

Outbreaks from Tree Nut, Legume, and Seed Pastes: Table and References

To repost or cite, please use the following citation: Harris, L. J., and S. Yada. 2022. Outbreaks of foodborne illness associated with the consumption of tree nut, legume, and seed pastes [Table and references]. In Outbreaks from tree nut, legume, and seed pastes. Available at: <https://ucfoodsafety.ucdavis.edu/low-moisture-foods/nuts-and-nut-pastes>.

Outbreaks of foodborne illness associated with the consumption of tree nut, legume, and seed pastes

Paste type	Product (source)	<i>Salmonella enterica</i> serovar or other pathogen	Year	Number of cases	Isolated from product?	Outbreak location(s)	Source
Tree nut							
Almond	almond and/or peanut butter	<i>S. Braenderup</i>	2014	6	no (yes from environment samples)	USA (CT, IA, NM, TN, TX)	CDC, 2014b
	sprouted almond and cashew-almond spreads (U.S. almonds; cashews from Indonesia)	<i>S. Paratyphi B</i> (aka <i>S. Java</i>)	2015	13 (all nut spreads)	no	USA (CA, CO, GA, HI, ID, IL, ME, NC, NJ, OR)	CDC, 2016; Heiman Marshall et al., 2018; US FDA, 2016
	vegan pâté: almond/cashew/walnut/mushroom (nut sources not stated)	<i>C. botulinum</i> type B	2020	13	yes	Vietnam	Ngan et al., 2020; Whitworth, 2020
Cashew	cashew “cheese” ¹ – raw (California; cashews from SE Asia)	<i>S. Stanley</i>	2013	17	yes	USA (CA, NV, WY)	CDC, 2014a; Whitworth, 2014
	cashew cheese ¹ – raw, fermented (made in Canada)	<i>S. Weltevreden</i>	2017	23	yes	Canada	Schmitt et al., 2018
	sprouted cashew-almond spreads (cashews from Indonesia; U.S. almonds)	<i>S. Paratyphi B</i> (aka <i>S. Java</i>)	2015	13 (all nut spreads)	no	USA (CA, CO, GA, HI, ID, IL, ME, NC, NJ, OR)	CDC, 2016; Heiman Marshall et al., 2018; US FDA, 2016
	vegan pâté: almond/cashew/walnut/mushroom (nut sources not stated)	<i>C. botulinum</i> type B	2020	13	yes	Vietnam	Ngan et al., 2020; Whitworth, 2020
	cashew brie – vegan product (made in U.S.)	<i>S. Chester</i> , <i>S. Duisburg</i> , <i>S. Urbana</i> , <i>S. Typhimurium</i> Note: <i>S. Vinohrady</i> & <i>S. Leiden</i> also isolated	2021	20	yes (brie, raw cashews)	USA (CA, FL, MD, TN)	CDC, 2021; Fensterbush, 2021; US FDA, 2021a, 2021b

Paste type	Product (source)	<i>Salmonella enterica</i> serovar or other pathogen	Year	Number of cases	Isolated from product?	Outbreak location(s)	Source
		from facility, product and/or raw cashews but not associated with outbreak cases					
Hazelnut	sprouted hazelnut spreads (hazelnuts from Turkey)	<i>S. Paratyphi</i> B (aka <i>S. Java</i>)	2015	13 (all nut spreads)	no	USA (CA, CO, GA, HI, ID, IL, ME, NC, NJ, OR)	CDC, 2016; Heiman Marshall et al., 2018; US FDA, 2016
Walnut	vegan pâté: almond/cashew/walnut/mushroom (nut sources not stated)	<i>C. botulinum</i> type B	2020	13	yes	Vietnam	Ngan et al., 2020; Whitworth, 2020

¹The “cheese” was a non-dairy product made from cashews, water, and other ingredients.

Paste type	Product (Source)	<i>Salmonella enterica</i> serovar or other pathogen	Year	Number of cases	Isolated from product?	Outbreak location(s)	Source
Legume							
Peanut	peanut butter (Australia)	S. Mbandaka	1996	15	yes	Australia	Scheil et al., 1998
	peanut butter (USA)	S. Tennessee	2006–07	715	yes	USA (48 states)	CDC, 2007; Sheth et al., 2011
	peanut butter (not stated)	<i>C. botulinum</i> (serotypes A and B) ²	2006–08	5	yes (spores)	Canada	Sheppard et al., 2012
	peanut butter, peanut butter–containing products (USA)	S. Typhimurium	2008–09	714	yes	USA (46 states), one case in Canada	Cavallaro et al., 2011; CDC, 2009, 2010
	peanut butter (USA)	S. Bredeney	2012	42	no	USA (20 states)	CDC, 2012a, 2013a
	peanut and/or almond butter (USA)	S. Braenderup	2014	6	no (yes from environment samples)	USA (CT, IA, NM, TN, TX)	CDC, 2014b
	peanut butter (USA)	S. Senftenberg	2022	21	(ongoing investigation)	USA (17 states: AR, AZ, FL, GA, IL, IN, MA, MI, MO, NC, NY, OH, SC, TX, VA, WA, WV)	US FDA, 2022
Soynut (roasted soybean)	soynut butter (USA)	<i>Escherichia coli</i> O157:H7	2017	32	yes	USA (12 states)	Beach, 2017; CDC, 2017; Hassan et al., 2019; US FDA, 2017

Paste type	Product (Source)	<i>Salmonella enterica</i> serovar or other pathogen	Year	Number of cases	Isolated from product?	Outbreak location(s)	Source
Seed							
Sesame	halva (Turkey)	S. Typhimurium DT 104	2001	27 (Sweden) 18 (Norway) 17 (Australia)	yes	Australia, Germany, Norway, Sweden, United Kingdom	Aavitsland et al., 2001; Brockmann, 2001; de Jong et al., 2001; Little, 2001; O'Grady et al., 2001
	tahini (Egypt)	S. Montevideo	2002	55	yes	Australia	Tauxe et al., 2008; Unicomb et al., 2005
	tahini (Lebanon)	S. Montevideo	2003	3	yes	Australia	Unicomb et al., 2005
	tahini and halva (Lebanon)	S. Montevideo	2003	10	yes	New Zealand	Unicomb et al., 2005
	tahini (Lebanon) and hummus (made from the tahini)	S. Bovismorbificans	2011	23	yes	USA (7 states)	CDC, 2012b
	tahini (Turkey) and hummus (made from the tahini)	S. Montevideo S. Mbandaka S. Maastricht	2012	12 3 1	yes	New Zealand	NZPHS, 2013; Paine et al., 2014
	tahini (Turkey)	S. Montevideo, S. Mbandaka	2013	16	yes	USA (9 states)	CDC, 2013b
	sesame-based food products (incl. tahini and seeds)	<i>Salmonella enterica</i> 11:z41:enz15 (new serotype)	2016–17	40	yes	EU Member States (Greece, Germany, Czech Republic, Luxembourg)	ECDC, 2017
	tahini (Israel)	S. Concord	2018–19	8	yes	USA (4 states)	CDC, 2019a; US FDA, 2019
	tahini (Palestine)	S. Concord	2019	6	yes	USA (3 states)	CDC, 2019b
	sesame-based tahini/halva products (Syria)	S. Amsterdam S. Havana S. Kintambo S. Mbandaka S. Orion S. Senftenberg	2019–21	135	yes	EU/EEA countries (121): Denmark, Sweden, Germany, Norway, Netherlands + linked cases in USA (6), Canada (8)	EFSA, 2021

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