

TOXICITY DATA

PRINCIPLES FOR ASSESSING TOXIC EFFECTS IN ANIMALS

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The main objective of toxicity studies in animals is to determine the adverse effects on biological systems. The results provide the experimental data necessary for the prevention of harmful effects in humans exposed to tested chemical compounds.

In principle, all new chemicals require toxicity testing before their large-scale manufacture is undertaken. However, the growing number of chemicals introduced annually into industrial production and the limited resources available necessitate the establishment of priorities in the selection of chemicals for testing. Essential criteria for such testing are:

- indication or suspicion of hazard to human health and type and severity of potential health effects;
- probable extent of production and use;
- potential for persistence in the environment;
- potential for accumulation in the biota and the environment; and
- type and size of population likely to be exposed.

A priority chemical for testing would rate highly with respect to all or most of these criteria (1). The above-mentioned criteria should also be considered when the extent of toxicity testing required is being proposed. In general, a higher priority for testing is linked with the larger scope of toxicity testing.

Before beginning an experimental toxicity evaluation an approximate estimation of toxicity may be useful, based on the chemical structure, the physical and chemical properties of the substance and on the known correlation of these variables with biological activity (2-5). Based on the chemical structure and toxicity of chemically related compounds, the preliminary prediction of the nature and site of toxic action may be possible. Stability of the chemical in various ambient conditions, possibility of photodecomposition and knowledge of decomposition products are essential, both for designing the toxicological experiments and for avoiding loss of the test compound during storage and preparation for