

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

(1) CHEMICAL: Trichlorfon

(2) TYPE OF FORMULATION: Active ingredient

(3) CITATION: Meith, K., Beier, D., and Losch, K. 1975.

[Studies on organophosphorus preparations in cattle, pigs,
and sheep with special reference to cholinesterase activity.]
Arch. Exp. Veterinarmed. 29:501-517 (Translated from German)

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- (6) TOPIC: This study has information pertinent to discipline toxicology, topic biochemistry. It relates to none of the Proposed Guidelines data requirements.
- (7) CONCLUSION: Treatment of sheep by bathing with 0.025% Trichlorfon-Wolfen solution or spraying with 1% Trichlorfon-Wolfen solution resulted in a very mild inhibition of blood acetylcholinesterase activity (maximum inhibition of 21 and 20%, respectively), but no symptoms of intolerance. Treatment of sheep by the pour-on method using 6% Trichlorfon solution (36 mg/kg and 60 mg/kg) did not cause symptoms of intolerance, but did produce a marked inhibition of the cholinesterase activity for the higher dose (70%). Doses of 50, 100, 125 and 150 mg of Trichlorfon-Wolfen/kg, when administered perorally, did not induce intoxications. With all peroral doses, a strong inhibition of the acetylcholinesterase activity was observed, ranging from 54% (50 mg/kg) to 81% (150 mg/kg).

CORE CLASSIFICATION: Not applicable

- (8) MATERIALS AND METHODS: Trichlorfon of unspecified purity and from an unnamed source was administered to 30 healthy sheep, weighing about 50 kg each (unspecified sex). Four methods of treatment were used: whole body bath, whole body spray, pour-on, and peroral. Acetylcholinesterase activity was measured using the hydroxamic acid method. Normal acetylcholinesterase activities were measured in

all animals prior to treatment. The animals treated with the appropriate preparation of trichlorfon and blood samples were taken from the jugular vein at intervals of 2, 4, 8, and 16 hours and analyzed. The collection of specimens was continued up to 240 hours after treatment. For peroral administration, "Trichlorfon-Wolfen" was suspended in 20-30 ml water and sprayed into the oral cavity with a syringe. Animal housing conditions were unspecified.

- (9) REPORTED RESULTS: The maximum inhibition of blood acetylcholinesterase activity observed with the various methods of treatment with trichlorfon is presented below.

| <u>No. of Animals</u> | <u>Preparation</u> | <u>Method of Treatment</u> | <u>Dose</u> | <u>Time (h)</u> | <u>Maximum Enzymatic Inhibition (%)</u> |
|-----------------------|--------------------------|----------------------------|-----------------|-----------------|---|
| 3 | Trichlorfon solution | Whole body bath | 0.025% solution | 4 | 21 |
| 3 | Trichlorfon solution, 1% | Whole body spray | 1 liter/animal | 4 | 20 |
| 3 | Trichlorfon solution, 6% | Pour-on | 30 ml/50 kg | 28 | 27 |
| 3 | Trichlorfon solution, 6% | Pour-on | 50 ml/50 kg | 24 | 70 |
| 3 | Trichlorfon-Wolfen | Peroral | 50 mg/kg | 24 | 54 |
| 3 | Trichlorfon-Wolfen | Peroral | 100 mg/kg | 4 | 54 |
| 6 | Trichlorfon-Wolfen | Peroral | 125 mg/kg | 6 | 79 |
| 6 | Trichlorfon-Wolfen | Peroral | 150 mg/kg | 4 | 81 |

All methods of treatment used produced no clinical symptoms of intolerance. For the group treated by pour-on at 50 ml/kg, the 70% inhibition observed lasted for only a few hours and after 16-22 hours, normal acetylcholinesterase activity was once again observed. For the group treated perorally with 100 mg/kg, the enzymatic inhibition was maximal at 4 hours and the reactivation of the enzyme required up to 44 hours.

(10) DISCUSSION: The authors presented evidence showing that the administration of trichlorfon at a dose causing a 70-80% inhibition of blood acetylcholinesterase activity does not produce clinical symptoms of intolerance in sheep. Therefore, in contrast to the situation with cattle, diminished cholinesterase activity is unreliable as an indicator of systemic toxicity of trichlorfon preparations in sheep. The study would have been improved if absolute values of cholinesterase activity had been presented, rather than mean values of percentage inhibition.

(11) TECHNICAL REVIEW TIME: 4.5 hours