DATA EVALUATION RECORD PAGE 1 OF

CASE: GS0333 FENAMIPHOS

CONT-CAT: 01 GUIDELINES: 71-4

MRID: 121291

Lamb, D.; Carsel, M.; Mallicoat, D.; et al. (1982) Fenamiphos Reproduction Study with Bobwhite Quail: Study No. 80-675-03; 82224. (Unpublished study received December 16, 1982 under 3125-283; submitted by Mobay Chemical Corp., Kansas City, MO; CDL:071291-D).

REVIEW RESULTS:

VALID X INVALID ____ INCOMPLETE ____

GUIDELINE: SATISFIED X PARTIALLY SATISFIED ___ NOT SATISFIED ___

DIRECT RVW TIME = START DATE: END DATE:

REVIEWED BY: Richard W. Felthousen

TITLE: Wildlife Biologist

ORG: EEB/HED

LOC/TEL: 557-1392

SIGNATURE: DATE: 12/04/86

APPROVED BY: O. Gutenson

TITLE: Acting Registration Standard Coordinator

ORG: EEB/HED

LOC/TEL:

SIGNATURE: DATE: 12/21/87

This bioassay is scientifically sound and demonstrates that dietary exposure of 8 ppm reduces bobwhite quail chick survival by 31%. The highest NOEL was 2.0 ppm.

6 pages

DATA EVALUATION RECORD

1. Chemical: Nemacur

2. Formulation: Technical (90%)

3. Citation: Lamb, D.W. and Carsel, MA. 1982. Fenamiphos Reproduction Study with Bobwhite Quail. Reference Tox. 305; AC 8224. Mobay Chemical Corporation (EPA Accession No. 071291)

4. Reviewed By: Charles A. Bowen II
Fisheries Biologist
Ecological Effects Branch
Hazard Evaluation Division (TS-769)

5. Date Reviewed: March 3, 1983

6. Test Type: 25-Week Avian Reproduction Study

A. Test Species: Bobwhite Quail (Colinus virginianus)

7. Reported Results:

Dietary exposures of 0.5, 2.0, or 8.0 ppm fenamiphos had no significant effects on adult body weight, feed consumption, brain cholinesterase, survival or egg production, shell thickness, cracking, fertility or hatchling, or on weight of chicks. Chick survival to 14 days was reduced by 31% in the 8.0 ppm group. The highest no-observed-effect level (NOEL) was 2.0 ppm.

8. Reviewer's Conclusion:

This bioassay is scientifically sound and demonstrates that chronic dietary exposure up to 8.0 ppm should not effect the reproductive success of upland birds. This study will fulfill the requirement for an avian reproduction study on bobwhite quail.

9. Test Procedures:

Pen-reared male and female bobwhite quail were obtained from Morris Quail Farm, Goulds, Florida. They were 21 weeks old when the study was initiated and their weight range was: males - 160 to 210 g, females - 165 to 220 g.

The birds were housed one male and one female per cage. There was a 5-week observation and acclimation period.

One hundred males and one hundred females were randomly assigned to treatment groups. Each group had 24 cages with one male and one female per cage, plus an extra cage for replacement purposes.

Dietary Level (ppm)	No. Cages	Birds per Cage Male	Female
0	24	1	1
0.5	24	1	1
2.0	24	1	1
8.0	24	1	1

Pairs of birds were housed in Georgia Quail Farm breeding cages. Temperature and humidity were maintained at 69 to 74°F and 35 to 55%, respectively. For the first 8 weeks the birds were kept under a regime of 7 1/2 hours of light per day to condition the birds for maximum egg production. The photoperiod was then increased to 17 hours light per day for the duration of the study. The birds received at least 6 foot candles of illumination throughout the study. There were no environmental deviations that affected the study. Food and water were available ad libitum.

Fenamiphos was administered to the birds at 0.5, 2.0 and 8.0 ppm in their diet. The test article was dissolved in acetone mixed with corn oil. This solution was placed in a separatory funnel and was added to the feed slowly while mixing in a 30-quart bowl of a Hobart Mixer, Moded D-300T. Acetone, also used as a rinsing agent for the glassware used in the feed preparation, evaporated before the food was presented to the birds. The amount of test article was adjusted to 100% ai.

The control group received a diet containing 1% corn oil. Fresh batches of diet were prepared weekly and stored in the freezer until used. The diet was available ad libitum. After 1 week, all uneaten diet was removed and freshly mixed feed was offered to the birds. The test diet was administered for 10 weeks prior to the onset of egg laying and during egg laying.

All adult birds were observed daily throughout the study for clinical signs and mortality. Body weights were recorded at weeks 0, 2, 4, 6, 8, and 25 for the study. A weighted amount of feed was offered weekly to each group, and the feed remaining at the end of the week was weighed to determine the weight of feed consumed.

The hens started laying during the tenth week of the study and eggs were collected twice daily until week 25. The eggs were stored at 60°F and 65° relative humidity. All eggs were candled before being set. The eggs were placed in an incubator. Eggs were candled on day 11 of incubation to measure fertility and on day 21 to measure embryo survival. On day 21 of incubation the eggs were allowed to hatch.

Throughout incubation the temperature was maintained at 99.5°F with a wet bulb humidity of 84°F. The eggs were rotated automatically each hour through day 21 of incubation. When the eggs were transferred to the hatcher, rotation was discontinued, the temperature was lowered to 99.0°F, and the wet bulb humidity was raised to 86°F.

All hatchlings were removed from the hatcher on day 25 of incubation, and the average body weight of the hatchlings was determined. Hatchlings were housed according to parental group 100°F, from hatching to day 14 of brooding. The chicks were given food and water ad libitum. For 1 week after hatching Ralston Purina Puramycin was added to the water supply for all chicks hatched after the fifth week. At 14 days of age the chicks were weighed and sacrificed.

On one day in the first, third, fifth, seventh, and ninth week of egg laying, all eggs laid that day were used to measure eggshell thickness. They were opened at the waist and the contents were thoroughly washed out. The shells were allowed to dry for at least 48 hours at room temperature. The average thickness of the dried shell plus the membrane at the waist was determined by measuring at three points around the waist using a micrometer calibrated to 0.01 mm units.

10. Statistical Analysis:

The values were subjected to an analysis of variance followed by Duncan's New Multiple Range Test (SAS Version). All significant differences were expressed at the 95% level.

11. Reported Results:

Two males from the control group and one female each from level 0.5 and 2.0 ppm died during the study. Lesions on these and the birds which were sacrificed at the end of the study were nonspecific and not compound-related. The control male that was found dead 10 days after the initiation of the study had hung himself on the cage wire and was replaced with the extra male.

There were no significant differences in mean body weights between control and compound-exposed groups.

There were no significant differences between groups in feed consumption.

The only parameter significantly different from the control group is the percent 14-day survivors among the 8.0 ppm chicks.

With respect to shell thickness, only the 2.0 ppm group for week 3 was significantly different from the control thickness. This is considered a chance occurrence.

At the termination of the 25-week study, brain cholinesterase activities from compound-exposed birds were 9 to 15% below those from control birds. No biological significance is attached to cholinesterase reductions of this magnitude.

12. Study Author's Conclusions:

The test compound had no significant effects on adult body weight, feed consumption, brain cholinesterase, survival or egg production, shell thickness, cracking, fertility or hatching, or on weight of chicks. Chick survival to 14 days was reduced by 31% in the 8.0 ppm group. The highest no-observed-effect level was 2.0 ppm.

13. EEB Statistical Analysis:

The number of eggs laid and 14-day old survivors were examined for significant differences using EEB's Trttab program. Trttab is a chi-squared analysis (2-way table) which examines frequency data for differences in the number of eggs laid in each group and examines 14-day survivors (egg set - # dead = 14-day survivors).

The chi-square statistic (appendix I) indicates their is no significant difference between controls and treatment groups. Fenimaphos does not significantly effect egg production or egg viability in bobwhite quail.

14. Reviewer's Conclusion:

The conclusions drawn by the author are supported by the statistical procedure cited earlier. No deviations from EPA recommended protocols were noted.

15. Validation Status: Core

16. Category Repairability: N.A.