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Proof of the transfer of aluminium from menu trays to food

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The Cook&Chill process is a standard method used in institutional catering facilities, such as children's day care centres, schools, canteens and out-of-house catering. "In view of the aluminium contamination that already exists in the population, the goal should be to minimise every additional source of uptake wherever possible. This applies above all to vulnerable consumer groups, such as small children and elderly people, who may well be eating food that was kept warm in an aluminium tray every day," says BfR President Professor Dr. Dr. Andreas Hensel. Aluminium compounds are a natural component of drinking water and many untreated foods, such as fruit and vegetables. Consumers can also ingest aluminium through the inappropriate use of cooking utensils made of aluminium or through aluminium foil and cosmetic products.

In the BfR research project "Extent of the release of metals from food contact materials", the transfer of aluminium ions from four uncoated aluminium menu trays to the test foods sauerkraut juice, apple sauce and sieved tomatoes was examined. These foods had been prepared under the conditions of the Cook&Chill method before being kept warm for two hours. The Cook&Chill process is a method used in the field of institutional catering comprising the process stages hot filling, quick chilling, refrigerated storage and regeneration (reheating). The aluminium trays are usually kept warm until the food is eaten.

With all samples, the European Council's limit value for the release of aluminium of 5 milligrams (mg) of aluminium per kilogram of food was exceeded by far. The European Council's panel of experts for food

contact materials derived the limit value for the release of aluminium using the ALARA principle, which means that levels of a substance in a food should be as low as reasonably achievable by technical or other means. Despite the limited number of samples examined, the BfR is assuming that the release of aluminium ions from the uncoated menu trays is material-specific and that the results can therefore be generalised. The BfR is planning additional tests with salty foods.

Plant-based foods and drinking water in particular are essential oral intake sources of aluminium in humans. Several foods can have high aluminium levels for geogenic reasons. According to an estimation made by the European Food Safety Authority (EFSA) in 2008, the tolerable weekly intake (TWI) derived by EFSA of 1 milligram (mg) of aluminium per kilogram of body weight is probably already being exceeded by a substantial percentage of the population. Aluminium intake from food contact materials only contributes to the aluminium intake of the population to a small extent, with the exception of acidic and salty foods which come into contact with aluminium. EFSA also points out that the use of uncoated aluminium menu trays can lead to increased aluminium concentrations in ready-to-eat dishes.

According to the results of measurements made by the BfR, with a daily consumption of 200 g of acidic foods from uncoated aluminium trays, an adult would have an additional intake of roughly 0.5 mg aluminium per kilogram body weight in the course of a week. In the view of the BfR, this would mean that the probability of the TWI being exceeded would increase significantly. Although exceedance of the TWI does not necessarily mean that a health impairment will occur, the safety margin applied when deriving the TWI from health-relevant effects in experimental animals is reduced. For this reason, the BfR recommends that avoidable intake of aluminium should be reduced. This applies primarily to vulnerable consumer groups, such as children and elderly people, who may consume every day foods that have been kept warm in

uncoated aluminium trays, e.g. in institutional or out-of-house catering facilities.

The majority of the ingested aluminium is excreted via the kidneys in healthy humans. Non-excreted aluminium can accumulate in the lungs and skeletal system in particular in the course of a lifetime. Regarding the hazard potential, effects on the nervous system, fertility, embryonic development, and bone mineralisation were identified.

Provided by BfR Federal Institute for Risk Assessment