

Aluminium in apple juice: no storing of fruit juice in aluminium tanks

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Elevated aluminium levels in fruit juice, particularly in apple juice, were measured by the official food control authorities. The cause was the incorrect storage of juice in aluminium containers that were not coated with varnish. As aluminium is dissolved by acid-containing and salt-containing food, the metal was able to migrate to the juice.

In the case of short-term dietary intake, aluminium is scarcely harmful at all. In the case of elevated, long-term intake, aluminium can, however, lead to brittle bones, anaemia and brain damage in humans. In animal studies it was shown that low doses of the substance can already impair reproduction and the developing nervous system. Hence the European Food Safety Authority (EFSA) has established for the lifelong intake of aluminium a tolerable weekly intake (TWI) of 1 milligram (mg) per kilogram body weight.

The Federal Institute for Risk Assessment (BfR) has undertaken a health assessment of aluminium uptake from apple juice. It also took into account other possible dietary sources of aluminium intake by consumers. The substance may be contained as a food additive for instance in confectionery, may migrate to food from food-contact articles like cooking utensils or aluminium foil or may be contained naturally in food (fruit, vegetables, cereals, soya, meat). Hence, in the opinion of BfR, at most 50% of the TWI value should be exhausted by fruit juice including apple juice.

According to BfR calculations the 50% exhaustion of the TWI value by adults is achieved through average apple juice consumption with 30 mg aluminium per litre fruit juice. In the case of high consumption half of the TWI is already exhausted by 8 mg aluminium per litre. Children are a particularly sensitive group of consumers. For them BfR took into account the higher drinking volumes compared to body weight. In the case of people who drink a lot of apple juice no more than 2 mg aluminium should be contained per litre juice in the long term in order to ensure that no more than 50% of the TWI is exhausted. The aluminium levels of up to 87 mg per litre fruit juice measured could lead to the TWI being exceeded several times over for children and adults. However, when assessing the health risk it must be born in mind that the TWI does not refer to a short-term, one-off exceeding but to lifelong intake.

Because of the expected migration of aluminium to food, BfR recommends that this metal should not in principle be used in contact with acid-containing and salt-containing food and beverages. At best varnished aluminium tanks are suitable for the storage of fruit juice.

The full version of this BfR Health Assessment is available in German on http://www.bfr.bund.de/cm/208/aluminium_in_apfelsaft_lagerung_von_fruchtsaeften_nicht_in_aluminiumtanks.pdf