# Safety testing (of non-medical products) (1)

## What is safety testing?

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Using animals to test the safety of chemicals is a very controversial issue that has been the subject of many high profile campaigns by animal advocates.

The purpose of safety testing (also referred to as **toxicology**) is to provide information on whether new substances for use in industry, agriculture or in the household may have harmful effects when they come into contact with humans, animals and the environment.

For many types of product, testing on animals is required by law – to satisfy the relevant authorities (regulatory bodies) that a new product or substance should be allowed to be marketed. There are safety testing requirements for chemicals, such as food additives and pesticides, and the ingredients of paints, plastics and household cleaners.

Some safety tests are used to try to predict the likely effects of new chemicals on wildlife, for example whether a chemical would affect the health of fish if it were to enter rivers and streams. However, most safety tests are intended to provide information considered necessary for assessing the risk of products to human health.

There are nine different safety tests that may be done for each chemical, depending on its intended use and how much of it will be made. Two examples are as follows:

# 1) To test whether a chemical irritates the eyes or skin (using rabbits)

To test whether a chemical causes skin irritation, small areas of the back of each rabbit (normally albino rabbits) are shaved and the test chemical is applied to the skin. Normally, the chemical is dissolved in water or a saline solution, but it may be used as a solid moistened with water. It is covered with gauze and left for four hours. The gauze is then removed and, over the next 72 hours, the skin is examined for reddening or swelling. If the chemical is not expected to be severely irritant, three rabbits are used – but if it is expected to be an irritant, only one may be used.

To test for eye irritancy, the chemical is dropped into one eye of the rabbit, which is observed for up to 72 hours for signs of reddening, opacity or other damage. As with skin irritancy, one or three rabbits may be used. It is usual to test skin first because skin irritants would almost certainly be eye irritants and so do not need to be tested in the eye.



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# Safety testing (of non-medical products) (2)

# 2) To detect the ability of a chemical to cause cancer (using rats or mice)

To test for ability to cause cancer (carcinogenicity), 400 animals (rats or mice) are divided into four groups of 100. One group is left untreated (controls), but the other groups are treated every day with a set dose of the test chemical; a high, a medium and a low dose. Usually, this involves mixing the chemical with the food or water of the animals, but other treatments include force-feeding by stomach tube or daily/weekly painting of chemicals onto the skin. Treatment starts soon after birth, or at weaning, and continues for most of the animals' lives – about 18 months for mice and two years for rats. At death, which may be by euthanasia, all animals are examined for cancers.

## What are the animal welfare concerns?

The tests vary with respect to the species and numbers of animal used, the way in which the animals are exposed to the substance, the duration of the test and the effects that are measured. Some examples of what is done and of the effects are:

- Chemicals are applied to the animals' skin or in their eyes, or given to them by injection, by stomach tube or by inhalation. For example, mice and rats are kept in small tubes and forced to breathe air containing the substance for a number of hours each day, often over a period of many months
- Severe suffering may occur if the substance being tested is poisonous. Symptoms may include irritation to the skin or eyes, internal bleeding, loss of appetite, aggression, salivation, changes in blood pressure, coma, convulsions, tremors, loss of hair and fur, dehydration or nasal discharge, cancer, birth defects, sickness and death
- Almost all of the animals are killed afterwards for post-mortem examination and further analysis of the body tissues.

#### Some ethical issues

According to the law, animals can only be used in experiments if the benefits of the experiments outweigh any suffering for the animals. For safety testing, the intended benefit is that testing will enable people and the environment to be protected from harm. Obviously this is important, but it does not take into account how much humans need or want the chemical that is being tested. For example, the substance could be a new pesticide that would increase agricultural yields, a new ingredient for furniture polish or a component of a new coloured paint for cars.

#### Is it acceptable for people to have these products, if animals have to suffer to test them?

It can be argued that some substances are more 'important' than others – many people believe that it is wrong to cause animals to suffer so that humans can develop, sell and use new products that others consider to be trivial. An important question to ask is whether humans really need each new product in the first place. Fewer products would mean less animal testing!



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# Safety testing (of non-medical products) (3)

## Are there alternative methods?

It is acknowledged that the use of animals in safety testing is far from perfect, given that a mouse or fish might respond differently to other animals or humans when exposed to a chemical or a drug. For this reason, as well as the ethical reasons, it is important that alternative, more reliable methods are developed.

In safety testing, the most useful techniques so far developed for replacing animals have been based on:

- the use of cells and tissues maintained outside the body (e.g. skin cells can be • grown in test tubes to test some of the effects of chemicals instead of using the skin of living animals)
- the analysis of the chemicals using computer modelling
- carefully controlled tests on human volunteers.

It takes a long time to develop alternative methods and many years for these to be accepted as alternatives by the regulatory bodies.

## Other information

**Cosmetic products** by definition include soaps, shower and bath salts, foams, gels, deodorants, haircare products (shampoos, conditioners, sprays and colourants), shaving creams/foams and lotions, toothpastes and mouthwashes, sun creams, anti-wrinkle products, face packs and hand lotions, aftershaves and perfumes.

Hundreds of cosmetic ingredients have already been safety tested and are in general use. Is there any justification for causing animals to suffer, in order to develop more? In the UK, the testing of cosmetic products and/or ingredients on animals has been banned since the late 1990s. However, it is still currently possible to buy cosmetic products in the UK that have been tested on animals in other countries. This situation will change by 2013, when it will be illegal for any cosmetic product to be sold in Europe if it has been tested on animals, no matter where in the world that testing took place.

- A new European law (called '**REACH**') came into force in 2007. It means that many chemicals – used before new stringent safety testing requirements came into force in 1981 – may have to undergo safety tests that could involve at least eight million laboratory animals. The chemicals concerned are used by industry to make many types of product from household cleaners to paint and plastic goods.
- There are very extensive testing requirements for products such as food additives and pesticides, if it is expected that people or the environment will be exposed to high levels of the substance in question. The law demands that these products are tested on a rodent (rat or mouse) and also on a non-rodent species. Often this means tests on doas.



