Shaughnessy No: 009001

Date Out of EAB: APR 11 1988

To: George LaRocca
Product Manager #15
Registration Division (TS-767C)

From: Michael Firestone, Chief
Special Review Section
Exposure Assessment Branch
Hazard Evaluation Division (TS-769C)

Thru: Paul F. Schuda, Chief
Exposure Assessment Branch
Hazard Evaluation Division (TS-769C)

Attached, please find the EAB review of:

Reg./File # : 602-309

Chemical Name : Lindane

Type Product : Insecticide

Product Name : Purina Dog Dip

Company Name : Purina Mills, Incorporated

Purpose : Protocol Review for Exposure Study

Date Received : 11/30/87 Action Code: 352

Date Completed: 4/5/88 EAB #(s): 80149

Monitoring study requested: X Total Reviewing Time: 4 days

Monitoring study voluntarily: _____

Deferrals to: _____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1.0 INTRODUCTION

In September 1985 the Agency issued a Registration Standard for the insecticide lindane (1). This document identified exposure data for workers applying the material to dip dogs as a data gap. Purina Mills, Incorporated, the registrant for Purina Dog Dip (EPA 602-309), responded with a protocol for a study to measure dermal and respiratory exposures of individuals using this product.

Purina Dog Dip is an emulsifiable concentrate containing 6.5 percent lindane as the active ingredient. The product is labelled for kennel, commercial, farm, and sport dog uses only. One ounce of the formulated product is mixed with one gallon of water to form a 0.05 percent solution. A worker is restricted to 12 or fewer treatments (defined as dipping 3 dogs or less) per year. Applicators are required to wear elbow length waterproof gloves, a waterproof apron, and unlined waterproof boots during treatments.

2.0 DESCRIPTION OF STUDY

2.1 Dipping Procedure

Dogs are treated by placing them into a stock tank containing a 0.05 percent solution of lindane. The galvanized metal tank is approximately 3 feet long, 2 feet deep, and 2 feet wide. The capacity is approximately 80 gallons of treatment solution. The tanks are located inside the kennel.

Dogs are normally brought to the dipping area for treatment. The dog is placed into the treatment solution. Any exposed parts are treated by sponging the solution over these areas avoiding the eyes and mouth. The total time that the animal is in the solution should be less than 30 seconds. Following the dipping the dog is immediately returned to its holding area.

2.2 Exposure Monitoring

The potential dermal and respiratory exposures of applicators to lindane during dog dipping will be measured during 15 work cycles at 2 locations. Each work cycle will consist of the treatment and handling of 3 dogs, each selected randomly from dogs present in the kennel at the time of the study. All dogs will be dipped indoors. The weight, age (if known), and sex of each dog will be recorded. The animals will be observed for side effects at 12 and 24 hours after dipping. All label restrictions and warnings will be followed during treatments. Dogs that are too small (less than 20 pounds), too young (less than 4 months), nursing, or within 30 days of giving birth will not be treated.

Applicators will wear all label required protective clothing during treatment. Dermal exposure of the body of applicators will be measured using chromatography paper patches attached

inside and under the clothing at locations described in the Agency's Pesticide Assessment Guidelines - Subdivision U (2). The dermal pads will be removed from the applicator and placed directly into the extraction vessels. Hand exposure will be measured by hand rinse with isopropyl alcohol. Residues on the face will be determined by swabbing areas with isopropyl alcohol. A template will be used to provide uniformity of the areas measured. Four facial swabs will be used.

Respiratory exposure during treatment will be measured by drawing air through charcoal tubes located in the breathing zone of the applicator. Sampling rates and equipment were not specified. In addition to the personal sampling, samples will be collected near the dipping location and in adjacent areas such as waiting rooms, kennels, or offices. Both inlet and return air will be monitored. Samples will be collected at intervals of 1, 4, 8, 12, and 24 hours after mixing the dipping solution.

2.3 Analytical Chemistry

Dermal patches will be extracted with 100 ml of hexane. A 1:1 mixture of hexane:acetone will be used to extract the charcoal tubes. Hand wash samples for the right and left hands will be pooled prior to analysis. A 200 ml aliquot of the hand wash will be extracted with hexane. The hexane layer will be washed with distilled water and dried with anhydrous sodium sulfate. The sample will be reduced to dryness and rediluted with 50 ml hexane. Facial swab samples will be pooled and extracted with hexane. The extract will be treated in the same manner as the hand wash from this point onward. Lindane will be quantified by gas chromatography using an electron capture detector.

3.0 CONCLUSIONS

EAB finds the protocol to be acceptable and requires only minor clarifications. Dog dipping is a rather unusual method of applying a pesticide, involving direct contact with a freshly treated animal. The Pesticide Assessment Guidelines recommend shoulder and/or upper arm patches for the measurement of upper arm exposure. Since there may be direct contact of the upper arm with the treated animal there should be patches located on both the upper arms and shoulders.

The equipment to be used for air sampling was not fully described. The accuracy of any sampling equipment must be adequately documented. EAB emphasizes that strict quality

assurance procedures must be followed in all stages of the study and that appropriate field spikes and recovery samples must be included.

David Jaquith

David Jaquith
Special Review Section 2
Exposure Assessment Branch
Hazard Evaluation Division (TS-769C)

REFERENCES

1) EPA (1985) Guidance for the Reregistration of Pesticide Products Containing Lindane as the Active Ingredient. EPA RS-85-027.

2) EPA (1987) Pesticide Assessment Guidelines - Subdivision U Applicator Exposure Monitoring. PB87-133286.