

Outbreaks from Tree Nuts, Peanuts, and Sesame Seeds: Table and References

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Outbreaks of foodborne illness associated with the consumption of tree nuts, peanuts, and sesame seeds

Type	Product (source)	<i>Salmonella enterica</i> serovar or other pathogen	Year	Number of cases	Isolated from product?	Outbreak location(s)	Source
Tree nuts							
Almond	raw whole (California)	S. Enteritidis PT 30	2000–01	168	yes	Canada, USA	CDPH, 2002; Chan et al., 2002; Isaacs et al., 2005
	raw whole (California)	S. Enteritidis PT 9c	2003–04	47	no	Canada, USA	CDC, 2004; CDPH, 2004
	raw whole (California?)	S. Enteritidis NST 3+ (aka PT 30)	2005–06	15	no	Sweden	Ledet Müller et al., 2007
	raw whole (Australia)	S. Typhimurium PT 3	2012	43	yes	Australia	OzFoodNet, 2013; Whitworth, 2012 (+ personal communication); FSANZ, 2012
	almond and/or peanut butter	S. Braenderup	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)	S. Paratyphi B (aka S. Java)	2015	13 (all nut spreads)	no	USA (CA, CO, GA, HI, ID, IL, ME, NC, NJ, OR)	CDC, 2016a; Heiman Marshall et al., 2018; US FDA 2016a
	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, 2020b
Brazil nuts	nut bars, muesli, and granola (UK products; Brazil nuts from Bolivia)	S. Typhimurium cases S. Anatum isolated from Bolivian product	2020	98	yes	UK	News Desk, 2020; Whitworth, 2020a

Type	Product (source)	<i>Salmonella enterica</i> serovar or other pathogen	Year	Number of cases	Isolated from product?	Outbreak location(s)	Source
Cashew	peanut/cashew mix (not stated)	<i>S. Typhimurium</i> PT 170	2010	19	yes	Australia	OzFoodNet, 2010
	cashew “cheese” ¹ – raw (California; cashews from SE Asia)	<i>S. Stanley</i>	2013–14	18	yes	USA (CA, NV, WY)	CDC, 2014a; Whitman et al., 2021; 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, 2016a; Heiman Marshall et al., 2018; US FDA, 2016a
	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, 2020b
	cashew brie – vegan product (made in U.S.)	<i>S. Chester</i> , <i>S. Duisburg</i> , <i>S. Leiden</i> , <i>S. Urbana</i> , <i>S. Typhimurium</i> , <i>S. Vinohrady</i>	2020–21	20	yes (brie, raw cashews)	USA (CA, FL, MD, TN)	CDC, 2021; Fensterbush, 2021; US FDA, 2021a, 2021b
Coconut	desiccated (Papua New Guinea)	<i>S. Typhi</i> , <i>S. Senftenberg</i> and possibly others	1953	>50 (est. from epi curve)	yes	Australia	Wilson and Mackenzie, 1955
	desiccated (Sri Lanka)	<i>S. Paratyphi B</i>	1960–61	3	yes	England	Semple et al., 1961
	desiccated (not stated)	<i>S. Java</i> PT Dundee	1999	18	yes	United Kingdom	Ward et al., 1999
	frozen, precut pieces (Indonesia)	<i>S. Chailey</i>	2017	14 (USA) 5 (Canada)	no	USA (CO, KA, OR, PA, TX, UT, WA), Canada (BC)	Luna et al., 2018; Obenhuber, 2020
	frozen, shredded (Vietnam)	<i>S. I 4,[5],12:b:-</i> <i>S. Newport</i>	2017–18	26 (USA) 1 (Canada) 1 (USA)	yes	USA (CA, CO, CT, MA, NJ, NY, OK, PA, WA), Canada	CDC, 2018a; Obenhuber, 2020

Type	Product (source)	<i>Salmonella enterica</i> serovar or other pathogen	Year	Number of cases	Isolated from product?	Outbreak location(s)	Source
	dried, raw (Sri Lanka?)	<i>S. Typhimurium</i>	2017–18	14	yes	USA (CA, CO, CT, ID, MO, OR, TX, UT + DC)	CDC, 2018b; Obenhuber, 2020
Hazelnut	in-shell (Oregon)	<i>E. coli</i> O157:H7	2010–11	8 (USA) 2 (Canada)	yes	Canada, USA (WI, MN, MI)	CDC, 2011a; CDPH, 2013; Farber, 2015 (personal communication); Miller et al., 2012
	in-shell (Oregon)	<i>S. Typhimurium</i>	2016	6	yes	USA (OR, WA)	Beach, 2017; OHA, 2017; Whitman et al., 2021
	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, 2016a; Heiman Marshall et al., 2018; US FDA 2016a
Pine nut	whole, bulk (Turkey)	<i>S. Enteritidis</i>	2011	53	yes	USA (MD, NY, NJ, PA, VA, WV)	CDC, 2011b; Whitman et al., 2021
Pistachio	pistachios; pistachio products (California)	<i>S. Montevideo</i> <i>S. Newport</i> <i>S. Senftenberg</i>	2008–09	83	yes	USA (21 states)	CDC, 2009b; Whitham et al., 2021
	roasted (California)	<i>S. Senftenberg</i>	2013	8	yes	USA (CA, KS, MA, MD, PA, WI)	US FDA, 2014
	roasted inshell and shelled (California)	<i>S. Montevideo</i> <i>S. Senftenberg</i>	2015–16	9 Montevideo 2 Senftenberg	yes	USA (AL, AZ, CT, GA, MI, MN, ND, VA, WA)	CDC, 2016b; US FDA, 2016b, 2016c
Walnut	raw shelled halves, pieces, walnut crumbs (California)	<i>E. coli</i> O157:H7	2011	14	no	Canada	CFIA, 2011; PHAC, 2011
	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, 2020b

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

Type	Product (Source)	<i>Salmonella enterica</i> serovar or other pathogen	Year	Number of cases	Isolated from product?	Outbreak location(s)	Source
Peanuts							
Peanut	boiled peanuts (Taiwan)	<i>C. botulinum</i> type A	1986	9 total 2 fatal	yes (toxin)	Taiwan	Chou et al., 1988; Tsai et al., 1990
	savory snack (Israel)	<i>S. Agona</i> PT 15	1994–95	71	yes	Israel, United Kingdom, USA	Killelea et al., 1996; Shohat et al., 1996; Threlfall et al., 1996
	peanut butter (Australia)	<i>S. Mbandaka</i>	1996	15	yes	Australia	Scheil et al., 1997, 1998
	flavored or roasted in-shell (Asia)	<i>S. Stanley</i> and <i>S. Newport</i>	2001	97 Stanley 12 Newport	yes	Australia, Canada, United Kingdom	Kirk et al., 2004
	boiled (USA)	<i>S. Thompson</i>	2006	100	yes	USA (South Carolina)	Marler Clark LLP, 2006; ProMED-mail, 2006; Christian et al., 2007
	peanut/cashew mix (not stated)	<i>S. Typhimurium</i> PT 170	2010	19	yes, but not same MLVA	Australia	OzFoodNet, 2010
	peanut butter (USA)	<i>S. Tennessee</i>	2006–07	715	yes	USA (48 states)	CDC, 2007a, 2007b; 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)	<i>S. Typhimurium</i>	2008–09	714	yes	USA (46 states), one case in Canada	Cavallaro et al., 2011; CDC, 2009a, 2010
	peanut butter (USA)	<i>S. Bredeney</i>	2012	42	no	USA (20 states)	CDC, 2012a, 2013a
	peanut and/or almond butter	<i>S. Braenderup</i>	2014	6	no (yes from environment samples)	USA (CT, IA, NM, TN, TX)	CDC, 2014b

² Outbreak of intestinal toxemia botulism, which is very rare; two of three patients studied had a history of Crohn's disease and bowel surgery.

Type	Product (Source)	<i>Salmonella enterica</i> serovar or other pathogen	Year	Number of cases	Isolated from product?	Outbreak location(s)	Source
Seeds							
Sesame seed	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

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