

Salad mix contaminated with groundsel containing pyrrolizidine alkaloids

BfR Opinion No 028/2007, 10 January 2007

A pre-packaged salad mix including radicchio, frisee lettuce and lamb's lettuce was found to contain parts of other plants. The official food analysis of the contaminated salad mix revealed that these were blossoms and leaves of common groundsel (*Senecio vulgaris* L.) a wildly growing yellow-flowered plant with a bitter taste spread widely throughout temperate zones. The Federal Institute for Risk Assessment (BfR) has been asked to assess the consumer health risk associated with the intake of common groundsel.

Cases of poisoning have shown that common groundsel can cause life-threatening liver damage in humans and animals. This is caused by substances in groundsel such as senecionine and riddelline that belong to the group of unsaturated pyrrolizidine alkaloids (PAs) and are among the group's most poisonous substances. In animal experiments, these alkaloids have been carcinogenic and in various *in vitro* and *in vivo* tests genotoxic. The International Agency for Research on Cancer (IARC) classifies riddelline as probably carcinogenic for humans. A portion size below which unsaturated PAs do not constitute a health risk cannot be determined science-based and therefore a tolerable intake can also not be derived. As a preventive measure, the intake of PAs should be avoided as much as possible.

As a result of its exposure assessment, BfR concludes that acute to medium-term liver damage due to the intake of salad mix contaminated with common groundsel cannot be excluded. For an adult weighing 60 kilograms, the long-term intake would entail an estimated 220 to 349 micrograms (μg) of unsaturated PAs per day and therefore far exceed the tolerated daily intake of 0.1 μg unsaturated PAs for medicinal products without therapeutic indications. The possible intake of unsaturated PAs through other foodstuffs has not been taken into account due to a lack of data. It is likely that the distribution of different kinds of groundsel has increased as a result of the ban of certain herbicides. BfR advocates an examination of the possible increased consumer exposure to unsaturated PAs that could enter foods such as milk, meat, eggs or honey through animal feed.

BfR suggests that special care is taken during harvest and the preparation of salads, leafy vegetables and herbs. Consumers should clean, wash and sort out plant parts that cannot be allotted to edible plants well before eating.

The full version of the BfR Information in German is available on http://www.bfr.bund.de/cm/208/salatmischung_mit_pyrrolizidinalkaloid_haltigem_geiskraut_v_erunreinigt.pdf