

ETHYL CORPORATION

INTER-OFFICE

To Gary Ter Haar ADDRESS

FROM Theodore J. Benya ADDRESS

SUBJECT Comparison of Vinyl Chloride Two-Year Toxicity Studies: CIVO¹ versus C. Maltoni² DATE May 30, 1979

I. CIVO Calculationsa) Assumptions:

Rat Weight: 0.4 kg
 Daily Food Intake: 20 g
 Administration: 4 hrs./day x 5 days/wk.
 Duration of Exposure: 140 weeks
 Absorption Efficiency: 50% of dose

b) Calculation: (Example)

1% PVC powder (4000 ppm VCM) in feed would provide 20 ppm dose assuming 50% absorption.

20 ppm would yield 0.4 mg per 20 g of feed, or 1 mg VCM/kg assuming 0.4 kg rat.

II. Maltoni Inhalation ppm Concentration Conversion to mg/kga) Assumptions

Rat breathing Rate: 100 ml/min.
 Administration: 4 hrs./day x 5 days/wk.
 Duration of Exposure: 52 weeks
 Absorption Efficiency: 80% of dose

b) Calculations: (Example)

$$50 \text{ ppm} = \frac{\text{Xmg}}{1000 \text{ l}} \times \frac{24.45}{62}$$

$$50 \text{ ppm} = \frac{0.1268 \text{ mg}}{\text{l}}$$

Amount Administered Per Day:

$$50 \text{ ppm} = \frac{0.1268 \text{ mg}}{\text{l}} \times \{ (6 \text{ l/hr.}) (4 \text{ hrs./day}) \}$$

$$= 3.04 \text{ l mg/day}$$

Amount Absorbed Per Day/kg Rat:

$$50 \text{ ppm} = 3.04 \text{ mg/day} (80\%) / 0.4 \text{ kg}$$

$$= 2.43 \text{ mg/day} / 0.4 \text{ kg}$$

$$\approx 6.09 \text{ mg/kg}$$

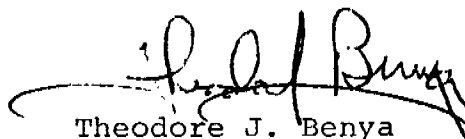
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$\therefore$ 250 ppm $\approx$ 30.4 mg/kg
500 ppm $\approx$ 60.0 mg/kg
2500 ppm $\approx$ 304 mg/kg

III. Discussion (See Tumor Incidence Table Attached)

In comparison, the CIVO and Maltoni data appear to be consistent. In contrast, when comparing Maltoni and IBT data (previously reported) the latter indicated a four- to seven-fold greater incidence in liver angiosarcomas.



Theodore J. Benya

TJB:sbb

- ¹ Centraal Instituut Voor Voedingsonderzoek (W. Germany)
"Central Institute for Nutrition and Food Research",
October, 1978
- ² Institute of Oncology and Tumour Centre (Bologna, Italy)
"Origins of Human Cancer", Cold Spring Harbor 1977 Conference . pps. 119-146.

cc: J. Lees

Tox: VC (Animal Studies)

EC- 1528

TUMOR INCIDENCE (%) TABLE

Study	Route	mg/kg	Liver Angiosarcomas	Zymbal Carcinomas	Mammary Carcinomas
CIVO	Feed	1.7	0	0	1.9
Maltoni	Gavage	3.3	0	0	0
CIVO	Feed	5.0	5	1.2	2.5
Maltoni	Inhal.	6.0 (50 ppm)	1.6	0	3.1
CIVO	Feed	14.1	22.5	0	5.6
Maltoni	Gavage	16.6	11.2	1.2	2.5
Maltoni	Inhal.	30.0 (250 ppm)	6.0	0	1.5
Maltoni	Gavage	50.0	20.0	0	1.2
Maltoni	Inhal.	61.0 (500 ppm)	10.0	6	1.5
CIVO	Gavage	300	35	1.2	4.4
Maltoni	Inhal.	304 (2500 ppm)	18	3	1.4