

Unravelling the exposure and risk to free glutamate from food additive and non-additive sources in Belgium

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The latest evaluation of EFSA on glutamic acid and its salts (E 620-625) concluded that exposure estimates exceeded the acceptable daily intake (ADI) of 30 mg/kg bw/day as well as doses associated with adverse health effects [1]. Based on these conclusions, the EFSA panel recommended to revise maximum permitted levels of E 620-625 in food. The available data did, however, not allow to make a distinction between the exposure to free glutamate naturally present in food from that added as a food additive. Hence, we developed an approach based on careful sample selection, a sensitive analytical method and semi-probabilistic intake assessments, to perform a refined exposure and risk assessment for Belgian children, adolescents and adults to free glutamate from different sources.

Materials and methods

A priority scheme, based on apparent major contributing food groups to exposure, expected concentrations in food products, data gaps, consumption amounts, market sales data and food labeling data, resulted in the selection and sampling of 561 food items, either labeled with E 620-625 or not. For each sample that was labeled with E620-625, at least one similar food item without E 620-625 was sampled as well. All samples were analysed by UHPLC-MS/MS. The occurrence data were linked to consumption data from the Belgian Food Consumption Survey (N = 3146, 3-64 years) [2]. The habitual intake of free glutamate was assessed using SPADE (Statistical Program to Assess Dietary Exposure [3]) for following scenarios: (1) intake from food additive and non-additive sources, with and without the assumption of brand-loyalty (2) intake from non-

additive sources, (3) intake from food additive use, assessed as the difference between scenario (1) and (2). Brand-loyalty was determined at the food group level. The risk assessment was performed by comparing the habitual intake with the ADI.

Results and conclusions

Mean and high level exposure estimates for free glutamate were all below the ADI of 30 mg/kg bw/day. The habitual intake of free glutamate by children (3-9 y) was higher than that by adolescents (10-17 y) and adults (18-64 y), due to their higher food consumption per unit body weight. The high-level exposure of children to free glutamate used as food additive, reached 25% of the ADI. At population level, almost 80% of the mean habitual intake of free glutamate was from non-additive sources. Ripened cheese was the major contributing food group to exposure. Brand-loyalty to ripened cheese may lead to high-level exposures for children at 82% of the ADI. These results indicate that the current exposure levels in Belgium are of no health concern, but regular follow-up of the exposure by children is recommended.

Acknowledgements

The research that yielded these results, was funded by the Belgian Federal Public Service Health, Food Chain Safety and Environment through the contract RT20/3 FREEGLUTAMATE.

References

- [1] EFSA (2017) *EFSA Journal*, 15, 4910.
- [2] S. Bel et. al. (2016) *Archives of Public Health*, 74, 20.
- [3] ALM. Dekkers et. al. (2014) *The Journal of Nutrition*, 144, 2083.