

Guidelines/Criteria	
	Reference: Chaturvedi AK. 1993. Biochemical and toxicological studies on the mixtures of three commonly-used herbicides in mice. Arch Environ Contam Toxicol 24(4):449-454.
In vivo Study Type Route of Administration Species & age of animals	Repeat dose study in mice focussed on liver effects Drinking water Male ICR mice 20-24g
Study Duration	30 days
Type of Mixture Binary >2 components Similar acting or dissimilar What Mode of Action was investigated?	Yes Yes, all three Dissimilar Nothing specific
Parameters/End points Measured Target organs/Critical effects Pharmacological changes or adverse effects	Food and water consumption, body weight, organ weights, serum liver enzyme concentrations, pentobarbital induced sleeping time, liver kidney and spleen pathology, liver enzyme activities. Depends on endpoint - the key endpoint in terms of results was pentobarbital-induced sleeping time, which is pharmacological, not toxicological.
Individual Components Characterisation of individual compounds Name, exact chemical name, CAS no. Were dose responses established for individual components? Were no effect levels established? Were doses below the NO(A)ELs investigated?	Alachlor, atrazine and picloram No, only a single dose tested Atrazine at 10ppm had an effect, but 10ppm was a NOEL for alachlor and for picloram alone No
Mixtures Investigated Number of dose levels How does the mixture make-up compare to individual components? (e.g. low dose) equivalents used?) No. of technical replicates per exposure condition (<i>in vitro</i>) No. of animals per dose group (<i>in vivo</i>)	One, 10ppm of each of two components, or 10ppm of all three Stated to be approximately 10000 times higher than concentrations detected in ground water 40
Observations/Findings	Since NOELs were only established for alachlor and picloram, only this mixture is of relevance. Alachlor plus picloram reduced the pentobarbital-induced sleep time by 24%, which was statistically significant. This mixture has no other effects.
Overall opinion (e.g. sufficient numbers of groups investigated, group sizes adequate, observations reproducible, low dose levels used investigated)	Results were only reported in summary form. The effect on sleeping time is interpreted by the authors as being caused by liver enzyme induction. A 90 day drinking water study at the same doses body weights were reduced about 10% for all treated groups (stat sig), making it not relevant. A 21 day oral gavage study was also performed, but each single component produced effects.