Data Evaluation Report on the Acute Dietary Toxicity of AE F130060 Technical to Northern Bobwhite Quail (*Colinus Virginianus*)

PMRA Submission Number EPA MRID Number 45386226

Data Requirement:

PMRA DATA CODE	
EPA DP Barcode	D284719
OECD Data Point	
EPA MRID	45386226
EPA Guideline	§71-2a

1/9/2004

Test material: AE F 130060 Technical **Purity:** 94.6%
Common name: Mesosulfuron-methyl
Chemical name: IUPAC: Methyl 2-[3-(4,6-dimethoxyprimidin-2-yl)ureidosulfonyl]-4-methanesulfonamidomethylbenzoate
CAS name: Not reported
CAS No.: Not reported
Synonyms: Code: AE F130060 00 1C95 0001

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Staff Scientist, Dynamac Corporation

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Date: 8/22/03

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{EPA/OECD/PMRA}

Date:

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Company Code:
Active Code:
EPA PC Code: 122009

Date Evaluation Completed:

CITATION: Ebert, E. 1999. Bobwhite Quail Dietary LC_{50} Study. Unpublished study performed by Hoechst Marion Roussel Deutschland GmbH, Hattersheim, Germany. Laboratory Report No. 98.0964. Study submitted by Aventis CropScience, Research Triangle Park, NC. Study initiated August 3, 1998 and completed January 20, 1999.

EXECUTIVE SUMMARY:

The acute dietary toxicity of AE F130060 Technical (Mesosulfuron-methyl) to 14-day-old Northern Bobwhite quail (*Colinus virginianus*) was assessed over 8 days. AE F130060 Technical was administered to the birds in the diet at nominal concentrations of 0 (two negative control groups), 312.5, 625, 1250, 2500, and 5000 ppm. Mean-measured concentrations were <1 (LOD, controls), 297, 731, 1350, 2350, and 4800 ppm.

No mortality was observed during the study. The acute dietary LC_{50} is >4800 ppm, which categorizes AE F130060 Technical (Mesosulfuron-methyl) as slightly toxic to Bobwhite quail on an acute dietary basis. In addition, there were no clinical signs of toxicity, or treatment-related effects on body weight or food consumption, and terminal necropsy revealed no gross abnormalities. The NOEC was 4800 ppm.

This toxicity study is scientifically sound and fulfills the guideline requirements for an avian dietary study using the Northern Bobwhite quail (§71-2a). This study is classified as CORE.

food consumption was reduced at all treatments need to recalculate maxi. conc to reflect this

Results Synopsis

Test Organism Size/Age: 14-days old, 29.9 ± 1.01 g

LC_{50}: >4800 ppm
NOEC: 4800 ppm
LOEC: >4800 ppm
Endpoint(s) Affected: None

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: The protocol followed procedures of the U.S. Environmental Protection Agency Pesticide Assessment Guidelines, Series 71-2 (1982) and OECD Draft Guideline for Testing of Chemicals "Avian Dietary Toxicity Test" (1984). The following deviations from §71-2 were noted:

1. Raw (individual) body weight and feed consumption data were not provided.
2. Specific details pertaining to treated feed preparation were not reported.

COMPLIANCE: Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided. This study was conducted in accordance with OECD principles of GLP (p. 3).

A. MATERIALS:

1. Test Material AE F 130060 Technical (Mesosulfuron-methyl)

Description: Light beige powder

Lot No./Batch No.: Pfl. 35316

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Purity:	94.6%
Stability of Compound Under Test Conditions:	Stability of the test material in avian diet was assessed after 10 days of room temperature storage in treated feed prepared at 312.5 and 5000 ppm. Recoveries averaged 100-114% of nominal concentrations (p. 26). In addition, samples of each test level were analyzed for concentration verification after 11 days of deep frozen storage, just prior to test initiation. Recoveries averaged 94-117% of nominal concentrations (p. 26).
Storage conditions of test chemicals:	Stored at 25 ± 5°C in the dark.

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:	14 days
Weight at study initiation:	29.9 ± 1.01 g (individual data not provided)
Source:	Hoechst Marion Roussel Deutschland GmbH

B. STUDY DESIGN:

1. Experimental Conditions

a. Range-finding Study: No range-finding study was 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):	3 days Same as test Water and Ssniff® Complete Diet for Quails (Rearing) was provided *ad libitum*. Not reported.	Diet composition is provided on p. 23.
Pen size and construction materials	Plastic boxes on corrugated cardboard with quartz sand; 4200 cm^2/group floor space.	*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 controls), 312.5, 625, 1250, 2500, and 5000 ppm <1 (LOD, controls), 297, 731, 1350, 2350, and 4800 ppm	Mean-measured concentrations were reviewer-calculated from data provided on p. 26. Batches had been stored deep frozen for 11 days prior to analysis. *Four minimum, 5 or 6 strongly recommended, in a geometric scale, unless LC_{50} > 5000 ppm.*
Solvent/vehicle, if used type: amount:	N/A N/A	*EPA requires: Distilled water, corn oil, propylene glycol, 1% carboxymethylcellulose, or gum arabic. Solvent not more than 2%.*

Parameter	Details	Remarks *Criteria*
Diet preparation and feeding	3 kg final mixtures of each concentration were prepared and stored deep frozen for 11 days prior to study initiation (not further specified).	Homogeneity was assessed at the low and high levels on the day of preparation, stability was assessed at the low and high levels after 10 days of room temperature storage, and concentration verification was assessed at all levels after 11 days of deep frozen storage. *EPA requires: Control group tested with diet containing the maximum amount of vehicle used in treated diets?*
Feed withholding period	None	
Indicate whether stability and homogeneity of test material in diet determined (Yes/No)	Yes	
Number of birds per replicate/group for negative control: for vehicle control: for treated:	 10 N/A 10	 *EPA requires: 10 (strongly recommended)*
Number of replicates/group (if used) for negative control: for vehicle control: for treated:	 2 N/A 1	
Test conditions temperature: relative humidity(%): photoperiod:	 Brooder: 28-33˚C Room: 25˚C 40-80% 17 hours light/7 hours dark	The light intensity in the cage was approximately 100-300 lux. ***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 (g/bird/day) - Body weight - Necropsy	
Indicate the stability and homogeneity of test chemical in the diet	Stability: Stability of the test material in avian diet was assessed after 10 days of room temperature storage in treated feed prepared at 312.5 and 5000 ppm. Recoveries averaged 100-114% of nominal concentrations (p. 26). Homogeneity: Homogeneity was assessed on the day of preparation in treated feed prepared at 312.5 and 5000 ppm. Three samples were collected from each of the prepared batches. Coefficients of Variation (C.V.) were 8.5% for the 312.5 ppm level and 7.8% for the 5000 ppm level (reviewer-calculated from data provided on p. 25).	In addition, samples of each test level were analyzed for concentration verification after 11 days of deep frozen storage, just prior to test initiation. Recoveries averaged 94-117% of nominal concentrations (p. 26). Ideally, the C.V. should be ≤5% to ensure a homogeneous mixture.
Indicate if the test material was regurgitated	Regurgitation was not reported.	
Treatments on which necropsies were performed	None	

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Observation intervals	Mortality and signs of toxicity were measured at least once daily (twice daily during work-days). Food consumption was recorded on Days 1-6 and 6-9. Body weights were determined on Days 1, 6, and 9.	The day of treatment was Day 1.
Were raw data included?	Raw data were included.	

II. RESULTS AND DISCUSSION:

A. MORTALITY:

No mortality occurred during the 8-day study (Table 1, p. 15).

Table 3: Effect of AE F130060 Technical on mortality of *Colinus virginianus*.

Treatment, ppm mean-measured (and nominal)		No. of birds per treatment	Cumulative mortality								
			Days								
			1	2	3	4	5	6	7	8	9
Negative control		20	0	0	0	0	0	0	0	0	0
297 (312.5)		10	0	0	0	0	0	0	0	0	0
731 (625)		10	0	0	0	0	0	0	0	0	0
1350 (1250)		10	0	0	0	0	0	0	0	0	0
2350 (2500)		10	0	0	0	0	0	0	0	0	0
4800 (5000)		10	0	0	0	0	0	0	0	0	0
NOEC		4800 ppm									
LC_{50}		>4800 ppm									
Reference chemical	mortality	N/A									
	LC_{50}	N/A									
	NOEC	N/A									

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B. SUB-LETHAL TOXICITY ENDPOINTS:

No clinical signs of toxicity were observed during the study, and no treatment-related effects on feed consumption or body weight were observed (Tables 2-5, pp. 17-21). In addition, no gross abnormalities were observed upon terminal necropsy (Table 6, p. 22).

Table 4: Sublethal effects of AE F130060 Technical on *Colinus virginianus*.

Treatment, ppm mean measured (and nominal)		Observation				
		Mean body weight (g)			Food consumption (g/bird/day)	
		Day			Day	
		1	6	9	1-6	6-9
Negative control		30.4	45.1	55.0	6.3	7.2
Negative control		29.2	42.0	51.0	6.2	7.9
297 (312.5)		28.3	41.6	50.3	5.1	6.6
731 (625)		31.4	45.8	55.8	5.8	7.3
1350 (1250)		30.5	44.8	53.9	5.2	6.4
2350 (2500)		29.9	44.0	52.9	4.7	6.5
4800 (5000)		29.4	42.7	51.2	5.2	6.4
NOEC		4800 ppm				
EC_{50}		>4800 ppm				
Reference chemical	NOEC	N/A				
	EC_{50}	N/A				

C. REPORTED STATISTICS:

Because there were no mortalities or sublethal effects, the NOEC was visually determined.

D. VERIFICATION OF STATISTICAL RESULTS:

Statistical analyses were not required for mortality, as this endpoint could be visually determined. Replicate data were not provided for body weight or food consumption, and these endpoints could not be statistically verified.

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LC_{50}: >4800 ppm
NOEC: 4800 ppm
LOEC: >4800 ppm
Endpoint(s) Affected: None

E. STUDY DEFICIENCIES:

There were no significant deviations from U.S. EPA guideline §71-2 that affected the validity or acceptability of this study.

F. REVIEWER'S COMMENTS:

The reviewer's conclusions agreed with the study authors'.

Since the highest mean-measured concentration was below the required limit level of 5000 ppm, a more conservative Toxicity Category was assigned.

Based on the feed consumption and concentration in the diet, the mean daily uptake of the test compound was calculated (Table 5, p. 21). Uptake of AE F130060 Technical averaged 45.6, 93.8, 172.5, 317.5, and 720.0 mg/kg bw/day for the 312.5, 625, 1250, 2500, and 5000 ppm groups, respectively.

G. CONCLUSIONS:

This toxicity study is scientifically sound and fulfills the guideline requirements for an avian dietary LC_{50} study using the Northern Bobwhite quail (§71-2a). There were no significant effects of AE F130060 Technical on mortality, body weight, or food consumption. No clinical signs of toxicity were observed, and necropsy revealed no gross abnormalities. The acute dietary LD_{50} was >4800 ppm, which categorizes AE F130060 Technical (Mesosulfuron-methyl) as slightly toxic to Northern Bobwhite quail.

LC_{50}: >4800 ppm
NOEC: 4800 ppm
LOEC: >4800 ppm
Endpoint(s) Affected: None

III. REFERENCES:

A reference list was not provided.

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