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

World Health Organization

ANNEX 2. SCIENTIFIC AND OTHER PUBLICLY AVAILABLE DATA ON ASPARTAME USE IN ARTIFICIALLY SWEETENED BEVERAGES

1. Introduction

The Working Group considered whether the intake of artificially sweetened beverages (ASBs) could be used as a proxy for aspartame exposure in a given population in a given time period. [The Working Group noted that the main questions were: (1) during which period was a substantial proportion of aspartame intake via ASBs; and (2) during which period were ASBs primarily sweetened with aspartame, thus limiting co-exposure to other artificial sweeteners. The following document is a non-exhaustive collection of scientific data and other publicly available information pertinent to these questions which complements the data reported in Section 1 of the monograph on aspartame in the present volume.]

2. Aspartame approval as a food additive in selected countries

Table 1 provides information on the year of approval of aspartame as a food additive in beverages in different countries.

3. Aspartame use in different countries

USA

Aspartame has been used in solid foods since 1981 and in beverages since 1983. The first soft drink that was sweetened entirely with aspartame entered the market in August 1983, and others followed in early 1984 (Hollie, 1984). In 1984, the major soft-drink makers were sweetening their diet drinks with a blend of four to five parts saccharin to one part aspartame. The major diet and "light" cola brands became 100% sweetened by aspartame at the beginning of 1985 (Anonymous, 1984; Pott and Schrage, 1984; Yoshihara, 1985). As a result, in the USA between 1984 and 1987, the per capita consumption of aspartame increased from [2.6 kg] to [6.4 kg], and the per capita consumption of saccharin decreased from [4.5 kg] to [2.7 kg] (HSPA, 1987). In 1984, 3% of all soft drinks were sweetened by aspartame only versus 17% in 1985. In 1984, 13% of all soft drinks were sweetened with the combination of aspartame plus saccharin versus 4% in 1985 (Stellman, 1988). In 1987, most diet soft drinks were sweetened by aspartame, or a blend of saccharin and aspartame (USDA, 1987).

Table 1. Year of approval of aspartame as a food additive in beverages

Country	Year	Permitted use	Reference
Canada	1981	Soft drinks, desserts, breakfast cereals, chewing gum, tabletop sweetener	Health Canada (2023)
South Africa	1982	Carbonated beverages	Reuters (1982)
USA	1983	Carbonated beverages and carbonated beverage syrup bases	Office of the Federal Register (1983)
Denmark	1983	Tabletop sweetener, foods, beverages	Taylor (1985)
Ireland	1983	Tabletop sweetener, foods, beverages	Taylor (1985)
Sweden	1982	Carbonated beverages; chewing gum, ice cream, and vitamin C with aspartame came onto the market in 1984	Pettersson (1982); Johansson (1983); Taylor (1985)
United Kingdom	1983	Tabletop sweetener, foods, beverages	Government of the United Kingdom (1983)
Switzerland	1983	Tabletop sweetener, foods, beverages	Taylor (1985)
France	1988	Food products, including beverages, chewing gum, etc.	Boussard (1991)
European Union[a]	1994	Foodstuffs intended for human consumption (including beverages)	European Parliament and Council (1994)
China	1986	Foods and beverages	ReportLinker (2023)
Australia	1982 1986	Tabletop sweetener Soft drinks	Shoebridge (1991); Australian Beverages Council (2019); The NutraSweet Company (1988)
USA	1986	Other types of beverages than carbonated	USDA (1987)
USA	1996	General purpose sweetener	Office of the Federal Register (1996)

[a] 1994 is the date of the European Union harmonization. [The Working Group noted that it is expected that national legislation in almost all European Union countries approved aspartame before that date (see examples in the list above).]

It was reported in 2006 that aspartame was found in more than 6000 products (European Commission, 2006). In the USA, 85–90% of all aspartame was used in beverages, mainly diet carbonated soft drinks (USDA, 2012). The most popular aspartame-containing soft drinks in the USA were the diet cola brands of the major soft-drink makers (USDA, 2012).The annual amount of aspartame used in diet soda in the USA in 2006 was 4500 metric tonnes (Schernhammer et al., 2012). With the amount of aspartame used annually across all applications in the USA estimated at 5000 to 5500 metric tonnes (Heinzinger, 2006), diet soda thus accounted for the large majority (~86%) of all aspartame in foods (Schernhammer et al., 2012).

Oceania and Africa

In 1986 and 1987, diet versions of major cola brands containing aspartame were launched in Australia (Shoebridge, 1991). Aspartame demand in Africa and Oceania has not increased since the peak in 1998 (IASR, 2004).

Europe

In the European Union (EU), the surge in aspartame consumption emerged later and more steadily than in the USA. In the mid-1980s, aspartame accounted for little more than 2% of the European market for intense sweeteners. European legislation harmonizing the use of low-calorie sweeteners, including aspartame and acesulfame potassium (acesulfame-K), in foodstuffs and drinks was introduced in 1994

(European Parliament and Council, 1994), and by 1996, the market share for aspartame had risen to 20% in volume terms and stayed approximately on that level at least until 2001. The United Kingdom (UK) was the biggest consumer of intense sweeteners in the EU: in 1987, 31% of the general population used aspartame regularly (i.e. weekly) (IASR, 2004).

In an analysis of 95 aspartame-containing soft drinks from 10 European countries, aspartame concentrations ranged from 30 to 527 mg/L and were highly variable among similar soft drinks bought in different countries (van Vliet et al., 2020).

Denmark

In 1999, the Regional Veterinary and Food Control Authority analysed a representative sample of 81 non-alcoholic light drinks of Danish production. Carbonated and non-carbonated soft drinks were sweetened with a mixture of aspartame and acesulfame-K, with or without cyclamate and/or saccharin. Only 1 carbonated drink out of 21, and 3 non-carbonated drinks out of 60, were sweetened with aspartame only (Leth et al., 2007). In a similar study in 2005, 37% of the non-carbonated flavoured beverages and 50% of the carbonated beverages contained aspartame. No beverage was sweetened with aspartame only (Jensen, 2007). In similar studies carried out in 2008, 2010, 2014, and 2016, no beverage was sweetened by aspartame only (Villadsen and Jakobsen, 2012; Jensen, 2014, 2016), with the exception of 1 out of 10 cola brands (Nielsen and Zederkopff Ballin, 2009).

Ireland

In the 2011 National Adult Nutrition Survey, aspartame was the second most frequently added sweetener; as the only sweetener, it was found in 35 products, most of which were energy-reduced or no added sugar (NAS) dairy products. Among various combinations of sweetener, the most common was aspartame with acesulfame-K, which occurred in 115 products – mainly still and carbonated flavoured drinks (57%), and energy-reduced or NAS dairy products (20%). Aspartame plus saccharin was the second most commonly used combination and was found in 49 products, 98% of which were still and carbonated energy-reduced or NAS flavoured drinks. Aspartame was the sweetener consumed in the highest amount in the total population (1.05 mg/kg bw per day). Aspartame only was used to sweeten 6% of the energy-reduced or NAS carbonated flavoured drinks, and aspartame in combination with other sweeteners was used in 65% (Buffini et al., 2018).

Italy

Products containing aspartame and acesulfame-K consumed by teenagers in Rome in 2000–2001 were found in all the product categories, frequently in combination (Arcella et al., 2004). Among a nationally representative sample of the Italian population, non-alcoholic beverages accounted for 48% of aspartame use and tabletop sweeteners accounted for 43% (LeDonne et al., 2017).

Portugal

In 2006/2007, 25 light soft drinks, 13 mineral water-based soft drinks, and 10 light nectars were analysed. Aspartame and acesulfame-K were detected in 92% and 72%; 62% and 77%, and 80% and 100%, respectively. About [80%] of the drinks were sweetened with both aspartame and acesulfame-K (Lino et al., 2008). In 2015–2016, soft drinks were the main source of exposure to aspartame (48%). Of the non-nutritive intense sweeteners, acesulfame-K and aspartame were

consumed in the highest quantities (Carvalho et al., 2022).

Japan

A major light cola brand, sweetened with aspartame, came onto the Japanese market in 1984 but did not appeal to Japanese consumers and was renewed by adding fructose (12 kcal/100 mL) and renaming as "low-calorie cola". A light cola sweetened with aspartame reappeared on the Japanese market in 1999 (Nakamoto and Nakahashi, 1999). In 1996, aspartame accounted for 25% of the Japanese intense sweetener market (IASR, 2004).

4. Aspartame use in artificially sweetened beverages over time

In the USA, the two most popular diet colas were sweetened with saccharin until 1984, when saccharin was replaced with aspartame (Hollie, 1984; Anonymous, 1984; Pott and Schrage, 1984). Beverages were a major area of aspartame use (USDA, 1985), and aspartame replaced saccharin mainly in the soft-drink market, since many manufacturers switched from a mixture of saccharin and aspartame to a 100% aspartame-sweetened product (USDA, 1986). The advances of aspartame on the USA market were spurred largely by growth in demand for diet soft drinks (USDA, 1995).

In 1993, acesulfame-K had broad approval for use in beverages in the EU, Canada, and Australia, and the first diet colas sweetened with a combination of aspartame and acesulfame-K were launched. In Europe, the blend of acesulfame-K and aspartame became increasingly popular (USDA, 1995). In the USA, acesulfame-K was approved for use in non-alcoholic beverages in 1998 (Office of the Federal Register, 1998), and the two major diet cola manufacturers launched diet brands sweetened with a combination of aspartame and acesulfame-K in 1998 and 1999 (Hays, 1998; Hegenbart, 2000). Many diet soft-drink bottlers in the EU, Canada, and the USA switched from 100% aspartame to blends of aspartame and acesulfame-K for their second-ranking brands and some top-line brands (IASR, 2004; Weihrauch and Diehl, 2004). Also, saccharin in combination with aspartame was widely used in fountain syrups, or about 20–25% of the diet carbonated beverage market in the USA. Between 2002 and 2009, the share of aspartame among high-intensity sweeteners in beverage use in the USA decreased from about 80% to about 70% (USDA, 2012).

Table 2 provides additional information on aspartame use in ASBs found in different types of sources (e.g. scientific publications, journals, newspapers, and websites from specific brands, or social media channels).

Table 2. Timeline of aspartame use in artificially sweetened beverages in selected countries

Country	Beverage	Used as the unique sweetener (period in years)	Used in combination with other sweeteners (period in years)	Reference
USA	Coke Zero		2005, aspartame + acesulfame-K 2010, aspartame + acesulfame-K	NBC News (2005); Franz (2010)
USA	Diet 7-Up	1985	1983–1984 (about 20% aspartame + 80% saccharin)	Hollie (1984); Anonymous (1984); Pott and Schrage (1984)
USA	Diet Cherry Coke	Before 1999	1999, aspartame + acesulfame-K	Hegenbart (2000)
USA	Diet Coke	1985	1983–1984 (20% aspartame + 80% saccharin)	Hollie (1984); Anonymous (1984); Pott and Schrage (1984)
USA	Diet Coke	2010		Franz (2010)
USA	Diet Dr Pepper	2010		Franz (2010)
USA	Diet Pepsi	1985	1983–1984 (about 20% aspartame + 80% saccharin)	Hollie (1984); Anonymous (1984); Pott and Schrage (1984)
USA	Diet Pepsi	1983–2015	2015, sucralose + acesulfame-K (no aspartame)	Roberts (2015)
USA	Diet Pepsi	2010		Franz (2010)
USA	Diet Sprite	Before 1999	1999, aspartame + acesulfame-K	Hegenbart (2000)
USA	Fresca	Before 1999	1999, aspartame + acesulfame-K	Hegenbart (2000)
USA	Pepsi One		1999–2015, aspartame + acesulfame-K	Hegenbart (2000)
USA	Pepsi XL		1995, 50% aspartame + 50% fructose	Collins (1995)
Canada	Pepsi Max		1994–2002, aspartame + fructose	Collins (1995)
Germany	Coke Light		2005, 2006, 2010, 2011, 2012, aspartame + acesulfame-K	Stephen Morris Marketing (2023)
United Kingdom	Diet Pepsi	1994–2015 and after		Roberts (2015)
France	Coca-Cola Light		2014, aspartame + acesulfame-K	Tricoulet (2014)
France	Coca-Cola Zero	1988	2007, aspartame + acesulfame-K	Coca-Cola Web (2023); Quelle Difference? (2015); Tricoulet (2014)
France	Coca-Cola Zero Cherry		2014, aspartame + acesulfame-K	Tricoulet (2014)
France	Pepsi Max		1994, aspartame + acesulfame-K	Tricoulet (2014)
France	Pepsi Light		2014, aspartame + acesulfame-K	Tricoulet (2014)
Denmark	Various beverages		1999, all diet sodas tested (n = 21) except one were sweetened with a mixture of aspartame and acesulfame-K, with or without cyclamate and/or saccharin	Leth et al. (2007)

Table 2. (continued)

Country	Beverage	Used as the unique sweetener (period in years)	Used in combination with other sweeteners (period in years)	Reference
Denmark	Pepsi Max	2008		Nielsen and Zederkopff Ballin (2009)
Denmark	Pepsi Max	2008	2010, aspartame + acesulfame-K	Villadsen and Jakobsen (2012)
Denmark	Coca-Cola Light, Coca-Cola Zero, other diet colas and diet sodas		2014, aspartame + acesulfame-K, with or without cyclamate and/or saccharin	Jensen (2014)
Denmark	All diet sodas tested		2010, aspartame + acesulfame-K, with or without cyclamate and/or saccharin	Jensen (2016)
Sweden	Coca-Cola Light		1983, aspartame + saccharin	Johansson (1983)
Japan	Coca-Cola Light		1995, or earlier with aspartame + fructose	Collins (1995).
Europe	Pepsi Max		1993, aspartame + acesulfame-K	Collins (1995)

acesulfame-K, acesulfame potassium.

References

Anonymous (1984). Diet Coke switches to aspartame. The Washington Post. 29 November 1984. Available from: https://www.washingtonpost.com/archive/business/1984/11/30/diet-coke-switches-to-aspartame/ceec0da8-010a-42db-a1dd-6f5a37f8294b/.

Arcella D, Le Donne C, Piccinelli R, Leclercq C (2004). Dietary estimated intake of intense sweeteners by Italian teenagers. Present levels and projections derived from the INRAN-RM-2001 food survey. *Food Chem Toxicol.* 42(4):677–85. doi:10.1016/j.fct.2003.12.004 PMID:15019193

Australian Beverages Council (2019). Aspartame. Fact sheet. Waterloo (NSW), Australia: Australian Beverages Council. Available from: https://www.australianbeverages.org/wp-content/uploads/2019/11/Technical_Aspartame_FINAL.pdf.

Boussard C (1991). Les édulcorants de synthèse à fort pouvoir sucrant : saccharine, aspartame, acesulfame de potassium [thesis]. Grenoble, France: Universite Grenoble Alpes – UFR Pharmacie. Available from: https://dumas.ccsd.cnrs.fr/dumas-03358952. [French]

Buffini M, Goscinny S, Van Loco J, Nugent AP, Walton J, Flynn A, et al. (2018). Dietary intakes of six intense sweeteners by Irish adults. *Food Addit Contam Part A Chem Anal Control Expo Risk Assess.* 35(3):425–38. doi:10.1080/19440049.2017.1411619 PMID:29210609

Carvalho C, Correia D, Severo M, Magalhães V, Casal S, Ramos E, et al. (2022). Dietary exposure to artificial sweeteners and associated factors in the Portuguese population. *Food Addit Contam Part A Chem Anal Control Expo Risk Assess.* 39(7):1206–21. doi:10.1080/19440049.2022.2075039 PMID:35604339

Coca-Cola Web (2023). [Chronology]. Coca-Cola Web. Available from: https://cocacolaweb.fr/coca-cola/chronologie/. [French]

Collins G (1995). Pepsi will take another swing at market for low-sugar cola. The New York Times. 23 March 1995. Available from: https://www.nytimes.com/1995/03/23/business/pepsi-will-take-another-swing-at-market-for-low-sugar-cola.html.

European Commission (2006). CORDIS EU research results. Available from: https://cordis.europa.eu/article/id/25605-findings-on-risk-from-aspartame-are-inconclusive-says-efsa.

European Parliament and Council (1994). European Parliament and Council Directive 94/35/EC of 30 June 1994 amending Directive 89/107/EEC on the approximation of the laws of Member States concerning food additives authorized for use in foodstuffs intended for human consumption. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31994L0034.

Franz M (2010). Amounts of sweeteners in popular diet sodas. Diet soft drinks. In: Diabetes self-management. Available from: https://web.archive.org/web/20140108193608/http://static.diabetesselfmanagement.com/pdfs/DSM0310_012.pdf.

Government of the United Kingdom (1983). Sweeteners in food regulations. Food composition and labelling. Statutory Instruments 1983 No. 1211. The Ministry of Agriculture, Fisheries and Food, the Secretary of State for Social services, and the Secretary of State. Available from: https://www.legislation.gov.uk/uksi/1983/1211/pdfs/uksi_19831211_en.pdf.

Hays CL (1998). New Pepsi drink to use special sweetener. 1 July 1998. New York Times. Section D, page 2. Available from: https://www.nytimes.com/1998/07/01/business/new-pepsi-drink-to-use-special-sweetener.html.

Health Canada (2023). Aspartame. Government of Canada, Health Canada. Available from: https://www.canada.ca/en/health-canada/services/food-nutrition/food-safety/food-additives/sugar-substitutes/aspartame-artificial-sweeteners.html.

Hegenbart S, editor (2000). Diet Rite switches sweeteners. Food Ingredients Online. Available from: https://www.foodingredientsonline.com/doc/diet-rite-switches-sweeteners-0001, accessed 27 February 2024.

Heinzinger C (2006). Annual aspartame use across all applications in the US. Boston, USA: NutraSweet [personal communication].

Hollie PG (1984). Pepsi's diet soft drinks switched to Nutrasweet. The New York Times. 2 November 1984; Section D, p. 9. Available from: https://www.nytimes.com/1984/11/02/business/pepsi-s-diet-soft-drinks-switched-to-nutrasweet.html.

HSPA (1987). Hawaiian sugar manual 1987. A handbook of statistical information. Hawaii, USA: Hawaiian Sugar Planters' Association. Available from: https://evols.library.manoa.hawaii.edu/server/api/core/bitstreams/5a96db93-570d-4f47-b941-6633acffa2b5/content.

IASR (2004). World market of sugar and sweeteners. Leinfelden-Echterdinger, Germany: International Association for Stevia Research. Available from: https://www.uni-hohenheim.de/fileadmin/einrichtungen/stevia/downloads/World_Market_Sugar.pdf.

Jensen U (2007). [Monitoring and control of food additives: intense sweeteners, colouring agents and preservatives in non alcoholic drinks (soft drinks), Part II]. Regional Laboratory East, Project No. 2004-20-64-00338. Glostrup, Denmark: Danish Veterinary and Food Administration. [Danish]

Jensen U (2014). [Colorants and sweeteners in non-alcoholic beverages]. Project No. 2011-20-64-00320. Glostrup, Denmark: Danish Veterinary and Food Administration. [Danish]

Jensen U (2016). [Colorants and sweeteners in non-alcoholic flavoured beverages]. Project No. 2011-20-793-00320. Glostrup, Denmark: Danish Veterinary and Food Administration. [Danish]

Johansson L (1983). [Finally – a soft drink for diabetics]. *Diabetes*. 33(2):5–7. Available from: https://gupea.ub.gu.se/bitstream/handle/2077/66276/gupea_2077_66276_1.pdf?sequence=1&isAllowed=y. [Swedish]

Le Donne C, Mistura L, Goscinny S, Janvier S, Cuypers K, D'Addezio L, et al. (2017). Assessment of dietary intake of 10 intense sweeteners by the Italian population. *Food Chem Toxicol*. 102:186–97. doi:10.1016/j.fct.2017.02.014 PMID:28216168

Leth T, Fabricius N, Fagt S (2007). Estimated intake of intense sweeteners from non-alcoholic beverages in Denmark. *Food Addit Contam*. 24(3):227–35. doi:10.1080/02652030601019429 PMID:17364923

Lino CM, Costa IM, Pena A, Ferreira R, Cardoso SM (2008). Estimated intake of the sweeteners, acesulfame-K and aspartame, from soft drinks, soft drinks based on mineral waters and nectars for a group of Portuguese teenage students. *Food Addit Contam Part A Chem Anal Control Expo Risk Assess*. 25(11):1291–6. doi:10.1080/02652030802195309 PMID:19680835

Nakamoto S, Nakahashi I (1999). Diet Coca-Cola now available in Japan. The Cola Encyclopedia. 6 July 1999. Available from: https://www.colawp.com/topics/1999/0700-en.html.

NBC News (2005). Coke to launch new no-calorie soda. NBC News online. 21 March 2005. Available from: https://www.nbcnews.com/id/wbna7257920.

Nielsen S, Zederkopff Ballin N (2009). Project No. 2007-20-64-00728. Glostrup, Denmark: Danish Veterinary and Food Administration; [Monitoring and control of food additives: Intense sweeteners, colouring agents and preservatives in non-alcoholic drinks (soft drinks) (Part III).]. Available from: https://docplayer.dk/9381318-Overvaagning-og-kontrol-af-tilsaetningsstoffer-intense-soedestoffer-farvestoffer-og-konserveringsstoffer-i-ikkealkoholholdige.html.

Office of the Federal Register (1983). Food additives permitted for direct addition to food for human consumption; aspartame. Final rule. Rules and Regulations. 21 CFR Part 172. Docket No. 82F-0305. United States Food and Drug Administration. Federal Register Vol. 48, No. 132, 8 July 1983. Available from: https://www.fda.gov/media/89189/download.

Office of the Federal Register (1996). Food additives permitted for direct addition to food for human consumption; aspartame. Rules and Regulations. 21 CFR Part 172. Docket No. 94F-0405. United States Food and Drug Administration. Federal Register Vol. 61, No. 126, 28 June 1996. Available from: https://www.govinfo.gov/content/pkg/FR-1996-06-28/pdf/96-16522.pdf.

Office of the Federal Register (1998). Food additives permitted for direct addition to food for human consumption; acesulfame potassium. 21 CFR Part 172. Docket No. 90F-0220. Rules and Regulations. United States Food and Drug Administration. Federal Register Vol. 63, No. 128, 6 July 1998. Available from: https://www.govinfo.gov/content/pkg/FR-1998-07-06/pdf/98-17700.pdf.

Pettersson H (1982). [The Swedish Food Agency has approved a new sweetener]. *Diabetes*. 32(4):532. Available from: https://gupea.ub.gu.se/bitstream/handle/2077/66277/gupea_2077_66277_1.pdf?sequence=1&isAllowed=y. [Swedish]

Pott M, Schrage M (1984). Pepsi switches sweeteners. The Washington Post. 2 November 1984. Available from: https://www.washingtonpost.com/archive/politics/1984/11/02/pepsi-switches-sweeteners/a5e27e90-bd54-4ccf-8669-1cf600c63417/.

Quelle difference? (2015). Quelle est la différence entre le Coca Zéro et le Coca Light? Quelle difference? 25 May 2015. Available from: http://www.quelle-difference.fr/difference-coca-light-coca-zero.html. [French]

ReportLinker (2023). Market research of aspartame in China. CCM Information Science & Technology Co., Ltd. Available from: https://www.reportlinker.com/p06099853/Market-Research-of-Aspartame-in-China.html.

Reuters (1982). Searle sweetener. The New York Times Archives. 28 September 1982; Section D, p. 10 [National edition]. Available from: https://www.nytimes.com/1982/09/28/business/searle-sweetener.html.

Roberts M (2015). Pepsi to drop artificial sweetener aspartame. BBC News online. 27 April 2015. Available from: https://www.bbc.com/news/health-32478203.

Schernhammer ES, Bertrand KA, Birmann BM, Sampson L, Willett WC, Feskanich D (2012). Consumption of artificial sweetener- and sugar-containing soda and risk of lymphoma and leukemia in men and women. *Am J Clin Nutr*. 96(6):1419–28. doi:10.3945/ajcn.111.030833 PMID:23097267

Shoebridge N (1991). Nutrasweet shows how to influence public taste. 18 January 1991. The Australian Financial Review, Nine Entertainment Co. Pty Ltd. Available from: afr.com/companies/nutrasweet-shows-how-to-influence-pub, accessed 5 June 2023.

Stellman SD (1988). Sweetener usage in America: a brief history and current usage patterns. In: Williams GM, editor. Sweeteners: health effects. Princeton (NJ), USA: Princeton Scientific Publishers; pp. 1–18.

Stephen Morris Marketing (2023). Welcome to Stephen Morris Coca-Cola collectibles. Available from: https://cocacolacollectibles.co.uk/.

Taylor SE (1985). Artificial sweeteners. Updated 07/12/85. IB85119. USA, Science Policy Research Division. Congressional Research Service. Available from: https://www.everycrsreport.com/files/19850712_IB85119_55a8e9111435a602bd7dc517c6407f3ce6e067f9.pdf.

The NutraSweet Company (1988). Media release. NutraSweet Submission to Industries Assistance Commission Inquiry, 6 December 1988. Available from: https://parlinfo.aph.gov.au/parlInfo/download/media/pressrel/HNC092015048568/upload_binary/HNC092015048568.pdf;fileType=application%2Fpdf#search=%22aspartame%201980s%22.

Tricoulet A (2014). Les sodas à base de cola : des recettes secrètes au service de la médecine, à consommer avec modération [thesis]. Bordeaux, France: University of Bordeaux; [French]. Available from: Available from https://dumas.ccsd.cnrs.fr/dumas-01020715

USDA (1985). Sugar and sweetener outlook and situation report. Washington (DC), USA: United States Department of Agriculture, Economic Research Service. SSRV10N3. September 1985. Available from: https://downloads.usda.library.cornell.edu/usda-esmis/files/pv63g024f/9019s427v/2r36v0532/SSS-09-30-1985.pdf.

USDA (1986). Sugar and sweetener outlook and situation report. Washington (DC), USA: United States Department of Agriculture, Economic Research Service. SSRV11N1. March 1986. Available from: https://downloads.usda.library.cornell.edu/usda-esmis/files/pv63g024f/5d86p188f/2b88qf52r/SSS-03-30-1986.pdf.

USDA (1987). Sugar and sweetener outlook and situation report. Washington (DC), USA: United States Department of Agriculture, Economic Research Service. SSRV12N1. March 1987. Available from: https://books.google.fr/books?id=fux2CDu--rMC&pg=PA1&lpg=PA1&dq=Sugar+and+sweetener+outlook+and+situation+report.+United+States+Department+of+Agriculture.+Economic+Research+Service.+SSRV12N1.,+March+1987&source=bl&ots=Cm7_a6ke4F&sig=ACfU3U1WX1hBLQkmMHyrbFBeYlRR3o6mcA&hl=fr&sa=X&ved=2ahUKEwi8-t_P9vuCAxXVRvEDHSJhBsEQ6AF6BAgaEAM#v=onepage&q&f=false.

USDA (1995). Sugar and sweetener situation and outlook yearbook. SSSV20N4. Washington (DC), USA. Economic Research Service, United States Department of Agriculture. Available from: https://downloads.usda.library.cornell.edu/usda-esmis/files/pv63g024f/6108vc98b/qv33rz496/SSS-12-22-1995.txt.

USDA (2012). High-intensity sweeteners. Sugar and sweeteners outlook. Washington (DC), United States Department of Agriculture. 14 March 2012. Available from: https://downloads.usda.library.cornell.edu/usda-esmis/files/pv63g024f/4t64gp94s/h128ng68q/SSS-03-14-2012.pdf.

van Vliet K, Melis ES, de Blaauw P, van Dam E, Maatman RGHJ, Abeln D, et al. (2020). Aspartame and Phe-containing degradation products in soft drinks across Europe. *Nutrients*. 12(6):1887. doi:10.3390/nu12061887 PMID:32599819

Villadsen J, Jakobsen M (2012). [Monitoring and control of food additives: intense sweeteners and preservatives in drinks]. Subproject 6, No. 2009-20-64-00183. Glostrup, Denmark: Danish Veterinary and Food Administration. [Danish]

Weihrauch MR, Diehl V (2004). Artificial sweeteners–do they bear a carcinogenic risk? *Ann Oncol*. 15(10):1460–5. doi:10.1093/annonc/mdh256 PMID:15367404

Yoshihara N (1985). Sugar substitute: NutraSweet: a big taste of success. Los Angeles Times. 12 April 1985. Available from: https://www.latimes.com/archives/la-xpm-1985-04-12-mn-7766-story.html, accessed 27 February 2024.