12-19-90

DATA EVALUATION RECORD

1. CHEMICAL: Methyl isothiocyanate

2. TEST MATERIAL: Methyl isothiocyanate, Technical

3. STUDY TYPE: Pheasant Dietary LC_{50} Test

4. CITATION:
Ross, D. B., Cameron, M. M., Roberts, N. L., 1977. The Subacute Toxicity (LC_{50}) of Methyl Isothiocyanate To The Pheasant, Performed By Huntingdon Research Center, Huntingdon, Cambridgeshire, England, Project No. SHG 135-WL/77646, For Nor-Am Chemical Company, 3509 Silverside Road, P.O. Box 7495 Wilmington, DE 19803, MRID #00119184

5. REVIEWED BY:

Dennis McLane
Ecological Effects Branch
Environmental Fate and Effects Division (H7507 C)

12-19-90

6. APPROVED BY:

Les Touart, Acting Section Head
Ecological Effects Branch
Environmental Fate and Effects Division (H7507 C)

2/23/91

7. CONCLUSION:

The study is not scientifically sound and does not meet the guideline requirements.

8. Background:

A summary submitted in connection with list B procedure resulted in the review of this study.

9. MATERIALS AND METHODS:

A. Test Organisms:

Species-Ring necked pheasant

Supplier-Lincolnshire Pheasantries

Age-12 days

Acclimation period-12 days

B. Test System:

Pen size-not reported

Environmental temperature-not reported

Relative humidity-not reported

Ventilation-"Because of the volatility of the test compound, and to avoid contamination between treatment, the birds offered diet containing ZK3318 were housed in a building to provide increased air extraction."(excerpted from study)

Photoperiod-not reported

Dose preparation-"A bulk mix of the basal diet containing all ingredients with the exception of maize oil was prepared by a local foodstuffs compounder. The composition of this diet is given in Appendix 4. Immediately prior to using the diets on appropriate amount of edible grade maize oil (Mazola - Corn products) was mixed with some of the 'dry' diet to give the required quantity of basal diet. In preparing each experimental diet an accurately weighed amount of ZK3318 or dieldrin was thoroughly mixed with a small amount of maize oil and then combined with the 'dry' diet to give the Final test diet. Fresh batches of treated diet were prepared daily as the test compound was known to be volatile."

C. Test Design:

Range finding test-not reported

Definitive test

Nominal concentrations-2500, 5000, 7500, 10000, and 11500 ppm

Controls- 3 control levels were used.

Number of test organisms-10 birds per level

Biological observations-bodyweight, food consumption, mortalities, signs of toxicity, and gross post-mortem examinations

Pen conditions-The report did not contain the following:

1. Size of the pen
2. Temperature
3. Humidity
4. Lighting

10. REPORTED RESULTS:

Mean measured concentrations-Not performed

Recovery of chemical-Not applicable

Bodyweights-"Birds offered diet containing ZK 3318 showed a lower rate of bodyweight gain than the negative and positive control group of birds at all stages of the study. This reduction may partially be explained by the modification in housing and ventilator which had to be adopted because of the volatile nature of the compound. These modifications when associated with the fact that the young pheasant is not an easy bird to work with and did not respond well to those modifications resulted in a general decrease in bodyweight gain, although the birds remained apparently healthy."

Food consumption-"Detailed results are given in Appendix 3. There was a variation between treatment groups at all stages of the study. Food consumption of groups offered diet containing ZK3318 and dieldrin was lower than that of the control groups."

Mortality and observations- " Birds offered diets containing ZK3318 and dieldrin appeared lethargic and showed some loss of muscle function during the treatment period."

5 day treatment period- 7500 ppm level 10 deaths, 10000 ppm level 5 deaths, 11200 ppm 4 deaths

3 day observation period- 10000 ppm level 5 deaths, 11200 ppm level 1 death

Gross pathology- " All surviving birds where 5 or more mortalities occurred were examined post-mortem. Five birds from each of the other groups were also examined."

"No abnormalities were detected."

11. STUDY AUTHORS'S CONCLUSIONS / QUALITY ASSURANCE MEASURES:

A signed statement indicated that the test was performed as reported.

Conclusion

Although it was not possible to determine an exact LC_{50} value for ZK3318, it was apparent that, with an LC_{50} within the range of 5,000 - 10000 ppm. It was considerably less toxic to the Ring-necked pheasant than dieldrin with an LC_{50} value of 43 ppm."

12. REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:

A. Test Procedure:

The following items were not reported:

1. Birds were of the same hatch
2. Health of the birds
3. Size of the pens
4. Temperature
5. Humidity
6. Lighting
7. Amount of corn oil
8. Mix ratio
9. Food consumption per pen
10. Percent active ingredient

The following items do not meet guideline criteria:

1. The concentration in the feed was not measured.

B. Statistical Analysis:

Statistical analysis was not attempted by the laboratory.

C. Discussion/Results:

The following items are expected the effect the results:

1. It was mentioned by the laboratory that the pheasants did not appear to adjust well the artificial conditions of the lab.

2. MITC is highly volatile and would be expected to evaporate from the food quickly. Therefore the relationship of the nominal concentration to the actual concentration is known. Not knowing the tested concentration makes deriving the LC_{50} value impossible.

3. Unreported items listed above.

D. Adequacy of the Study:

1. Classification: Invalid

2. Rationale:
MITC is highly volatile and would be expected to evaporate from the food quickly. Therefore the relationship of the nominal concentration to the actual concentration is unknown. Not knowing the tested concentration makes deriving the LC_{50} value or making inferences difficult if not impossible.

3. Repairability: This study can not be repaired.

13. COMPLETION OF ONE-LINER FOR STUDY:

yes

mclane methyl isothiocyanate pheasant lc50

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
11200	10	5	50	62.30469
10000	10	10	100	9.765625E-02
7500	10	10	100	9.765625E-02
5000	10	0	0	9.765625E-02
2500	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 5000 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 6123.72

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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