

Sapphire News

The Sapphire Group Addresses Reference Doses and Drinking Water Equivalents for 1,2,3-trichloropropane.

R. G. Tardiff and M. L. Carson. Derivation of a reference dose and drinking water equivalent level for 1,2,3-trichloropropane. *Food Chem Toxicol* 48 (6):1488-1510, 2010

In some US potable water supplies, 1,2,3-trichloropropane (TCP) has been present at ranges of nondetect to less than 100 ppb, resulting from past uses. In subchronic oral studies, TCP produced toxicity in kidneys, liver, and other tissues. TCP administered by corn oil gavage in chronic studies produced tumors at multiple sites in rats and mice; however, interpretation of these studies was impeded by substantial premature mortality. Drinking water equivalent levels (DWELs) were estimated for a lifetime of consumption by applying biologically-based safety/risk assessment approaches, including Monte Carlo techniques, and with consideration of kinetics and modes of action, to possibly replace default assumptions. Internationally recognized Frameworks for human relevance of animal data were employed to interpret the findings. Calculated were a Reference dose (=39 $\mu\text{g}/\text{kg}\cdot\text{d}$) for noncancer, and Cancer Values (CV) (=1-14 $\mu\text{g}/\text{kg}\cdot\text{d}$) based on nonlinear dose-response relationships for mutagenicity as a precursor of cancer. Lifetime Average Daily Intakes (LADI) are 3,120 and 790-1,220 $\mu\text{g}/\text{person}\cdot\text{d}$ for noncancer and cancer, respectively. DWELs, estimated by applying a relative source contribution (RSC) of 50% to the LADIs, are 780 and 200-280 $\mu\text{g}/\text{L}$ for noncancer and cancer, respectively. These DWELs may inform establishment of formal/informal guidelines and standards to protect public health.