IARC MONOGRAPHS

ASPARTAME, METHYLEUGENOL, AND ISOEUGENOL

VOLUME 134

This publication represents the views and expert opinions of an IARC Working Group on the Identification of Carcinogenic Hazards to Humans, which met in Lyon, France, 6–13 June 2023

LYON, FRANCE - 2024

IARC MONOGRAPHS ON THE IDENTIFICATION OF CARCINOGENIC HAZARDS TO HUMANS

Advance publication, 29 April 2024



International Agency for Research on Cancer

	•	•			
Sample type	Location and collection date	No. of samples (occurrence)	Occurrence	Comments	Reference
Packaged foods and beverages	USA, 2005–2010	85 451 (NR)	Most commonly used sweetener was sugar-containing forms (e.g. corn syrup). Aspartame was the second most common sweetener in diet sweetened beverages, and the third most common sweetener in yogurts, but it was not possible to determine the exact quantities used because product formulation was proprietary data. Aspartame did not feature in the 15 other food or beverage groups examined.	Nielsen Homescan Consumer panels, Gladson Nutrition Database, 2007 and 2010. Acesulfame-K and sucralose were also present in diet sweetened beverages. High-fructose corn syrup and fructose were also found in yogurts.	<u>Ng et al.</u> (2012)
Beverages	Slovenia, 2017–2020	2017: [138] (any low and/or no-calorie sweetener) [(75)] 2019: [189] [(64)] 2020: 333 [(102)]	Aspartame was one of the top three most commonly found sweeteners, $n = 102$ (31% of foods and beverages) in 2020. Aspartame was found only in combinations in the 333 beverages with added LNCS: aspartame + acesulfame-K were found in 42 products (12.6%), acesulfame-K + aspartame + cyclamates were found in 24 products (7.2%); acesulfame-K + aspartame + cyclamates + saccharin were found in 26 products (7.8%). Concentrations, NR	Composition and Labelling Information System.	<u>Hafner and</u> <u>Pravst (2021)</u>
Foods and beverages	New Zealand, 2013 and 2019	2013: 12 153 (116) 2019: 14 645 (174)	Aspartame was one of the top three most prevalent NNSs in 2013 but not in 2019. Figures indicated beverages and confectionery as main sources. The Working Group could not extract exact numbers.	Nutritrack database, providing data from four supermarket stores in Auckland, New Zealand, updated annually (<u>Uniservices,</u> <u>2019</u>)	<u>Nunn et al.</u> (2021)

Table S1.1 Reported occurrence of aspartame in food^a

Table S1.1	(continued)						
Sample type	Location and collection date	No. of samples (occurrence)	Occurrence	Comments	Reference		
Foods and beverages	Brazil, 2021	1869 (479)	Aspartame was one of the top three most commonly found sweeteners (14%). Most likely be found with acesulfame-K, although quantitative figures were not given. From graph, food groups most likely declared in: "diet/light concentrates and industrialized juices" > "other sweets" > ice cream/popsicle > coffee > sweet filled biscuits.	Part of a national exposure assessment using maximum permitted levels. Occurrence based on online supermarket audit.	<u>Takehara</u> <u>et al. (2022)</u>		
Total foods	France, 2009–2021	102 865 study participants, [35 791] consumers of artificial sweeteners. (117) aspartame only consumers; (21 309) consumers of aspartame + acesulfame-K; (7272) consumers of aspartame + acesulfame-K + sucralose)	Soft drinks with no added sugars, tabletop sweeteners and yogurt/cottage cheese were the main contributors to total artificial sweetener intake (not just aspartame). Aspartame was the main artificial sweetener and contributed 58% of intakes.	Association with NutriNet-Santé cancer study	<u>Debras et al.</u> (2022)		
Total food supply	Sydney, Australia, 2015 and 2019	2015: 21 051 (122) 2019: 21 366 (137)	Decrease in the proportion of products listing aspartame from 21.0% to 14.4%.	The George Institute FoodSwitch database (data from four large Australian supermarkets)	<u>Dunford</u> <u>et al. (2022)</u>		

Acesulfame-K, acesulfame potassium; LNCS, low- and no-calorie sweetener; NA, not applicable; NNS, non-nutritive sweetener; NR, not reported. ^a Papers with occurrence data only.

References

- Debras C, Chazelas E, Srour B, Druesne-Pecollo N, Esseddik Y, Szabo de Edelenyi F, et al. (2022). Artificial sweeteners and cancer risk: Results from the NutriNet-Santé population-based cohort study. *PLoS Med.* 19(3):e1003950. doi:<u>10.1371/journal.pmed.1003950</u> PMID:<u>35324894</u>
- Dunford EK, Coyle DH, Louie JCY, Rooney K, Blaxland A, Pettigrew S, et al. (2022). Changes in the presence of nonnutritive sweeteners, sugar alcohols, and free sugars in Australian foods. *J Acad Nutr Diet*. 122(5):991–999. e7. doi:10.1016/j.jand.2021.11.018 PMID:34864247
- Hafner E, Pravst I (2021). The sharp rise in the use of low- and no-calorie sweeteners in non-alcoholic beverages in Slovenia: an update based on 2020 data. *Front Nutr.* 8:778178. doi:<u>10.3389/fnut.2021.778178</u> PMID:<u>34869543</u>
- Ng SW, Slining MM, Popkin BM (2012). Use of caloric and noncaloric sweeteners in US consumer packaged foods, 2005–2009. *J Acad Nutr Diet*. 112(11):1828–34. e1, 6. doi:10.1016/j.jand.2012.07.009 PMID:23102182

- Nunn R, Young L, Ni Mhurchu C (2021). Prevalence and types of non-nutritive sweeteners in the New Zealand food supply, 2013 and 2019. *Nutrients*. 13(9):3228. doi:10.3390/nu13093228 PMID:34579101
- TakeharaCT, NicoluciÍG, AndradeTFS, Arisseto-Bragotto AP (2022). A comprehensive database of declared high-intensity sweeteners in Brazilian commercial products and updated exposure assessment. *Food Res Int*. 161:111899. doi:10.1016/j.foodres.2022.111899 PMID:36192918
- Uniservices (2019). The Nutritrack database. Auckland, New Zealand: National Institute for Health Innovation, University of Auckland, and Uniservices. Available from: <u>https://diet.auckland.ac.nz/sites/</u> <u>default/files/2019-08/The Nutritrack Database.pdf</u>, accessed 30 August 2023.