

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

1. CHEMICAL: Strychnine Alkaloid
2. TEST MATERIAL: Strychnine Alkaloid
3. STUDY TYPE: Acute Dietary LC50
4. CITATION AND MRID NO: Record, R.C., 1987. tests to Determine the Dietary LC-50 of Strychnine Alkaloid to European Ferrets (Mustela putorius furo). MRID # 402965-02
5. AUTHORS, STUDY DATE, TEST LABORATORY :
Raymond C. Record, June 1987, Summit Laboratories

6. REVIEWED BY:

Richard W. Felthousen
Wildlife Biologist
EEB/EFED

Signature: *Richard W. Felthousen*
Date: 8/14/91

7. APPROVED BY:

for Norm Cook
Supervisory Biologist
EEB/EFED

Signature: *Allen W. Vaughan*
Date: 8.20.91

8. CONCLUSIONS:

The study has been found to be inadequate to support registration because there were insufficient number of test animals per treatment level.

9. RECOMMENDATIONS: N/A

10. BACKGROUND: The USEPA required Registrants of strychnine treated egg baits to provide data determining the dietary LC50 of strychnine alkaloid to the European ferret.

11. DISCUSSION OF INDIVIDUAL TESTS:

12. MATERIALS AND METHODS:

- A. Test Animals: European ferret (Mustela putorius furo)
- B. Dosage: 110, 165, 220, 275 ppm
- C. Test System: pen study
- D. Test Design and Procedures: Test animals were young adult (approximately 10 months old) ferrets from the Peterson Fur farm, Sanborn, Minnesota. They were individually housed in wire cages (40 cm wide, 60 cm

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long, 38 cm high). They were maintained under 12;12 L/D photoperiod between 65-75 degrees fahrenheit at 50% relative humidity. Test animals were fed a ration of commercial mink food and water ad libitum prior to and after testing.

Range finding tests were performed to determine the concentrations to be tested. Test diets were prepared by taking a stock solution of strychnine and mixing with appropriate amounts of water and acetic acid to achieve a standard volume solution per unit of mink food, then measured into the mink food and mixed to the desired test concentration.

The concentrations tested were 110, 165, 220 and 275 ppm. Samples of the test diets were submitted to the Wyoming Department of Agriculture Division of State Laboratories for analysis. The observed analysis was within 90% of the expected concentration for all treatment levels.

Food consumption was determined for each day and all ferrets were weighed at the beginning and end of each test. Symptoms of toxicosis were noted and all dead animals were subjected to gross necropsy.

E. Statistics: Litchfield/Wilcoxin Method

13. REPORTED RESULTS:

The calculated dietary LC50 of strychnine alkaloid to the European ferret was reported to be 198 ppm with 95 percent confidence limits of 148 to 262 ppm. Symptoms of toxicosis included hyperexcitability, tetanic seizures and immobility.

14. STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:

No conclusions or quality assurance measures reported.

15. REVIEWER'S DISCUSSION:

A. Test Procedure: With the exception for the number of test animals per treatment level the test procedure was adequate to determine an LC50 value.

B: Statistical analyses: See attached

C. Discussion/Results: The EEB is aware that Summit Laboratories was the subject of an EPA audit to determine if Good Laboratory Practice was adhered to during the conduct of these tests. The conclusion was, that although GLP was not followed, for certain practices, deviations from GLP should not have significantly altered the results of the study.

The Results section of the study stated ..."
Frequently, animals which appeared to be sleeping normally would commence convulsive trembling movements if they were awakened during the daily feedings. Five ferrets exhibited such convulsive symptoms on successive days but survived the test period and exhibited no such symptoms (in fact appeared in good health) during the posttest period." Based upon this observation the researcher stated, ..." This observation leads one to hypothesize that those ferrets that survived may have been able to limit their intake of toxic food to a point just below the level of toxicity." The EEB believes there are insufficient data to support this observation.

D. Adequacy of the Study:

(1) Classification: Supplemental

(2) Rationale: The study provides some information relative to the toxicity of strychnine alkaloid to the European ferret, however, because insufficient number of animals per concentration were used (only 6 animals per treatment were used and a minimum of 10 is required) the study cannot be considered adequate to support registration.

(3) Repairability: Provided the Registrant can make a scientifically sound argument as to why the LC50, as established for the 6 animals tested, would not differ significantly from an LC50 value for 10 animals, the EEB would consider upgrading the study to CORE status.

FITE STRYCHNINE FERRET 10-15-87

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
275	6	4	66.66667	34.375
220	6	3	50	65.625
165	6	3	50	65.625
110	6	0	0	1.5625

THE BINOMIAL TEST SHOWS THAT 0 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 190.5255

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	.5423295	202.6481	151.4738	337.2193

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
5	.7153704	1	.4123694

SLOPE = 4.978449
 95 PERCENT CONFIDENCE LIMITS = .7676983 AND 9.189199

LC50 = 209.4091
 95 PERCENT CONFIDENCE LIMITS = 148.2171 AND 425.1803

LC10 = 116.3847
 95 PERCENT CONFIDENCE LIMITS = 6.40399 AND 158.679

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