Estimated intake of benzoic and sorbic acids in Denmark

The monitoring of food additives and recent dietary surveys carried out in Denmark have earlier been used to estimate the intake of sweeteners and nitrite in relation to acceptable daily intakes. The ubiquitous use of the preservatives benzoic and sorbic acids raises the question of the magnitude of the intake of these preservatives in relation to acceptable daily intakes. This area is explored in this paper. The content of benzoic and sorbic acids in all food groups, where they are allowed, was monitored in Denmark 17 times between 2001 and 2006 with a total of 1526 samples. Transgressions of maximum limits, illegal use or declaration faults were found in about 3% of samples. From repeated investigations on fat-based foods (salads and dressings), marmalade and stewed fruit, it is concluded that the amounts used in industry have been relatively stable throughout the whole period, although limited data for marmalade show some variation. Most foods in the categories soft drinks, dressings, fat-based salads, pickled herrings, and marmalade contain benzoic and sorbic acid, and sliced bread also contains in some cases sorbic acid. The median daily intake and intake distribution of benzoic and sorbic acids were calculated with data from the Danish National Survey of Dietary Habits and Physical Activity (age from 4 to 75 years) conducted in 2000-2004 with 5785 participants. The median intakes of both benzoic acid and sorbic acid are well below the acceptable daily intakes of 0.5 and 0.25 mg kg⁻¹ body weight (bw) day⁻¹ for benzoic and sorbic acid, respectively. However, the 90th percentile based on the average of the samples with a content of benzoic acid is higher than the acceptable daily intake for both men and women, with the highest value of 16 mg kg⁻¹ bw day⁻¹ for both boys and girls in the 4-6-year-old age group. Based on the average of all samples, the 95th percentile is over the acceptable daily intake for men up to 34 years and for women up to 24 years, and the 90th percentile for men up to 18 years and for women up to 10 years. Soft drinks, salads and dressings are the main contributors to benzoic acid intake. The sorbic acid intake based on the average of all samples is well below the acceptable daily intake. However, for the intake based on the average of samples with content, the 95th percentile exceeds the acceptable daily intake. This is caused by the dominating contribution to the intake of sorbic acid from sliced bread, but since only seven out of 42 samples have added sorbic acid, the calculation based on the average of samples with content will exaggerate the intake. With a built-in safety factor of 100 in the acceptable daily intakes and judging from the literature, the high intakes of benzoic acid should not cause any concern for ill-effects. However, there must be a reason to reconsider the maximum limits especially for benzoic acid in soft drinks, dressings and salads and for sorbic acid in sliced bread.