(7-11-06)

Data Evaluation Report on the Acute Dietary Toxicity of N-521 (Dazomet) to Bobwhite Quail (*Colinus virginianus*)
PMRA Submission Number EPA MRID Number 423651-02

Data Requirement:	PMRA DATA CODE	
	EPA DP Barcode	D313233
	OECD Data Point	
	EPA MRID	423651-02
	EPA Guideline	§71-2a

Test material: N-521
Common name: Dazomet
Chemical name: IUPAC: Not reported
CAS name: Not reported
CAS No.: Not reported
Synonyms: Not reported

Purity: 99.6-99.8%

Primary Reviewer: Rebecca Bryan
Staff Scientist, Dynamac Corporation

Signature: Rebecca Bryan
Date: 6/23/05

QC Reviewer: Teri Myers
Staff Scientist, Dynamac Corporation

Signature: Teri Myers
Date: 7/1/05

Secondary
~~Primary~~ **Reviewer:** James Felkel
Wildlife Biologist, OPP/EFED/ERBV

Signature:
Date: 3/17/06

Secondary Reviewer(s):
{EPA/OECD/PMRA}

Date:

Reference/Submission No.:

Company Code:
Active Code:
EPA PC Code: 035602

CITATION: Bisinger, E. 1982. Avian Dietary LC50 of N-521 in Bobwhite Quail. Unpublished study performed by Bio-Life Associates, Ltd. Neillsville, WI. Laboratory Project No. 82 QD 21. Study submitted by Stauffer Chemical Company. Experimental start date October 6, 1982 and experimental termination date October 14, 1982. The final report issued November 11, 1982.

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Disclaimer: This Data Evaluation Record may have been revised by the Environmental Fate and Effects Division subsequent to signing by Dynamac Corporation personnel.

EXECUTIVE SUMMARY:

The acute dietary toxicity of N-521 (Dazomet) to 12-day-old Bobwhite quail (*Colinus virginianus*) was assessed over 8 days. N-521 was administered to the birds in the diet at nominal concentrations of 0 (negative control), 312, 625, 1250, 2500, and 5000 ppm. The mean-measured concentrations were not determined.

By 8 days, there was 0, 0, 30, 70, and 70% mortality in the 312, 625, 1250, 2500, and 5000 ppm treatment groups, respectively, compared to 2% vehicle control mortality. The 8-day LC_{50} was 2301 ppm, with 95% C.I. of 1562-3838 ppm, which categorizes N-521 (Dazomet) as slightly toxic to Northern Bobwhite quail on an acute dietary basis. Anorexia was the clinical sign of toxicity observed in the 1250, 2500, and 5000 ppm test groups during the study. There were treatment-related reductions for body weight gain and food consumption in the 1250, 2500, and 5000 ppm test groups compared to the control. Replicate data were not provided for sub-lethal endpoints, so statistical analyses were not conducted. The NOEC based on visual inspection of the data for sub-lethal endpoints was 625 ppm a.i.

This toxicity study is scientifically sound, however it does not fulfill the guideline requirements for an avian dietary study using the Bobwhite quail (§71-2a) because the stability and homogeneity of the test chemical was not determined. This study is classified as SUPPLEMENTAL.

Results Synopsis

Test Organism Size/Age: 12-days old; 20.5-24.5 g (means)

LC_{50}: 2301 ppm 95% C.I.: 1562-3838 ppm
NOEC: 625 ppm Slope: 2.73(1.37-4.09)
LOEC: 1250 ppm
Endpoint(s) Affected: Mortality, clinical signs of toxicity, body weight, and feed consumption
Most sensitive endpoint: Mortality and clinical signs of toxicity

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: The protocol followed procedures of the U.S. EPA Pesticide Assessment Guidelines, Subsection 71-2 (1982). The following deviations from §71-2 were noted:

1. Mortality and feeding during acclimation was not reported.
2. The stability and homogeneity of the test chemical in diet was not determined.

These deviations did not affect the validity of the study, however, the acceptability was affected because the stability and homogeneity of the test chemical was not determined.

COMPLIANCE: Signed and dated Data Confidentiality statement was provided. However, the GLP and Quality Assurance statements were not reported

A. REPORTED MATERIALS:

1. **Test Material** N-521 (Dazomet)

Description: Not reported

Lot No./Batch No.: 830 Aged

Purity: 99.6-99.8%

Stability of Compound Under Test Conditions: Not determined.

Storage conditions of test chemicals: Not reported

OECD requires water solubility, stability in water and light, pK_a, P_{ow} and vapor pressure of the test compound. OECD requirements were not reported.

2. **Test organism:**

Species: Bobwhite quail (*Colinus virginianus*)

Age at study initiation: 12 days

Weight at study initiation: 20.5-24.5 g (means)

Source: Thompson's Quail Farm, Franksville, WI

B. REPORTED STUDY DESIGN:

1. Experimental Conditions

a. Range-finding Study: None reported.

b. Definitive Study:

Table 1: Experimental Parameters

Parameter	Details	Remarks *Criteria*
Acclimation period: Conditions (same as test or not): Feeding: Health (any mortality observed):	11 days Same as test Not reported The birds determined as suitable for testing were used (mortality not reported).	
Pen size and construction materials	The wire pens were 45.7 x 61 x 45.7 cm.	*EPA requires: about 35 x 100 x 24 cm*
Test duration	5 days with treated feed, and 3 days with"clean" feed.	*EPA requires: 5 days with treated feed and at least 3 days observation with "clean" feed.*
Test concentrations nominal: measured:	0 (negative control), 312, 625, 1250, 2500, and 5000 ppm Not determined.	*Four minimum, 5 or 6 strongly recommended, in a geometric scale, unless LC_{50} > 5000 ppm a.i..*
Solvent/vehicle, if used type: amount:	Corn oil. 200 g	*EPA requires: Distilled water, corn oil, propylene glycol, 1% carboxymethylcellulose, or gum arabic. Solvent not more than 2%.*
Diet preparation and feeding	The appropriate amount of test substance with corn oil premix was incorporated in the standard diet. Enough was made to last the 5-day treatment period, and the diet was presented at test initiation.	*EPA requires: Control group tested with diet containing the maximum amount of vehicle used in treated diets?*
Feed withholding period	None	

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Parameter	Details	Remarks *Criteria*
Indicate whether stability and homogeneity of test material in diet determined (Yes/No)	No	
Number of birds per replicate/group for negative control: for vehicle control: for treated:	 N/A 10 10	 *EPA requires: 10 (strongly recommended)*
Number of replicates/group (if used) for negative control: for vehicle control: for treated:	 N/A 5 1	

Parameter	Details	Remarks *Criteria*
Test conditions temperature: relative humidity(%): photo-period:	92-104°F 38-61% Continuous	***Brooder temperature:*** *about 35°C (95°F)* ***Room temperature:*** *22-27°C (71-81°F)* ***Relative humidity:*** *30-80%* ***Photoperiod:*** *Minimum of 14 h of light.*
Reference chemical, if used	None used.	

2. Observations:

Table 2: Observations

Criteria	Details	Remarks *Criteria*
Parameters measured (mortality/body weight/ mean feed consumption/ others)	- Mortality - Clinical signs of toxicity - Mean feed consumption - Mean body weight	
Indicate the stability and homogeneity of test chemical in the diet	The stability and homogeneity were not determined.	
Indicate if the test material was regurgitated	None reported	
Treatments on which necropsies were performed	All birds that died during the test and 4 surviving birds (2 males and 2 females) from each treatment group, if available, were subjected to gross necropsy.	
Observation intervals	Mortality and signs of toxicity were measured at least once daily. Food consumption was recorded on Days 0-5 and 6-8. Body weights were determined on Days 0 and 8.	
Were raw data included?	Yes	

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II. RESULTS AND DISCUSSION:

A. REPORTED MORTALITY:

By 8 days, there was 0, 0, 30, 70, and 70% mortality in the 312, 625, 1250, 2500, and 5000 ppm treatment groups, respectively, compared to 2% vehicle control mortality. The 8-day LC_{50} was 1850 ppm, with 95% C.I. of 1028-3330 ppm.

Table 3: Effect of N-521 (Dazomet) on Mortality of *Colinus virginianus*.

Treatment, ppm Nominal		No. of birds per treatment	Cumulative mortality								
			Days								
			0	1	2	3	4	5	6	7	8
Vehicle control		50	0	0	0	0	0	1	1	1	1
312		10	0	0	0	0	0	0	0	0	0
625		10	0	0	0	0	0	0	0	0	0
1250		10	0	0	0	0	0	0	2	2	3
2500		10	0	0	2	3	3	3	4	5	7
5000		10	0	0	0	2	3	5	6	6	7
NOEC		625 ppm (nominal)									
LC_{50}		1850 ppm, 95% C.I.: 1028-3330 ppm									
Reference chemical	mortality	N/A									
	LC_{50}	N/A									
	NOEC	N/A									

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B. REPORTED SUB-LETHAL TOXICITY ENDPOINTS:

Anorexia was the clinical sign of toxicity observed in the 1250, 2500, and 5000 ppm test groups during the study. There were treatment-related reductions for body weight gain in the 1250, 2500, and 5000 ppm test groups compared to the control. The food consumption was reduced in the 1250, 2500, and 5000 ppm test groups compared to the control. Statistical analyses were not conducted on sub-lethal endpoints. The NOEC based on visual inspection of the data for sub-lethal endpoints was 625 ppm a.i.

Table 4: Sub-lethal effects of N-521 on *Colinus virginianus*.

Treatment, ppm Nominal		Observation				
		Mean body weights (g)		Body Weight Gain	Food consumption (g/bird/day)	
		Day 0	Day 8	Days 0-8	Day 0-5	Day 6-8
Vehicle control[1]		22.4	45.6	23.2	4.8	6.8
312		22.5	41.2	18.7	4.6	6.0
625		23.4	42.1	18.7	4.2	6.1
1250		23.6	34.4	10.8	4.0	5.2
2500		24.5	39.3	14.8	2.5	5.0
5000		22.9	28.3	5.4	2.2	3.9
NOEC		625 ppm a.i. (nominal)			625 ppm a.i. (nominal)	
EC_{50}		Not determined			Not determined	
Reference chemical	NOEC	N/A				
	EC_{50}	N/A				

[1] Reviewer-calculated from replicate means.

C. REPORTED STATISTICS:

The LC_{50} was calculated using the Litchfield and Wilcoxon method. Neither body weight or feed consumption data were statistically compared. The results are based on nominal concentrations.

LC_{50}: 1850 ppm 95% C.I.: 1028-3330 ppm
NOEC: 625 ppm Slope: 2.69
LOEC: 1250 ppm
Endpoint(s) Affected: Mortality, clinical signs of toxicity, body weight, and feed consumption
Most sensitive endpoint: Mortality and clinical signs of toxicity

D. VERIFICATION OF STATISTICAL RESULTS:

The LC_{50} was determined using the Probit method via TOXANAL statistical software. Statistical analyses were not conducted to compare body weight and food consumption data because replicate data were not provided. Results for these endpoints were verified visually.

LC_{50}: 2301 ppm 95% C.I.: 1562-3838 ppm
NOEC: 625 ppm Slope: 2.73(1.37-4.09)
LOEC: 1250 ppm
Endpoint(s) Affected: Mortality, clinical signs of toxicity, body weight, and feed consumption
Most sensitive endpoint: Mortality and clinical signs of toxicity

E. STUDY DEFICIENCIES:

The deviations did not affect the validity of the study, however, the acceptability was affected because the stability and homogeneity of the test chemical was not determined.

F. REVIEWER'S COMMENTS:

The reviewer's conclusions were similar to those of the study author; however, the reviewer's LC_{50} value was slightly higher with a narrower 95% confidence interval. As a result, the reviewer's results are reported in the Executive Summary and Conclusions sections. Differences between estimates are attributed to the different statistical methods used.

G. CONCLUSIONS:

This toxicity study is scientifically sound, however it does not fulfill the guideline requirements for an avian dietary study using the Bobwhite quail (§71-2a) because the stability and homogeneity of the test chemical was not determined. This study is classified as SUPPLEMENTAL. There were treatment-related effects on mortality, clinical signs of toxicity, body weight, and food consumption at test levels ≥ 1250 ppm. The 8-day LC_{50} was 2301 ppm, with 95% C.I. of 1562-3838 ppm, which categorizes N-521 (Dazomet) as slightly toxic to Northern Bobwhite quail on an acute dietary basis.

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III. REFERENCES:

Litchfield, J.T., Jr. and Wilcoxon, F., "A Simplified Method of Evaluating Dose-Effect Experiments", J. Pharm. & Exp. Ther. 96, 99 (1949).

APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 1767.767

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	.2725377	2134.134	1398.504	3750.323

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
5	.2473071	1	.3874342

SLOPE = 2.734484
95 PERCENT CONFIDENCE LIMITS = 1.374625 AND 4.094342

LC50 = 2300.712
95 PERCENT CONFIDENCE LIMITS = 1562.177 AND 3837.806

LC10 = 789.6296
95 PERCENT CONFIDENCE LIMITS = 286.6971 AND 1219.883