyst. The materials were charged into a 4.5 m³ reactor and heating was started after addition of nitrobenzene, but the temperature controller was miss-set, and overheating at a high rate ensued. The exothermic reaction was much faster than normal because of the more effective catalyst, and partial failure of the cooling water led to an uncontrollable exothermic reaction [39]. Other hazardous reactions have not been identified.

(10.4)

Conditions to avoid: No specific conditions to avoid have been identified.

(10.5)

Incompatible materials: No specific incompatible materials have been identified.

(10.6)

Hazardous decomposition products: No hazardous decomposition products have been identified.**Section 11 Toxicological Information**

(11.1)

Information on toxicological effects: The information provided in this section is consistent with the information provided in the REACH Chemical Safety Report (CSR) for sodium molybdate. Further information can be obtained from the REACH Molybdenum Consortium, an initiative of the International Molybdenum Association (IMO). For contact details, please refer to Section 16 of this data sheet.

Toxicity endpoints	Description of effects
Toxicokinetics: Absorption, Distribution, Metabolism and Excretion	Molybdenum is an essential element. Uptake of sodium molybdate dissolves and exists predominantly in the form of the molybdate ion (MoO_4^{2-}). Oral absorption: Rapid and almost complete absorption through GI tract. Inhalation absorption: Well absorbed based on animal data. Absorption in humans dependent on particle size, deposition/clearance. Dermal absorption: Low to negligible. Metabolism: No metabolism. Molybdenum compounds transform quickly to molybdate anions (MoO_4^{2-}) upon dissolution. Excretion: Rapidly eliminated from plasma predominantly via renal excretion (>80%), and faeces (<10%).
(a) acute toxicity	Low acute toxicity LD ₅₀ , oral, rat: between 2733 and 6556 mg/kg bw (male/female) [29] LD ₅₀ , dermal, rat: > 2000 mg/kg bw (male/female) [30] LC ₅₀ , inhalation, rat (4h): > 1.93 mg/L (male/female) [31]
(b) skin corrosion/irritation	Not irritating / not corrosive to the skin [32].
(c) serious eye damage/irritation	Not irritant / not corrosive to the eyes [33].
(d) respiratory or skin sensitisation	Sodium molybdate is not sensitising to the skin [34]. There is no data indicating respiratory sensitisation.
(e) germ-cell mutagenicity	Not a germ cell mutagen. Negative test results three tests with sodium molybdate for: Bacterial reverse mutation assay [35], in vitro micronucleus assay in human lymphocytes [36], and in vitro gene mutation assay (tk) in mouse lymphoma cells [37].
(f) carcinogenicity	Not a carcinogen. (Read-across for absence of systemic carcinogenicity, based on chronic toxicity and carcinogenicity studies with molybdenum trioxide [38]. Local effects in the lung observed in these molybdenum trioxide studies are specific to molybdenum trioxide and not read-across to sodium molybdate).
(g) reproductive toxicity	There are currently no reliable scientific data available indicating adverse effects on reproduction or fertility.
(h) STOT-single exposure	There are no specific target organ effects after single exposure to sodium molybdate.
(i) STOT-repeated exposure	No reliable scientific data available indicating adverse systemic effects after repeated exposure to molybdenum substances.
(j) aspiration hazard	Not applicable (not an aerosol/mist).



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Section 12	Ecological Information
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(12.1)

Toxicity

(12.1.1)

Reliable acute aquatic toxicity test results: (Tests conducted with sodium molybdate; UV-spectra of aqueous solutions of sodium molybdate dihydrate demonstrated that the only dissolved molybdenum species, originating directly from sodium molybdate dihydrate is molybdate; critical values for classification are also expressed as mg Na₂MoO₄·2H₂O).

Test Organisms:	End-point	Range of values	References
Freshwater fish: <i>Pimephales promelas</i>	96h-LC ₅₀	609 – 681.4 mg Mo/L (1.536-1,718 mg Na ₂ MoO ₄ ·2H ₂ O/L)	[1]
Freshwater fish: <i>Oncorhynchus mykiss</i>	96h-LC ₅₀	7600 mg Mo/L	[2]
Freshwater fish: <i>Oncorhynchus mykiss</i>	96h-LC ₅₀	781 – 1339 mg Mo/L (recalculated – logistic fit)	[3]
Invertebrates: <i>Daphnia magna</i>	48h-LC ₅₀	1680.4 – 1776.6 mg Mo/L	[1]
Invertebrates: <i>Daphnia magna</i>	48h-LC ₅₀	2729.4 mg Mo/L	[4]
Invertebrates: <i>Daphnia magna</i>	48h-LC ₅₀	2847.5 mg Mo/L	[5]
Invertebrates: <i>Daphnia magna</i>	48h-LC ₅₀	130.9 mg Mo/L (330.1 mg Na ₂ MoO ₄ ·2H ₂ O/L)	[6]
Invertebrates: <i>Ceriodaphnia dubia</i>	48h-LC ₅₀	1005.5 – 1024.6 mg Mo/L	[1]
Invertebrate (aq. worm): <i>Girardia dorotocephala</i>	96h-LC ₅₀	1226 mg Mo/L	[1]
Algae: <i>Pseudokirchneriella subcapitata</i>	72h-ErC ₅₀ (growth rate)	295.0 – 390.9 mg Mo/L 289.2 – 369.6 mg Mo/L Geom. mean: 333.1 mg Mo/L (840 mg Na ₂ MoO ₄ ·2H ₂ O/L)	[7] [8]

Tests were conducted according to international test guidelines (e.g., OECD) or scientifically acceptable methods.

(12.1.2)

Reliable chronic toxicity test results: UV-spectra of aqueous solutions of sodium molybdate dihydrate demonstrated that the only dissolved molybdenum species, originating directly from sodium molybdate dihydrate is molybdate):

Test organisms	Range of values (EC ₁₀ or NOEC)	References
Aquatic freshwater toxicity data		
<i>Oncorhynchus mykiss</i> , <i>Pimephales promelas</i> , <i>Pseudokirchneriella subcapitata</i> , <i>Ceriodaphnia dubia</i> , <i>Daphnia magna</i> , <i>Chironomus riparius</i> , <i>Brachionus calyciflorus</i> , <i>Lymnaea stagnalis</i> , <i>Xenopus laevis</i> , <i>Lemna minor</i>	43.3–241.5 mg Mo/L	[1], [4], [7], [8], [9], [10], [11]
Most sensitive species were the fish <i>O. mykiss</i> (43.3 mg Mo/L) and <i>P. promelas</i> (60.2 mg Mo/L). Symptoms of toxicity were effects on biomass growth, reproduction, (population) growth rate and malformation during development.		
Aquatic marine toxicity data		
<i>Mytilus edulis</i> , <i>Acartia tonsa</i> , <i>Phaeodactylus tricornutum</i> , <i>Cyprinodon variegatus</i> , <i>Americamysis bahia</i> , <i>Crassostrea gigas</i> , <i>Dendroaster excentricus</i> , <i>Dunaliella tertiolecta</i> , <i>Ceramium tenuicorne</i> , <i>Strongylocentrotus purpuratus</i> ,	4.4–1,174 mg Mo/L	[12], [13], [14], [15], [16], [17], [18], [19]
Most sensitive species were the mussel <i>M. edulis</i> (4.4 mg Mo/L) and the copepod <i>A. tonsa</i> (7.96 mg Mo/L). Symptoms of toxicity include effects on biomass growth, growth rate, reproduction and malformation during development		
Chronic sediment toxicity		
No reliable acute/chronic sediment data for molybdenum available. PNEC derivation was based on the equilibrium partitioning method, taking into account the PNEC _{freshwater} and the sediment K _d given in section 12.4.		
Chronic terrestrial toxicity test results (values were determined in different top soils with contrasting properties and spiked with sodium molybdate):		
Annelid worms: <i>Enchytraeus crypticus</i> , <i>Eisenia andrei</i>	7.88-1661 mg Mo/kg dw (n=11)	[20]
Arthropod: <i>Folsomia candida</i>	37.9– >3395 mg Mo/kg dw	[20]
Plants: <i>Hordeum vulgare</i> , <i>Brassica napus</i> , <i>Trifolium pratense</i> , <i>Lolium perenne</i> , <i>Lycopersicon esculentum</i>	4–3476 mg Mo/kg dw	[21]
Soil micro-organisms (nitrification, glucose-induced respiration, plant residue mineralisation)	10–3840 mg Mo/kg dw	[22]



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Plants are most sensitive, with reduced shoot yield being the most first symptoms of toxicity, followed by reduced reproduction of invertebrates. Toxicity of sodium molybdate dihydrate in soils is dependent on the soil type. Sandy soils (e.g., 5% clay) with a low organic carbon content (e.g., 1%), a low iron oxide content (e.g., 0.5 g/kg) and high pH (e.g., 7) are most sensitive, while clay soils (e.g., 30% clay) with a high organic carbon content (e.g., 12%), high iron oxide content (e.g., 10 g/kg) and low pH (e.g., 4.5) are least sensitive.

Tests were conducted according to international test guidelines (e.g., OECD, ASTM, ISO, EPA).

(12.1.3)

Toxicity data for micro-organisms (for STP) (values were determined using molybdenum trioxide unless indicated otherwise; UV-spectra of aqueous solutions of molybdenum trioxide demonstrated that the only dissolved molybdenum species, originating directly from molybdenum trioxide is also the molybdate anion):

Test Organisms:	End-point:	Range of values	References
Domestic activated sludge population	3h-EC ₅₀ (respiration inhibition)	1926 mg Mo/L	[23]
Domestic activated sludge population	3h-EC ₅₀ (respiration inhibition)	216.5 mg Mo/L	[23]
Domestic activated sludge population	30 min-NOEC (O ₂ utilization)	> 950 mg Mo/L ⁽¹⁾	[24]

⁽¹⁾: test conducted with sodium molybdate

Tests were conducted according to international accepted test guidelines or scientifically acceptable methods. For an overview of PNECs for the different compartments see section 8.1.2.

(12.1.4)

Conclusion on the environmental classification and labelling: Sodium molybdate dihydrate is not hazardous to the aquatic environment as:

- The lowest acute reference values for fish, invertebrates and algae are > 100 mg Mo/L
- The lowest aquatic NOEC for these three trophic levels is > 1 mg Mo/L (i.e., 43.2 mg Mo/L for the rainbow trout)
- There is no evidence for bioaccumulation or bio-magnification in the environment

(12.2)

Persistence and degradability: Sodium molybdate – when released into the environment - will rapidly dissolve and will be present as the molybdate species under normal environmental conditions.

(12.3)

Bioaccumulative potential: Available BCF/BAF data for the aquatic environment show a distinct inverse relationship with the exposure concentration. This finding demonstrates that molybdenum is homeostatically controlled by these organisms and this up to the milligram range of exposure. Available information on transfer of molybdenum through the food chain indicates that molybdenum does not bio-magnify in aquatic food chains.

Although not homeostatically controlled in terrestrial plants and invertebrates, molybdenum is not largely concentrated from soil into plants or soil to invertebrates. There is no significant concentration increase from diet to mammals or birds. It is concluded that bio-magnification is not significant in the terrestrial food chain.

(12.4)

Mobility in soil: Molybdate originating from sodium molybdate dihydrate is soluble in water and with its relatively low K_d value, the molybdate ions are leachable through normal soil and are mobile in sediment. Typical log K_d-values of 3.25 and 2.94 have been determined for sediment and soil, respectively.

(12.5)

Results of PBT and vPvB assessment: The PBT and vPvB criteria of Annex XIII to the REACH Regulation do not apply to inorganic substances, such as sodium molybdate. Therefore a PBT and vPvB assessment is not required.

(12.6)

Other adverse effects: Molybdate originating from sodium molybdate dihydrate can contribute to the onset of molybdenosis (which is a molybdenum-induced copper deficiency) in ruminants such as cattle, deer, and sheep. The level and bio-availability of copper in the animal diet are critical factors in the onset of



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molybdenosis. The recommended minimum dietary Cu:Mo mass ratio threshold to prevent molybdenosis is 1.30, i.e. there should be 30% more copper than molybdenum in the diet (note: mass ratio, not molar ratio). Cu & Mo content in the diet can be monitored, and if the ratio is < 1.3 then provide Cu supplements such as copper sulphate enriched feeds or copper sulphate enriched salt blocks for ruminants to use *ad libitum*. If there are ruminants in the vicinity of the plant, identify direct and diffuse air emission sources at the plant and carry out and record emission minimization measures. Have an animal health check programme in place (e.g. blood tests for copper) to verify that the measures are effective.

Sodium molybdate dihydrate is not expected to contribute to ozone depletion, ozone formation, global warming or acidification. Sodium molybdate is believed to be environmentally neutral.

Additional adverse effects: Conversely, a lack of molybdenum in the diet of the human population may increase gastrointestinal and esophageal cancer. [40][41]

Section 13 Disposal Considerations

(13.1)

Waste treatment methods: Waste (substance and container material) shall be recycled/recovered or disposed of as applicable and in accordance with community (EU) and local legislation.

Section 14 Transportation Information

Regulation (abbreviation)	Regulation (title)	transport classification
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road	None
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail	None
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways	None
IMDG	International Maritime Dangerous Goods	None
IATA	Technical Instructions for the Safe Transport of Dangerous Goods by Air	None

(14.1)

UN number: None, Not Dangerous for Transport

(14.2)

UN proper shipping name: None, Not Dangerous for Transport

(14.3)

Transport hazard class(es): None, Not Dangerous for Transport

(14.4)

Packing group: None, Not Dangerous for Transport

(14.5)

Environmental hazards: None, Not Dangerous for Transport

(14.6)

Special precautions for user: None, Not Dangerous for Transport

(14.7)

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: None

Section 15 Regulatory Information

(15.1)

Safety, health and environmental regulations/legislation specific for the substance or mixture

(15.1.1)

Worldwide Chemical Inventories: See section 16.7.3 for list of countries where you will find sodium molybdate on chemical inventories and regulatory lists. Sodium molybdate is not a SEVESO substance, not an ozone-depleting substance and not a persistent organic pollutant.

(15.1.2)

Other regulatory information: Germany: Water Hazard class, WGK = 1 (low hazard to water)



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(15.2)

Chemical safety assessment: A Chemical Safety Assessment has been carried out by the Molybdenum Consortium for its members in the context of the REACH registration. For contact details, see Section 16.

Section 16	Other Information
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(16.1)

Version: (New) 30 June 2011**Creation Date:** 30 June 2011

(16.1.1)

Reason for Change: New Safety Data Sheet for compliance with regulation (EC) No. 1907/2006 ("REACH"). The information provided in this SDS is consistent with the information provided in the REACH Chemical Safety Report (CSR) for sodium molybdate, submitted to the European Chemicals Agency in September 2010. This SDS replaces an older Climax Molybdenum Company sodium molybdate MSDS.

(16.2)

Abbreviations and acronyms used in this data sheet:

bw	Body Weight
(e-)SDS	(Extended) Safety Data Sheet
CSA	Chemical Safety Assessment
CSR	Chemical Safety Report
DNEL	Derived No Effect Level
ECHA	European Chemicals Agency
mg/kg bw	Milligrams per kilo bodyweight
OEL	Occupational Exposure Limit
PBT	Persistent, bioaccumulative and toxic
PNEC	Predicted No Effect Concentration
REACH	Abbreviation for regulation (EC) No. 1907/2006 on the Registration, Evaluation, Authorisation and Restriction of Chemicals .
STOT	Specific target organ toxicity
STP	Sewage Treatment Plant
TLV	Threshold Limit Value
TWA	Time Weighted Average
vPvB	very persistent and very bioaccumulative

(16.3)

Literature reference and sources of data: The information provided in this SDS is consistent with the information provided in the REACH chemical safety report (CSR) for sodium molybdate. Non confidential data from the REACH registration dossier is published by the European Chemicals Agency ECHA, see <http://apps.echa.europa.eu/registered/registered-sub.aspx> [weblink checked 2010-11-23]

The REACH registration, CSA and CSR have been prepared by the REACH Molybdenum Consortium, an initiative of the International Molybdenum Association (IMO). For further information, please refer to <http://www.molybdenumconsortium.org/> and <http://www.imoa.info> [weblinks checked 2010-12-20].

Reference List:

- [1] GEI Consultants, Inc (2009). Ambient Water Quality Standards for Molybdenum. Report. Testing laboratory: GEI Consultants, Ecological Division, 5575 South Sycamore Street, Suite 101, Littleton, Colorado (USA). Owner company: Chevron Mining Inc, Questa, New Mexico 87556.
- [2] Huntingdon Research centre (1994a). The acute toxicity of sodium molybdate dihydrate to rainbow trout (*Oncorhynchus mykiss*). Testing laboratory: Huntingdon Research Centre Ltd. Report no.: IMA 13(b) /920163. Owner: International Molybdenum Association, 280 Earls Court, London, SW5 9AS, England. Report date: 1994-06-09.
- [3] McConnell RP (1977). Toxicity of molybdenum to rainbow trout under laboratory conditions. Molybdenum in the environment vol2. The geochemistry, cycling and industrial uses of molybdenum. New York: Marcel Dekker, pp 725-730.
- [4] Rodriguez (2007). Sodium molybdate: Acute and chronic Toxicity to *Daphnia magna*. Final Report to the International Molybdenum Association. Testing laboratory: Chilean Mining and Metallurgy Research Center. Owner: International Molybdenum Association. Report date: 2007-08-01.
- [5] Diamantino TC, Guilhermino L, Almeida E, Soares AMVM (2000). Toxicity of sodium molybdate and sodium dichromate to *Daphnia magna* Straus evaluated in acute, chronic and acetylcholinesterase inhibition tests. *Ecotoxicology and Environmental Safety*, 45, 253-259.



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- [6] Huntingdon Research Centre (1994b). The acute toxicity of sodium molybdate dihydrate to *Daphnia magna*. Testing laboratory: Huntingdon Research Centre Ltd, PO box 2, Huntingdon, Cambridgeshire, PE18 6ES England. Report no.: IMA 13(a)/920162. Owner: International Molybdenum Association. Report date: 1994-06-09.
- [7] De Schampelaere KAC, Janssen CR (2008). MOLYTOX - Ecotoxicity of molybdate ion (MoO_4^{2-}) to the freshwater green alga *Pseudokirchneriella subcapitata*. Final Report, prepared for the International Molybdenum Association. Testing laboratory: Laboratory of Environmental Toxicology and Aquatic Ecology. Owner: International Molybdenum Association. Report date: 2008-09-01.
- [8] Rodríguez PH (2008). Sodium Molybdate: Toxicity to *Pseudokirchneriella subcapitata*, comparative testing using CIMM and University of Gent Algae and OECD media. Final Report to the International Molybdenum Association. Testing laboratory: Chilean Mining and Metallurgy Research Center. Owner: International Molybdenum Association. Report date: 2008-05-01.
- [9] Parametrix Environmental Research Lab (2008a). Early Life Stage Toxicity of Molybdenum to the Rainbow Trout (*Oncorhynchus mykiss*) Under Flow-Through conditions. Final Report prepared for the International Molybdenum Association. Testing laboratory: PERL (Parametrix Environmental Research Laboratory, 33972 Texas St. SW, Albany, Oregon, 97321. Report no.: 598-5541-001. Owner: International Molybdenum Association. Report date: 2008-06-05.
- [10] Parametrix Environmental Research Lab (2007). Early Life Stage Toxicity of Molybdenum to the Fathead minnow (*Pimephales promelas*) Under Flow-Through conditions. Final Report prepared for the International Molybdenum Association. Testing laboratory: PERL (Parametrix Environmental Research Laboratory, 33972 Texas St. SW, Albany, Oregon, 97321. Owner: International Molybdenum Association. Study number: 598-5541-001. Report date: 2007-12-24.
- [11] De Schampelaere KAC, Nguyen LTH, Janssen CR (2008). MOLYTOX - Ecotoxicity of molybdate ion (MoO_4^{2-}) to eight freshwater species. Final Report, prepared for the International Molybdenum Association. Testing laboratory: Laboratory of Environmental Toxicology and Aquatic Ecology, Ghent University, Belgium. Owner: International Molybdenum Association. Report date: 2008-09-03.
- [12] Morgan JD, Mitchell DG, Chapman PM (1986). Individual and combined toxicity of manganese and molybdenum to mussel, *Mytilus edulis*, larvae. *Bulletin of Environmental Contamination and Toxicology* 37, 303-307.
- [13] Grontmij / Aquasense (2009). Tests on toxicity of molybdenum (Mo) to a selection of marine organisms. Final Report, prepared for the International Molybdenum Association. Testing laboratory: Grontmij/Aquasense, Colijnsplaat, The Netherlands. Report no.: Project Nr. 274811. Owner: International Molybdenum Association. Report date: 2009-10-26.
- [14] Parametrix Environmental Research Lab (2009). Early Life Stage Toxicity of Molybdenum to the Sheepshead Minnow (*Cyprinodon variegatus*). Final Report prepared for the International Molybdenum Association. Testing laboratory: PERL (Parametrix Environmental Research Laboratory, 33972 Texas St. SW, Albany, Oregon, 97321. Report no.: 598-5541-001. Owner: International Molybdenum Association. Report date: 2008-12-01.
- [15] Lehman C (2010). Disodium molybdate: life-cycle toxicity test of the saltwater mysid, *Americamysis bahia*, conducted under flow-through conditions. Report prepared for the International Molybdenum Association. Testing laboratory: ABC Laboratories, Inc. 7200 E. ABC Lane, Columbia. Report no.: ABC Study No 65760. Report date: 2010-08-01.
- [16] Parametrix Environmental Research Laboratory (2008b). Toxicity of molybdenum to the sand dollar *Dendraster excentricus*. Final Report, prepared for the International Molybdenum Association. Testing laboratory: Parametrix Environmental Research Laboratory (PERL), Albany, Oregon, USA. Report no.: Test No. 779-1. Owner: International Molybdenum Association. Report date: 2008-12-05.
- [17] Parametrix Environmental Research Laboratory (2010). Toxicity of molybdenum to the purple sea urchin (*Strongylocentrotus purpuratus*). Final Report, prepared for the International Molybdenum Association. Testing laboratory: Parametrix, Corvallis, Oregon, USA. Report no.: 598-5541-001. Owner: International Molybdenum Association. Report date: 2010-02-01.
- [18] Le Page GC, Stewart KM, Vaughan M (2010). Sodium molybdate dihydrate: growth inhibition test with the marine and brackish water macroalgae *Ceramium tenuicorne*. Final Report, prepared for the International Molybdenum Association. Testing laboratory: Brixham Environmental Laboratory, AstraZeneca UK Limited, Brixham, Devon, TQ5 8BA, UK. Report no.: Report No BR0146/B. Owner: International Molybdenum Association. Report date: 2010-03-01.
- [19] Le Page GC, Hayfield AJ (2010). Sodium molybdate dihydrate: Determination of the toxicity to the marine alga *Dunaliella tertiolecta*. Final Report, prepared for the International Molybdenum Association. Testing laboratory: Brixham Environmental Laboratory, AstraZeneca UK Limited, Brixham, Devon, TQ58BA, UK. Owner: International Molybdenum Association. Report date: 2010-02-01.
- [20] van Gestel AM, Borgman E, Verweij RA and Diez-Ortiz M (2009). Toxicity and bioavailability of molybdenum in terrestrial environments-soil invertebrates. Final report prepared for the International Molybdenum Association. Testing laboratory: Vrije universiteit. Owner: International Molybdenum Association. Report date: 2009-10-30.
- [21] Micò C, Zhao FJ, McGrath SP (2010). Toxicity and Bioavailability of Molybdenum in Terrestrial Environments. Biological endpoint: Plant toxicity. Final report prepared for the International Molybdenum Association. Testing laboratory: Rothamsted Research. Owner: International Molybdenum Association. Report date: 2010-01-01.
- [22] Smolders E and Buekers J (2009). Toxicity and bioavailability of molybdenum in terrestrial environments: micro-organisms. Final Report to the International Molybdenum Association. Testing laboratory: University of Leuven, Division of Soil and Water Management. Owner: International Molybdenum Association. Report date: 2009-03-01.
- [23] Huntingdon Research Centre (1994c). Assessment of the inhibitory effect of molybdenum oxide (pure) on the respiration of activated sewage sludge. Report to the International Molybdenum Association. Testing laboratory: Huntingdon Research Centre Ltd. Owner: International Molybdenum Association. Study number: IMA 10(c)/920191. Report date: 1994-06-02.
- [24] Stearns Catalytic Corp. (1985). Evaluation of acute effects of sodium molybdate on the activated sludge process and on the batch anaerobic sludge digestion process. Laboratory Report for Amax Inc. Testing laboratory: Stearns Catalytic Corp. Report no.: 29225. Owner company: Amax Inc. Report date: 1985-01-01.
- [25] Lide, D.R. (ed.): CRC Handbook of chemistry and physics. Section 4. Properties of the elements and inorganic compounds. 88th Edition (2008), CRC press, New York, 4.1-4.163.
- [26] Sodium molybdate dihydrate: relative density (OECD 109). Unpublished study report for the International Molybdenum Association (IMOA). Report No. 20070330.01, Siemens Prozess-Sicherheit, Frankfurt am Main, Germany, 2007
- [27] Water solubility of sodium molybdate dihydrate (OECD 105). Unpublished study report for the International Molybdenum Association (IMOA). Report No. 20071507/01-PCSB, Eurofins-GAB GmbH, Pforzheim, Germany, 2008.
- [28] Molybdenum trioxide: Oxidising Properties UN Test O.1. Unpublished study report for the International Molybdenum Association (IMOA). Report No. 20090443.01, Siemens AG, Prozess-Sicherheit, Frankfurt am Main, Germany, 2009.
- [29] Baldrick, P. & Healing, G. (1990). Acute oral toxicity to rats of sodium molybdate. Testing laboratory: Huntingdon Research Centre Ltd., P. O. Box 2, Huntingdon, Cambridgeshire, PE18 6ES, England. Report no.: 90934D/IMA 1/AC. Owner: International Molybdenum Association, UK. Report date: 1990-11-02



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- [30] Baldrick, P. & Healing, G. (1990). Acute dermal toxicity to rats of sodium molybdate. Testing laboratory: Huntingdon Research Centre Ltd., P. O. Box 2, Huntingdon, Cambridgeshire, PE18 6ES, England. Report no.: 90800D/IMA 2/AC. Owner: International Molybdenum Association, UK. Report date: 1990-11-06.
- [31] Jackson, G.C. et al. (1991). Sodium molybdate acute inhalation toxicity study in rats 4-hour exposure. Testing laboratory: Huntingdon Research Centre Ltd., P. O. Box 2, Huntingdon, Cambridgeshire, PE18 6ES, England. Report no.: IMA 7/901486. Owner: International Molybdenum Association, UK. Report date: 1991-04-08.
- [32] Liggett, M. P. & McRae, L. A. (1990). Irritant effects on rabbit skin of sodium molybdate. Testing laboratory: Huntingdon Research Centre Ltd., P. O. Box 2, Huntingdon, Cambridgeshire, PE18 6ES, England. Report no.: 90924D/IMA 3/SE. Owner: International Molybdenum Association, UK. Report date: 1990-11-02.
- [33] Liggett, M. P. & McRae, L. A. (1990). Irritant effects on the rabbit eye of sodium molybdate. Testing laboratory: Huntingdon Research Centre Ltd., P. O. Box 2, Huntingdon, Cambridgeshire, PE18 6ES, England. Report no.: 90949D/IMA 4/SE. Owner: International Molybdenum Association, UK. Report date: 1990-11-02.
- [34] Allan, S. A. (1996). Sodium molybdate 241/32 - Skin sensitisation in the guinea pig. Testing laboratory: Huntingdon Life Sciences Ltd., P. O. Box 2, Huntingdon, Cambridgeshire, PE18 6ES, England. Report no.: IMA16a/930983/SS. Owner: International Molybdenum Association, UK. Report date: 1996-01-23.
- [35] Beevers, C. (2009). Reverse mutation in five histidine-requiring strains of *Salmonella typhimurium*. Testing laboratory: Covance Laboratories Ltd., Otley Road, Harrogate, North Yorkshire HG3 1PY, ENGLAND. Report no.: 2992/1. Owner: International Molybdenum Association, Belgium. Report date: 2009-01-12.
- [36] Taylor, H. (2009). Induction of micronuclei in cultured human peripheral blood lymphocytes. Testing laboratory: Covance Laboratories Ltd., Otley Road, Harrogate, North Yorkshire HG3 1PY, England. Report no.: 2992/2. Owner: International Molybdenum Association, Belgium. Report date: 2009-01-14.
- [37] Lloyd, M. (2009). Mutation at the thymidine kinase (tk) locus of mouse lymphoma L5178Y cells (MLA) using the MicrotitreR fluctuation technique. Testing laboratory: Covance Laboratories Ltd., Otley Road, Harrogate, North Yorkshire HG3 1 PY, England. Report no.: 2992/3. Owner: International Molybdenum Association, Belgium. Report date: 2009-01-20.
- [38] NTP (1997). Toxicology and carcinogenesis studies of molybdenum trioxide (CAS No. 1313-27-5) in F344/N rats and B6C3F1 mice (Inhalation studies). NTP Technical Report 462, NIH Publication No. 97-3378. Testing laboratory: Hazleton Laboratories America, Inc (Vienna, VA) and Bartelle Pacific Northwest Laboratories (Richland, WA).
- [39] Bretherick's Handbook of Reactive Chemical Hazards. 7th Edition, Elsevier Academic Press, 2007
- [40] Blot WJ, Li JY, Taylor PR, et al. Nutrition intervention trials in Linxian, China: supplementation with specific vitamin/mineral combinations, cancer incidence, and disease-specific mortality in the general population. *J Natl Cancer Inst*. 1993; 85:1483-1492.
- [41] Esophageal cancer mortality and total hardness levels in Taiwan's drinking water - Authors CY Yang, HF Chiu, MF Cheng, SS Tsai, CF Hung, MC Lin Full source Environmental Research, 1999, Vol. 81, Issue 4, pp 302-308

(16.4)

Classification procedure for mixtures: Sodium molybdate is a pure substance.

(16.5)

R-phrases and/or H-statements: Imbedded in document where applicable.

(16.6)

Advice on any training appropriate for workers to ensure protection of human health and the environment.

Use this SDS as a Hazard Communication tool and provide training to assist in your risk assessment. Be mindful that many factors determine whether the reported hazards are risks in the workplace or other settings. Before handling sodium molybdate workers should receive appropriate training about safe handling conditions as described in this Safety Data Sheet.

(16.7)

Other Information

(16.7.1)

List of EU Poison Centres.

Country	Telephone Number	Website	Address
Austria Vienna Vergiftungsinformationszentrum (Poisons Information Centre)	+ 43 1 40 406 4343	http://www.meduniwien.ac.at/viz/	Allgemeines Krankenhaus Waehringer Guertel 18-20, Vienna, Austria
Belgium Centre Anti-Poisons/ Antigifcentrum	+ 32 70 245 245	http://www.poisoncentre.be	Hôpital Militaire Reine Astrid, Rue Bruyn, Brussels, B-1120, Belgium
Germany Berlin Giftberatung Virchow- Klinikum, Medizinische	+ 49 30 450 653 565	http://www.giftnotruf.de	Augustenberger Platz 1 – Berlin 13353, Germany



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Fakultät der Humboldt-Universität zu Berlin			
Italy Rome Centro Antiveneni (Poisons Centre) Dipartimento di Tossicologia Clinica Università Cattolica del Sacro Cuore	+ 39 06 305 4343	http://www.tox.it	Largo Agostino Gemelli 8 I-00168 Roma
Luxembourg Uses Belgian service: Centre Anti-Poisons/ Antigifcentrum	+ 32 70 245 245	http://www.poissoncentre.be	Hôpital Militaire Reine Astrid, Rue Bruyn, Brussels, B-1120, Belgium
Netherlands Bilthoven National Poisons Information Centre, National Institute for Public Health & Environment	+ 31 30 274 88 88	https://www.vergiftigingen.info https://www.productnotification.nl	3720 BA Bilthoven
Poland Warsaw (Warszawa) Warsaw Poison Control & Info Centre, Praski Hospital	+ 48 22 619 66 54 / + 48 22 619 08 97	No website available.	Al. Solidarnosci 67, P-03 401 Warszawa
Sweden Stockholm Giftinformationscentralen (Swedish Poisons Info Centre) Karolinska Hospital	+ 46 8 33 12 31 (International) 112 (National)	http://www.giftinformationscentralen.se	SE 171 76 Stockholm
United Kingdom National Poison Information Service Centre	National: 0844 892 0111	http://www.npis.org	
The International Programme on Chemical Safety (IPCS) – Directory of EU Poison Centres		http://www.who.int/ipcs/poisons/centre/directory/euro/en/	

(16.7.2)

Euro Country OEL's

Type of limit value	Limit value [mg Mo/m ³]	References, Legislation,...	Information on recommended monitoring procedures
Austria: Molybdenum compounds (as Mo), soluble compounds, STEL (Peak) , 2 times per shift, 60 minutes:	20 Inhalable dust fraction	GKV_MAK (Austria 9/2007)	Consult the national authorities about which measurement methodology is suitable to demonstrate respective limit values.
Austria: Molybdenum compounds (as Mo), soluble compounds, 8-hour TWA reference period	10 Inhalable dust fraction	GKV_MAK (Austria 9/2007)	Applicable standards for monitoring of inhalable and/or respirable dust may include: HSE-MDHS 14: (10/1989) NIOSH 0500 (15/8/1994) NIOSH 0600 (15/1/1998) BS 1/2/92-KB (18/12/91)
Belgium: molybdenum compounds (as Mo), soluble , in the respirable fraction, TLV-TWA	0.5 Respirable dust fraction	Belgian Royal Decree of 11/06/2009 (protection of the employee's health and safety against the risk of chemicals).	



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Belgium: Mo compounds (as Mo), soluble , TLV-TWA	10 Inhalable dust fraction	Belgian Royal Decree of 11/06/2009 (protection of the employee's health and safety against the risk of chemicals).	Consult the national authorities about which measurement methodology is suitable to demonstrate respective limit values. Applicable standards for monitoring of inhalable and/or respirable dust may include: HSE-MDHS 14: (10/1989) NIOSH 0500 (15/8/1994) NIOSH 0600 (15/1/1998) BS 1/2/92-KB (18/12/91)
Denmark: Molybdenum compounds (as Mo), soluble , 8-hour TWA reference period	5	Arbejdstilsynet (Denmark 3/2008)	
Denmark: Molybdenum compounds (as Mo), insoluble , 8-hour TWA reference period	10	Arbejdstilsynet (Denmark 3/2008)	
France: No indicative or mandatory Occupational Exposure Limit (OEL) specifically for molybdenum. 8-hour TWA reference period to be protective against long-term exposure:	10 mg/m ³ Total dust 5 mg/m ³ Respirable dust fraction		
Germany: No limit value (MAK-value) is defined for Mo or molybdenum trioxide. In the absence of a MAK-value, 8-hour TWA limit values for general dust should be applied:	10 mg/m ³ Inhalable dust fraction 3 mg/m ³ Respirable dust fraction	Deutsche Forschungsgemeinschaft: List of MAK and BAT values 2010. Commission for the Investigation of Health Hazards of Chemical Compounds in the Workplace, Report no. 46 WILEY-VCH Verlag GmbH & Co, KGaA, Weinheim, ISBN: 978-3-527-32815-4	
Italy: Molybdenum compounds (as Mo), soluble compounds, 8-hour TWA reference period:	10 Inhalable dust fraction 3 Respirable dust fraction	ACGIH TLV (USA 2/2010)	
Luxembourg: OEL's used in Luxembourg are those used by Germany, unless specific OEL's are provided (none identified for molybdenum)	See Germany		
Netherlands: Employers & employees responsible for setting Occupational Exposure Levels for safe handling since 1-1-2007		http://www.rivm.nl/rvs/nomen/werk/grens	
Poland: Molybdenum compounds (as Mo), soluble compounds, STEL/Peak for	10		



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15 minutes:			
Poland: Molybdenum compounds (as Mo), soluble compounds, 8-hour TWA reference period	4		
Sweden: Molybdenum compounds (as Mo), 8-hour TWA reference period:	10 Total dust 5 Respirable dust fraction	AFS 2005:17 (Sweden 6/2007)	
United Kingdom: molybdenum compounds (as Mo), soluble compounds, long-term exposure limit (8-hour TWA reference period)	5 Inhalable dust fraction	UK HSE List of approved workplace exposure limits (WEL), October 2007, (http://www.hse.gov.uk/cosh/table1.pdf)	MDHS: Methods for the Determination of Hazardous Substances (MDHS) guidance http://www.hse.gov.uk/pubns/mdhs/
United Kingdom: molybdenum compounds (as Mo), soluble compounds, short-term exposure limit (15-minute reference period)	10 Inhalable dust fraction		
United Kingdom: molybdenum compounds (as Mo), insoluble compounds , long-term exposure limit (8-hour TWA reference period)	10 Inhalable dust fraction		
United Kingdom: molybdenum compounds (as Mo), insoluble compounds, short-term exposure limit (15-minute reference period)	20 Inhalable dust fraction		
Further source of information: European Agency for Safety & Health at Work:		http://osha.europa.eu/en/topics/ds/oel/members.stm	

Also See the downloadable list on the MoCon SDS webpage for the OEL values in EU countries that MoCon has been able to source. Some of the example data shown above was taken from the GESTIS Database on International Limit Values (http://bgia-online.hvbg.de/LIMITVALUE/WebForm_gw.aspx), accessed 2010-11-10

Another source of available information on Occupational Exposure Limits from Member States is the OSHA (European Agency for Safety and Health at work) website:
<http://osha.europa.eu/en/topics/ds/oel/index.stm/members.stm>

There are also commercial databases where this type of information is available on a subscription or other payment basis. Likewise, Eurometaux is developing an OEL database for several metals. (The MoCon downloadable OEL list includes the Eurometaux data).

Note that as shown in the right-hand column of the UK example above, this section 8.1 must also include the currently recommended monitoring or observation methods for at least the most relevant substances. These monitoring methods can be: personal air monitoring, room air monitoring, biological monitoring etc according to agreed standards. The specific standard should be referenced, for example: "DIN EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents." You should consult the national authorities about which measurement methodology is suitable to demonstrate respective limit values.



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(16.7.3.1)

Sodium molybdate (CAS: 7631-95-0) is found on the following regulatory lists

Australia Exposure Standards
 Australia Inventory of Chemical Substances (**AICS**)
 Austria Occupational Exposure Limits - Maximum Workplace Concentrations (MAK) (German)
 Belgium Occupational Exposure Limits (French)
 Bulgaria Limit values for the chemical agents in the air at the working environment
 Canada - Alberta Occupational Exposure Limits
 Canada - British Columbia Occupational Exposure Limits
 Canada - Northwest Territories Occupational Exposure Limits
 Canada - Northwest Territories Occupational Exposure Limits (French)
 Canada - Ontario Occupational Exposure Limits
 Canada - Quebec Occupational Exposure Limits (French)
 Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
 Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances
 Canada Domestic Substances List (**DSL**)
 Canada Ingredient Disclosure List (SOR/88-64)
 Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS
 China Inventory of Existing Chemical Substances
 China Occupational Exposure Limits for Hazardous Agents in the Workplace
 Czech Republic Occupational Exposure Limits (PEL and NPK-P) (Czech)
 Denmark Limit values for air pollutants
 Denmark Limit values for air pollutants (Danish)
 Estonia Limit values for chemical hazards in the working environment (Estonian)
 EU Directive 96/61/EC concerning integrated pollution prevention and control, Annex III
 European Customs Inventory of Chemical Substances - ECICS (Danish)
 European Customs Inventory of Chemical Substances - ECICS (Dutch)
 European Customs Inventory of Chemical Substances - ECICS (Finnish)
 European Customs Inventory of Chemical Substances - ECICS (French)
 European Customs Inventory of Chemical Substances - ECICS (German)
 European Customs Inventory of Chemical Substances - ECICS (Greek)
 European Customs Inventory of Chemical Substances - ECICS (Italian)
 European Customs Inventory of Chemical Substances - ECICS (Portuguese)
 European Customs Inventory of Chemical Substances - ECICS (Spanish)
 European Customs Inventory of Chemical Substances - ECICS (Swedish)
 European Customs Inventory of Chemical Substances (English)
 European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (English)
 European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (French)
 European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (German)
 European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (Spanish)
 Finland Occupational Exposure Levels (Finnish) - Concentrations Known to be Harmful
 Finland Occupational Exposure Levels (Swedish) - Concentrations Known to be Harmful
 France Threshold Limit Values for Occupational Exposure - VLE/VME (French)
 Germany Classification of Substances Hazardous to Waters (WGK)
 Germany Recommended Exposure Limits - MAK Values
 Germany Recommended Exposure Limits - MAK Values (German)
 Germany Substances for which no MAK value can be established at present
 Germany Substances for which no MAK value can be established at present (German)
 Greece Occupational Exposure Limits
 Hungary Occupational Exposure Limits (Hungarian)
 India Chemical Accidents Rules - Schedule 1: List of Hazardous Chemicals
 India Hazardous Wastes Rules - Schedule 2: List of Wastes Constituents with Concentration Limits
 India Manufacture, Storage and Import of Hazardous Chemical Rules - Schedule 1: List of Hazardous and Toxic Chemicals
 Ireland Occupational Exposure Limits
 Ireland Occupational Exposure Limits - Intended Changes
 Italy Occupational Exposure Limits
 Japan Chemical Substances Control Law - Existing/New Chemical Substances
 Japan Industrial Safety and Health Law (ISHL) - Dangerous Substances
 Japan Industrial Safety and Health Law (ISHL) - Notifiable Substances
 Japan PRTR Law
 Korea (South) Existing Chemicals List (**KECL**)
 Korea (South) Occupational Exposure Standards (Korean)
 Malaysia Permissible Exposure Limits
 Mexico Maximum Permissible Exposure Limits
 New Zealand Hazardous Substances and New Organisms (**HSNO**) Act - Chemicals (single components)
 New Zealand Inventory of Chemicals (**NZIoC**)
 New Zealand Workplace Exposure Standards (WES)
 Norway Administrative norms for air contamination in the workplace
 OECD Representative List of High Production Volume (HPV) Chemicals
 Philippines Inventory of Chemicals and Chemical Substances (**PICCS**)



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Philippines Occupational Exposure Limits
 Poland Workplace Maximum Allowable Concentration (Polish)
 Portugal Occupational exposure limits to chemical agents (Portuguese)
 Russia Maximum Allowed Concentrations (PDK) of Harmful Substances in the Air of Workplace Zone
 Scotland Pollution Inventory
 Singapore Permissible Exposure Limits of Toxic Substances
 Slovak Republic Highest Admissible Exposure Limits (Slovak)
 Spain Changes Proposed for Occupational Limit Values
 Spain Changes Proposed for Occupational Limit Values (Spanish)
 Spain Occupational Exposure Limit for Chemical Agents (Spanish)
 Sweden Occupational Exposure Limit Values (Swedish)
 Switzerland Occupational Exposure Limits (German)
 Taiwan Permissible Concentration of Airborne Harmful Substances
 UK Workplace Exposure Limits (WELs)
 US - Alaska Limits for Air Contaminants
 US - California Environmental Health Standards for the Management of Hazardous Waste - List of Inorganic Persistent and Bioaccumulative Toxic Substances
 and Their STLC & TTLC Values
 US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List
 US - California Permissible Exposure Limits for Chemical Contaminants
 US - Connecticut Hazardous Air Pollutants
 US - Hawaii Air Contaminant Limits
 US - Idaho - Limits for Air Contaminants
 US - Michigan Exposure Limits for Air Contaminants
 US - Minnesota Hazardous Substance List
 US - Minnesota Permissible Exposure Limits (PELs)
 US - North Carolina Permissible Exposure Limits (PELs) for Air Contaminants
 US - Oregon Permissible Exposure Limits (Z1)
 US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
 US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
 US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
 US - Washington Permissible exposure limits of air contaminants
 US - Wisconsin Hazardous Air Contaminants with Acceptable Ambient Concentrations [NLV]
 US ACGIH Threshold Limit Values (TLV)
 US DOE Temporary Emergency Exposure Limits (TEELs)
 US OSHA Permissible Exposure Levels (PELs) - Table Z1
 US Toxic Substances Control Act (TSCA) - Inventory

(16.7.3.2)

Sodium molybdate (CAS: 10102-40-6) is found on the following regulatory lists;

Australia Exposure Standards
 Australia Inventory of Chemical Substances (AICS)
 Austria Occupational Exposure Limits - Maximum Workplace Concentrations (MAK) (German)
 Belgium Occupational Exposure Limits (French)
 Bulgaria Limit values for the chemical agents in the air at the working environment
 Canada - Alberta Occupational Exposure Limits
 Canada - British Columbia Occupational Exposure Limits
 Canada - Northwest Territories Occupational Exposure Limits
 Canada - Northwest Territories Occupational Exposure Limits (French)
 Canada - Ontario Occupational Exposure Limits
 Canada - Quebec Occupational Exposure Limits (French)
 Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
 Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances
 Canada Domestic Substances List (DSL)
 Canada Ingredient Disclosure List (SOR/88-64)
 Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS
 China Inventory of Existing Chemical Substances
 China Occupational Exposure Limits for Hazardous Agents in the Workplace
 Czech Republic Occupational Exposure Limits (PEL and NPK-P) (Czech)
 Denmark Limit values for air pollutants
 Denmark Limit values for air pollutants (Danish)
 Estonia Limit values for chemical hazards in the working environment (Estonian)
 EU Directive 96/61/EC concerning integrated pollution prevention and control, Annex III
 European Customs Inventory of Chemical Substances - ECICS (Danish)
 European Customs Inventory of Chemical Substances - ECICS (Dutch)
 European Customs Inventory of Chemical Substances - ECICS (Finnish)
 European Customs Inventory of Chemical Substances - ECICS (French)



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European Customs Inventory of Chemical Substances - ECICS (German)
 European Customs Inventory of Chemical Substances - ECICS (Greek)
 European Customs Inventory of Chemical Substances - ECICS (Italian)
 European Customs Inventory of Chemical Substances - ECICS (Portuguese)
 European Customs Inventory of Chemical Substances - ECICS (Spanish)
 European Customs Inventory of Chemical Substances - ECICS (Swedish)
 European Customs Inventory of Chemical Substances (English)
 European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (English)
 European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (French)
 European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (German)
 European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (Spanish)
 Finland Occupational Exposure Levels - Concentrations Known to be Harmful
 Finland Occupational Exposure Levels (Finnish) - Concentrations Known to be Harmful
 Finland Occupational Exposure Levels (Swedish) - Concentrations Known to be Harmful
 France Threshold Limit Values for Occupational Exposure - VLE/VME (French)
 Germany Classification of Substances Hazardous to Waters (WGK)
 Germany Recommended Exposure Limits - MAK Values
 Germany Recommended Exposure Limits - MAK Values (German)
 Germany Substances for which no MAK value can be established at present
 Germany Substances for which no MAK value can be established at present (German)
 Greece Occupational Exposure Limits
 Hungary Occupational Exposure Limits (Hungarian)
 India Chemical Accidents Rules - Schedule 1: List of Hazardous Chemicals
 India Hazardous Wastes Rules - Schedule 2: List of Wastes Constituents with Concentration Limits
 India Manufacture, Storage and Import of Hazardous Chemical Rules - Schedule 1: List of Hazardous and Toxic Chemicals
 Ireland Occupational Exposure Limits
 Ireland Occupational Exposure Limits - Intended Changes
 Italy Occupational Exposure Limits
 Japan Chemical Substances Control Law - Existing/New Chemical Substances
 Japan Industrial Safety and Health Law (ISHL) - Dangerous Substances
 Japan Industrial Safety and Health Law (ISHL) - Notifiable Substances
 Japan PRTR Law
 Korea (South) Existing Chemicals List (KECL)
 Korea (South) Occupational Exposure Standards (Korean)
 Malaysia Permissible Exposure Limits
 Mexico Maximum Permissible Exposure Limits
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Chemicals (single components)
 New Zealand Inventory of Chemicals (NZIoC)
 New Zealand Workplace Exposure Standards (WES)
 Norway Administrative norms for air contamination in the workplace
 OECD Representative List of High Production Volume (HPV) Chemicals
 Philippines Inventory of Chemicals and Chemical Substances (PICCS)
 Philippines Occupational Exposure Limits
 Poland Workplace Maximum Allowable Concentration (Polish)
 Portugal Occupational exposure limits to chemical agents (Portuguese)
 Russia Maximum Allowed Concentrations (PDK) of Harmful Substances in the Air of Workplace Zone (Russian)
 Scotland Pollution Inventory
 Singapore Permissible Exposure Limits of Toxic Substances
 Slovak Republic Highest Admissible Exposure Limits (Slovak)
 Spain Changes Proposed for Occupational Limit Values
 Spain Changes Proposed for Occupational Limit Values (Spanish)
 Spain Occupational Exposure Limit for Chemical Agents (Spanish)
 Sweden Occupational Exposure Limit Values (Swedish)
 Switzerland Giftliste (List of Toxic Substances) 1 [NLV]
 Switzerland Occupational Exposure Limits (German)
 Taiwan Permissible Concentration of Airborne Harmful Substances
 Taiwan Scope and Application Standards of Food Additives - Nutritional Additives
 UK Workplace Exposure Limits (WELs)
 US - Alaska Limits for Air Contaminants
 US - California Environmental Health Standards for the Management of Hazardous Waste - List of Inorganic Persistent and Bioaccumulative Toxic Substances and Their STLC & TTLC Values
 US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List
 US - California Permissible Exposure Limits for Chemical Contaminants



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US - Connecticut Hazardous Air Pollutants
 US - Hawaii Air Contaminant Limits
 US - Idaho - Limits for Air Contaminants
 US - Michigan Exposure Limits for Air Contaminants
 US - Minnesota Hazardous Substance List
 US - Minnesota Permissible Exposure Limits (PELs)
 US - North Carolina Permissible Exposure Limits (PELs) for Air Contaminants
 US - Oregon Permissible Exposure Limits (Z1)
 US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
 US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
 US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
 US - Washington Permissible exposure limits of air contaminants
 US - Wisconsin Hazardous Air Contaminants with Acceptable Ambient Concentrations [NLV]
 US ACGIH Threshold Limit Values (TLV)
 US DOE Temporary Emergency Exposure Limits (TEELs)
 US OSHA Permissible Exposure Levels (PELs) - Table Z1
 US Toxic Substances Control Act (TSCA) - Inventory

(16.7.4)

REACH Statement and Point of Contact Information

Climax Molybdenum has pre-registered and registered this substance as required by the European Union's Registration, Evaluation, Authorization, and Restriction of Chemicals regulation, EC 1907/2006 (REACH). Additional registration information is available upon request. Any REACH-related inquiries regarding this substance should be directed to Ir. Aad van Meerkerk, Climax Molybdenum B.V., Rotterdam, The Netherlands, Tel: +31-181-243705; Email: aad_vanmeerkerk@fmi.com.

(16.7.5)

Disclaimer

The information contained herein was obtained from sources we believe to be accurate and is based on the available scientific evidence known to Freeport-McMoRan Corporation. It is provided solely for compliance with the Hazard Communication Standard and is not meant to convey analytical information. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this material. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. This document provides transportation and environmental information, but is not the definitive resource and does not replace required training and knowledge required to address transportation and environmental-related requirements, language, or actions. No representations, guarantees or warranties of any kind are made as to the accuracy of the information contained herein, the suitability of the material or the information contained herein for particular applications, the hazards connected with the use of the material, or the results to be obtained from the use thereof. The user assumes all risks and liability of any use, processing, handling or storage of the material, variations in methods, conditions and equipment used to store, handle or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at user's sole discretion. Compliance with all applicable federal, state and local laws and regulations remains the responsibility of the user.

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Appendix B:

Individual Animal Tables

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INDIVIDUAL TABLES

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Table B1. Individual Female Mortality

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group	Dose Level	Sex	Animal	Cage	Removal Day	Removal Week	Removal Date	Removal Time	Time Slot	Removal Symptom	Pathology Reason
1	0 ppm	Female	2 ^a	2	20	2	05/07/2012	7:00	.	RTerm	R1
			4	4	20	2	05/07/2012	7:00	.	RTerm	R1
			6	6	20	2	05/07/2012	7:01	.	RTerm	R1
			8	8	20	2	05/07/2012	7:02	.	RTerm	R1
			10	10	20	2	05/07/2012	7:02	.	RTerm	R1
			12	12	20	2	05/08/2012	6:59	.	RTerm	R1
			14	14	20	2	05/08/2012	7:01	.	RTerm	R1
			16	16	20	2	05/08/2012	7:03	.	RTerm	R1
			18	18	20	2	05/08/2012	7:05	.	RTerm	R1
			20	20	20	2	05/08/2012	7:06	.	RTerm	R1
2	37.5 ppm	Female	22	22	20	2	05/07/2012	7:03	.	RTerm	R1
			24	24	20	2	05/07/2012	7:04	.	RTerm	R1
			26	26	20	2	05/07/2012	7:04	.	RTerm	R1
			28	28	20	2	05/07/2012	7:05	.	RTerm	R1
			30	30	20	2	05/07/2012	7:06	.	RTerm	R1
			32	32	20	2	05/08/2012	7:08	.	RTerm	R1
			34	34	20	2	05/08/2012	7:09	.	RTerm	R1
			36	36	20	2	05/08/2012	7:10	.	RTerm	R1
			38	38	20	2	05/08/2012	7:11	.	RTerm	R1
			40	40	20	2	05/08/2012	7:12	.	RTerm	R1
3	187 ppm	Female	42	42	20	2	05/07/2012	7:06	.	RTerm	R1
			44	44	20	2	05/07/2012	7:07	.	RTerm	R1
			46	46	20	2	05/07/2012	7:08	.	RTerm	R1
			48	48	20	2	05/07/2012	7:09	.	RTerm	R1
			50	50	20	2	05/07/2012	7:10	.	RTerm	R1
			52	52	20	2	05/08/2012	7:14	.	RTerm	R1
			54	54	20	2	05/08/2012	7:15	.	RTerm	R1
			56	56	20	2	05/08/2012	7:16	.	RTerm	R1
			58	58	20	2	05/08/2012	7:17	.	RTerm	R1
			60	60	20	2	05/08/2012	7:18	.	RTerm	R1

^aFemale was not pregnant.

Table B1. Individual Female Mortality (continued)
Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group	Dose Level	Sex	Animal	Cage	Removal		Removal Date	Removal Time	Time Slot	Removal Symptom	Pathology Reason
					Day	Week					
4	375 ppm	Female	62	62	20	2	05/07/2012	7:10	.	RTerm	R1
			64	64	20	2	05/07/2012	7:12	.	RTerm	R1
			66	66	20	2	05/07/2012	7:12	.	RTerm	R1
			68	68	20	2	05/07/2012	7:13	.	RTerm	R1
			70	70	20	2	05/07/2012	7:14	.	RTerm	R1
		Female	72	72	20	2	05/08/2012	7:20	.	RTerm	R1
			74	74	20	2	05/08/2012	7:21	.	RTerm	R1
			76	76	20	2	05/08/2012	7:22	.	RTerm	R1
			78	78	20	2	05/08/2012	7:23	.	RTerm	R1
			80	80	20	2	05/08/2012	7:25	.	RTerm	R1
5	750 ppm	Female	82	82	20	2	05/07/2012	7:14	.	RTerm	R1
			84	84	20	2	05/07/2012	7:15	.	RTerm	R1
			86	86	20	2	05/07/2012	7:16	.	RTerm	R1
			88	88	20	2	05/07/2012	7:17	.	RTerm	R1
			90	90	20	2	05/07/2012	7:17	.	RTerm	R1
			92	92	20	2	05/08/2012	7:26	.	RTerm	R1
			94	94	20	2	05/08/2012	7:30	.	RTerm	R1
			96	96	20	2	05/08/2012	7:31	.	RTerm	R1
			98	98	20	2	05/08/2012	7:32	.	RTerm	R1
			100	100	20	2	05/08/2012	7:33	.	RTerm	R1

Table B2. Individual Female Gestational Body Weights

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female Bodyweight (g)

0 ppm	Day(s) Relative to Mating (L)						
	3	6	9	12	15	18	20
4	210.3	237.2	261.5	278.6	301.0	344.4	377.5
6	202.5	221.6	240.9	265.7	277.9	321.4	350.0
8	188.6	210.4	229.6	251.9	265.3	318.2	351.1
10	241.8	263.9	291.5	316.8	339.8	394.6	432.4
12	215.1	241.2	261.9	276.7	288.4	331.1	349.7
14	237.7	255.2	267.7	286.1	309.1	341.8	383.0
16	228.5	241.5	256.0	268.7	283.9	306.5	344.1
18	211.9	232.6	249.0	263.0	284.4	324.4	361.5
20	228.8	248.4	264.9	285.0	304.9	315.8	337.3
Mean	218.36	239.11	258.11	276.94	294.97	333.13	365.18
SEM	5.76	5.46	5.86	6.19	7.26	8.69	9.78
N	9	9	9	9	9	9	9

Table B2. Individual Female Gestational Body Weights (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female Bodyweight (g)

37.5 ppm	Day(s) Relative to Mating (L)						
	3	6	9	12	15	18	20
22	202.0	214.7	227.1	236.4	258.5	297.1	328.7
24	215.4	240.8	249.5	257.9	264.1	276.4	289.1
26	224.8	245.8	266.2	288.0	303.8	340.8	372.5
28	210.6	227.7	243.0	260.7	285.1	324.4	350.1
30	203.7	225.1	241.8	267.7	283.9	323.2	352.2
32	218.7	237.1	259.9	278.3	316.3	357.4	399.5
34	211.1	227.9	245.7	256.5	269.6	294.7	316.2
36	222.9	240.2	263.0	272.9	310.9	348.0	396.3
38	238.7	257.9	286.8	310.3	331.2	373.2	417.0
40	230.4	256.5	257.8	297.8	316.5	360.1	407.1
Mean	217.83	237.37	254.08	272.65	293.99	329.53	362.87
SEM	3.69	4.38	5.20	6.89	7.96	10.13	13.54
N	10	10	10	10	10	10	10

Table B2. Individual Female Gestational Body Weights (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female Bodyweight (g)

187 ppm	Day(s) Relative to Mating (L)						
	3	6	9	12	15	18	20
42	228.5	239.9	249.4	265.6	288.2	327.5	344.1
44	194.1	212.4	227.0	239.5	251.9	288.1	309.9
46	204.7	228.6	240.7	265.5	278.0	317.3	346.3
48	213.7	229.6	253.2	257.5	284.7	322.7	349.0
50	216.8	228.3	243.4	264.6	287.0	332.1	372.1
52	217.4	235.0	254.7	267.6	280.4	321.6	356.1
54	209.0	235.1	255.4	265.5	289.4	319.3	353.8
56	223.8	237.4	260.3	280.1	302.4	345.7	387.7
58	236.3	252.5	276.0	292.8	313.7	345.4	386.3
60	238.7	250.5	260.6	300.7	330.4	374.2	422.2
Mean	218.30	234.93	252.07	269.94	290.61	329.39	362.75
SEM	4.42	3.65	4.18	5.52	6.73	7.15	9.73
N	10	10	10	10	10	10	10

Table B2. Individual Female Gestational Body Weights (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female Bodyweight (g)

375 ppm	Day(s) Relative to Mating (L)						
	3	6	9	12	15	18	20
62	199.9	215.6	230.8	246.9	274.7	314.4	350.9
64	232.8	254.8	278.5	302.8	319.3	379.2	406.3
66	216.3	244.6	266.5	291.4	315.3	363.1	402.4
68	203.5	215.5	223.8	244.5	256.4	311.3	331.6
70	211.3	243.8	261.0	287.2	302.2	361.1	377.3
72	233.0	243.2	249.2	273.9	296.1	332.4	365.9
74	242.0	257.4	283.8	296.7	314.4	353.4	390.1
76	215.0	233.6	257.3	272.6	293.4	330.2	367.4
78	218.5	230.1	249.2	260.2	272.0	311.0	335.1
80	224.8	243.3	261.2	273.4	300.7	334.9	381.7
Mean	219.71	238.19	256.13	274.96	294.45	339.10	370.87
SEM	4.26	4.57	5.97	6.33	6.58	7.59	8.19
N	10	10	10	10	10	10	10

Table B2. Individual Female Gestational Body Weights (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female Bodyweight (g)

750 ppm	Day(s) Relative to Mating (L)						
	3	6	9	12	15	18	20
82	211.8	235.5	247.9	268.9	293.3	333.1	358.2
84	206.7	225.9	242.6	253.6	262.0	301.8	326.8
86	218.5	246.6	260.2	269.7	298.1	342.4	364.2
88	239.4	267.5	288.5	307.7	339.5	387.7	415.4
90	201.2	233.1	242.0	263.5	290.1	333.5	364.1
92	245.9	266.2	279.9	302.4	326.5	370.1	410.9
94	233.3	238.0	263.5	278.8	305.3	346.6	374.9
96	219.0	234.9	253.3	272.6	287.2	326.5	355.9
98	221.8	239.1	254.4	276.6	308.8	348.3	394.2
100	209.9	220.8	240.9	254.7	281.9	318.9	355.8
Mean	220.75	240.76	257.32	274.85	299.27	340.89	372.04
SEM	4.62	4.88	5.12	5.69	7.03	7.79	8.68
N	10	10	10	10	10	10	10

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Table B3. Individual Female Feed Consumption During Gestation

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female Feed Consumption (g/day)

0 ppm	Day(s) Relative to Mating						
	3 → 6	6 → 9	9 → 12	12 → 15	15 → 18	18 → 20	3 → 20
2 ^a							
4	16.9	21.6	21.6	25.3	25.7	27.2	22.8
6	17.9	16.7	22.1	33.2	27.2	24.8	23.6
8	20.8	20.6	23.1	21.6	25.0	23.6	22.4
10	24.3	28.6	29.6	31.6	35.5	35.0	30.5
12	21.2	23.6	21.9	21.3	22.5	19.1	21.7
14	18.4	19.3	20.0	18.3	22.4	13.9	19.0
16	22.9	23.3	24.4	21.1	22.2	13.2	21.7
18	28.8	16.8	17.0	17.1	24.0	13.6	19.9
20	18.0	17.3	23.1	23.0	22.3	17.1	20.3
Mean	21.02	20.86	22.53	23.62	25.21	20.81	22.43
SEM	1.27	1.31	1.14	1.84	1.41	2.47	1.12
N	9	9	9	9	9	9	9

^aFemale was not pregnant.

Table B3. Individual Female Feed Consumption During Gestation (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female Feed Consumption (g/day)

37.5 ppm	Day(s) Relative to Mating						
	3 → 6	6 → 9	9 → 12	12 → 15	15 → 18	18 → 20	3 → 20
22	16.8	16.2	18.5	27.7	21.8	18.0	19.9
24	17.7	15.7	18.8	17.7	20.8	13.3	17.6
26	22.7	24.0	25.1	26.0	23.5	26.0	24.5
28	19.7	15.7	26.1	21.0	24.9	20.9	21.4
30	17.6	19.9	23.9	20.2	21.6	20.4	20.6
32	20.0	24.4	22.2	28.7	31.1	28.6	25.7
34	15.3	15.1	18.9	16.3	21.1	12.9	16.8
36	20.9	27.0	22.1	26.8	29.5	28.2	25.6
38	19.7	21.0	27.0	22.4	30.8	18.5	23.5
40	25.5	24.7	22.9	21.7	25.9	23.3	24.0
Mean	19.59	20.36	22.55	22.85	25.10	20.99	21.96
SEM	0.94	1.42	0.97	1.35	1.29	1.76	1.01
N	10	10	10	10	10	10	10

Table B3. Individual Female Feed Consumption During Gestation (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female Feed Consumption (g/day)

187 ppm	Day(s) Relative to Mating						
	3 → 6	6 → 9	9 → 12	12 → 15	15 → 18	18 → 20	3 → 20
42	21.9	16.4	17.6	21.2	19.8	15.3	18.9
44	17.0	17.1	17.8	17.0	22.5	9.3	17.2
46	18.5	19.4	22.3	19.3	23.3	21.7	20.7
48	16.8	16.2	18.5	18.0	22.2	17.6	18.3
50	18.7	18.0	22.2	22.0	25.9	21.5	21.4
52	18.3	18.4	20.2	18.7	27.0	24.0	20.9
54	21.3	26.3	20.5	22.5	32.1	26.7	24.8
56	19.7	21.0	22.4	21.2	21.8	19.3	21.0
58	22.3	23.5	26.9	31.0	21.8	19.3	24.4
60	10.1	17.3	26.9	25.7	25.9	29.6	22.2
Mean	18.46	19.35	21.54	21.65	24.23	20.41	20.97
SEM	1.11	1.05	1.06	1.30	1.12	1.82	0.77
N	10	10	10	10	10	10	10

Table B3. Individual Female Feed Consumption During Gestation

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female Feed Consumption (g/day)

375 ppm	Day(s) Relative to Mating						
	3 → 6	6 → 9	9 → 12	12 → 15	15 → 18	18 → 20	3 → 20
62	13.4	14.8	19.4	15.9	23.7	21.3	17.9
64	20.8	22.5	25.5	23.1	32.5	27.0	25.1
66	21.4	22.9	26.6	24.8	32.2	30.8	26.2
68	15.9	17.1	19.6	17.8	25.9	21.6	19.5
70	21.3	19.9	25.1	23.5	27.6	20.1	23.1
72	18.8	18.9	22.1	24.4	25.4	21.6	21.9
74	20.2	24.9	32.0	25.8	27.2	22.9	25.7
76	19.5	21.7	21.8	22.1	26.9	19.8	22.1
78	19.0	21.9	24.0	21.6	24.6	22.3	22.2
80	23.2	21.1	19.2	19.0	25.3	20.5	21.4
Mean	19.36	20.56	23.53	21.80	27.14	22.77	22.51
SEM	0.90	0.94	1.27	1.03	0.95	1.10	0.83
N	10	10	10	10	10	10	10

Table B3. Individual Female Feed Consumption During Gestation

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female Feed Consumption (g/day)

750 ppm	Day(s) Relative to Mating						
	3 → 6	6 → 9	9 → 12	12 → 15	15 → 18	18 → 20	3 → 20
82	19.6	19.4	22.1	21.4	24.6	22.4	21.5
84	15.9	16.9	19.5	19.4	22.1	17.5	18.6
86	15.7	15.6	26.3	23.2	26.2	15.4	20.7
88	25.3	27.0	27.5	25.8	33.7	31.9	28.3
90	16.7	19.5	20.1	21.9	25.1	18.5	20.4
92	20.5	21.5	23.9	22.2	27.4	24.9	23.3
94	14.7	21.8	23.2	26.2	28.1	23.9	22.9
96	18.6	19.2	21.3	20.4	20.4	13.0	19.1
98	20.0	19.2	31.8	33.9	24.7	23.3	25.6
100	14.5	20.2	21.1	24.8	24.6	21.8	21.1
Mean	18.14	20.02	23.69	23.92	25.68	21.23	22.17
SEM	1.06	0.97	1.21	1.32	1.14	1.71	0.94
N	10	10	10	10	10	10	10

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Table B4. Individual Female Clinical Observations During Gestation

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

				Day numbers relative to Mating Date																			
Group	Sex	Animal	Clinical Sign	Site	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	f	4	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		6	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		8	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		10	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		12	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		14	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		16	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		18	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		20	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Severity Codes: X = Present

Group 1 - 0 ppm Group 2 - 37.5 ppm Group 3 - 187 ppm Group 4 - 375 ppm Group 5 - 750 ppm

Table B4. Individual Female Clinical Observations During Gestation (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

				Day numbers relative to Mating Date																			
Group	Sex	Animal	Clinical Sign	Site	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
2	f	22	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		24	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		26	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		28	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		30	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		32	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		34	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		36	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		38	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		40	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Severity Codes: X = Present

Group 1 - 0 ppm Group 2 - 37.5 ppm Group 3 - 187 ppm Group 4 - 375 ppm Group 5 - 750 ppm

Table B4. Individual Female Clinical Observations During Gestation (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group	Sex	Animal	Clinical Sign	Site	Day numbers relative to Mating Date																	
					3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3	f	42	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		44	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		46	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		48	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		50	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		52	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		54	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		56	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		58	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		60	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Severity Codes: X = Present

Group 1 - 0 ppm Group 2 - 37.5 ppm Group 3 - 187 ppm Group 4 - 375 ppm Group 5 - 750 ppm

Table B4. Individual Female Clinical Observations During Gestation (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

				Day numbers relative to Mating Date																			
Group	Sex	Animal	Clinical Sign	Site	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
4	f	62	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		64	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	.	.	.	.	.	.	.	X
			Sore(s) on Body	Nose/Snout	.	.	.	.	.	.	.	.	.	.	X	X	X	X	X	X	X	X	.
		66	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		68	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		70	No Abnormalities Detected		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	X
			Scab(s)	Right Shoulder	.	.	.	.	.	.	X	X	X	X	X	X	X	X	X	X	X	X	.
			Sore(s) on Body	Right Shoulder	X	X	X	X	X	X	.	.	.	.	.	.	.	.	.	.	.	.	.
		72	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		74	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		76	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		78	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		80	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Severity Codes: X = Present

Group 1 - 0 ppm Group 2 - 37.5 ppm Group 3 - 187 ppm Group 4 - 375 ppm Group 5 - 750 ppm

Table B4. Individual Female Clinical Observations During Gestation (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

				Day numbers relative to Mating Date																				
Group	Sex	Animal	Clinical Sign	Site	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
5	f	82	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		84	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		86	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		88	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		90	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		92	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		94	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		96	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		98	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		100	No Abnormalities Detected		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Severity Codes: X = Present

Group 1 - 0 ppm Group 2 - 37.5 ppm Group 3 - 187 ppm Group 4 - 375 ppm Group 5 - 750 ppm

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Table B5. Individual Gravid Uterus Weight and Corrected Weight Change

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 1 0 ppm

Dam Number	Pregnancy Status	Pregnancy Type	Gravid Uterus g	Terminal BW g	Net BW g	Corrected BW Change From Day 3 g
4	P	1pre	76.25	374.0	297.75	87.45
6	P	1pre	70.66	. ^a	.	.
8	P	1pre	87.62	. ^b	.	.
10	P	1pre	72.75	413.8	341.05	99.25
12	P	1pre	64.24	348.2	283.96	68.86
14	P	1pre	81.30	376.2	294.90	57.20
16	P	1pre	69.82	341.3	271.48	42.98
18	P	1pre	81.70	356.5	274.80	62.90
20	P	1pre	27.25	334.9	307.65	78.85
-----			-----			-----
MEAN			70.177	363.56	295.941	71.070
S.D.			17.616	27.07	23.682	19.044
N			9	7	7	7

^aTerminal body weight was inadvertently not recorded for this female.

^bRecorded terminal body weight was unrealistic so it was excluded.

Pregnancy Status Codes: P = Pregnant

Pregnancy Type Codes: 1pre = Pregnant

Table B5. Individual Gravid Uterus Weight and Corrected Weight Change (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 2 37.5 ppm						
Dam Number	Pregnancy Status	Pregnancy Type	Gravid Uterus g	Terminal BW g	Net BW g	Corrected BW Change From Day 3 g
22	P	1pre	83.13	320.6	237.47	35.47
24	P	1pre	7.47	273.3	265.83	50.43
26	P	1pre	73.84	361.2	287.36	62.56
28	P	1pre	75.54	342.2	266.66	56.06
30	P	1pre	72.43	345.1	272.67	68.97
32	P	1pre	87.50	392.1	304.60	85.90
34	P	1pre	35.56	316.3	280.74	69.64
36	P	1pre	93.00	387.7	294.70	71.80
38	P	1pre	96.37	413.1	316.73	78.03
40	P	1pre	85.60	399.1	313.50	83.10
MEAN			71.044	355.07	284.026	66.196
S.D.			28.053	44.00	24.555	15.541
N			10	10	10	10

Pregnancy Status Codes: P = Pregnant

Pregnancy Type Codes: 1pre = Pregnant

Table B5. Individual Gravid Uterus Weight and Corrected Weight Change (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 3 187 ppm						
Dam Number	Pregnancy Status	Pregnancy Type	Gravid Uterus g	Terminal BW g	Net BW g	Corrected BW Change From Day 3 g
42	P	1pre	67.92	333.3	265.38	36.88
44	P	1pre	64.93	302.2	237.27	43.17
46	P	1pre	78.40	334.3	255.90	51.20
48	P	1pre	74.25	335.3	261.05	47.35
50	P	1pre	84.93	349.0	264.07	47.27
52	P	1pre	62.80	355.1	292.30	74.90
54	P	1pre	64.30	347.3	283.00	74.00
56	P	1pre	101.61	382.2	280.59	56.79
58	P	1pre	75.30	376.8	301.50	65.20
60	P	1pre	91.40	414.1	322.70	84.00
MEAN			76.584	352.96	276.376	58.076
S.D.			12.813	31.33	24.829	15.676
N			10	10	10	10

Pregnancy Status Codes: P = Pregnant

Pregnancy Type Codes: 1pre = Pregnant

Table B5. Individual Gravid Uterus Weight and Corrected Weight Change (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 4 375 ppm						
Dam Number	Pregnancy Status	Pregnancy Type	Gravid Uterus g	Terminal BW g	Net BW g	Net BW Change From Day 3 g
62	P	1pre	88.29	338.3	250.01	50.11
64	P	1pre	80.88	394.0	313.12	80.32
66	P	1pre	83.35	387.2	303.85	87.55
68	P	1pre	62.42	318.7	256.28	52.78
70	P	1pre	78.91	366.3	287.39	76.09
72	P	1pre	72.20	362.0	289.80	56.80
74	P	1pre	74.65	381.1	306.45	64.45
76	P	1pre	93.10	361.5	268.40	53.40
78	P	1pre	69.87	333.7	263.83	45.33
80	P	1pre	74.90	372.5	297.60	72.80
MEAN			77.857	361.53	283.673	63.963
S.D.			9.035	24.47	22.482	14.439
N			10	10	10	10

Pregnancy Status Codes: P = Pregnant
Pregnancy Type Codes: 1pre = Pregnant

Table B5. Individual Gravid Uterus Weight and Corrected Weight Change (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 5 750 ppm						
Dam Number	Pregnancy Status	Pregnancy Type	Gravid Uterus g	Terminal BW g	Net BW g	Net BW Change From Day 3 g
82	P	1pre	70.78	345.4	274.62	62.82
84	P	1pre	61.01	317.3	256.29	49.59
86	P	1pre	71.23	350.8	279.57	61.07
88	P	1pre	87.13	398.5	311.37	71.97
90	P	1pre	76.53	347.0	270.47	69.27
92	P	1pre	85.72	399.3	313.58	67.68
94	P	1pre	77.70	367.3	289.60	56.30
96	P	1pre	72.42	348.3	275.88	56.88
98	P	1pre	91.80	379.1	287.30	65.50
100	P	1pre	75.51	349.5	273.99	64.09
MEAN			76.983	360.25	283.267	62.517
S.D.			9.124	25.78	17.906	6.772
N			10	10	10	10

Pregnancy Status Codes: P = Pregnant

Pregnancy Type Codes: 1pre = Pregnant

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Table B6. Individual Fetal Data

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 1 0 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
2							CL_Left	CL_Right	Gravid Uterus Wt
							Pregnancy Type:	Not Pregnant	Early PM: No
4							CL_Left 4	CL_Right 8	Gravid Uterus Wt (g) 76.25
							Pregnancy Type:	Pregnant	Early PM: No
	1	L01	Viab	Ext.	3.7121	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.9545	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	3.7924	F	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.9070	F	External, No Abnormalities Detected		
	5	R08	Viab	Ext.	3.9800	M	External, No Abnormalities Detected		
	6	R07	Viab	Ext.	3.7547	M	External, No Abnormalities Detected		
	7	R06	Viab	Ext.	4.1411	M	External, No Abnormalities Detected		
	8	R05	Viab	Ext.	3.6687	F	External, No Abnormalities Detected		
	9	R04	Viab	Ext.	4.1841	M	External, No Abnormalities Detected		
	10	R03	Viab	Ext.	4.1146	M	External, No Abnormalities Detected		
	11	R02	Viab	Ext.	3.8501	M	External, No Abnormalities Detected		
	12	R01	Viab	Ext.	4.3944	M	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 1 0 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
6							CL_Left 8	CL_Right 7	Gravid Uterus Wt (g) 70.66 Pregnancy Type: Pregnant Early PM: No
	1	L01	Viab	Ext.	3.3910	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.7579	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	3.8010	F	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.5591	F	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	3.9968	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	3.9368	F	External, No Abnormalities Detected		
	7	R06	Viab	Ext.	3.6712	F	External, No Abnormalities Detected		
	8	R05	Viab	Ext.	3.5815	F	External, No Abnormalities Detected		
	9	R04	Viab	Ext.	3.6902	F	External, No Abnormalities Detected		
	10	R03	Viab	Ext.	3.5393	F	External, No Abnormalities Detected		
	11	R02	Viab	Ext.	3.6678	M	External, No Abnormalities Detected		
	12	R01	Viab	Ext.	3.2712	F	External, No Abnormalities Detected		
8							CL_Left 5	CL_Right 6	Gravid Uterus Wt (g) 87.62 Pregnancy Type: Pregnant Early PM: No
	1	L01	Viab	Ext.	4.3628	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.0437	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	4.6955	M	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 1 0 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
8	4	L04	Viab	Ext.	4.4023	F	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.8609	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	4.5486	M	External, No Abnormalities Detected		
	7	L07	Viab	Ext.	4.5413	M	External, No Abnormalities Detected		
	8	R06	Viab	Ext.	4.2866	F	External, No Abnormalities Detected		
	9	R05	Viab	Ext.	4.6416	M	External, No Abnormalities Detected		
	10	R04	Viab	Ext.	4.6287	F	External, No Abnormalities Detected		
	11	R03	Viab	Ext.	4.5121	F	External, No Abnormalities Detected		
	12	R02	Viab	Ext.	3.9330	F	External, No Abnormalities Detected		
	13	R01	Viab	Ext.	4.5548	M	External, No Abnormalities Detected		
10							CL_Left 6 CL_Right 8 Gravid Uterus Wt (g) 72.75 Pregnancy Type: Pregnant Early PM: No		
		L03	Earl						
	1	L01	Viab	Ext.	3.6177	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.6352	F	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.9561	F	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	3.8238	M	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 1 0 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
10	6	L06	Viab	Ext.	3.8509	M	External, No Abnormalities Detected		
	7	R07	Viab	Ext.	3.8610	F	External, No Abnormalities Detected		
	8	R06	Viab	Ext.	3.7059	M	External, No Abnormalities Detected		
	9	R05	Viab	Ext.	3.6515	F	External, No Abnormalities Detected		
	10	R04	Viab	Ext.	4.0695	M	External, No Abnormalities Detected		
	11	R03	Viab	Ext.	4.0515	M	External, No Abnormalities Detected		
	12	R02	Viab	Ext.	2.7239	F	External, No Abnormalities Detected		
	13	R01	Viab	Ext.	3.5801	M	External, No Abnormalities Detected		
12							CL_Left 10 CL_Right 6 Gravid Uterus Wt (g) 64.24 Pregnancy Type: Pregnant Early PM: No		
		L06	Earl						
		R02	Earl						
		R07	Earl						
	1	L01	Viab	Ext.	4.0173	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.1634	M	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	3.9303	F	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.0999	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 1 0 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
12	5	L05	Viab	Ext.	3.9803	F	External, No Abnormalities Detected		
	8	R06	Viab	Ext.	3.8822	F	External, No Abnormalities Detected		
	9	R05	Viab	Ext.	3.7836	F	External, No Abnormalities Detected		
	10	R04	Viab	Ext.	4.1775	M	External, No Abnormalities Detected		
	11	R03	Viab	Ext.	4.0947	F	External, No Abnormalities Detected		
	13	R01	Viab	Ext.	3.9727	M	External, No Abnormalities Detected		
14							CL_Left 6	CL_Right 7	Gravid Uterus Wt (g) 81.30
							Pregnancy Type: Pregnant Early PM: No		
	1	L01	Viab	Ext.	3.6580	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.1212	M	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	3.9311	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.9252	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.1021	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	4.2459	M	External, No Abnormalities Detected		
	7	L07	Viab	Ext.	4.1589	F	External, No Abnormalities Detected		
	8	R06	Viab	Ext.	3.5207	M	External, No Abnormalities Detected		
9	R05	Viab	Ext.	3.5701	F	External, No Abnormalities Detected			

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 1 0 ppm							
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations
14	10	R04	Viab	Ext.	4.0708	M	External, No Abnormalities Detected
	11	R03	Viab	Ext.	4.0865	M	External, No Abnormalities Detected
	12	R02	Viab	Ext.	3.6165	F	External, No Abnormalities Detected
	13	R01	Viab	Ext.	4.0208	M	External, No Abnormalities Detected
16							CL_Left 9 CL_Right 5 Gravid Uterus Wt (g) 69.82 Pregnancy Type: Pregnant Early PM: No
	1	L01	Viab	Ext.	3.9331	F	External, No Abnormalities Detected
	2	L02	Viab	Ext.	3.9672	M	External, No Abnormalities Detected
	3	L03	Viab	Ext.	4.1228	M	External, No Abnormalities Detected
	4	L04	Viab	Ext.	4.1667	M	External, No Abnormalities Detected
	5	L05	Viab	Ext.	3.5262	F	External, No Abnormalities Detected
	6	L06	Viab	Ext.	4.0048	M	External, No Abnormalities Detected
	7	R06	Viab	Ext.	3.8121	F	External, No Abnormalities Detected
	8	R05	Viab	Ext.	3.8503	M	External, No Abnormalities Detected
	9	R04	Viab	Ext.	3.6794	M	External, No Abnormalities Detected
	10	R03	Viab	Ext.	2.2836	F	External, No Abnormalities Detected
	11	R02	Viab	Ext.	3.9443	M	External, No Abnormalities Detected
	12	R01	Viab	Ext.	3.7642	M	External, No Abnormalities Detected

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 1 0 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
18							CL_Left 4	CL_Right 10	Gravid Uterus Wt (g) 81.70
							Pregnancy Type: Pregnant	Early PM: No	
	1	L01	Viab	Ext.	4.2051	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.0397	M	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	3.8693	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.3453	F	External, No Abnormalities Detected		
	5	R09	Viab	Ext.	4.3590	M	External, No Abnormalities Detected		
	6	R08	Viab	Ext.	3.8312	F	External, No Abnormalities Detected		
	7	R07	Viab	Ext.	3.8928	M	External, No Abnormalities Detected		
	8	R06	Viab	Ext.	3.8434	M	External, No Abnormalities Detected		
	9	R05	Viab	Ext.	4.0752	M	External, No Abnormalities Detected		
	10	R04	Viab	Ext.	4.1256	M	External, No Abnormalities Detected		
	11	R03	Viab	Ext.	3.9475	F	External, No Abnormalities Detected		
	12	R02	Viab	Ext.	3.7615	F	External, No Abnormalities Detected		
	13	R01	Viab	Ext.	3.9182	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)
Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 1 0 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
20							CL_Left 10	CL_Right 3	Gravid Uterus Wt (g) 27.25
							Pregnancy Type: Pregnant	Early PM: No	
		R02	Earl						
	1	L01	Viab	Ext.	4.1024	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.9468	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	4.3066	M	External, No Abnormalities Detected		
	5	R01	Viab	Ext.	3.9794	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 2 37.5 ppm												
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations					
22							CL_Left 9	CL_Right 10	Gravid Uterus Wt (g) 83.13			
							Pregnancy Type: Pregnant Early PM: No					
	1	L01	Viab	Ext.	4.4384	M	External, No Abnormalities Detected					
	2	L02	Viab	Ext.	4.1610	M	External, No Abnormalities Detected					
	3	L03	Viab	Ext.	4.5916	M	External, No Abnormalities Detected					
	4	L04	Viab	Ext.	4.0395	M	External, No Abnormalities Detected					
	5	L05	Viab	Ext.	4.2311	F	External, No Abnormalities Detected					
	6	R08	Viab	Ext.	4.5363	M	External, No Abnormalities Detected					
	7	R07	Viab	Ext.	4.0978	F	External, No Abnormalities Detected					
	8	R06	Viab	Ext.	4.4649	M	External, No Abnormalities Detected					
	9	R05	Viab	Ext.	4.0470	M	External, No Abnormalities Detected					
	10	R04	Viab	Ext.	4.1784	F	External, No Abnormalities Detected					
	11	R03	Viab	Ext.	4.4077	M	External, No Abnormalities Detected					
	12	R02	Viab	Ext.	4.2117	M	External, No Abnormalities Detected					
	13	R01	Viab	Ext.	3.7355	F	External, No Abnormalities Detected					
24							CL_Left 7	CL_Right 5	Gravid Uterus Wt (g) 7.47			
							Pregnancy Type: Pregnant Early PM: No					
		R01	Dead									

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 2 37.5 ppm											
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex		Observations			
26								CL_Left 6 CL_Right 9 Gravid Uterus Wt (g) 73.84 Pregnancy Type: Pregnant Early PM: No			
		L05	Earl								
	1	L01	Viab	Ext.	3.8127	F		External, No Abnormalities Detected			
	2	L02	Viab	Ext.	3.7055	F		External, No Abnormalities Detected			
	3	L03	Viab	Ext.	3.8034	F		External, No Abnormalities Detected			
	4	L04	Viab	Ext.	4.0510	M		External, No Abnormalities Detected			
	6	R08	Viab	Ext.	3.8337	F		External, No Abnormalities Detected			
	7	R07	Viab	Ext.	3.6296	F		External, No Abnormalities Detected			
	8	R06	Viab	Ext.	3.7573	M		External, No Abnormalities Detected			
	9	R05	Viab	Ext.	3.6750	F		External, No Abnormalities Detected			
	10	R04	Viab	Ext.	3.9080	M		External, No Abnormalities Detected			
	11	R03	Viab	Ext.	3.9691	F		External, No Abnormalities Detected			
	12	R02	Viab	Ext.	3.7648	M		External, No Abnormalities Detected			
	13	R01	Viab	Ext.	3.5244	F		External, No Abnormalities Detected			
28								CL_Left 10 CL_Right 6 Gravid Uterus Wt (g) 75.54 Pregnancy Type: Pregnant Early PM: No			
		R03	Earl								

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 2 37.5 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
28	1	L01	Viab	Ext.	3.5976	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.1142	M	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	3.8926	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.9930	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	2.7842	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	4.0928	M	External, No Abnormalities Detected		
	7	L07	Viab	Ext.	3.6440	F	External, No Abnormalities Detected		
	8	R07	Viab	Ext.	3.9037	F	External, No Abnormalities Detected		
	9	R06	Viab	Ext.	4.0843	F	External, No Abnormalities Detected		
	10	R05	Viab	Ext.	3.7506	M	External, No Abnormalities Detected		
	11	R04	Viab	Ext.	3.6311	M	External, No Abnormalities Detected		
	13	R02	Viab	Ext.	4.0347	M	External, No Abnormalities Detected		
	14	R01	Viab	Ext.	3.5733	F	External, No Abnormalities Detected		
30							CL_Left 8 CL_Right 5 Gravid Uterus Wt (g) 72.43 Pregnancy Type: Pregnant Early PM: No		
	1	L01	Viab	Ext.	3.3396	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.3025	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 2 37.5 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
30	3	L03	Viab	Ext.	4.1047	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.3914	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	3.7586	F	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	3.4558	M	External, No Abnormalities Detected		
	7	R06	Viab	Ext.	3.6593	F	External, No Abnormalities Detected		
	8	R05	Viab	Ext.	3.8705	M	External, No Abnormalities Detected		
	9	R04	Viab	Ext.	4.0898	M	External, No Abnormalities Detected		
	10	R03	Viab	Ext.	3.5277	F	External, No Abnormalities Detected		
	11	R02	Viab	Ext.	3.3162	F	External, No Abnormalities Detected		
12	R01	Viab	Ext.	3.4530	F	External, No Abnormalities Detected			
32							CL_Left 9 CL_Right 10 Gravid Uterus Wt (g) 87.50 Pregnancy Type: Pregnant Early PM: No		
	1	L01	Viab	Ext.	4.1263	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.0480	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	4.1717	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.9844	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	3.9927	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 2 37.5 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
32	6	L06	Viab	Ext.	4.0684	F	External, No Abnormalities Detected		
	7	L07	Viab	Ext.	4.1243	F	External, No Abnormalities Detected		
	8	R07	Viab	Ext.	4.1738	F	External, No Abnormalities Detected		
	9	R06	Viab	Ext.	3.8281	F	External, No Abnormalities Detected		
	10	R05	Viab	Ext.	3.4779	M	External, No Abnormalities Detected		
	11	R04	Viab	Ext.	3.9350	M	External, No Abnormalities Detected		
	12	R03	Viab	Ext.	4.2212	F	External, No Abnormalities Detected		
	13	R02	Viab	Ext.	3.8470	M	External, No Abnormalities Detected		
	14	R01	Viab	Ext.	3.7815	F	External, No Abnormalities Detected		
34						CL_Left 8 CL_Right 7 Gravid Uterus Wt (g) 35.56 Pregnancy Type: Pregnant Early PM: No			
	1	L01	Viab	Ext.	4.1763	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.6878	M	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	3.9790	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.0397	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	3.8131	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 2		37.5 ppm											
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations						
36							CL_Left 5 CL_Right 12 Gravid Uterus Wt (g) 93.00 Pregnancy Type: Pregnant Early PM: No						
	1	L01	Viab	Ext.	4.1037	M	External, No Abnormalities Detected						
	2	L02	Viab	Ext.	4.2801	M	External, No Abnormalities Detected						
	3	L03	Viab	Ext.	3.8694	F	External, No Abnormalities Detected						
	4	L04	Viab	Ext.	3.9726	F	External, No Abnormalities Detected						
	5	L05	Viab	Ext.	4.0589	F	External, No Abnormalities Detected						
	6	R11	Viab	Ext.	3.9476	F	External, No Abnormalities Detected						
	7	R10	Viab	Ext.	3.4923	F	External, No Abnormalities Detected						
	8	R09	Viab	Ext.	3.9714	M	External, No Abnormalities Detected						
	9	R08	Viab	Ext.	4.2215	M	External, No Abnormalities Detected						
	10	R07	Viab	Ext.	4.0535	F	External, No Abnormalities Detected						
	11	R06	Viab	Ext.	4.1520	M	External, No Abnormalities Detected						
	12	R05	Viab	Ext.	3.8582	F	External, No Abnormalities Detected						
	13	R04	Viab	Ext.	4.2531	F	External, No Abnormalities Detected						
	14	R03	Viab	Ext.	3.3249	F	External, No Abnormalities Detected						
	15	R02	Viab	Ext.	3.9699	M	External, No Abnormalities Detected						
	16	R01	Viab	Ext.	3.3237	F	External, No Abnormalities Detected						

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 2		37.5 ppm											
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations						
38							CL_Left 8 CL_Right 6 Gravid Uterus Wt (g) 96.37 Pregnancy Type: Pregnant Early PM: No						
	1	L01	Viab	Ext.	4.2436	M	External, No Abnormalities Detected						
	2	L02	Viab	Ext.	4.1413	F	External, No Abnormalities Detected						
	3	L03	Viab	Ext.	4.1365	F	External, No Abnormalities Detected						
	4	L04	Viab	Ext.	4.2620	F	External, No Abnormalities Detected						
	5	L05	Viab	Ext.	4.2015	M	External, No Abnormalities Detected						
	6	L06	Viab	Ext.	3.8936	F	External, No Abnormalities Detected						
	7	L07	Viab	Ext.	2.9719	F	External, No Abnormalities Detected						
	8	L08	Viab	Ext.	4.2466	F	External, No Abnormalities Detected						
	9	R07	Viab	Ext.	4.4833	M	External, No Abnormalities Detected						
	10	R06	Viab	Ext.	4.5606	M	External, No Abnormalities Detected						
	11	R05	Viab	Ext.	3.9979	M	External, No Abnormalities Detected						
	12	R04	Viab	Ext.	4.2845	F	External, No Abnormalities Detected						
	13	R03	Viab	Ext.	4.0160	F	External, No Abnormalities Detected						
	14	R02	Viab	Ext.	3.8933	F	External, No Abnormalities Detected						
	15	R01	Viab	Ext.	3.6095	F	External, No Abnormalities Detected						

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 2 37.5 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
40							CL_Left 6	CL_Right 8	Gravid Uterus Wt (g) 85.60 Pregnancy Type: Pregnant Early PM: No
	1	L01	Viab	Ext.	3.9464	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.2074	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	4.0524	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.7771	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.1296	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	3.1455	F	External, No Abnormalities Detected		
	7	R08	Viab	Ext.	4.1375	M	External, No Abnormalities Detected		
	8	R07	Viab	Ext.	3.8738	F	External, No Abnormalities Detected		
	9	R06	Viab	Ext.	3.7673	F	External, No Abnormalities Detected		
	10	R05	Viab	Ext.	3.9563	F	External, No Abnormalities Detected		
	11	R04	Viab	Ext.	3.4732	F	External, No Abnormalities Detected		
	12	R03	Viab	Ext.	4.1014	M	External, No Abnormalities Detected		
	13	R02	Viab	Ext.	3.8300	M	External, No Abnormalities Detected		
	14	R01	Viab	Ext.	3.3817	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 3 187 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
42							CL_Left 7	CL_Right 2	Gravid Uterus Wt (g) 67.92 Pregnancy Type: Pregnant Early PM: No
	1	L01	Viab	Ext.	4.3058	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.4723	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	4.1892	F	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.5744	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.5740	F	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	4.8382	M	External, No Abnormalities Detected		
	7	L07	Viab	Ext.	4.6262	M	External, No Abnormalities Detected		
	8	L08	Viab	Ext.	4.3171	M	External, No Abnormalities Detected		
	9	R02	Viab	Ext.	4.5594	F	External, No Abnormalities Detected		
	10	R01	Viab	Ext.	4.3513	F	External, No Abnormalities Detected		
44							CL_Left 4	CL_Right 7	Gravid Uterus Wt (g) 64.93 Pregnancy Type: Pregnant Early PM: No
		R02	Earl						
	1	L01	Viab	Ext.	3.9852	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.7524	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	4.0483	M	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 3 187 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
44	4	L04	Viab	Ext.	3.9798	F	External, No Abnormalities Detected		
	5	R08	Viab	Ext.	4.0094	M	External, No Abnormalities Detected		
	6	R07	Viab	Ext.	4.0059	M	External, No Abnormalities Detected		
	7	R06	Viab	Ext.	3.7314	F	External, No Abnormalities Detected		
	8	R05	Viab	Ext.	3.7843	F	External, No Abnormalities Detected		
	9	R04	Viab	Ext.	3.8978	M	External, No Abnormalities Detected		
	10	R03	Viab	Ext.	3.5006	F	External, No Abnormalities Detected		
	12	R01	Viab	Ext.	3.5129	F	External, No Abnormalities Detected		
46							CL_Left 10 CL_Right 5 Gravid Uterus Wt (g) 78.40 Pregnancy Type: Pregnant Early PM: No		
	1	L01	Viab	Ext.	3.8281	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.8347	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	3.9371	F	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.1792	F	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.3451	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	3.9600	F	External, No Abnormalities Detected		
	7	L07	Viab	Ext.	3.6403	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 3 187 ppm										
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations			
46	8	L08	Viab	Ext.	4.1252	M	External, No Abnormalities Detected			
	9	L09	Viab	Ext.	4.2085	M	External, No Abnormalities Detected			
	10	R04	Viab	Ext.	4.2834	M	External, No Abnormalities Detected			
	11	R03	Viab	Ext.	3.8347	F	External, No Abnormalities Detected			
	12	R02	Viab	Ext.	3.6300	F	External, No Abnormalities Detected			
	13	R01	Viab	Ext.	3.9146	F	External, No Abnormalities Detected			
48							CL_Left 6	CL_Right 8	Gravid Uterus Wt (g) 74.25	
							Pregnancy Type: Pregnant Early PM: No			
	1	L01	Viab	Ext.	3.5965	F	External, No Abnormalities Detected			
	2	L02	Viab	Ext.	4.1191	M	External, No Abnormalities Detected			
	3	L03	Viab	Ext.	3.8298	M	External, No Abnormalities Detected			
	4	L04	Viab	Ext.	3.7960	F	External, No Abnormalities Detected			
	5	L05	Viab	Ext.	3.5850	F	External, No Abnormalities Detected			
	6	R07	Viab	Ext.	3.9997	F	External, No Abnormalities Detected			
	7	R06	Viab	Ext.	4.1284	F	External, No Abnormalities Detected			
	8	R05	Viab	Ext.	3.9399	F	External, No Abnormalities Detected			
9	R04	Viab	Ext.	3.6939	F	External, No Abnormalities Detected				

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 3 187 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
48	10	R03	Viab	Ext.	3.8435	F	External, No Abnormalities Detected		
	11	R02	Viab	Ext.	3.5444	M	External, No Abnormalities Detected		
	12	R01	Viab	Ext.	3.5784	F	External, No Abnormalities Detected		
50							CL_Left 5 CL_Right 8 Gravid Uterus Wt (g) 84.93 Pregnancy Type: Pregnant Early PM: No		
	1	L01	Viab	Ext.	4.3463	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.0049	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	4.3457	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.4455	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	3.9644	M	External, No Abnormalities Detected		
	6	R08	Viab	Ext.	4.2057	M	External, No Abnormalities Detected		
	7	R07	Viab	Ext.	4.0249	M	External, No Abnormalities Detected		
	8	R06	Viab	Ext.	4.4550	M	External, No Abnormalities Detected		
	9	R05	Viab	Ext.	4.4055	M	External, No Abnormalities Detected		
	10	R04	Viab	Ext.	4.0160	F	External, No Abnormalities Detected		
	11	R03	Viab	Ext.	4.1198	M	External, No Abnormalities Detected		
	12	R02	Viab	Ext.	3.9328	F	External, No Abnormalities Detected		
	13	R01	Viab	Ext.	3.8200	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)
Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 3 187 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g		Sex	Observations	
52								CL_Left 8 CL_Right 2 Gravid Uterus Wt (g) 62.80 Pregnancy Type: Pregnant Early PM: No	
		L02	Earl						
		L07	Earl						
	1	L01	Viab	Ext.	3.5853		F	External, No Abnormalities Detected	
	3	L03	Viab	Ext.	3.7647		F	External, No Abnormalities Detected	
	4	L04	Viab	Ext.	3.8175		F	External, No Abnormalities Detected	
	5	L05	Viab	Ext.	3.9652		F	External, No Abnormalities Detected	
	6	L06	Viab	Ext.	4.1422		M	External, No Abnormalities Detected	
	8	L08	Viab	Ext.	3.1657		M	External, No Abnormalities Detected	
	9	L09	Viab	Ext.	3.7541		F	External, No Abnormalities Detected	
	10	L10	Viab	Ext.	3.8700		F	External, No Abnormalities Detected	
	11	R02	Viab	Ext.	4.1097		F	External, No Abnormalities Detected	
	12	R01	Viab	Ext.	3.9903		M	External, No Abnormalities Detected	

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 3 187 ppm											
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations				
54							CL_Left 8	CL_Right 7	Gravid Uterus Wt (g)	64.30	
							Pregnancy Type: Pregnant		Early PM: No		
	1	L01	Viab	Ext.	3.4862	M	External, No Abnormalities Detected				
	2	L02	Viab	Ext.	3.4623	M	External, No Abnormalities Detected				
	3	L03	Viab	Ext.	3.6867	M	External, No Abnormalities Detected				
	4	L04	Viab	Ext.	3.5279	M	External, No Abnormalities Detected				
	5	L05	Viab	Ext.	2.2784	M	External, No Abnormalities Detected				
	6	L06	Viab	Ext.	3.7807	M	External, No Abnormalities Detected				
	7	R06	Viab	Ext.	3.4508	F	External, No Abnormalities Detected				
	8	R05	Viab	Ext.	3.5114	M	External, No Abnormalities Detected				
	9	R04	Viab	Ext.	3.3659	F	External, No Abnormalities Detected				
	10	R03	Viab	Ext.	3.3408	M	External, No Abnormalities Detected				
56	11	R02	Viab	Ext.	3.2441	M	External, No Abnormalities Detected				
	12	R01	Viab	Ext.	3.2632	M	External, No Abnormalities Detected				
							CL_Left 11	CL_Right 9	Gravid Uterus Wt (g)	101.61	
							Pregnancy Type: Pregnant		Early PM: No		
	1	L01	Viab	Ext.	3.5533	M	External, No Abnormalities Detected				
	2	L02	Viab	Ext.	3.6524	M	External, No Abnormalities Detected				
	3	L03	Viab	Ext.	3.7812	M	External, No Abnormalities Detected				

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 3 187 ppm							
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations
56	4	L04	Viab	Ext.	3.6998	M	External, No Abnormalities Detected
	5	L05	Viab	Ext.	4.1874	M	External, No Abnormalities Detected
	6	L06	Viab	Ext.	3.8704	M	External, No Abnormalities Detected
	7	L07	Viab	Ext.	3.6081	M	External, No Abnormalities Detected
	8	L08	Viab	Ext.	4.3118	M	External, No Abnormalities Detected
	9	R09	Viab	Ext.	4.2205	M	External, No Abnormalities Detected
	10	R08	Viab	Ext.	3.8950	M	External, No Abnormalities Detected
	11	R07	Viab	Ext.	3.6109	M	External, No Abnormalities Detected
	12	R06	Viab	Ext.	4.0785	M	External, No Abnormalities Detected
	13	R05	Viab	Ext.	3.5504	F	External, No Abnormalities Detected
	14	R04	Viab	Ext.	4.0001	M	External, No Abnormalities Detected
	15	R03	Viab	Ext.	3.4719	F	External, No Abnormalities Detected
	16	R02	Viab	Ext.	3.5357	F	External, No Abnormalities Detected
	17	R01	Viab	Ext.	3.5621	F	External, No Abnormalities Detected
							CL_Left 9 CL_Right 5 Gravid Uterus Wt (g) 75.30 Pregnancy Type: Pregnant Early PM: No
	1	L01	Viab	Ext.	3.6370	F	External, No Abnormalities Detected

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 3 187 ppm							
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations
58	2	L02	Viab	Ext.	3.6989	F	External, No Abnormalities Detected
	3	L03	Viab	Ext.	4.0587	M	External, No Abnormalities Detected
	4	L04	Viab	Ext.	3.3097	M	External, No Abnormalities Detected
	5	L05	Viab	Ext.	4.0920	M	External, No Abnormalities Detected
	6	L06	Viab	Ext.	4.1877	M	External, No Abnormalities Detected
	7	L07	Viab	Ext.	4.0411	F	External, No Abnormalities Detected
	8	L08	Viab	Ext.	3.9163	M	External, No Abnormalities Detected
	9	L09	Viab	Ext.	4.0000	F	External, No Abnormalities Detected
	10	R03	Viab	Ext.	4.2560	M	External, No Abnormalities Detected
	11	R02	Viab	Ext.	4.4101	M	External, No Abnormalities Detected
	12	R01	Viab	Ext.	3.9851	F	External, No Abnormalities Detected
	CL_Left 15 CL_Right 9 Gravid Uterus Wt (g) 91.40 Pregnancy Type: Pregnant Early PM: No						
60		R05	Earl				
	1	L01	Viab	Ext.	4.2817	M	External, No Abnormalities Detected
	2	L02	Viab	Ext.	4.2072	M	External, No Abnormalities Detected
	3	L03	Viab	Ext.	4.1877	M	External, No Abnormalities Detected

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 3 187 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
60	4	L04	Viab	Ext.	4.1352	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	3.5668	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	4.0075	F	External, No Abnormalities Detected		
	7	L07	Viab	Ext.	4.1898	M	External, No Abnormalities Detected		
	8	R08	Viab	Ext.	4.2283	M	External, No Abnormalities Detected		
	9	R07	Viab	Ext.	3.9536	F	External, No Abnormalities Detected		
	10	R06	Viab	Ext.	3.9218	M	External, No Abnormalities Detected		
	12	R04	Viab	Ext.	4.2101	M	External, No Abnormalities Detected		
	13	R03	Viab	Ext.	3.8822	M	External, No Abnormalities Detected		
	14	R02	Viab	Ext.	4.2349	M	External, No Abnormalities Detected		
	15	R01	Viab	Ext.	3.9892	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 4 375 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
62							CL_Left 8	CL_Right 9	Gravid Uterus Wt (g) 88.29 Pregnancy Type: Pregnant Early PM: No
	1	L01	Viab	Ext.	4.1732	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.8220	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	4.3248	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.8329	F	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.5445	F	External, No Abnormalities Detected		
	6	R08	Viab	Ext.	4.8234	F	External, No Abnormalities Detected		
	7	R07	Viab	Ext.	4.6138	M	External, No Abnormalities Detected		
	8	R06	Viab	Ext.	4.2896	F	External, No Abnormalities Detected		
	9	R05	Viab	Ext.	4.5664	F	External, No Abnormalities Detected		
	10	R04	Viab	Ext.	4.4377	F	External, No Abnormalities Detected		
	11	R03	Viab	Ext.	4.5200	F	External, No Abnormalities Detected		
	12	R02	Viab	Ext.	3.8379	F	External, No Abnormalities Detected		
	13	R01	Viab	Ext.	3.9333	F	External, No Abnormalities Detected		
64							CL_Left 9	CL_Right 8	Gravid Uterus Wt (g) 80.88 Pregnancy Type: Pregnant Early PM: No
		L03	Earl						

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 4 375 ppm							
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations
64	1	L01	Viab	Ext.	4.0537	F	External, No Abnormalities Detected
	2	L02	Viab	Ext.	4.5445	M	External, No Abnormalities Detected
	4	L04	Viab	Ext.	4.5468	M	External, No Abnormalities Detected
	5	L05	Viab	Ext.	4.5575	F	External, No Abnormalities Detected
	6	L06	Viab	Ext.	4.3623	M	External, No Abnormalities Detected
	7	L07	Viab	Ext.	4.3106	F	External, No Abnormalities Detected
	8	L08	Viab	Ext.	4.3500	F	External, No Abnormalities Detected
	9	R05	Viab	Ext.	4.4200	F	External, No Abnormalities Detected
	10	R04	Viab	Ext.	4.2000	F	External, No Abnormalities Detected
	11	R03	Viab	Ext.	4.1700	M	External, No Abnormalities Detected
	12	R02	Viab	Ext.	4.2300	M	External, No Abnormalities Detected
	13	R01	Viab	Ext.	4.2200	M	External, No Abnormalities Detected
66							CL_Left 7 CL_Right 8 Gravid Uterus Wt (g) 83.35 Pregnancy Type: Pregnant Early PM: No
		L07	Earl				
	1	L01	Viab	Ext.	4.3872	M	External, No Abnormalities Detected
	2	L02	Viab	Ext.	3.6887	F	External, No Abnormalities Detected

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 4 375 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
66	3	L03	Viab	Ext.	2.9297	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.2998	F	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.6089	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	4.6054	M	External, No Abnormalities Detected		
	8	R07	Viab	Ext.	4.5470	F	External, No Abnormalities Detected		
	9	R06	Viab	Ext.	4.7737	M	External, No Abnormalities Detected		
	10	R05	Viab	Ext.	4.4030	F	External, No Abnormalities Detected		
	11	R04	Viab	Ext.	4.2829	M	External, No Abnormalities Detected		
	12	R03	Viab	Ext.	4.0430	F	External, No Abnormalities Detected		
	13	R02	Viab	Ext.	4.2760	F	External, No Abnormalities Detected		
14	R01	Viab	Ext.	4.3064	M	External, No Abnormalities Detected			
68							CL_Left 8	CL_Right 9	Gravid Uterus Wt (g) 62.42 Pregnancy Type: Pregnant Early PM: No
	1	L01	Viab	Ext.	3.7383	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.1803	M	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	3.9399	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.8716	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 4 375 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
68	5	L05	Viab	Ext.	3.9741	F	External, No Abnormalities Detected		
	6	R05	Viab	Ext.	4.3713	M	External, No Abnormalities Detected		
	7	R04	Viab	Ext.	4.1356	M	External, No Abnormalities Detected		
	8	R03	Viab	Ext.	4.3661	M	External, No Abnormalities Detected		
	9	R02	Viab	Ext.	4.0730	F	External, No Abnormalities Detected		
	10	R01	Viab	Ext.	3.8623	F	External, No Abnormalities Detected		
70							CL_Left 12 CL_Right 8 Gravid Uterus Wt (g) 78.91 Pregnancy Type: Pregnant Early PM: No		
	1	L01	Viab	Ext.	3.5605	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.5601	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	1.6873	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.9063	F	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.0324	M	External, No Abnormalities Detected		
	6	R08	Viab	Ext.	4.0593	M	External, No Abnormalities Detected		
	7	R07	Viab	Ext.	3.5899	F	External, No Abnormalities Detected		
	8	R06	Viab	Ext.	3.8086	M	External, No Abnormalities Detected		
	9	R05	Viab	Ext.	3.8401	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 4 375 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
70	10	R04	Viab	Ext.	3.7589	F	External, No Abnormalities Detected		
	11	R03	Viab	Ext.	3.8383	F	External, No Abnormalities Detected		
	12	R02	Viab	Ext.	4.1379	M	External, No Abnormalities Detected		
	13	R01	Viab	Ext.	4.0097	F	External, No Abnormalities Detected		
72							CL_Left 6 CL_Right 8 Gravid Uterus Wt (g) 72.20 Pregnancy Type: Pregnant Early PM: No		
	1	L01	Viab	Ext.	3.9175	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.1305	M	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	3.8255	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.1181	M	External, No Abnormalities Detected		
	5	R08	Viab	Ext.	3.9680	F	External, No Abnormalities Detected		
	6	R07	Viab	Ext.	4.1408	M	External, No Abnormalities Detected		
	7	R06	Viab	Ext.	4.1006	M	External, No Abnormalities Detected		
	8	R05	Viab	Ext.	3.9136	F	External, No Abnormalities Detected		
	9	R04	Viab	Ext.	4.0916	M	External, No Abnormalities Detected		
	10	R03	Viab	Ext.	3.8258	F	External, No Abnormalities Detected		
	11	R02	Viab	Ext.	4.1002	M	External, No Abnormalities Detected		
	12	R01	Viab	Ext.	3.8043	M	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)
Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 4 375 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
74							CL_Left 10 CL_Right 15 Gravid Uterus Wt (g) 74.65 Pregnancy Type: Pregnant Early PM: No		
		L01	Late						
		L03	Earl						
	2	L02	Viab	Ext.	4.2715	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.9569	F	External, No Abnormalities Detected		
	5	R09	Viab	Ext.	4.0883	M	External, No Abnormalities Detected		
	6	R08	Viab	Ext.	4.3546	M	External, No Abnormalities Detected		
	7	R07	Viab	Ext.	3.8376	M	External, No Abnormalities Detected		
	8	R06	Viab	Ext.	4.0373	F	External, No Abnormalities Detected		
	9	R05	Viab	Ext.	4.1994	M	External, No Abnormalities Detected		
	10	R04	Viab	Ext.	3.8004	M	External, No Abnormalities Detected		
	11	R03	Viab	Ext.	3.7109	F	External, No Abnormalities Detected		
	12	R02	Viab	Ext.	3.9452	F	External, No Abnormalities Detected		
	13	R01	Viab	Ext.	3.8987	M	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 4 375 ppm										
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations			
76							CL_Left 9	CL_Right 5	Gravid Uterus Wt (g) 93.10	
							Pregnancy Type: Pregnant	Early PM: No		
	1	L01	Viab	Ext.	3.7644	F	External, No Abnormalities Detected			
	2	L02	Viab	Ext.	3.9577	F	External, No Abnormalities Detected			
	3	L03	Viab	Ext.	4.4271	M	External, No Abnormalities Detected			
	4	L04	Viab	Ext.	3.8545	F	External, No Abnormalities Detected			
	5	L05	Viab	Ext.	3.7131	F	External, No Abnormalities Detected			
	6	L06	Viab	Ext.	4.0898	M	External, No Abnormalities Detected			
	7	L07	Viab	Ext.	4.1300	M	External, No Abnormalities Detected			
	8	L08	Viab	Ext.	4.2346	M	External, No Abnormalities Detected			
	9	L09	Viab	Ext.	4.0815	F	External, No Abnormalities Detected			
	10	R06	Viab	Ext.	4.4667	M	External, No Abnormalities Detected			
	11	R05	Viab	Ext.	4.1175	M	External, No Abnormalities Detected			
	12	R04	Viab	Ext.	3.9115	F	External, No Abnormalities Detected			
	13	R03	Viab	Ext.	3.9951	M	External, No Abnormalities Detected			
	14	R02	Viab	Ext.	3.9198	F	External, No Abnormalities Detected			
	15	R01	Viab	Ext.	3.8417	F	External, No Abnormalities Detected			

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 4 375 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
78							CL_Left 6	CL_Right 9	Gravid Uterus Wt (g) 69.87 Pregnancy Type: Pregnant Early PM: No
	1	L01	Viab	Ext.	3.7129	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.8166	M	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	3.9827	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.9761	F	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	3.8429	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	3.5808	F	External, No Abnormalities Detected		
	7	R06	Viab	Ext.	3.9396	F	External, No Abnormalities Detected		
	8	R05	Viab	Ext.	3.6770	F	External, No Abnormalities Detected		
	9	R04	Viab	Ext.	3.4983	M	External, No Abnormalities Detected		
	10	R03	Viab	Ext.	4.0403	M	External, No Abnormalities Detected		
	11	R02	Viab	Ext.	3.8256	M	External, No Abnormalities Detected		
	12	R01	Viab	Ext.	3.7483	M	External, No Abnormalities Detected		
80							CL_Left 9	CL_Right 3	Gravid Uterus Wt (g) 74.90 Pregnancy Type: Pregnant Early PM: No
	1	L01	Viab	Ext.	4.1727	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.5447	M	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)
Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 4 375 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g		Sex	Observations	
80	3	L03	Viab	Ext.	4.4158		M	External, No Abnormalities Detected	
	4	L04	Viab	Ext.	4.6096		M	External, No Abnormalities Detected	
	5	L05	Viab	Ext.	4.0112		F	External, No Abnormalities Detected	
	6	L06	Viab	Ext.	4.2640		F	External, No Abnormalities Detected	
	7	L07	Viab	Ext.	4.0600		F	External, No Abnormalities Detected	
	8	L08	Viab	Ext.	4.3713		M	External, No Abnormalities Detected	
	9	L09	Viab	Ext.	4.7045		F	External, No Abnormalities Detected	
	10	R02	Viab	Ext.	4.1427		M	External, No Abnormalities Detected	
	11	R01	Viab	Ext.	4.2140		M	External, No Abnormalities Detected	

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 5 750 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
82							CL_Left 10 CL_Right 5	Gravid Uterus Wt (g) 70.78	
							Pregnancy Type: Pregnant	Early PM: No	
		L06	Earl						
	1	L01	Viab	Ext.	4.0919	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.2243	M	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	4.3024	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.2982	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.0393	F	External, No Abnormalities Detected		
	7	L07	Viab	Ext.	3.9833	M	External, No Abnormalities Detected		
	8	L08	Viab	Ext.	4.1667	F	External, No Abnormalities Detected		
	9	R04	Viab	Ext.	4.4367	M	External, No Abnormalities Detected		
	10	R03	Viab	Ext.	3.8075	F	External, No Abnormalities Detected		
	11	R02	Viab	Ext.	4.0065	F	External, No Abnormalities Detected		
	12	R01	Viab	Ext.	4.1204	M	External, No Abnormalities Detected		
84							CL_Left 6 CL_Right 6	Gravid Uterus Wt (g) 61.01	
							Pregnancy Type: Pregnant	Early PM: No	
	1	L01	Viab	Ext.	3.6941	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.9002	M	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 5 750 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
84	3	L03	Viab	Ext.	4.0657	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.0612	F	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.0853	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	3.9730	F	External, No Abnormalities Detected		
	7	R04	Viab	Ext.	3.5977	F	External, No Abnormalities Detected		
	8	R03	Viab	Ext.	3.4995	F	External, No Abnormalities Detected		
	9	R02	Viab	Ext.	3.8158	F	External, No Abnormalities Detected		
	10	R01	Viab	Ext.	3.7395	M	External, No Abnormalities Detected		
86							CL_Left 9	CL_Right 7	Gravid Uterus Wt (g) 71.23
							Pregnancy Type: Pregnant Early PM: No		
	1	L01	Viab	Ext.	4.1056	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.9706	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	4.4682	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	3.6324	F	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.1560	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	4.2301	M	External, No Abnormalities Detected		
	7	L07	Viab	Ext.	4.2222	M	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 5 750 ppm							
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations
86	8	R04	Viab	Ext.	4.1466	F	External, No Abnormalities Detected
	9	R03	Viab	Ext.	3.6704	F	External, No Abnormalities Detected
	10	R02	Viab	Ext.	4.2089	M	External, No Abnormalities Detected
	11	R01	Viab	Ext.	4.0387	M	External, No Abnormalities Detected
88							CL_Left 9 CL_Right 6 Gravid Uterus Wt (g) 87.13 Pregnancy Type: Pregnant Early PM: No
	1	L01	Viab	Ext.	4.0627	F	External, No Abnormalities Detected
	2	L02	Viab	Ext.	4.1771	M	External, No Abnormalities Detected
	3	L03	Viab	Ext.	4.3990	M	External, No Abnormalities Detected
	4	L04	Viab	Ext.	4.0664	F	External, No Abnormalities Detected
	5	L05	Viab	Ext.	4.6075	M	External, No Abnormalities Detected
	6	L06	Viab	Ext.	3.8700	F	External, No Abnormalities Detected
	7	L07	Viab	Ext.	4.2638	M	External, No Abnormalities Detected
	8	R06	Viab	Ext.	4.3932	M	External, No Abnormalities Detected
	9	R05	Viab	Ext.	4.2444	M	External, No Abnormalities Detected
	10	R04	Viab	Ext.	4.3734	M	External, No Abnormalities Detected
	11	R03	Viab	Ext.	4.4035	F	External, No Abnormalities Detected

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 5 750 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
88	12	R02	Viab	Ext.	4.2570	M	External, No Abnormalities Detected		
	13	R01	Viab	Ext.	3.4940	M	External, No Abnormalities Detected		
90							CL_Left 8 CL_Right 9 Gravid Uterus Wt (g) 76.53 Pregnancy Type: Pregnant Early PM: No		
		L03	Earl						
	1	L01	Viab	Ext.	3.9399	F	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.1572	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.1715	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.1035	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	4.1551	F	External, No Abnormalities Detected		
	7	R07	Viab	Ext.	4.1415	M	External, No Abnormalities Detected		
	8	R06	Viab	Ext.	3.9181	F	External, No Abnormalities Detected		
	9	R05	Viab	Ext.	4.0739	M	External, No Abnormalities Detected		
	10	R04	Viab	Ext.	4.0901	F	External, No Abnormalities Detected		
	11	R03	Viab	Ext.	3.9462	F	External, No Abnormalities Detected		
	12	R02	Viab	Ext.	3.8956	F	External, No Abnormalities Detected		
	13	R01	Viab	Ext.	3.8824	F	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 5 750 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
92							CL_Left 7	CL_Right 8	Gravid Uterus Wt (g) 85.72 Pregnancy Type: Pregnant Early PM: No
		R01	Earl						
	1	L01	Viab	Ext.	4.0723	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	3.9178	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	4.0143	F	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.0759	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.2608	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	4.1751	F	External, No Abnormalities Detected		
	7	L07	Viab	Ext.	4.2932	M	External, No Abnormalities Detected		
	8	R07	Viab	Ext.	3.7072	F	External, No Abnormalities Detected		
	9	R06	Viab	Ext.	4.0365	F	External, No Abnormalities Detected		
	10	R05	Viab	Ext.	3.9949	M	External, No Abnormalities Detected		
	11	R04	Viab	Ext.	3.9959	M	External, No Abnormalities Detected		
	12	R03	Viab	Ext.	4.0907	M	External, No Abnormalities Detected		
	13	R02	Viab	Ext.	3.8415	M	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 5 750 ppm											
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations				
94							CL_Left 7	CL_Right 5	Gravid Uterus	Wt (g) 77.70	
							Pregnancy Type: Pregnant		Early PM: No		
	1	L01	Viab	Ext.	3.9464	M	External, No Abnormalities Detected				
	2	L02	Viab	Ext.	3.7800	F	External, No Abnormalities Detected				
	3	L03	Viab	Ext.	4.0264	M	External, No Abnormalities Detected				
	4	L04	Viab	Ext.	3.9398	M	External, No Abnormalities Detected				
	5	L05	Viab	Ext.	3.9686	F	External, No Abnormalities Detected				
	6	L06	Viab	Ext.	4.4792	M	External, No Abnormalities Detected				
	7	L07	Viab	Ext.	4.0524	M	External, No Abnormalities Detected				
	8	R06	Viab	Ext.	4.0807	M	External, No Abnormalities Detected				
	9	R05	Viab	Ext.	4.1311	F	External, No Abnormalities Detected				
	10	R04	Viab	Ext.	4.3721	M	External, No Abnormalities Detected				
96	11	R03	Viab	Ext.	4.0428	M	External, No Abnormalities Detected				
	12	R02	Viab	Ext.	3.9228	M	External, No Abnormalities Detected				
							CL_Left 8	CL_Right 7	Gravid Uterus	Wt (g) 72.42	
							Pregnancy Type: Pregnant		Early PM: No		
	1	L01	Viab	Ext.	4.4031	F	External, No Abnormalities Detected				
	2	L02	Viab	Ext.	4.4896	F	External, No Abnormalities Detected				
	3	L03	Viab	Ext.	4.4098	F	External, No Abnormalities Detected				

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 5 750 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
96	4	L04	Viab	Ext.	4.8260	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.7788	M	External, No Abnormalities Detected		
	6	R05	Viab	Ext.	4.8401	M	External, No Abnormalities Detected		
	7	R04	Viab	Ext.	4.3527	F	External, No Abnormalities Detected		
	8	R03	Viab	Ext.	4.5250	F	External, No Abnormalities Detected		
	9	R02	Viab	Ext.	4.1413	F	External, No Abnormalities Detected		
	10	R01	Viab	Ext.	4.6105	M	External, No Abnormalities Detected		
98							CL_Left 6 CL_Right 9 Gravid Uterus Wt (g) 91.80 Pregnancy Type: Pregnant Early PM: No		
		L06	Earl						
	1	L01	Viab	Ext.	4.4695	M	External, No Abnormalities Detected		
	2	L02	Viab	Ext.	4.0755	F	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	4.4045	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.3500	M	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	4.0409	F	External, No Abnormalities Detected		
	7	L07	Viab	Ext.	4.1402	F	External, No Abnormalities Detected		
	8	R08	Viab	Ext.	4.5432	M	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 5 750 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g	Sex	Observations		
98	9	R07	Viab	Ext.	4.7165	M	External, No Abnormalities Detected		
	10	R06	Viab	Ext.	3.9943	M	External, No Abnormalities Detected		
	11	R05	Viab	Ext.	4.4172	M	External, No Abnormalities Detected		
	12	R04	Viab	Ext.	4.1137	F	External, No Abnormalities Detected		
	13	R03	Viab	Ext.	4.1920	M	External, No Abnormalities Detected		
	14	R02	Viab	Ext.	4.1326	M	External, No Abnormalities Detected		
	15	R01	Viab	Ext.	4.5871	M	External, No Abnormalities Detected		
100							CL_Left 10 CL_Right 9 Gravid Uterus Wt (g) 75.51 Pregnancy Type: Pregnant Early PM: No		
		L02	Earl						
	1	L01	Viab	Ext.	4.3575	M	External, No Abnormalities Detected		
	3	L03	Viab	Ext.	3.9841	M	External, No Abnormalities Detected		
	4	L04	Viab	Ext.	4.0150	F	External, No Abnormalities Detected		
	5	L05	Viab	Ext.	3.8715	M	External, No Abnormalities Detected		
	6	L06	Viab	Ext.	3.6843	F	External, No Abnormalities Detected		
	7	R07	Viab	Ext.	4.0401	M	External, No Abnormalities Detected		
	8	R06	Viab	Ext.	4.2870	M	External, No Abnormalities Detected		

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite
'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

Table B6. Individual Fetal Data (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Group: 5 750 ppm									
Dam Number	UFI	Posn	Type	Exam Set	Foetal Wt g		Sex	Observations	
100	9	R05	Viab	Ext.	3.2923		F	External, No Abnormalities Detected	
	10	R04	Viab	Ext.	3.9040		F	External, No Abnormalities Detected	
	11	R03	Viab	Ext.	3.9457		F	External, No Abnormalities Detected	
	12	R02	Viab	Ext.	3.6292		F	External, No Abnormalities Detected	
	13	R01	Viab	Ext.	3.5331		F	External, No Abnormalities Detected	

'UFI' = Unique Fetal Identity; Sexes: 'M' = Male, 'F' = Female, 'U' = Unsexed, 'H' = Hermaphrodite

'Type': 'Viab' = Live fetus, 'Earl' = Early Resorption, 'Dead' = Dead fetus

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Table B7. Individual Female Organ Weights

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female

0 ppm	Terminal Body Weight (g)	Liver (g)	Kidneys (g)	Liver Ratio (%)	Kidneys Ratio (%)
4	374.0	17.9300	2.0400	4.7941	0.5455
6	NM ^a	14.8800	1.8400	.	.
8	. ^b	NM ^a	2.4200	.	.
10	413.8	21.6300	2.3600	5.2272	0.5703
12	348.2	14.7300	2.2300	4.2303	0.6404
14	376.2	17.8000	2.1000	4.7315	0.5582
16	341.3	14.5700	1.9300	4.2690	0.5655
18	356.5	17.2000	1.7000	4.8247	0.4769
20	334.9	16.0500	2.3200	4.7925	0.6927
Mean	363.56	16.84875	2.10444	4.69561	0.57850
SEM	10.23	0.83723	0.08293	0.13076	0.02626
N	7	8	9	7	7

^aWeight was inadvertently not recorded.

^bWeight was unrealistic so it was excluded.

Table B7. Individual Female Organ Weights (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female

37.5 ppm	Terminal Body Weight (g)	Liver (g)	Kidneys (g)	Liver Ratio (%)	Kidneys Ratio (%)
22	320.6	14.6100	1.7500	4.5571	0.5459
24	273.3	11.8400	2.1600	4.3322	0.7903
26	361.2	16.4200	2.1500	4.5460	0.5952
28	342.2	14.5800	1.8400	4.2607	0.5377
30	345.1	14.8000	1.8300	4.2886	0.5303
32	392.1	18.8000	2.3000	4.7947	0.5866
34	316.3	14.2500	1.9600	4.5052	0.6197
36	387.7	18.2000	2.0000	4.6944	0.5159
38	413.1	17.6900	2.2800	4.2823	0.5519
40	399.1	19.0000	2.2000	4.7607	0.5512
Mean	355.07	16.01900	2.04700	4.50218	0.58247
SEM	13.91	0.74882	0.06263	0.06459	0.02521
N	10	10	10	10	10

Table B7. Individual Female Organ Weights (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female

187 ppm	Terminal Body Weight (g)	Liver (g)	Kidneys (g)	Liver Ratio (%)	Kidneys Ratio (%)
42	333.3	12.8800	1.8700	3.8644	0.5611
44	302.2	12.1200	1.6600	4.0106	0.5493
46	334.3	14.2400	1.8400	4.2596	0.5504
48	335.3	14.5500	1.8600	4.3394	0.5547
50	349.0	15.4200	2.2100	4.4183	0.6332
52	355.1	17.5100	2.1500	4.9310	0.6055
54	347.3	15.3000	1.9000	4.4054	0.5471
56	382.2	14.9600	1.9700	3.9142	0.5154
58	376.8	17.7000	2.2000	4.6975	0.5839
60	414.1	19.8800	2.4100	4.8008	0.5820
Mean	352.96	15.45600	2.00700	4.36412	0.56826
SEM	9.91	0.73908	0.07171	0.11626	0.01064
N	10	10	10	10	10

Table B7. Individual Female Organ Weights (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female

375 ppm	Terminal Body Weight (g)	Liver (g)	Kidneys (g)	Liver Ratio (%)	Kidneys Ratio (%)
62	338.3	14.1700	1.9400	4.1886	0.5735
64	394.0	17.1600	2.3500	4.3553	0.5964
66	387.2	18.9100	2.0700	4.8838	0.5346
68	318.7	13.9100	1.8700	4.3646	0.5868
70	366.3	15.9400	2.4800	4.3516	0.6770
72	362.0	16.3000	2.1000	4.5028	0.5801
74	381.1	17.2100	2.2500	4.5159	0.5904
76	361.5	15.0000	1.8000	4.1494	0.4979
78	333.7	13.4100	1.8800	4.0186	0.5634
80	372.5	17.3000	2.2000	4.6443	0.5906
Mean	361.53	15.93100	2.09400	4.39748	0.57907
SEM	7.74	0.56213	0.07125	0.08002	0.01455
N	10	10	10	10	10

Table B7. Individual Female Organ Weights (continued)

Dose Range-Finding Study for the Developmental Toxicity Evaluation of Sodium
Molybdate Dihydrate (CAS No. 10102-40-6) Administered in the Diet to CD (Sprague Dawley) Rats

Sex: Female

750 ppm	Terminal Body Weight (g)	Liver (g)	Kidneys (g)	Liver Ratio (%)	Kidneys Ratio (%)
82	345.4	14.9600	1.8100	4.3312	0.5240
84	317.3	13.4700	1.9500	4.2452	0.6146
86	350.8	15.0900	1.9800	4.3016	0.5644
88	398.5	16.5300	2.1700	4.1481	0.5445
90	347.0	16.0600	2.1400	4.6282	0.6167
92	399.3	19.8100	2.4000	4.9612	0.6011
94	367.3	15.0000	1.9000	4.0839	0.5173
96	348.3	14.4000	1.9800	4.1344	0.5685
98	379.1	17.3000	1.9000	4.5634	0.5012
100	349.5	15.7200	2.1200	4.4979	0.6066
Mean	360.25	15.83400	2.03500	4.38950	0.56589
SEM	8.15	0.55940	0.05478	0.08657	0.01358
N	10	10	10	10	10

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Appendix C:

MSU Analytical Results

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APPENDIX C

Molybdenum Sample Analysis by ICP-MS

Molybdenum analysis was performed by inductively coupled plasma – mass spectroscopy (ICP-MS) by the Diagnostic Center for Population and Animal Health in the College of Veterinary Medicine at Michigan State University. Details of the analytical procedure are as follows.

Feed samples were dried overnight in a 75 degree Celsius oven, and a dry matter ratio was obtained by measuring the moisture lost in drying. Dry feeds were weighed out and digested overnight in a 95 degree Celsius oven in individual sealed vessels with 1 ml nitric acid: 100 mg feed ratio. The resulting solution was diluted with 18 MΩ water to a final mass of 25g. The concentrated solutions and salts were further diluted with 18 MΩ water to lower the concentration of the analytes in the diluted samples into the calibration range.

Organ tissue samples were sectioned to 1g pieces. These were dried overnight in a 75 degree Celsius oven, and a dry matter ratio was obtained by measuring the moisture lost in drying. The dried tissues were weighed out and digested overnight in a 95 degree Celsius oven in individual sealed vessels with 1 ml nitric acid: 100 mg dry tissue ratio. The resulting solution was diluted with 18 MΩ water to a final mass of 25g.

Whole fetal samples were homogenized with a Brinkman Polytron with a 1cm homogenizer probe with saw tooth blades operated at greater than 20,000 rpm. One gram aliquots of the resulting slurry were weighed out. These were dried overnight in a 75 degree Celsius oven, and a dry matter ratio was obtained by measuring the moisture lost in drying. The dried fetal homogenates were weighed out and digested overnight in a 95 degree Celsius oven in individual sealed vessels with 1 ml nitric acid: 100 mg dry tissue ratio. The resulting solution was diluted with 18 MΩ water to a final mass of 25g.

200 µL of each digest, and serum/blood samples, were pipetted and diluted with 5mL of a solution containing 0.5% EDTA and Triton X-100, 1% ammonia hydroxide, 2% propanol and 20ppb of scandium, rhodium, indium and bismuth as internal standards. An Agilent 7500ce Inductively Coupled Plasma – Mass Spectrometer (ICP-MS) was used for the analysis. The ICP-MS was tuned to yield a minimum of 5000 cps sensitivity for 1ppb yttrium (mass 89), less than 1.0% oxide level as determined by the 156/140 mass ratio and less than 2.0% double charged ions as determined by the 70/140 mass ratio. Each element was calibrated using a 4 point linear curve of the analyte:internal standard response ratio.

Three modes were used to minimize the spectral interferences for the analysis. Copper (mass 65), zinc (mass 66) and cobalt (mass 59) were analyzed in helium mode. Selenium (mass 78) and iron (mass 56) were analyzed in hydrogen mode. Lastly, manganese (mass 55), and molybdenum (mass 95) were analyzed in non-gas mode.

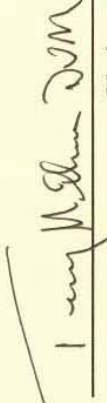
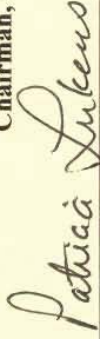
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**The American Association
of
Veterinary Laboratory Diagnosticians
Accreditation Committee**

certifies that

*Diagnostic Center for Population and Animal Health
Michigan State University
Lansing, Michigan*

*Has met the standard for
Full Accreditation/All species*



Chairman, Committee

Administrative Assistant, Committee

Expires December 31, 2012

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Analyzed April 2012

Sample Label	Sample Matrix	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)	Sulfate (µg/g dry)
2018CM 101211MA	ground feed	91.94	1027000	88.60	749.0	13.35	93.37	306.3	1109	940
5007 Dec 2111	pelleted feed	88.86	72480	81.68	326.5	11.89	81.68	385.8	1907	1890
5004 Dec 1911	pelleted feed	89.56	80330	81.17	309.7	12.95	97.94	333.4	1870	1890
5002 Dec 1511	pelleted feed	89.43	70920	86.05	281.4	12.03	90.04	385.3	1575	1820

Sample Label	Concentration (ppm)	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
lot DEC09112A		89.57	74025	137.15	337	11.49	76.425	278.95	2000.5
032612-A-02-1A	0	89.74	83790	162.9	314.65	11.0875	76.075	272	2006.5
032612-A-02-2A	37.5	89.47	78255	168.85	301.35	12.88	76.2	288.8	16790
032612-A-02-2B	37.5	89.89	75340	182.2	348.85	12.375	73.845	295.9	16145
032612-A-02-2C	37.5	88.98	78320	204.25	357.7	11.82	94.5	307	17099
032612-A-02-2D	37.5	89.14	71705	150.55	369	11.89	80.26	286.35	16645
032612-A-02-3A	187	89.47	91065	187.25	329.15	10.4	86.13	298.8	75645
032612-A-02-4A	375	89.17	87265	191.45	326.15	11.005	85.375	295.25	150950
032612-A-02-5A	750	89.37	86330	235.45	344.65	12.295	75.01	310.2	298200
032612-A-02-5B	750	88.87	80710	187.15	339.3	13.055	88.64	302.6	299200
032612-A-02-5C	750	89.54	76855	184.65	303.8	12.535	77.845	294.5	298950
032612-A-02-5D	750	88.97	82085	179.05	361.85	11.49	73.735	300.55	299350

Sample Label	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
NIST 1568a	N/A	19110	7.098	17.03	2.43	19.13	348.2	1421
NIST 1568a	N/A	19290	7.055	17.74	2.507	19.01	344.5	1416
NIST 1568a	N/A	20050	7.283	16.96	2.589	19.47	350.8	1421
NIST 1568a	Expected range(+/-)	20000	7.4	18	2.4	19.4	0.38	1.46
		1600	0.9	N/A	0.3	0.5	0.04	0.08

Analyzed May 2012

Sample Label	Sample Matrix	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
2018CM 101211MA	ground feed	88	1050621	94	742	13	91	293	1048
5007 Dec 2111	pelleted feed	93	67769	80	339	11	84	390	1945
5004 Dec 1911	pelleted feed	90	78000	85	318	13	96	325	1969
5002 Dec 1511	pelleted feed	86	72055	82	266	12	94	384	1602

Sample Label	Concentration (ppm)	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
lot DEC09112A		89.5	78022	147.88	334.1	10.78	77.55	278.48	1987.1
032612-A-02-1A	0	89.02	85550	158.5	301.1	10.56	78.36	278.3	2111
032612-A-02-2A	37.5	89.38	81307	158.7	296.5	12.98	77.80	287.1	15648
032612-A-02-2B	37.5	84.41	71347	184.2	334.9	12.73	73.25	314.2	15661
032612-A-02-2C	37.5	92.54	74639	190.6	362.7	11.68	96.67	325.7	16877
032612-A-02-2D	37.5	93.24	70414	148.0	365.3	11.93	84.43	273.2	15563
032612-A-02-3A	187	91.98	87240	177.3	320.6	10.31	81.65	305.1	75115
032612-A-02-4A	375	85.51	83513	190.7	308.5	10.56	80.85	290.5	140233
032612-A-02-5A	750	85.88	84690	248.4	338.8	12.09	72.83	303.1	298498
032612-A-02-5B	750	86.65	82405	183.8	346.1	12.98	88.73	287.8	314459
032612-A-02-5C	750	84.88	79084	192.4	308.7	12.90	77.61	309.8	312403
032612-A-02-5D	750	91.73	81182	183.7	340.9	11.20	75.95	305.1	289771

Sample Label	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
NIST 1568a	N/A	19989	6.98	17.52	2.54	18.04	329.05	1422
NIST 1568a	N/A	19830	6.75	16.64	2.59	18.93	330.03	1485
NIST 1568a	N/A	18647	6.89	17.67	2.55	18.40	356.06	1506
NIST 1568a	Expected range(+/-)	20000	7.4	18	2.4	19.4	0.38	1.46
		1600	0.9	N/A	0.3	0.5	0.04	0.08

Dam#	Dose (mg/kg)	Gender	Age	specimen	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
2	0	female	fetus	liver	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	0	female	fetus	liver	19.8	1746	1180	27.71	61.07	262	1533	209.3
6	0	female	fetus	liver	19.9	1620	1009	25.83	67.58	225.1	1706	183.1
8	0	female	fetus	liver	20.0	1861	739.4	26.02	72.54	239.6	1489	188.1
10	0	female	fetus	liver	19.3	1361	968.4	26.81	72.94	228.4	1617	183.6
12	0	female	fetus	liver	20.3	1588	964.8	25.51	65.14	219.2	1593	185.2
14	0	female	fetus	liver	19.8	1686	970.8	24.48	77.89	308	1650	214.7
16	0	female	fetus	liver	18.8	1606	903.2	31.15	70.21	249.4	1538	173.6
18	0	female	fetus	liver	20.1	1818	805.2	29.94	73.7	211.5	1671	200.7
20	0	female	fetus	liver	20.1	2076	1312	22.15	80.52	236.1	1936	196.3
22	37.5	female	fetus	liver	20.1	1850	788.9	28.44	53.82	285.4	1588	625.9
24	37.5	female	fetus	liver	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
26	37.5	female	fetus	liver	19.8	1953	1006	28.74	48.99	268.4	1553	705.8
28	37.5	female	fetus	liver	19.8	1429	797.3	29.94	60.16	225.7	1751	682.8
30	37.5	female	fetus	liver	20.1	2152	1042	27.52	70.2	271.5	1418	520.6
32	37.5	female	fetus	liver	20.3	1693	918.2	33.21	66.97	244.5	1715	645.2
34	37.5	female	fetus	liver	18.9	1893	1172	29.45	56.1	211.8	1687	519.2
36	37.5	female	fetus	liver	20.3	1367	739.5	26.32	63.71	201	1520	789.3
38	37.5	female	fetus	liver	20.5	1834	687.3	30.86	52.86	264	1447	541.8
40	37.5	female	fetus	liver	19.9	2082	842.2	26.27	65.22	278.7	1706	667.4
42	187	female	fetus	liver	20.6	3208	991.1	37.23	60.5	290.1	1615	1792
44	187	female	fetus	liver	20.5	1895	838.6	28.6	79.82	242.5	1622	1688
46	187	female	fetus	liver	19.8	1923	816.2	22.84	71.69	254.9	1742	2214
48	187	female	fetus	liver	20.4	2204	1060	27.69	81.23	261.2	1632	2742
50	187	female	fetus	liver	19.6	1600	771.9	31.76	62.37	257.7	1639	2131
52	187	female	fetus	liver	19.8	1435	938.8	25.65	78.57	264.8	1682	3769
54	187	female	fetus	liver	19.5	1606	1025	26.08	94.14	225.2	1887	2727
56	187	female	fetus	liver	19.3	1875	909.5	35	64.7	237.4	1562	6132
58	187	female	fetus	liver	20.2	1939	897.9	28.96	63.17	288.9	1595	1795
60	187	female	fetus	liver	19.6	1371	978.6	30.46	71.84	214.3	1683	3855
62	375	female	fetus	liver	19.6	1602	968	35.6	55.93	221.6	1473	5203
64	375	female	fetus	liver	20.6	1975	1111	28.55	53.21	277.9	1432	4586
66	375	female	fetus	liver	19.9	1835	922.5	22.75	79.87	216.5	1759	8161
68	375	female	fetus	liver	20.1	2406	807.5	27.92	72.36	276.7	1455	3216
70	375	female	fetus	liver	20.4	1778	848.6	38.48	74.59	268.4	1660	4425
72	375	female	fetus	liver	20.4	1662	832.7	30.58	51.75	232.8	1325	5723
74	375	female	fetus	liver	19.6	1891	1161	28.03	81.44	253.7	1694	8212
76	375	female	fetus	liver	19.5	2341	876.7	31.92	75.65	247.5	1671	5331
78	375	female	fetus	liver	19.3	1840	843	26.33	54.02	237.1	1774	4148
80	375	female	fetus	liver	19.3	1763	1018	21.56	68.96	225.3	1612	5062
82	750	female	fetus	liver	19.9	1570	765.3	26.95	70.45	272.5	1441	4936
84	750	female	fetus	liver	19.4	2429	920.7	22.71	66.47	268.2	1565	12540
86	750	female	fetus	liver	19.6	1777	1045	33.79	75.61	325.2	1621	7067
88	750	female	fetus	liver	19.8	1819	1045	37.16	83.83	309.8	1686	6392
90	750	female	fetus	liver	19.2	2131	1108	33.23	70.59	239.5	1585	9342
92	750	female	fetus	liver	19.5	2039	885	35.22	61.51	267.8	1913	8711
94	750	female	fetus	liver	19.7	2040	1004	38.61	80.93	273.8	1892	7465

Dam#	Dose (mg/kg)	Gender	Age	specimen	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
96	750	female	fetus	liver	19.8	1858	1100	26.39	52.22	266.7	1450	10100
98	750	female	fetus	liver	19.6	2376	1044	36.79	54.2	206.6	1190	14660
100	750	female	fetus	liver	19.7	2265	1085	25.66	68.72	208.1	1535	16650
2	0	male	fetus	liver	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	0	male	fetus	liver	19.2	2230	1375	29.67	65.12	295.2	1702	218.5
6	0	male	fetus	liver	18.7	2201	1128	30.34	75.96	253.6	1990	186.7
8	0	male	fetus	liver	20.3	2109	793.2	28.21	63.35	254.9	1447	203.9
10	0	male	fetus	liver	19.5	1678	1002	26.98	80.84	220.4	1700	201.3
12	0	male	fetus	liver	19.5	1781	1029	22.55	54.92	235.8	1464	187.6
14	0	male	fetus	liver	19.8	1764	1036	23.42	73.18	277.9	1661	199
16	0	male	fetus	liver	19.6	1616	933.4	27.65	56.91	256.3	1493	194.7
18	0	male	fetus	liver	19.4	2233	944.1	27.61	61.4	261.8	1594	192.8
20	0	male	fetus	liver	19.4	1988	1335	19.94	63.13	266.2	2008	177.7
22	37.5	male	fetus	liver	19.2	2218	752.4	29.71	48.97	265.9	1432	598.4
24	37.5	male	fetus	liver	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
26	37.5	male	fetus	liver	18.9	2130	887.5	31.74	61.64	299.5	1575	726.7
28	37.5	male	fetus	liver	19.1	1789	906.8	35	59.55	236.3	1553	722.3
30	37.5	male	fetus	liver	19.2	2522	1066	29.29	78.62	309.8	1877	580.3
32	37.5	male	fetus	liver	19.5	1905	955.6	33.47	80.37	282.1	1869	678.9
34	37.5	male	fetus	liver	18.4	1953	1249	24.77	76.04	234	1855	653.5
36	37.5	male	fetus	liver	19.1	1869	886.7	31.02	64.51	254.6	1522	870.7
38	37.5	male	fetus	liver	19.9	2258	833.4	33.15	50.59	281.8	1549	571.4
40	37.5	male	fetus	liver	19.6	2443	947.5	27.49	70.86	294.3	1811	692.9
42	187	male	fetus	liver	19.2	2172	1116	36.96	54.83	304.6	1522	2028
44	187	male	fetus	liver	18.6	2066	1113	29.04	80.13	251.5	1855	2035
46	187	male	fetus	liver	19.4	2154	718.3	22.14	64.64	277.9	1592	2148
48	187	male	fetus	liver	20.5	2959	1165	37.32	97.46	297.8	1754	2712
50	187	male	fetus	liver	19.3	2025	504.1	31.22	68.61	284.9	1497	2360
52	187	male	fetus	liver	19.3	1915	1180	29.12	78.48	308.4	1852	3986
54	187	male	fetus	liver	19.2	1683	941.5	23.48	71.01	213.5	1437	2540
56	187	male	fetus	liver	20.6	2165	1024	36.76	57.2	273.8	1390	5794
58	187	male	fetus	liver	19.6	2144	882.1	34.82	86.64	296.9	1555	1794
60	187	male	fetus	liver	19.1	1465	1091	33.64	65.71	247.3	1470	3668
62	375	male	fetus	liver	19.7	1907	997.3	36.05	65.72	247	1575	5207
64	375	male	fetus	liver	19.2	1644	1045	17.49	40.71	194.4	1247	4435
66	375	male	fetus	liver	19.4	2111	959.1	26.34	78.56	262.7	1737	7593
68	375	male	fetus	liver	19.0	2618	846	24.92	72.47	295	1387	3633
70	375	male	fetus	liver	19.3	2253	1019	43.21	72.19	350.9	1734	4905
72	375	male	fetus	liver	19.6	1960	804.8	28.94	48.72	219.1	1394	5997
74	375	male	fetus	liver	19.9	1902	1059	30.87	76.64	253.9	1496	7392
76	375	male	fetus	liver	18.4	2315	830.5	30.86	70.7	242.7	1632	5215
78	375	male	fetus	liver	18.8	2024	851.3	26.46	55.58	255.3	1734	4419
80	375	male	fetus	liver	19.3	1768	928.9	24.29	44.09	267.8	1473	4973
82	750	male	fetus	liver	19.6	1669	979.3	27.36	78.73	273.4	1695	5835
84	750	male	fetus	liver	19.2	2827	1067	26.85	66.07	331.3	1629	12760
86	750	male	fetus	liver	20.4	1912	1019	30.1	61.63	311.5	1430	6424
88	750	male	fetus	liver	19.7	1882	1089	37.13	74.88	291.8	1679	6882

Dam#	Dose (mg/kg)	Gender	Age	specimen	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
90	750	male	fetus	liver	20.0	4185	1142	40.9	89.3	299.1	1597	9344
92	750	male	fetus	liver	18.8	2245	988.4	36.54	55.57	271.3	1899	8920
94	750	male	fetus	liver	20.0	2025	793.9	30.62	66.8	219	1328	6425
96	750	male	fetus	liver	19.7	1927	954.7	19.89	60.81	191	1567	9633
98	750	male	fetus	liver	19.2	3076	1059	41.54	72.6	234	1474	15750
100	750	male	fetus	liver	19.0	1998	1009	27.71	65.93	205.4	1545	16450
2	0	female	adult	liver	28.8	9245	199.3	78.92	13.47	81.24	3631	2584
4	0	female	adult	liver	29.7	9199	256.8	68.34	13.04	75.19	3395	2367
6	0	female	adult	liver	29.7	6965	75.26	75.26	12.56	76.33	3631	2207
8	0	female	adult	liver	27.7	10540	176.3	87.46	13.41	81.73	3539	2413
10	0	female	adult	liver	28.9	8280	229.9	79.86	12.18	75.9	3422	2542
12	0	female	adult	liver	28.7	9694	271.8	80.81	13.48	83.08	3491	2716
14	0	female	adult	liver	29.0	10270	202.7	75.65	13.07	78.91	3327	2492
16	0	female	adult	liver	28.8	11180	200.5	85.53	12.48	77.22	3520	2278
18	0	female	adult	liver	27.6	9583	166	71.66	13.67	76.5	3342	2573
20	0	female	adult	liver	28.9	8356	303.7	59.01	12.89	78.8	3496	2278
22	37.5	female	adult	liver	28.8	11260	160.6	88.38	13.74	80.81	3571	2937
24	37.5	female	adult	liver	30.0	8641	405.4	65.97	12.35	78.41	3897	2515
26	37.5	female	adult	liver	29.3	11260	180.5	104.1	13.14	81.79	3572	2961
28	37.5	female	adult	liver	29.0	11200	214.5	81.42	13.07	73.17	3255	2724
30	37.5	female	adult	liver	30.6	11800	202.3	115.2	14.23	83.68	3565	2631
32	37.5	female	adult	liver	28.2	9285	213.7	79.21	13.76	83.19	3522	2898
34	37.5	female	adult	liver	28.4	10090	287.5	69.59	13.37	84.11	3540	2920
36	37.5	female	adult	liver	29.0	7489	212	81.99	14.25	76.54	3135	3187
38	37.5	female	adult	liver	27.7	12850	181.9	97.16	14.66	79.34	3607	3018
40	37.5	female	adult	liver	28.9	11480	153.6	77.91	13.15	78.16	3298	2664
42	187	female	adult	liver	28.2	12640	227.6	94.32	13.93	92.2	3877	3970
44	187	female	adult	liver	29.0	10870	250.8	81.27	13.33	73.62	3155	3801
46	187	female	adult	liver	28.3	12380	191.1	65.26	13.76	84.06	3638	3671
48	187	female	adult	liver	29.4	12400	212.7	82.47	13.26	79.3	3279	4216
50	187	female	adult	liver	29.0	9740	215.9	89.35	13.3	76.55	3442	3699
52	187	female	adult	liver	28.8	9998	263.9	84.57	15.7	85.2	3517	5624
54	187	female	adult	liver	27.5	11750	228	76.43	15.61	85.25	3632	4281
56	187	female	adult	liver	27.7	12690	223.1	77.22	20.52	79.33	3316	8271
58	187	female	adult	liver	28.2	11410	198.8	107.6	16.75	79.85	3665	3536
60	187	female	adult	liver	27.9	11010	219.9	77.65	13.42	82.66	3596	5192
62	375	female	adult	liver	28.7	12270	263.8	74.34	15.26	87.83	3345	5396
64	375	female	adult	liver	29.0	11200	177.6	82.9	16.41	86.46	3753	6159
66	375	female	adult	liver	29.1	11190	190.7	86.17	19.6	79.69	3323	8762
68	375	female	adult	liver	29.1	14090	208	83.3	15.61	343.5	3765	5284
70	375	female	adult	liver	27.7	10000	212.1	105.3	15.23	93.88	3683	5743
72	375	female	adult	liver	28.1	10050	220.1	67.68	13.67	79.47	3632	7407
74	375	female	adult	liver	31.3	10050	260.2	68.23	18.08	82.4	3482	7442
76	375	female	adult	liver	28.7	12640	203.3	97.85	16.8	83.94	3331	6623
78	375	female	adult	liver	29.2	12500	189.9	96.29	13.13	73.58	3300	6170
80	375	female	adult	liver	29.3	12250	227.3	72.09	14.48	72.99	3265	6529
82	750	female	adult	liver	28.7	12120	197.4	90.89	14.48	80.03	3588	7539

Dam#	Dose (mg/kg)	Gender	Age	specimen	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
84	750	female	adult	liver	29.5	14360	224.6	74.15	24.91	85.96	3574	12960
86	750	female	adult	liver	29.2	12650	193.6	113.1	16.59	91.77	3763	7658
88	750	female	adult	liver	28.5	12010	282.9	89.75	15.43	86.44	3592	6529
90	750	female	adult	liver	29.5	13880	218.5	75.74	16.12	83.42	3568	9085
92	750	female	adult	liver	28.6	11150	219	84.49	13.31	77.47	3344	9307
94	750	female	adult	liver	29.0	12820	210.5	106.3	17.78	89	4036	8015
96	750	female	adult	liver	27.7	13550	234.6	71.07	22.12	85.92	3849	11530
98	750	female	adult	liver	29.1	4438	69.28	26.83	7.549	26.08	1096	5043
100	750	female	adult	liver	29.0	10980	242.5	90.29	24	78.53	3344	15720
2	0	female	adult	kidney	22.8	3816	329.5	731	25.94	82.88	4603	1097
4	0	female	adult	kidney	23.2	4348	297.6	460.1	29.57	78.46	4457	1466
6	0	female	adult	kidney	23.9	3838	278.3	489.2	23.55	73.73	4329	1349
8	0	female	adult	kidney	21.3	4498	220.2	492.3	16.03	74.39	4246	1292
10	0	female	adult	kidney	23.0	3967	399.9	659.3	31.93	88.27	4098	1602
12	0	female	adult	kidney	22.3	4089	362.3	594.7	35.72	98.86	5049	1573
14	0	female	adult	kidney	23.2	5043	366.6	770	36.43	103.1	5812	1862
16	0	female	adult	kidney	22.8	2871	231.4	423.3	15.51	63.24	3733	1096
18	0	female	adult	kidney	22.8	2933	184.1	385.7	18.66	55.95	3438	1030
20	0	female	adult	kidney	22.4	3414	317.8	472.8	24.07	73.75	4054	1073
22	37.5	female	adult	kidney	22.1	2913	210.2	355.8	17.67	55.6	3321	1761
24	37.5	female	adult	kidney	22.8	4240	390.4	494.8	49.73	93.06	5013	2551
26	37.5	female	adult	kidney	21.9	4202	302.5	536.1	33.49	82.79	4737	2828
28	37.5	female	adult	kidney	23.0	3955	311.9	571.6	25.99	75.75	4111	2642
30	37.5	female	adult	kidney	21.5	4104	224.8	637	20.56	80.04	4650	2353
32	37.5	female	adult	kidney	23.7	3965	291	412.9	22.27	79.94	4300	2756
34	37.5	female	adult	kidney	23.5	4415	299.9	481.4	23.96	80.72	4669	2916
36	37.5	female	adult	kidney	22.5	3708	264.4	511.6	26.31	78.4	4535	3512
38	37.5	female	adult	kidney	22.1	4471	277.2	400.6	16.58	74.24	4526	2530
40	37.5	female	adult	kidney	22.7	4970	257.8	416.1	27.47	82.68	4570	2877
42	187	female	adult	kidney	22.7	4549	298.1	383.2	16.67	82.27	4600	6179
44	187	female	adult	kidney	22.7	4587	265.3	472.8	22.16	78.54	4479	6488
46	187	female	adult	kidney	22.0	4696	306.6	638.6	20.22	114.3	5040	7496
48	187	female	adult	kidney	22.6	4850	281.4	567.2	32.18	79.43	4746	12790
50	187	female	adult	kidney	23.4	5170	255.2	446.2	22.47	81.26	4526	7012
52	187	female	adult	kidney	23.3	3916	295.3	527.5	34.89	73.64	3338	16820
54	187	female	adult	kidney	23.7	3911	285.4	545.1	63.64	78.84	4291	9320
56	187	female	adult	kidney	22.2	5199	293.8	541.7	68.43	82.25	3885	35320
58	187	female	adult	kidney	23.0	4868	284.4	588.8	21.28	75.98	4444	5024
60	187	female	adult	kidney	22.6	4308	305.7	488.4	28.11	81.57	4374	12300
62	375	female	adult	kidney	21.5	4942	309	541.3	38.72	74.27	4477	21710
64	375	female	adult	kidney	21.7	4474	279.5	378.2	31.1	77.06	4272	19570
66	375	female	adult	kidney	22.9	4161	248.5	427.5	62.5	68.76	4064	40940
68	375	female	adult	kidney	21.5	4932	270.4	488.1	41.34	87.1	3055	15160
70	375	female	adult	kidney	21.6	9125	588.4	826.2	72	165.2	9284	38310
72	375	female	adult	kidney	22.2	4789	377.2	541.8	34.99	82.24	5218	42600
74	375	female	adult	kidney	21.9	4776	225.1	449.8	43.41	78.31	4364	21210
76	375	female	adult	kidney	22.5	5417	326.6	666	28.72	86.27	4808	14080

Dam#	Dose (mg/kg)	Gender	Age	specimen	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
78	375	female	adult	kidney	21.6	5663	412.2	744	36.07	96.78	5530	18860
80	375	female	adult	kidney	22.6	4202	242.1	454.8	23.34	63.97	4018	17840
82	750	female	adult	kidney	21.7	4834	305.2	631.7	64.3	86	4989	76300
84	750	female	adult	kidney	21.5	5947	307.1	580	23.43	90.85	5312	28430
86	750	female	adult	kidney	22.8	5176	319.1	620.1	34	92.08	5269	19320
88	750	female	adult	kidney	21.9	5023	293	529.9	43.21	78.49	3666	28030
90	750	female	adult	kidney	21.9	4540	358.2	401.3	13.79	79.59	4508	23140
92	750	female	adult	kidney	21.4	3520	206.4	420	45.45	60.56	3507	27950
94	750	female	adult	kidney	21.6	5188	341.3	543.6	100	83.01	4953	60120
96	750	female	adult	kidney	21.4	4566	271.5	562.6	149.5	71.7	4326	94550
98	750	female	adult	kidney	21.1	5141	402.2	640.6	159.9	86.86	4633	112900
100	750	female	adult	kidney	21.8	1634	545.6	600	108.9	393.8	31740	20200
2	0	female	adult	placenta	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	0	female	adult	placenta	18.9	776.7	670	86.49	14.01	64	1928	267.8
6	0	female	adult	placenta	18.0	782.9	493.4	96.06	21.42	69.64	2399	406.4
8	0	female	adult	placenta	17.4	764	505.6	61.76	24.47	64.63	2438	371.1
10	0	female	adult	placenta	18.6	664.1	619.3	78.01	16.13	66.77	2100	187.3
12	0	female	adult	placenta	18.5	776.7	620	86.82	16.39	68.24	2059	212
14	0	female	adult	placenta	17.9	564.2	641.5	60.89	20.44	63.94	2167	301.8
16	0	female	adult	placenta	17.5	558.9	614.2	80.89	22.11	65.55	2124	191.1
18	0	female	adult	placenta	17.5	715.6	586.4	78.05	14.98	65.14	1839	199.6
20	0	female	adult	placenta	17.6	682.3	738.1	91.72	11.7	64.67	2188	147.1
22	37.5	female	adult	placenta	17.6	753.5	597.1	50.72	18.7	68.5	2041	852.2
24	37.5	female	adult	placenta	16.2	829.4	559.9	54.35	15.09	79.58	2292	1042
26	37.5	female	adult	placenta	18.1	739.3	632	56.21	17.79	67.19	2070	1094
28	37.5	female	adult	placenta	17.7	651	559.7	61.03	22.22	68.1	2390	1219
30	37.5	female	adult	placenta	17.1	751.5	588.8	73.96	17.04	69.64	2115	804.3
32	37.5	female	adult	placenta	18.1	741.2	557.8	61.48	16.61	70.96	2142	1188
34	37.5	female	adult	placenta	17.5	635.1	718.8	66.55	14.3	63.18	2012	884.1
36	37.5	female	adult	placenta	17.7	799.5	591.5	75.88	14.72	70	1889	1279
38	37.5	female	adult	placenta	17.3	749.7	486.9	91.98	14.2	68.62	1947	865.9
40	37.5	female	adult	placenta	17.8	730.6	572.4	72.55	17.57	66.68	2164	982
42	187	female	adult	placenta	17.5	809.6	596.5	66.44	14.97	67.21	2126	3264
44	187	female	adult	placenta	16.8	727.6	519.4	82.19	13.81	69.35	2002	3254
46	187	female	adult	placenta	17.8	625.6	535.3	72.1	19.18	63.39	2231	4335
48	187	female	adult	placenta	17.2	762.8	578	96.52	23.17	68.13	2075	7412
50	187	female	adult	placenta	17.8	698.6	481.3	74.2	17.77	68.82	2007	4054
52	187	female	adult	placenta	16.9	599.4	683.6	93.78	30.73	62.69	2280	12860
54	187	female	adult	placenta	17.6	604.6	648.7	75.29	29.66	67.62	2242	7705
56	187	female	adult	placenta	17.4	734.7	599.1	97.94	37.24	65.27	1870	16720
58	187	female	adult	placenta	17.1	624.6	704.6	67.22	20.02	61.74	2051	3157
60	187	female	adult	placenta	16.8	623.5	641.5	94.47	24.53	64.55	2174	9115
62	375	female	adult	placenta	17.4	735	567.1	99.28	28.18	68.05	1988	11190
64	375	female	adult	placenta	17.9	773.3	603.2	69.91	24.21	69.58	2061	13310
66	375	female	adult	placenta	18.1	743	626.1	97.52	35.17	67.45	1964	21950
68	375	female	adult	placenta	16.5	959.8	601.6	102.8	16.95	65.2	1805	7569
70	375	female	adult	placenta	18.2	713.8	538.1	85.35	20.47	71.3	1962	9428

Dam#	Dose (mg/kg)	Gender	Age	Specimen	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
72	375	female	adult	placenta	17.9	711.4	759.1	53.96	17.55	60.25	1998	12050
74	375	female	adult	placenta	17.1	631.4	723.3	102.8	41.88	67.16	2026	23540
76	375	female	adult	placenta	17.2	785.3	631.1	64.89	29.73	71.2	2065	12310
78	375	female	adult	placenta	16.3	687.2	599.1	94.54	14.52	69.89	2059	7700
80	375	female	adult	placenta	17.5	722.4	614.2	83.46	16.87	67.31	2048	9499
82	750	female	adult	placenta	18.0	710.8	632.2	86.75	18.03	64.39	2148	10700
84	750	female	adult	placenta	17.0	930.4	690.2	82.57	51.06	71.05	2042	37790
86	750	female	adult	placenta	18.2	765.3	667.8	61.9	23.28	66.85	2009	16030
88	750	female	adult	placenta	18.5	841.9	580	75.04	28.5	66.46	2112	13010
90	750	female	adult	placenta	18.4	860.5	569.3	77.02	21.76	71.02	2000	17890
92	750	female	adult	placenta	17.7	765.6	593.4	89.24	20.44	65.87	2096	15270
94	750	female	adult	placenta	18.4	692.2	648.4	73.35	32.84	63.5	2070	18220
96	750	female	adult	placenta	16.9	712.1	799.6	64.42	32.39	63.29	1904	25200
98	750	female	adult	placenta	18.0	1049	564	77.18	68.94	66.58	2133	52170
100	750	female	adult	placenta	17.8	849.9	552.3	84.11	50.64	65.68	2041	43490
2	0	female	fetus	carcass	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	0	female	fetus	carcass	8.4	1241	345.4	91.39	17.87	111.6	1189	841
6	0	female	fetus	carcass	12.4	1112	360.7	83.16	11.35	116.6	1228	437.3
8	0	female	fetus	carcass	12.1	1211	289	105	10.1	112.8	1155	521.2
10	0	female	fetus	carcass	12.4	1037	336.4	130.9	11.65	112.4	1168	602
12	0	female	fetus	carcass	12.4	1009	330	75.87	9.25	113.6	1175	298.6
14	0	female	fetus	carcass	12.0	1090	329.8	76.23	11.64	120.5	1204	466.7
16	0	female	fetus	carcass	11.7	938.7	306	81.27	9.307	118	1167	371.1
18	0	female	fetus	carcass	12.2	1138	301.3	50.91	8.701	115.1	1215	304
20	0	female	fetus	carcass	12.4	1161	376.9	63.14	7.044	107.6	1233	630.4
22	37.5	female	fetus	carcass	12.2	1466	305	241.7	13.19	125.4	1231	1501
24	37.5	female	fetus	carcass	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
26	37.5	female	fetus	carcass	12.1	1329	349.2	95.63	11.79	115.6	1213	1215
28	37.5	female	fetus	carcass	11.9	1185	331.7	88.33	17.34	122.2	1284	1385
30	37.5	female	fetus	carcass	12.4	1381	327.6	67.97	13.67	118	1259	914.8
32	37.5	female	fetus	carcass	11.8	1069	333.2	109.6	11.3	114.4	1292	1171
34	37.5	female	fetus	carcass	10.8	1478	436.1	171.5	12.22	111	1330	1547
36	37.5	female	fetus	carcass	11.9	1047	279.4	53.83	8.501	110.3	1206	1344
38	37.5	female	fetus	carcass	12.5	1153	289.7	48.29	9.91	120.4	1206	859.2
40	37.5	female	fetus	carcass	12.3	1327	297.8	41.25	8.297	121.8	1247	1084
42	187	female	fetus	carcass	12.3	1308	309.1	111.8	11.21	122.7	1274	3278
44	187	female	fetus	carcass	12.0	1217	312.8	65.15	9.86	114.8	1218	3126
46	187	female	fetus	carcass	12.0	1251	296.9	48.56	11.25	124.9	1205	3941
48	187	female	fetus	carcass	12.2	1325	350.8	58.91	14	120.7	1242	6010
50	187	female	fetus	carcass	8.9	1143	313	72.82	10.37	117.7	1190	3958
52	187	female	fetus	carcass	12.6	938.6	348.8	64.06	12.73	111.5	1208	7647
54	187	female	fetus	carcass	11.9	1096	357.8	87.25	12.26	117	1197	5609
56	187	female	fetus	carcass	11.7	1130	333.5	70.48	18.5	111.5	1151	11930
58	187	female	fetus	carcass	12.4	1119	309.4	63.23	9.913	118	1229	3044
60	187	female	fetus	carcass	12.1	958.6	327	98.73	12.77	109.3	1186	7078
62	375	female	fetus	carcass	12.1	967.9	380	208.7	16.75	112.7	1246	9878
64	375	female	fetus	carcass	12.2	1101	341.9	80.64	12.64	115.6	1152	8532

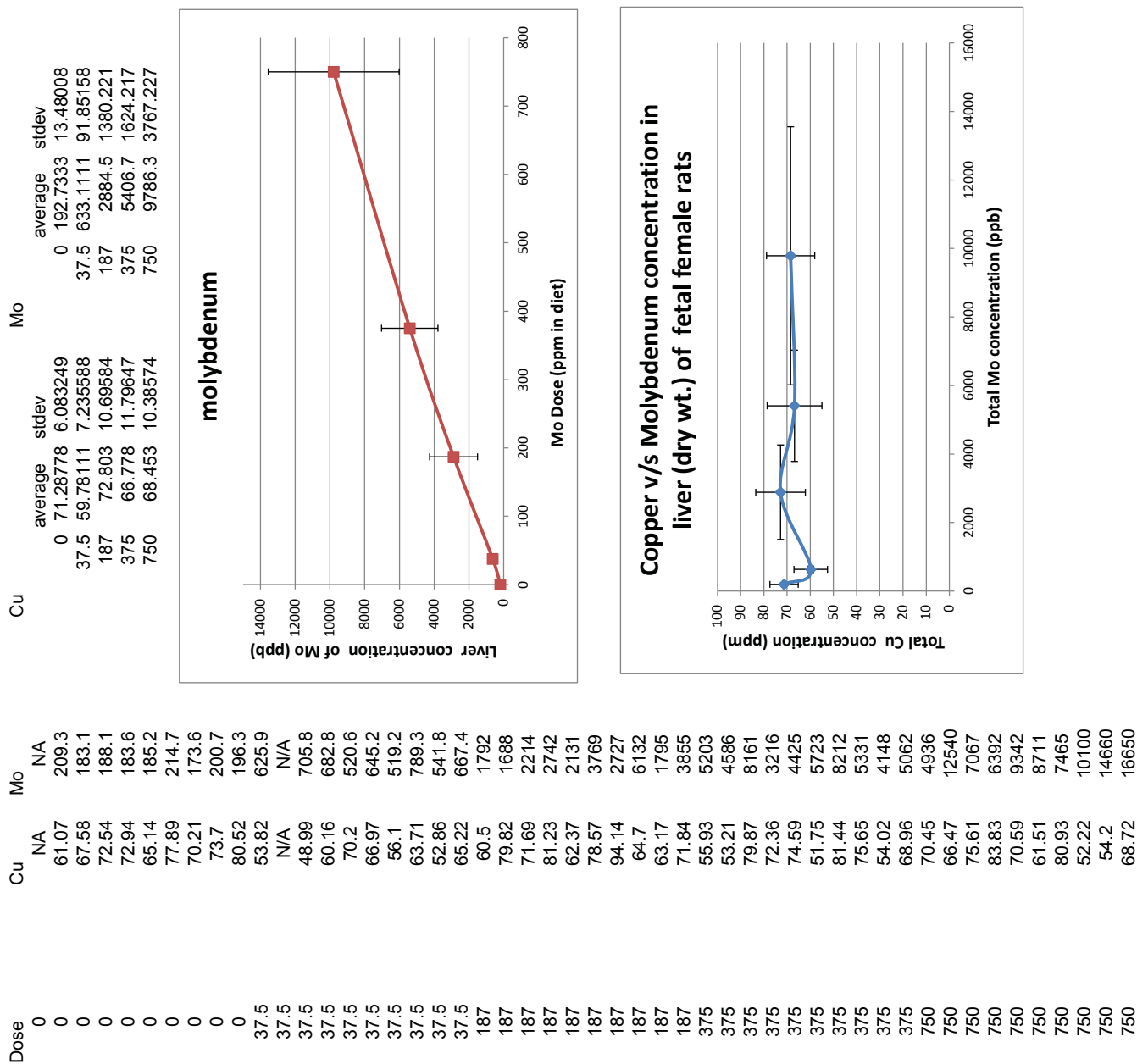
Dam#	Dose (mg/kg)	Gender	Age	specimen	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
66	375	female	fetus	carcass	12.2	909.5	319.5	47.97	17.97	111.3	1230	17400
68	375	female	fetus	carcass	12.3	1142	242.6	54.7	9.922	110.7	1145	6200
70	375	female	fetus	carcass	12.1	1079	297	59.19	10.91	121.3	1231	8711
72	375	female	fetus	carcass	12.1	995.4	302.9	74.65	11.39	110.6	1164	10660
74	375	female	fetus	carcass	12.3	969.2	322.2	62.03	17.72	108.5	1189	15970
76	375	female	fetus	carcass	12.3	1248	268.9	70.81	13.47	112.7	1196	9196
78	375	female	fetus	carcass	12.0	1046	283.3	101.8	10.14	115.1	1228	6878
80	375	female	fetus	carcass	12.2	965	317.4	91.63	11.18	112.7	1261	9460
82	750	female	fetus	carcass	12.4	959.4	315.6	69.84	9.727	115	1202	9179
84	750	female	fetus	carcass	12.2	1196	299.2	81.45	22.1	116.3	1191	25070
86	750	female	fetus	carcass	12.3	1025	344.3	76.39	15.15	119.4	1176	13460
88	750	female	fetus	carcass	12.5	988.2	375.4	71.21	12.56	112.9	1152	11980
90	750	female	fetus	carcass	12.1	1171	340.2	67.13	14.42	109.8	1201	15850
92	750	female	fetus	carcass	12.5	1073	313.5	72.7	10.38	113.1	1283	14100
94	750	female	fetus	carcass	12.3	1054	346.1	98.89	11.31	119.6	1204	14040
96	750	female	fetus	carcass	12.5	907.6	289.5	51.33	14.05	109.9	1131	18620
98	750	female	fetus	carcass	12.4	1126	289.5	97.17	19.31	107.3	1095	25820
100	750	female	fetus	carcass	12.5	798.4	336.1	107.5	23.52	103.9	1170	29060
2	0	male	fetus	carcass	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	0	male	fetus	carcass	12.3	941.9	380.7	114.1	10.89	117	1231	364.9
6	0	male	fetus	carcass	12.3	1173	333.6	106.6	8.133	121.6	1179	582.2
8	0	male	fetus	carcass	11.3	1273	284.7	68.62	9.135	117.6	1154	290.5
10	0	male	fetus	carcass	12.3	860.1	366.1	113.1	12.74	122	1226	364.3
12	0	male	fetus	carcass	12.3	1360	368.2	1492	13.1	121.6	1199	1164
14	0	male	fetus	carcass	12.3	956	360.5	78.87	9.091	119.7	1255	333.4
16	0	male	fetus	carcass	11.6	832.1	317.4	53.43	9.561	121.1	1202	221.4
18	0	male	fetus	carcass	12.0	1125	332.6	96.72	8.69	122.7	1237	321.2
20	0	male	fetus	carcass	11.7	1084	412.3	151	9.115	119.5	1281	880.4
22	37.5	male	fetus	carcass	11.8	913.4	294.8	80.14	8.613	114.3	1174	929.5
24	37.5	—	fetus	carcass	7.9	3273	811.7	1951	17.58	188.2	1602	4826
26	37.5	male	fetus	carcass	12.1	1045	309.7	99.78	14.49	113.5	1192	1234
28	37.5	male	fetus	carcass	12.5	786.1	265.1	82.28	8.972	116.2	1173	1128
30	37.5	male	fetus	carcass	12.3	1028	320.1	63.57	12.16	116.8	1209	866.4
32	37.5	male	fetus	carcass	11.8	987.8	324.8	95.33	9.877	119.2	1254	1323
34	37.5	male	fetus	carcass	11.9	991.1	359.1	103.6	15.99	114.5	1248	1120
36	37.5	male	fetus	carcass	12.1	867.2	264.2	75.59	9.71	110.7	1168	1466
38	37.5	male	fetus	carcass	11.7	1264	274.4	109.7	11.8	120.5	1210	1094
40	37.5	male	fetus	carcass	12.0	1373	284.9	87.03	11.62	124.6	1218	1157
42	187	male	fetus	carcass	12.5	924.1	324.7	79.58	10.81	119.4	1210	3258
44	187	male	fetus	carcass	12.1	965.8	327.3	134.1	11.68	118.9	1215	3107
46	187	male	fetus	carcass	12.1	1023	291.7	81.83	10.97	118.1	1203	4013
48	187	male	fetus	carcass	11.5	1432	322.9	121.3	12.18	117.5	1190	6260
50	187	male	fetus	carcass	12.1	921.6	298.5	76.95	9.002	122	1195	4022
52	187	male	fetus	carcass	12.1	1863	368.3	1902	17.04	117.2	1191	9331
54	187	male	fetus	carcass	12.0	1090	334.5	219.3	12.12	112.8	1202	5890
56	187	male	fetus	carcass	11.8	788.5	340.8	142.5	17.21	118	1162	12300
58	187	male	fetus	carcass	12.2	894.7	249.2	315.7	10.89	104	1109	3128

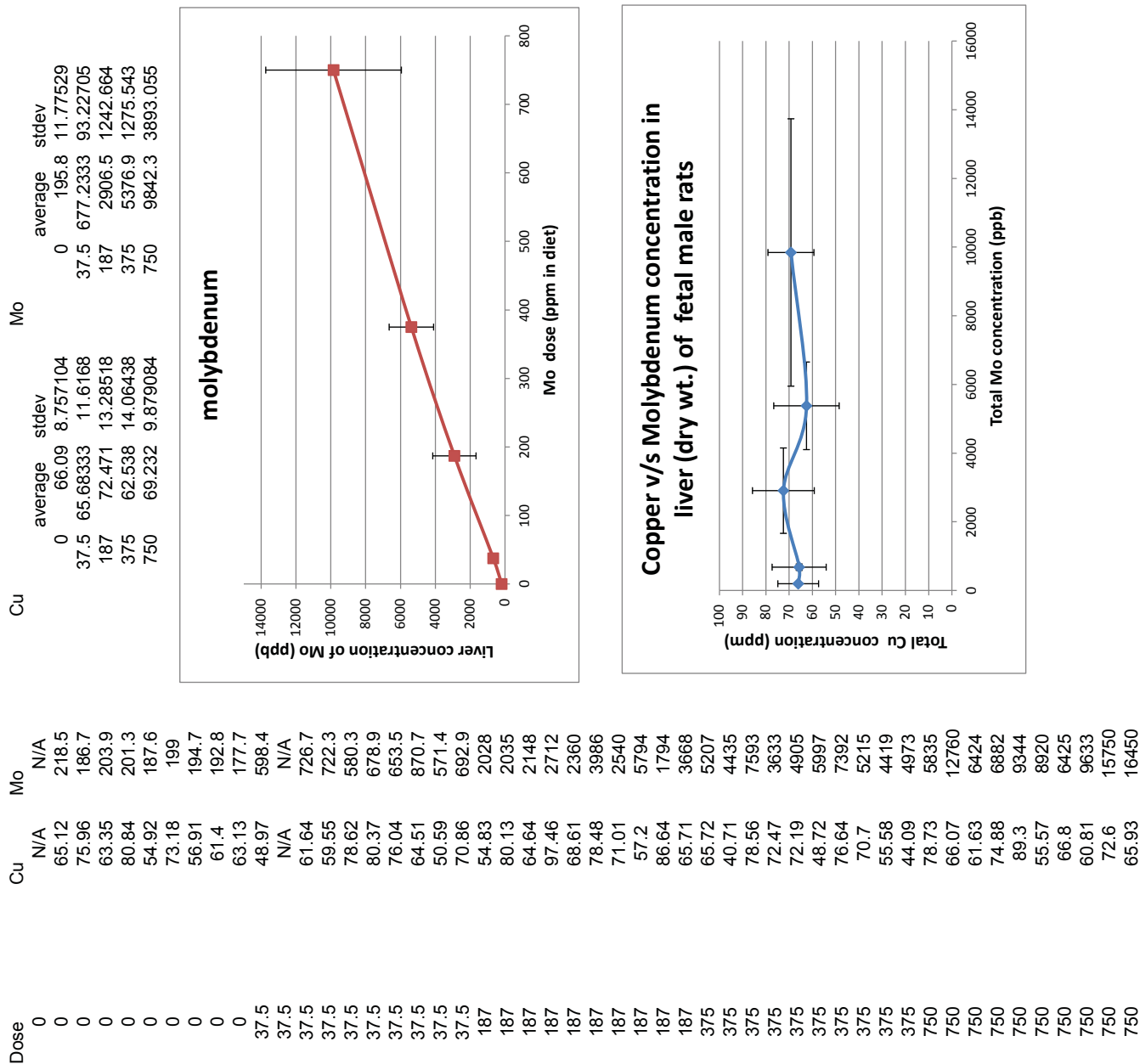
Dam#	Dose (mg/kg)	Gender	Age	specimen	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
60	187	male	fetus	carcass	11.5	974.7	353.4	116.7	12.39	117.8	1199	7333
62	375	male	fetus	carcass	13.0	1054	285.1	4802	35.03	118.4	1166	8704
64	375	male	fetus	carcass	12.4	903.5	332	520	13.63	122.1	1166	8815
66	375	male	fetus	carcass	12.2	906.9	277.8	227.8	17.67	108.4	1208	16380
68	375	male	fetus	carcass	12.7	1057	249.9	162.2	11.3	143.9	1149	6682
70	375	male	fetus	carcass	12.4	1012	304.1	107	11.67	119.8	1180	8575
72	375	male	fetus	carcass	11.3	932.9	328.5	122.3	12.6	115	1234	12050
74	375	male	fetus	carcass	11.9	1199	364.5	98.19	19.16	108.7	1174	16420
76	375	male	fetus	carcass	12.1	5715	261	104.8	15.7	113.7	1209	9526
78	375	male	fetus	carcass	11.8	1204	288.8	58.28	8.504	120.6	1266	7064
80	375	male	fetus	carcass	10.9	916.8	313.2	71.83	11.8	117.4	1178	9435
82	750	male	fetus	carcass	13.0	889.4	308.7	64.91	8.265	115.4	1180	9835
84	750	male	fetus	carcass	12.6	1394	336.7	155.3	23.6	118.2	1155	24370
86	750	male	fetus	carcass	12.7	1002	357.2	66.65	11.47	116.7	1173	13860
88	750	male	fetus	carcass	12.9	921.3	342.8	106.9	12.88	118.8	1159	12650
90	750	male	fetus	carcass	12.8	1105	341.2	64.4	14.06	110	1101	16360
92	750	male	fetus	carcass	11.8	1202	310.8	68.82	9.86	117.6	1312	14750
94	750	male	fetus	carcass	11.2	1358	349.7	52.94	14.57	115.1	1202	14070
96	750	male	fetus	carcass	11.0	1043	336.1	119.6	18.52	121.5	1231	20900
98	750	male	fetus	carcass	10.7	1130	309	54.87	19.68	110.6	1142	27960
100	750	male	fetus	carcass	11.8	945.2	301.6	89.61	22.5	109.8	1163	31380

Dam#	Dose (mg/kg)	Gender	Age	specimen	Dry Matter (%)	Manganese (ng/mL)	Iron (µg/mL)	Cobalt (ng/mL)	Copper (µg/mL)	Zinc (µg/mL)	Selenium (ng/mL)	Molybdenum (ng/mL)
2	0	female	adult	serum	N/A	3.959	4.749	0.3435	1.533	1.213	569.5	28.05
4	0	female	adult	serum	N/A	7.995	2.775	1.153	1.803	0.6194	322.7	39.09
6	0	female	adult	serum	N/A	7.676	2.072	0.9535	1.987	0.5835	326.3	31.02
8	0	female	adult	serum	N/A	5.169	0.6649	0.6299	1.367	0.4074	288.8	27.95
10	0	female	adult	serum	N/A	20.26	4.478	1.165	2.201	1.077	362.3	29.92
12	0	female	adult	serum	N/A	5.684	1.25	0.7001	2.089	0.8645	354.4	32.49
14	0	female	adult	serum	N/A	7.22	1.06	0.6946	1.777	0.618	277.5	35.92
16	0	female	adult	serum	N/A	6.478	1.077	0.6412	2.78	0.6541	314.7	29.74
18	0	female	adult	serum	N/A	2.248	1.44	1.274	1.646	0.7843	283.4	31.43
20	0	female	adult	serum	N/A	4.287	3.801	0.7152	1.904	1.067	378.9	29.1
22	37.5	female	adult	serum	N/A	8.471	1.124	0.8044	1.812	0.579	331.3	173.2
24	37.5	female	adult	serum	N/A	8.024	5.235	0.4141	1.841	1.35	473.8	220
26	37.5	female	adult	serum	N/A	4.857	1.102	0.9007	1.744	0.5558	301.7	268.5
28	37.5	female	adult	serum	N/A	9.653	4.652	1.019	1.754	0.6634	304.3	276
30	37.5	female	adult	serum	N/A	3.018	0.9835	0.8332	1.698	0.7801	291.4	186.1
32	37.5	female	adult	serum	N/A	5.478	1.784	1.078	1.478	0.8454	334.6	207.5
34	37.5	female	adult	serum	N/A	3.478	2.478	0.9831	1.574	0.6744	324.6	276.1
36	37.5	female	adult	serum	N/A	6.458	1.478	0.8846	1.943	0.5476	378.4	187.4
38	37.5	female	adult	serum	N/A	7.548	0.978	0.9194	1.147	0.7485	351.4	251.9
40	37.5	female	adult	serum	N/A	3.846	0.784	0.847	1.6476	0.2144	346.2	237.4
42	187	female	adult	serum	N/A	3.339	0.5936	0.8632	1.492	0.8655	304.8	704
44	187	female	adult	serum	N/A	2.403	5.057	0.7213	1.672	0.5654	330.9	751.1
46	187	female	adult	serum	N/A	6.819	1.121	0.7195	1.496	0.4815	333.2	837.3
48	187	female	adult	serum	N/A	5.484	1.499	1.061	1.991	0.9615	330.7	1246
50	187	female	adult	serum	N/A	7.669	3.004	1.076	1.68	0.6375	312.1	880.8
52	187	female	adult	serum	N/A	4.773	1.317	1.006	2.362	0.6356	331.2	1743
54	187	female	adult	serum	N/A	7.11	2.773	1.085	2.647	1.035	362.6	1278
56	187	female	adult	serum	N/A	7.156	0.9085	0.7129	2.22	0.5377	263.2	2368
58	187	female	adult	serum	N/A	6.887	1.317	1.198	2.119	0.6466	364.5	664.3
60	187	female	adult	serum	N/A	7.66	1.017	0.9371	2.175	0.7094	314.6	1778
62	375	female	adult	serum	N/A	12.72	7.307	4.182	1.727	0.6542	490.3	307.1
64	375	female	adult	serum	N/A	4.871	1.142	0.9736	3.236	0.9473	359	3495
66	375	female	adult	serum	N/A	6.648	1.353	1.016	3.257	0.875	283	3736
68	375	female	adult	serum	N/A	5.304	0.8438	0.8419	2.688	0.7598	307.4	1844
70	375	female	adult	serum	N/A	2.696	0.5883	0.8715	2.52	0.6582	312.5	2107
72	375	female	adult	serum	N/A	13.27	1.272	1.182	2.051	0.7404	361.6	3134
74	375	female	adult	serum	N/A	10.26	2.462	0.9471	3.058	0.8424	334.9	3298
76	375	female	adult	serum	N/A	4.475	0.6627	2.18	0.6766	0.6766	321.4	2199
78	375	female	adult	serum	N/A	5.343	0.6542	0.6701	1.086	0.384	213.6	1720
80	375	female	adult	serum	N/A	13.32	2.178	1.013	2.154	0.5946	347	2567
82	750	female	adult	serum	N/A	7.459	1.874	0.8745	2.045	1.024	341.9	3252
84	750	female	adult	serum	N/A	7.31	2.147	0.7845	1.874	1.024	289.8	3639
86	750	female	adult	serum	N/A	8.381	2.009	1.221	2.896	1.025	327.5	4001
88	750	female	adult	serum	N/A	3.33	0.6004	0.861	2.364	0.6709	302.1	2797
90	750	female	adult	serum	N/A	9.439	2.062	1.093	2.62	0.9534	385.9	4537
92	750	female	adult	serum	N/A	6.349	1.803	1.02	1.853	0.6698	326.3	4340
94	750	female	adult	serum	N/A	3.463	0.5722	0.8694	2.465	0.706	283.7	2841
96	750	female	adult	serum	N/A	8.951	1.293	0.7501	3.915	0.7803	341.6	5455
98	750	female	adult	serum	N/A	9.208	1.392	1.209	4.881	0.8703	289.8	8368
100	750	female	adult	serum	N/A	7.548	1.247	1.173	4.125	0.7842	378.4	6478

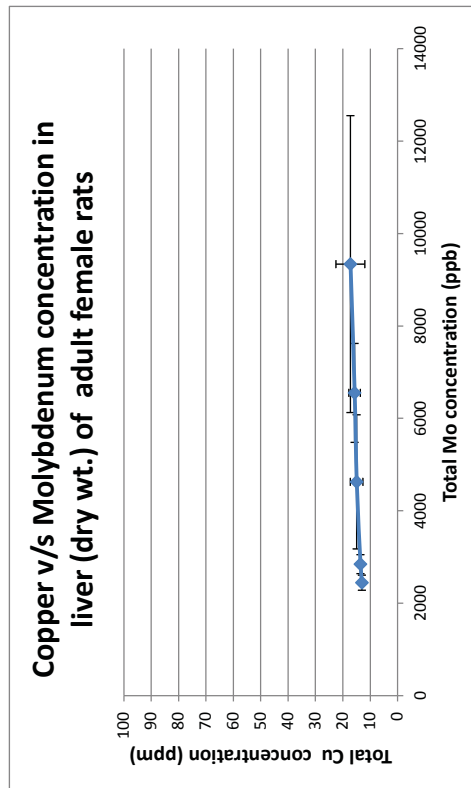
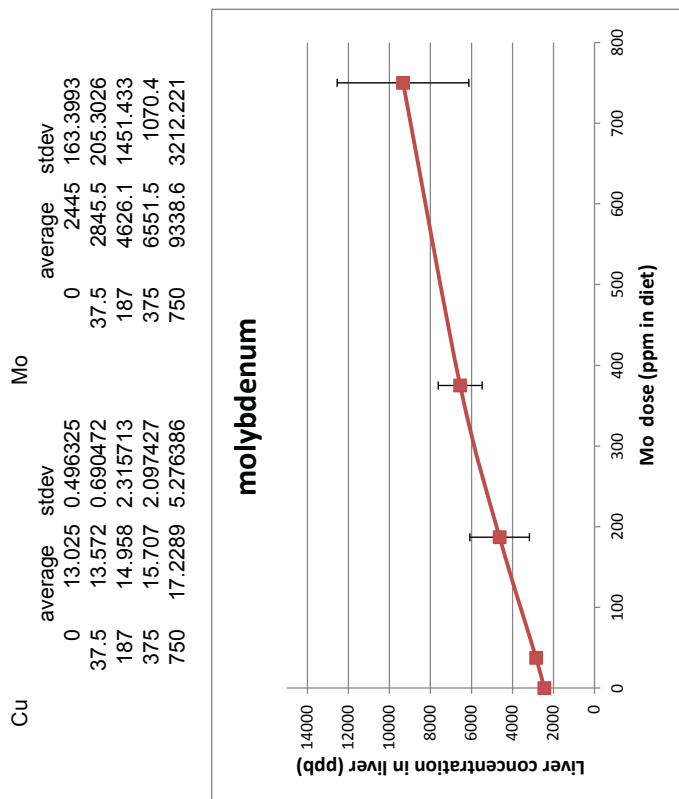
Sample Label	Dry Matter (%)	Manganese (ng/g dry)	Iron (µg/g dry)	Cobalt (ng/g dry)	Copper (µg/g dry)	Zinc (µg/g dry)	Selenium (ng/g dry)	Molybdenum (ng/g dry)
NIST 1577c Bovine Liver	N/A	9703	196.4	306.9	274.8	173.7	2094	3375
NIST 1577c Bovine Liver	N/A	10420	199	324.5	273.6	172.1	2081	3447
NIST 1577c Bovine Liver	N/A	10780	198.3	321.4	275.8	174	2067	3315
NIST 1577c Bovine Liver	N/A	10280	198.4	314.3	278.8	183.4	2040	3481
NIST 1577c Bovine Liver	N/A	10490	199.5	331.1	279.9	175.7	2037	3323
NIST 1577c Bovine Liver	N/A	10830	197.1	336.5	277.2	174.2	2028	3404
NIST 1577c Bovine Liver	N/A	10110	198.4	331.1	279.6	182.4	2036	3352
NIST 1577c Bovine Liver	N/A	10800	198.6	319	278.3	181.1	2028	3319
NIST 1577c Bovine Liver	N/A	10150	198.5	306.6	273.1	177.1	2016	3415
NIST 1577c Bovine Liver	N/A	10400	200.1	334.3	278.4	182.1	2035	3365
NIST 1577c Bovine Liver	N/A	10410	198	342.4	274	180.1	2019	3348
NIST 1577c Bovine Liver	N/A	10070	187.7	290.7	271	170.7	1927	3299
NIST 1577c Bovine Liver	N/A	10380	190.3	287.2	270	189.9	1950	3336
NIST 1577c Bovine Liver	N/A	10450	187.8	269.5	274.9	187	1924	3295
NIST 1577c Bovine Liver	N/A	10430	186.5	269.1	277.5	188.3	1925	3267
NIST 1577c Bovine Liver	N/A	10823	182.4	286.3	275.5	187.1	2075	3350
NIST 1577c Bovine Liver	N/A	10854	198.8	291.5	273.8	186.9	2057	3354
NIST 1577c Bovine Liver	N/A	10598	192	293.9	277	188.8	2087	3336
NIST 1577c Bovine Liver	N/A	10574	183.5	302.7	271.9	171.7	2084	3338
NIST 1577c Bovine Liver	N/A	10962	185.5	300.9	273	173.4	1991	3347
NIST 1577c Bovine Liver	N/A	10124	183.6	290.6	272.8	173.4	2099	3376
NIST 1577c Bovine Liver	N/A	10164	182.2	294.3	273.6	175	2054	3330
NIST 1577c Bovine Liver	N/A	10280	185.1	294.5	278.6	174.6	2047	3377
NIST 1577c Bovine Liver	N/A	10548	182.8	288.3	277.3	174.3	1978	3345
NIST 1577c Bovine Liver	N/A	10649	184.1	301.2	276.3	178.1	1947	3341
NIST 1577c Bovine Liver	N/A	10440	183.8	294.5	277.8	184	1978	3274
NIST 1577c Bovine Liver	N/A	10990	187.5	299.9	270.1	185.5	1981	3332
NIST 1577c Bovine Liver	N/A	10350	188.9	290.2	270.7	187	2001	3342
NIST 1577c Bovine Liver	N/A	10660	187.5	295.4	277	184	2048	3349
NIST 1577c Bovine Liver	N/A	10990	188.2	291.8	270.9	187	2078	3315
NIST 1577c Bovine Liver	N/A	10700	199.7	273.6	279.3	189.6	2047	3470
NIST 1577c Bovine Liver	N/A	10420	184.6	287.4	273	182.3	1984	3334
NIST 1577c Bovine Liver	N/A	10580	182.4	289.4	278.6	187.8	2078	3347
NIST 1577c Bovine Liver	N/A	10790	191.9	298.7	277	186.1	2074	3387
NIST 1577c Bovine Liver	Expected range(+/-)	10460 470	197.94 6.5	300 18	275.2 4.6	181.1 10	2031 45	3300 130

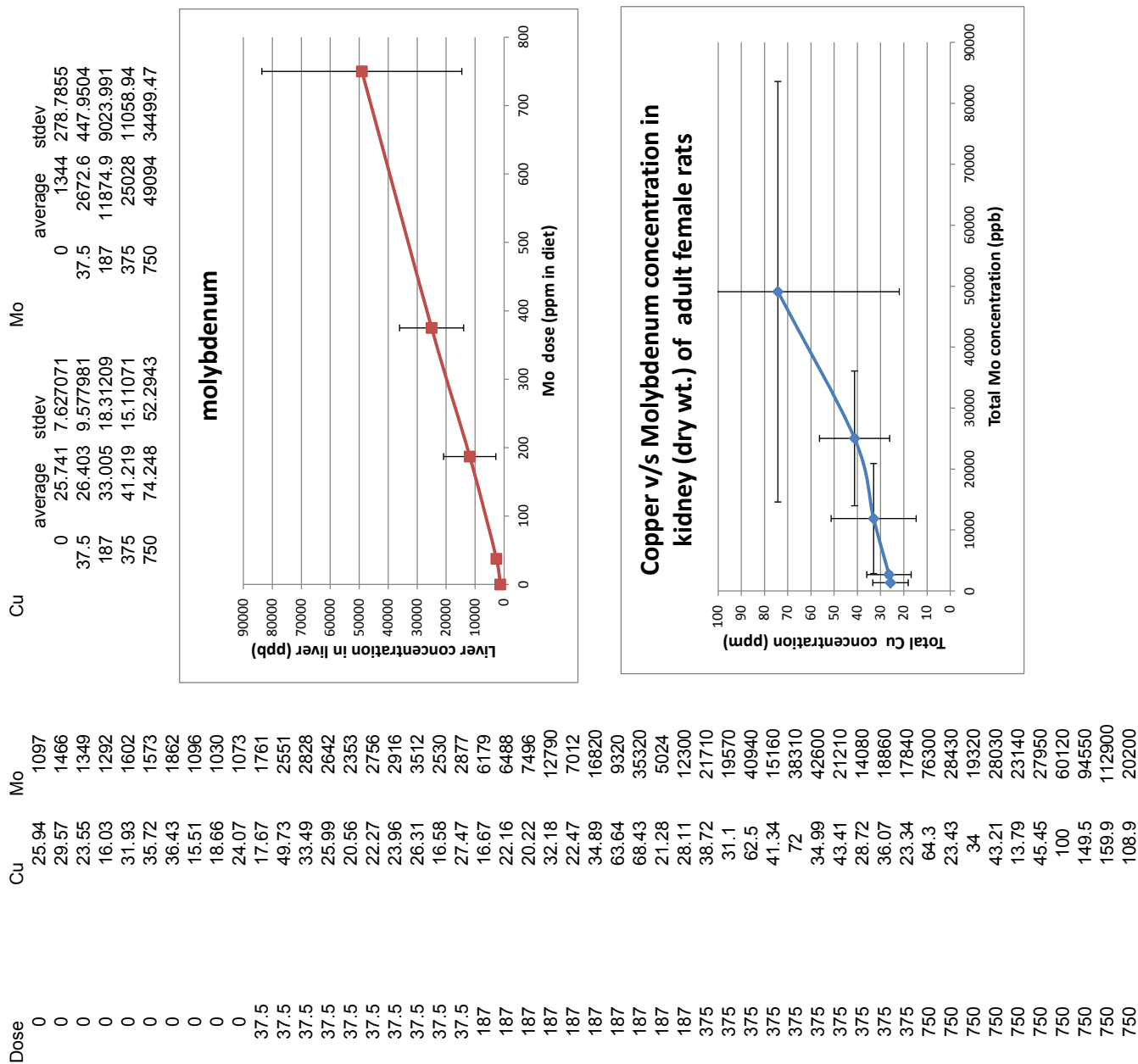
Sample Label	Dry Matter (%)	Manganese (ng/mL)	Iron (µg/mL)	Cobalt (ng/mL)	Copper (µg/mL)	Zinc (µg/mL)	Selenium (ng/mL)	Molybdenum (ng/mL)
DCPAH Bovine Serum	N/A	4.138	2.362	0.3003	0.749	1.252	67.77	10.38
DCPAH Bovine Serum	N/A	4.252	2.308	0.3336	0.7242	1.198	66.7	10.53
DCPAH Bovine Serum	N/A	3.593	2.36	0.3354	0.7492	1.247	67.93	10.93
DCPAH Bovine Serum	N/A	3.649	2.409	0.3443	0.7406	1.242	68.21	10.87
DCPAH Bovine Serum	N/A	3.68	2.327	0.3356	0.7298	1.229	66.93	10.8
DCPAH Bovine Serum	Expected	3.6	2.36	0.34	0.76	1.15	66	10.2
DCPAH Bovine Serum	range(+/-)	0.6	0.06	0.06	0.07	0.06	2	1



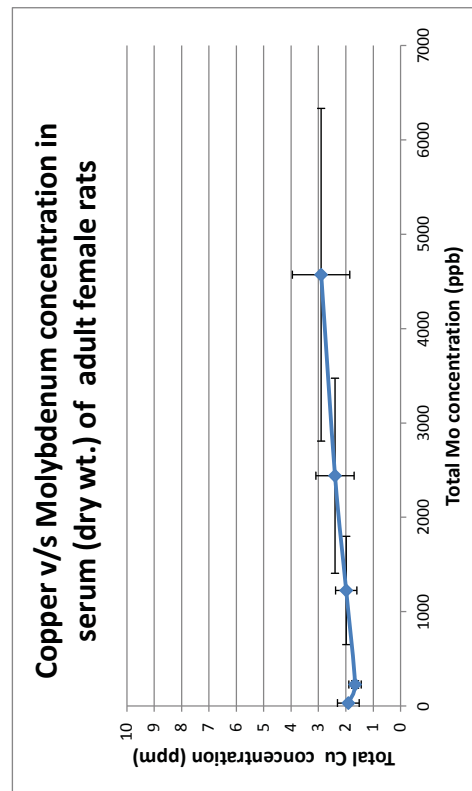
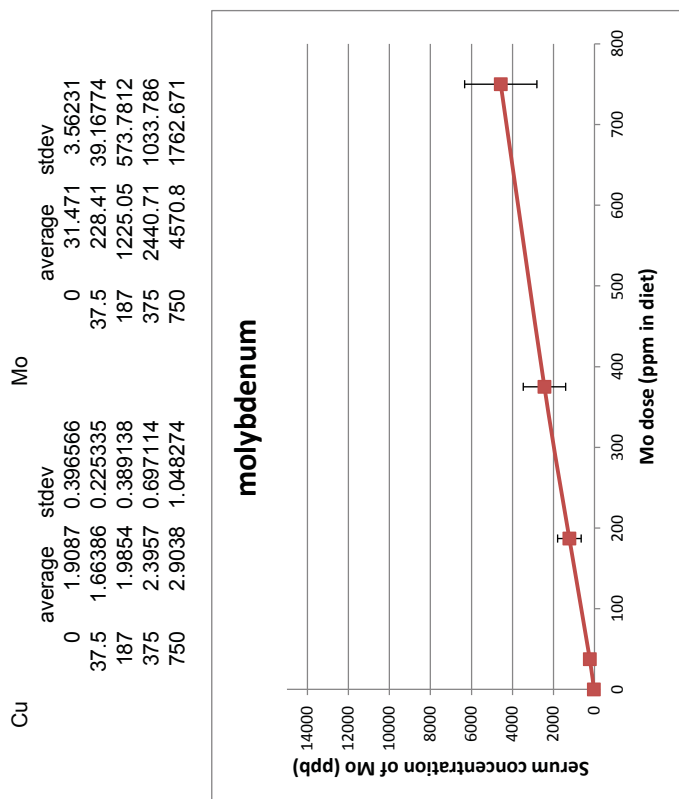


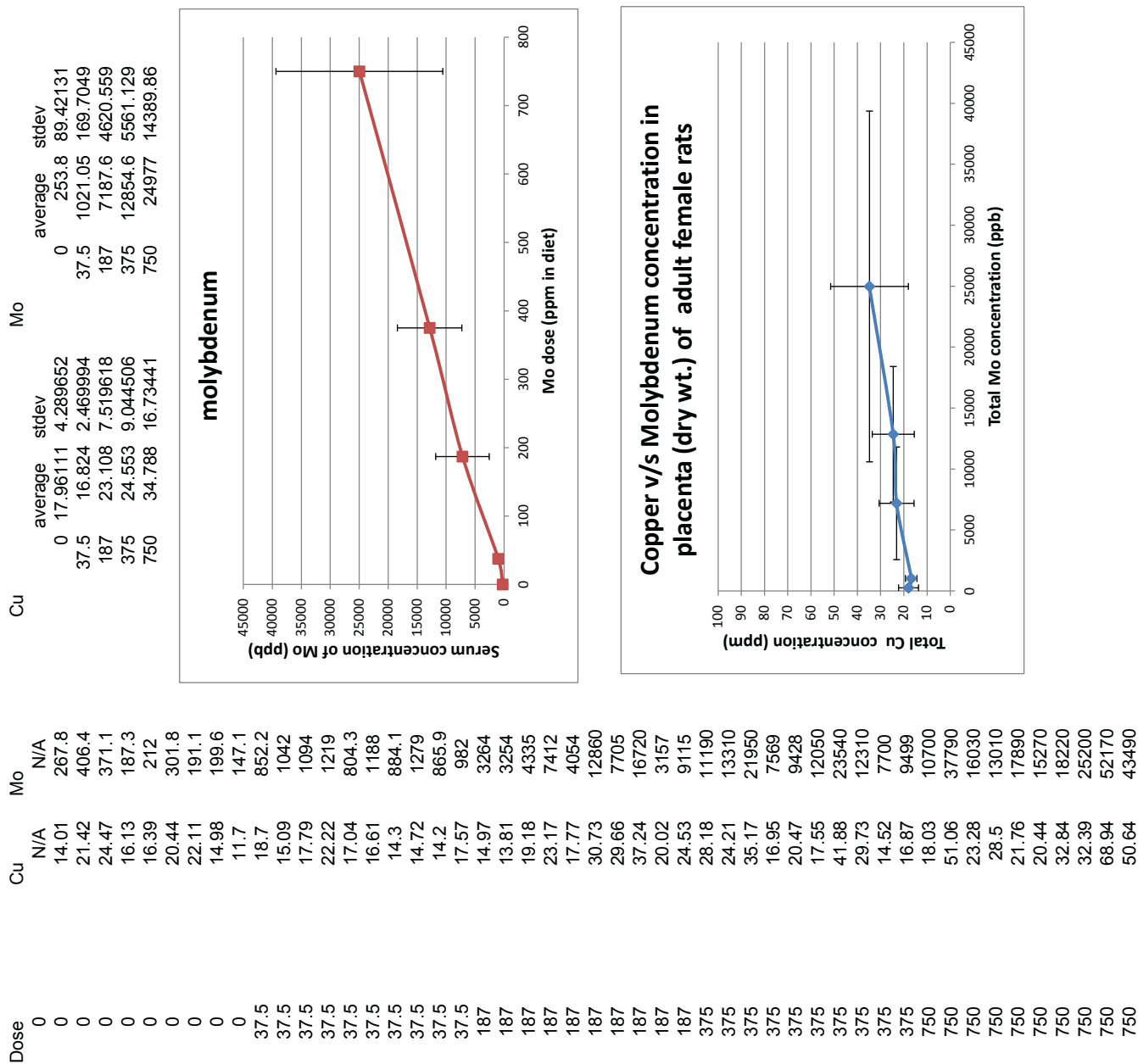
Dose	Cu	Mo
0	13.47	2584
0	13.04	2367
0	12.56	2207
0	13.41	2413
0	12.18	2542
0	13.48	2716
0	13.07	2492
0	12.48	2278
0	13.67	2573
0	12.89	2278
37.5	13.74	2937
37.5	12.35	2515
37.5	13.14	2961
37.5	13.07	2724
37.5	14.23	2631
37.5	13.76	2898
37.5	13.37	2920
37.5	14.25	3187
37.5	14.66	3018
37.5	13.15	2664
187	13.93	3970
187	13.33	3801
187	13.76	3671
187	13.26	4216
187	13.3	3699
187	15.7	5624
187	15.61	4281
187	20.52	8271
187	16.75	3536
187	13.42	5192
375	15.26	5396
375	16.41	6159
375	19.6	8762
375	15.61	5284
375	15.23	5743
375	13.67	7407
375	18.08	7442
375	16.8	6623
375	13.13	6170
375	13.28	6529
750	14.48	7539
750	24.91	12960
750	16.59	7658
750	15.43	6529
750	16.12	9085
750	13.31	9307
750	17.78	8015
750	22.12	11530
750	7.549	5043
750	24	15720

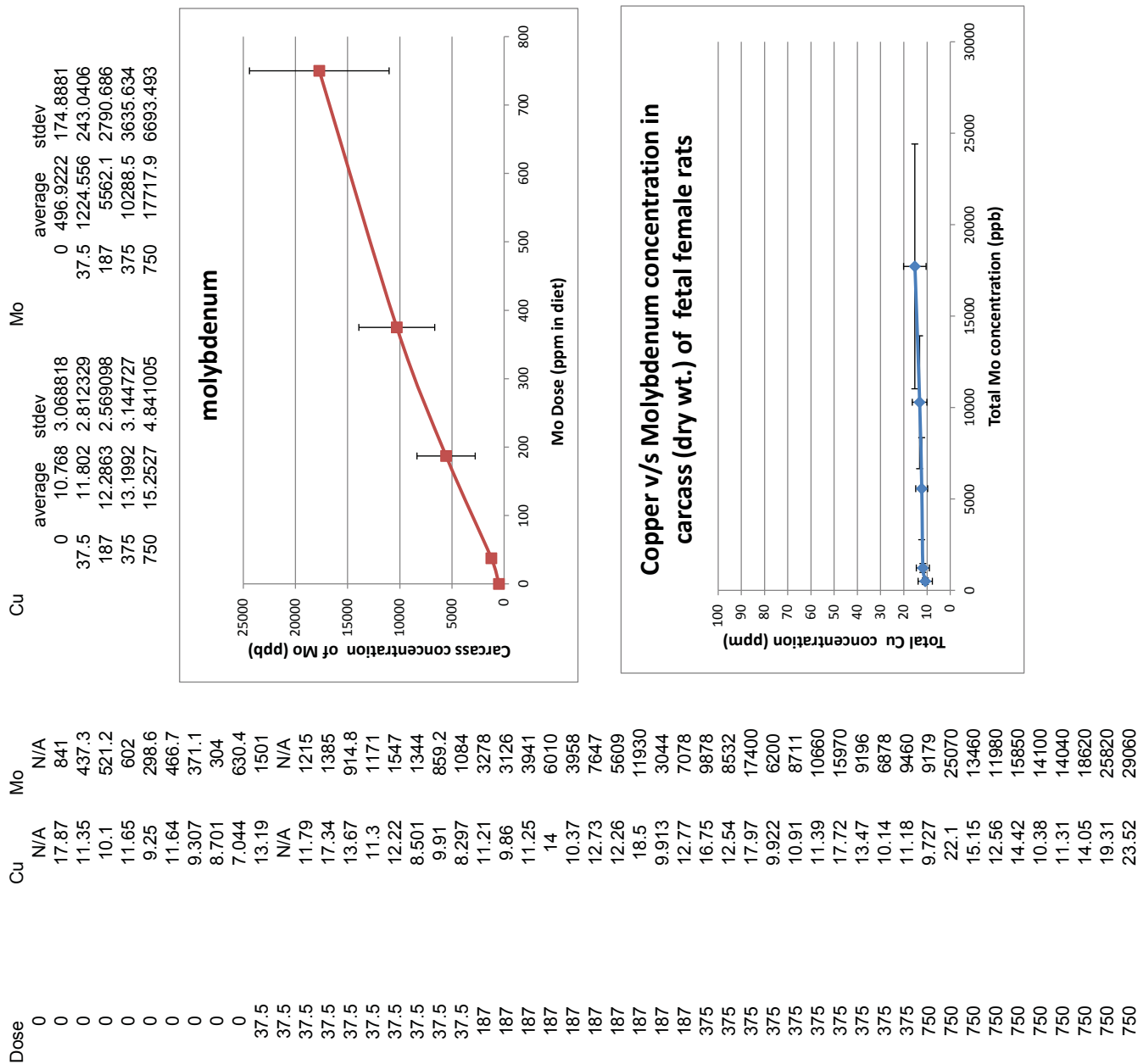




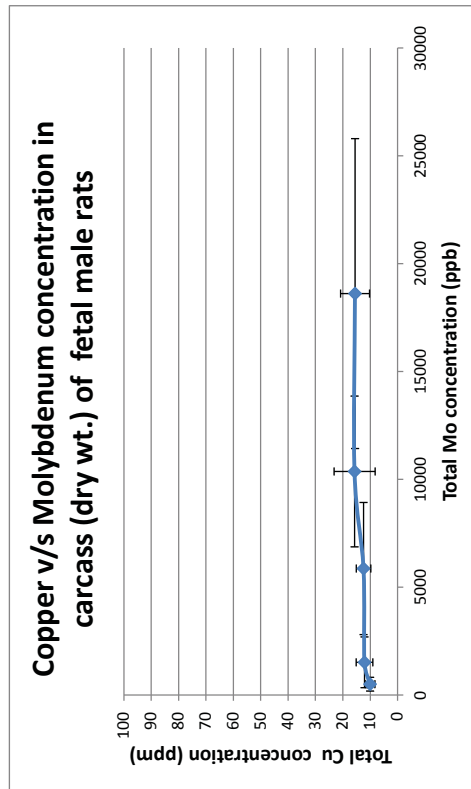
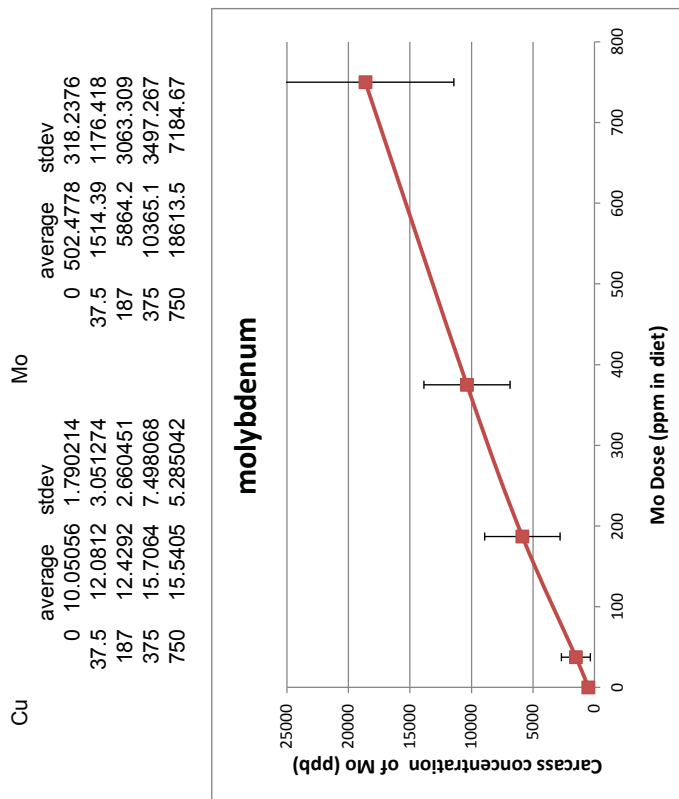
Dose	Cu	Mo
0	1.533	28.05
0	1.803	39.09
0	1.987	31.02
0	1.367	27.95
0	2.201	29.92
0	2.089	32.49
0	1.777	35.92
0	2.78	29.74
0	1.646	31.43
0	1.904	29.1
37.5	1.812	173.2
37.5	1.841	220
37.5	1.744	268.5
37.5	1.754	276
37.5	1.698	186.1
37.5	1.478	207.5
37.5	1.574	276.1
37.5	1.943	187.4
37.5	1.147	251.9
37.5	1.6476	237.4
187	1.492	704
187	1.672	751.1
187	1.496	837.3
187	1.991	1246
187	1.68	880.8
187	2.362	1743
187	2.647	1278
187	2.22	2368
187	2.119	664.3
187	2.175	1778
375	1.727	307.1
375	3.236	3495
375	3.257	3736
375	2.688	1844
375	2.52	2107
375	2.051	3134
375	3.058	3298
375	2.18	2199
375	1.086	1720
375	2.154	2567
750	2.045	3252
750	1.874	3639
750	2.896	4001
750	2.364	2797
750	2.62	4537
750	1.853	4340
750	2.465	2841
750	3.915	5455
750	4.881	8368
750	4.125	6478







Dose	Cu	Mo
0	N/A	N/A
0	10.89	364.9
0	8.133	582.2
0	9.135	290.5
0	12.74	364.3
0	13.1	1164
0	9.091	333.4
0	9.561	221.4
0	8.69	321.2
0	9.115	880.4
37.5	8.613	929.5
37.5	17.58	4826
37.5	14.49	1234
37.5	8.972	1128
37.5	12.16	866.4
37.5	9.877	1323
37.5	15.99	1120
37.5	9.71	1466
37.5	11.8	1094
37.5	11.62	1157
187	10.81	3258
187	11.68	3107
187	10.97	4013
187	12.18	6260
187	9.002	4022
187	17.04	9331
187	12.12	5890
187	17.21	12300
187	10.89	3128
187	12.39	7333
375	35.03	8704
375	13.63	8815
375	17.67	16380
375	11.3	6682
375	11.67	8575
375	12.6	12050
375	19.16	16420
375	15.7	9526
375	8.504	7064
375	11.8	9435
750	8.265	9835
750	23.6	24370
750	11.47	13860
750	12.88	12650
750	14.06	16360
750	9.86	14750
750	14.57	14070
750	18.52	20900
750	19.68	27960
750	22.5	31380



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Bedding and Nestlets

Sample Label	Dilution:	Dry Matter (%)	Manganese (ng/g)	Iron (µg/g)	Cobalt (ng/g)	Copper (µg/g)	Zinc (µg/g)	Selenium (ng/g)	Molybdenum (ng/g)
Water	1	1.00	2.77	0.01	0.1	0.02	0.43	0.18	0.13
Sanichip Hardwood Bedding	53.54	0.91	142300	17.61	10.6	1.32	4.76	6.56	65.29
Nestlets	54.78	0.95	1971	15.49	6.3	0.37	2.52	19.93	54.4

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