

US EPA ARCHIVE DOCUMENT

DATA EVALUATION RECORD

Releasable

- (1) CHEMICAL: Trichlorfon
- (2) TYPE OF FORMULATION: Active ingredient labeled with ³²P
- (3) CITATION: Dedek, W., and Schwarz, H. 1967. [Studies on the percutaneous absorption of ³²P-labeled systemic, minimally toxic organophosphorus compounds (OPC) in cattle.] Z. Naturforsch. 22b:702-706 (Translated from German)

(4) REVIEWED BY:

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- (6) TOPIC: This study has information pertinent to discipline toxicology, topic metabolism. It relates to the Proposed Guidelines data requirement 163.85-1.
- (7) CONCLUSION: Radioactivity from ^{32}P -trichlorfon crosses the skin of cattle, as determined by in vitro experiments. Trichlorfon (or at least CHCl_3 -soluble material) appears in the blood of cattle to the backs of which trichlorfon solutions have been applied. Some solvents allow more of the agent to cross the skin than others.
- CORE CLASSIFICATION: Not applicable
- (8) MATERIALS AND METHODS: In Vitro Experiments: Skin samples were collected from freshly slaughtered cattle. The skin pieces were stored for a maximum of 3 days in Ringer solution at 4°C . Samples (25 cm^2) of the same thickness were fixed in a metal ring with clamping screws and a ^{32}P -trichlorfon solution (25 ml) was poured onto the skin surface. The underside of the skin was in contact with 400 ml of stirred Ringer solution at 37.5°C . Decomposition processes were disregarded. The experiments were terminated at 23 hours, at which time the radioactivity in the lower solution had reached a constant value.

In Vivo Experiments: Radioactive trichlorfon in various solutions was applied to the backs of cattle at doses described as mg/kp (presumably mg/kg). The trichlorfon concentration in blood, determined as total radioactivity in CHCl_3 extracts, was measured.

- (9) REPORTED RESULTS: In Vivo Experiments - Results of these experiments are summarized in the following table:

Solvent	Concentration		Penetration (mg/cm ²)
	30°C ^b	(g/100 ml)	
Alkanediol	88	5.0	0.50-0.62
Caster Oil	303	3.2 ^c	0.43-0.46
Peanut oil ^a	53	1.4 ^c	1.18
Soybean oil ^a	60	1.3 ^c	1.07
Soybean:castor oil (4:1)	84	2.0	0.82
Mineral oil	193	0.6 ^c	0.10-0.13
Mineral oil:alcohol (4:1)	65	2.0	1.80-2.05

^aSimilar oils gave approximately the same results.

^bViscosity in centistokes

^cSaturated solution

In general, the more viscous the solution, the less radioactivity passed through the skin. In solutions of low viscosity, considerable amounts diffuse across this barrier.

In Vivo Experiments: Following application of trichlorfon (2% in mineral oil) to the backs of cattle at a dose of 18-20 mg/kg, blood levels rose to 3 ppm at 1 hour but dropped rapidly so that about 0.2 ppm remained at

6 hours. A 6% solution of trichlorfon in "fatty oil" gave rise to blood levels of 1.5 ppm at 2 hours; the levels remained greater than 0.5 ppm for about 8 hours. However, a 2% solution in "fatty oil" gave rise to blood levels that never exceeded 0.6 ppm. The same was true for a 5% solution in alkanediol. A 2% solution applied in water at a dose of 20-30 mg/kg and then rinsed from the back led to blood levels of about 0.1 ppm.

- (10) DISCUSSION: Numerous experimental details are omitted from this report. The size of the cattle and the precise procedure for application of the pesticide to their backs are examples.

Measurement of total radioactivity in the in vitro experiments did not take into account possible metabolism or chemical breakdown of trichlorfon.

In the in vivo experiments, no points were included in the graphs. Only a continuous line was presented. It is not known, therefore, how often samples were taken or how reproducible the results were.

The only valid conclusion that can be drawn is that some radioactive material penetrated the skin both in vitro and in vivo.

- (11) TECHNICAL REVIEW TIME: 4.0 hours