



ALUMINIUM & HEALTH

GLOSSARY

ALUMINIUM

Aluminium (scientific symbol Al) is a metallic element and is one of the most common elements on earth. It is found naturally in soils and water, as well as in many foods. In nature it is usually found in combination with other elements, usually as bauxite, from which metallic aluminium is made.

Aluminium is a very light weight metal that is soft and easy to shape, conducts heat well, resists corrosion and is non-flammable; it is also easy to recycle. Because of these properties, it is used for a wide range of products including cans and kitchen foils and cookware, as well as automobile and aircraft parts and construction materials.

ALUMINIUM SALT

Some consumer products contain aluminium that is not in its metallic form (as in foils and cookware) but in a “salt”. This is a type of compound that is made up of a metallic element, such as aluminium, and another, non-metallic element. Unlike pure metals salts are often soluble in water, though the solubility depends on the specific compound.

DOSE

In large doses almost anything can be a health risk – but in many cases, small doses may cause little or no risk, even with long-term exposures. In our daily lives we regularly encounter substances that are safe in the low doses at which they are present in our foods or other consumer products, but which could be harmful in larger amounts or higher concentrations. These include many natural substances, such as amygdalin, which is present in tiny quantities in apple seeds, or solanine in potatoes, as well as industrial products.

An important aspect of understanding dose is the level at which harmful effects occur, so that safe doses can be defined and harmful levels avoided.

EXPOSURE

Exposure relates to several different aspects of the ways that a hazard may come into contact with a person. These factors can have a greater influence on overall risk than the hazard on its own. Exposure factors include:

- The amount of hazard to which the person is exposed, or dose.
- The route of exposure, such as inhalation (breathing; how much reaches the lungs?), ingestion (eating or drinking; how much will be taken in or eliminated?), dermal (skin contact; how much is absorbed?).
- Exposure conditions, such as short or long term.

HAZARD

A hazard is something that has the potential to cause harm. It could be a substance, such as mercury or an influenza virus, or an event, like lightning. It is important to be clear on the exact nature of the hazard, as the effects that might be caused by the hazard are often related to the specific type or form of the hazard.

On its own, knowing about a hazard does not give us enough information to know what effects it could cause, just as we cannot know if a lightning storm might harm people until we can estimate where it might occur. What is needed is an understanding of dose and exposure factors.

REGULATED LEVELS

When setting levels of a potential hazard, regulators ensure that the benefits justify any risk it presents. In general this involves keeping permitted levels many times (100 or 1000 times) lower than the levels where any adverse effect occurs. Allowable amounts should also account for the way the product is used (such as the route and frequency of exposure) and provide for specific dose recommendations or use guidelines to protect any vulnerable groups.

RISK

Risk is the combination of hazard (a potential source of harm) and exposure (the amount of the hazard that people are exposed to and the ways that they could be exposed to it). It is often expressed as the likelihood that a given harmful effect will occur from a specified exposure to a hazard, or as the number of people in a population that may experience that effect.

Risk estimates should include an assessment of both hazard and exposure factors. Hazard-based assessments that do not consider exposure factors, such as dose, will usually significantly over-estimate the risk, or they may misunderstand the nature of the risk if they do not consider the route of exposure.

RISK BEARER/VULNERABLE GROUPS

Infants and children, pregnant women, the elderly, and those with certain medical conditions may be more susceptible to the effects of a hazard than healthy adults. Where this is true for a hazard, exposure guidelines or limits may be set low enough to protect the most vulnerable groups, or they may specify a safe dose or exposure level for these vulnerable groups.

RISK-BENEFIT

The amount of risk presented by the use of a potentially hazardous substance must always be balanced against the benefits of the substance. The level of risk that is tolerated from a hazard may be determined by the value and significance of the benefits from the substance, or by its ability to reduce another risk that is greater, such as with many medications.

SCIENTIFIC EVIDENCE

Reliable evidence (also referred to as scientific evidence) is produced by high quality scientific studies (reliable studies, reliable scientific studies or high quality studies), which are designed and conducted to prevent bias and ensure that results are interpreted appropriately. It is important that studies be conducted independently, free of any interference from organizations that have a financial or philosophic interest in a particular conclusion and that the studies gather the right data. The conclusions drawn as a result of the study must be supported by the evidence that they present.

Before they can be published in reputable journals, scientific studies are peer-reviewed by other experts in the field, evaluating the methods and the interpretation of results against disciplinary standards.

Scientific consensus on an issue develops among experts on the basis of the evidence that accumulates from peer-reviewed studies. It is therefore a very reliable guide to the best available knowledge on the issue. Studies and their results, published without the benefit of peer review may not be as reliable as those that undergo peer review.