

ALUMINIUM AND HEALTH

Fact sheet 6

ALUMINIUM IN FOOD AND PACKAGING

Most foods have some natural aluminium content, due to the abundance of aluminium in nature. Examples of food with high natural aluminium contents are tea and some herbs and spices. In the normal European diet, the daily aluminium intake from various foods is estimated at 2-10 mg, depending on the diet. In the U.S.A. this is normally higher because of greater use of intentional food additives, often used in processed cheese and biscuits. These additives, which consist of aluminium salts, are all approved by the appropriate authorities. Nearly all the daily aluminium intake comes from natural sources.

During the FAO/WHO Joint Expert Committee on Food Additives in 2011 the PTWI (Provisional Tolerable Weekly Intake) for aluminium was set to 2 mg/kg body weight which applies to all aluminium compounds in food, including additives. The Committee used the recent published study by Poirier et al as basis for the evaluation, giving a NOEL of 30 mg/kg bwt and applied an uncertainty factor of 100 to this.

Aluminium in the form of foils, menu trays, cans and other utensils is used extensively for the protection, storage, preservation and preparation of food and beverages. It conducts heat extremely well, making it very energy efficient for preparing and serving both hot and cold food.

Aluminium is also very light, reducing transport costs and making it suitable for packaging applications where weight is important. Aluminium is used in several types of packaging, also combined with other materials, because of its excellent barrier function. It keeps out micro-organisms, air and light in order to preserve the contents and extend the shelf life for the products.

Aluminium oxide, which forms on the surface of all aluminium metal in the presence of air, is stable in the pH range of 4.5 to 8.5, making aluminium suitable for storage of many different food types.

Aluminium beverage cans and food cans have a protective coating applied on the inside to prolong storage life. This ensures that the acids and salts in beverages or food never actually come into contact with the metal.

Aluminium foil wraps much of our food and is used domestically in the kitchen. It is widely accepted that only negligible amounts of aluminium from the aluminium foil migrates into the food. Due to the abundance and presence of aluminium in natural foods, some aluminium will always be ingested in the diet. The contribution from foods cooked in aluminium saucepans or from aluminium foil and beverage cans is almost negligible (normally in the order of 0,1 mg/day).

The only exception is when highly acidic or salty foods are cooked or stored in uncoated aluminium utensils for extended time periods.

The recently (2013) published technical guide document from Council of Europe has the following general advice:

“The storage of acidic (e.g. fruit juices), alkaline (e.g. lye dough products) or salty, liquid foodstuffs in uncoated aluminium utensils should be limited in order to minimise release.”

From low levels of ingested aluminium, only a very small percentage of what is ingested is absorbed by the stomach and intestines and almost all of what is absorbed is excreted by the kidneys. Recent studies have shown that less than 1% of ingested aluminium is absorbed and this can be as low as 0,01% depending on other constituents present.

Reference list :

- Joint FAO/WHO Expert Committee on Food Additives. Rome 12 – 23 June 2011.
- J. Poirier et al.; Double-blind, vehicle-controlled randomized twelve-month neurodevelopmental toxicity study of common aluminium salts in the rat
- EFSA – Safety of aluminium from dietary intake -Scientific opinion of the panel on Food Additives, Flavourings, Processing Aids and Food contact materials – 22 May 2008.
- Council of Europe: Metals and alloys used in food contact materials and articles (1st Edition) - A practical guide for manufacturers and regulators - European Directorate for the Quality of Medicines and Health Care. 2013