

## 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. 2019. 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: [http://ucfoodsafety.ucdavis.edu/Nuts\\_and\\_Nut\\_Pastes](http://ucfoodsafety.ucdavis.edu/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
<b>Tree nut</b>							
Almond	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, 2016; Heiman Marshall et al., 2018; US FDA, 2016
Cashew	raw cashew "cheese" <sup>1</sup> (California; cashews from SE Asia)	S. Stanley	2013	17	yes	USA (CA, NV, WY)	CDC, 2014a; Whitworth, 2014
	sprouted cashew-almond spreads (cashews from Indonesia; U.S. almonds)	S. Paratyphi B (aka S. Java)	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
Hazelnut	sprouted hazelnut spreads (hazelnuts from Turkey)	S. Paratyphi B (aka S. Java)	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

<sup>1</sup>The "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
<b>Legume</b>							
Peanut	peanut butter (Australia)	<i>S. Mbandaka</i>	1996	15	yes	Australia	Scheil et al., 1998
	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) <sup>2</sup>	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, 2009, 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
Soynut (roasted soybean)	soynut butter (USA)	<i>Escherichia coli</i> O157:H7	2017	32	yes	USA (12 states)	Beach, 2017; CDC, 2017; 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
<b>Seed</b>							
Sesame	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– 2017	40	yes	EU Member States (Greece, Germany, Czech Republic, Luxembourg)	ECDC, 2017
	tahini (Israel)	S. Concord	2018	5	yes	USA (3 states)	US FDA, 2018

## References Cited

- Beach, C. 2017. Amazon today removed nut butter recalled in March for E. coli. *Food Safety News*, September 5. Available at: <http://www.foodsafetynews.com/2017/09/amazon-today-removed-nut-butter-recalled-in-march-for-e-coli/#.Wfy9v1tSxyw>.
- Cavallaro, E., K. Date, C. Medus, S. Meyer, B. Miller, C. Kim, S. Nowicki, S. Cosgrove, D. Sweat, Q. Phan, J. Flint, E. R. Daly, J. Adams, E. Hyytia-Trees, P. Gerner-Smidt, R. M. Hoekstra, C. Schwensohn, A. Langer, S. V. Sodha, M. C. Rogers, F. J. Angulo, R. V. Tauxe, I. T. Williams, and C. Barton Behravesh. 2011. *Salmonella* Typhimurium infections associated with peanut products. *N. Engl. J. Med.* 365(7):601–610.
- Centers for Disease Control and Prevention [CDC]. 2007a. Multistate outbreak of *Salmonella* serotype Tennessee infections associated with peanut butter—United States 2006–2007. *MMWR Weekly* 56 (21):521–524.
- Centers for Disease Control and Prevention [CDC]. 2007b. Salmonellosis – Outbreak investigation February 2007. Available at: [http://www.cdc.gov/ncidod/dbmd/diseaseinfo/salmonellosis\\_2007/outbreak\\_notice.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/salmonellosis_2007/outbreak_notice.htm).
- Centers for Disease Control and Prevention [CDC]. 2009. Multistate outbreak of *Salmonella* infections associated with peanut butter and peanut butter-containing products—United States, 2008–2009. *MMWR Weekly* 58(4):85–90.
- Centers for Disease Control and Prevention [CDC]. 2010. Multistate outbreak of *Salmonella* Typhimurium infections linked to peanut butter, 2008–2009 (final update). Available at: <http://www.cdc.gov/salmonella/typhimurium/update.html>.
- Centers for Disease Control and Prevention [CDC]. 2012a. Multistate outbreak of *Salmonella* Bredeney infections linked to peanut butter manufactured by Sunland, Inc. (final update). Available at: <http://www.cdc.gov/salmonella/bredeney-09-12/index.html>.
- Centers for Disease Control and Prevention [CDC]. 2012b. Multistate outbreak of *Salmonella* serotype Bovismorbificans infections associated with hummus and tahini — United States, 2011. *MMWR Weekly* 61(46):944–947.
- Centers for Disease Control and Prevention [CDC]. 2013a. Notes from the field: *Salmonella* Bredeney infections linked to a brand of peanut butter —United States, 2012. *MMWR Weekly* 62(6):107. Available at: [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6206a4.htm?s\\_cid=mm6206a4\\_e](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6206a4.htm?s_cid=mm6206a4_e).
- Centers for Disease Control and Prevention [CDC]. 2013b. Multistate outbreak of *Salmonella* Montevideo and *Salmonella* Mbandaka infections linked to tahini sesame paste (final update). Available at: <http://www.cdc.gov/salmonella/montevideo-tahini-05-13/>.
- Centers for Disease Control and Prevention [CDC]. 2014a. Multistate outbreak of *Salmonella* Stanley infections linked to raw cashew cheese (final update). Available at: <http://www.cdc.gov/salmonella/stanley-01-14/index.html>.
- Centers for Disease Control and Prevention [CDC]. 2014b. Multistate outbreak of *Salmonella* Braenderup infections linked to nut butter manufactured by nSpired Natural Foods, Inc. (final update). Available at: <http://www.cdc.gov/salmonella/braenderup-08-14/index.html>.
- Centers for Disease Control and Prevention [CDC]. 2016. Multistate outbreak of *Salmonella* Paratyphi B variant L(+) tartrate(+) infections linked to JEM Raw brand sprouted nut butter spreads (final update). Available at: <http://www.cdc.gov/salmonella/paratyphi-b-12-15/index.html>.

- Centers for Disease Control and Prevention [CDC]. 2017. Multistate outbreak of Shiga toxin-producing *Escherichia coli* O157:H7 infections linked to I.M. Healthy brand SoyNut Butter (final update). Available at: <https://www.cdc.gov/ecoli/2017/o157h7-03-17/index.html>.
- European Centre for Disease Prevention and Control [ECDC]. 2017. Cluster of new *Salmonella* serotype cases with antigenic formula 11:z41:enz15 in four EU Member States. Available at: <http://ecdc.europa.eu/en/publications/Publications/20-mar-2017-RRA-cluster-new-Salmonella-serotypes-four-eu-member-states.pdf>.
- Heiman Marshall, K. E., H. Booth, J. Harrang, K. Lamba, A. Folley, M. Ching-Lee, E. Hannapel V. Greene, A. Classon, L. Whitlock, L. Shade, S. Viazis, T. Nguyen, and K. P. Neil. 2018. New product, old problem(s): multistate outbreak of *Salmonella* Paratyphi B variant L(+) tartrate(+) infections linked to raw sprouted nut butters, October 2015. *Epidemiol. Infect.* 147(20):1–6.
- New Zealand Public Health Surveillance [NZPHS]. 2013. Human *Salmonella* isolates, 2012. Available at: [https://surv.esr.cri.nz/enteric\\_reference/human\\_salmonella.php?we\\_objectID=3315](https://surv.esr.cri.nz/enteric_reference/human_salmonella.php?we_objectID=3315).
- Paine, S., C. Thornley, M. Wilson, M. Dufour, K. Sexton, J. Miller, G. King, S. Bell, D. Bandaranayake, and G. Mackereth. 2014. An outbreak of multiple serotypes of *Salmonella* in New Zealand linked to consumption of contaminated tahini imported from Turkey. *Foodborne Path. Dis.* 11(11):887–892.
- Scheil, W., S. Cameron, C. Dalton, C. Murray, and D. Wilson. 1998. A South Australian *Salmonella* Mbandaka outbreak investigation using a database to select controls. *Aust. N.Z. J. Public Health* 22:536–539.
- Sheppard, Y. D., D. Middleton, Y. Whitfield, F. Tyndel, S. Haider, J. Spiegelman, R. H. Swartz, M. P. Nelder, S. L. Baker, L. Landry, R. MacEachern, S. Deamond, L. Ross, G. Peters, M. Baird, D. Rose, G. Sanders, and J. W. Austin. 2012. Intestinal toxemia botulism in 3 adults, Ontario, Canada, 2006–2008. *Emerg. Infect. Dis.* 18(1):1–6.
- Sheth, A. N., M. Hoekstra, N. Patel, G. Ewald, C. Lord, C. Clarke, E. Villamil, K. Nicksich, C. Bopp, T.-A. Nguyen, D. Zink, and M. Lynch. 2011. A national outbreak of *Salmonella* serotype Tennessee infections from contaminated peanut butter: a new food vehicle for salmonellosis in the United States. *Clin. Infect. Dis.* 53:356–362.
- Tauxe, R. V., S. J. O’Brian, and M. Kirk. 2008. Outbreaks of food-borne diseases related to the international food trade. p. 69–112. In M. P. Doyle, and M. C. Erickson (ed.), *Imported food: Microbiological issues and challenges*. ASM Press, Washington, DC.
- Unicomb, L. E., G. Simmons, T. Merritt, J. Gregory, C. Nicol, P. Jelfs, M. Kirk, A. Tan, R. Thomson, J. Adamopoulos, C. L. Little, A. Currie, and C. B. Dalton. 2005. Sesame seed products contaminated with *Salmonella*: three outbreaks associated with tahini. *Epidemiol. Infect.* 133:1065–1072.
- U.S. Food and Drug Administration [US FDA]. 2016. FDA investigated multistate outbreak of *Salmonella* infections linked to raw nut butter products. Available at: <http://www.fda.gov/Food/RecallsOutbreaksEmergencies/Outbreaks/ucm475416.htm#update>.
- U.S. Food and Drug Administration [US FDA]. 2017. FDA investigated multistate outbreak of *E. coli* O157:H7 infections linked to SoyNut Butter. Available at: <https://www.fda.gov/Food/RecallsOutbreaksEmergencies/Outbreaks/ucm544964.htm>.
- U.S. Food and Drug Administration [US FDA]. 2018. FDA investigating a multistate outbreak of *Salmonella* Concord linked to tahini produced by Achdut Ltd. Available at: <https://www.fda.gov/Food/RecallsOutbreaksEmergencies/Outbreaks/ucm626790.htm>.
- Whitworth, J. 2014. *Salmonella* from cashews sickens 14. *Food Quality News*, January 6. Available at: <http://www.foodqualitynews.com/Food-Alerts/Salmonella-from-cashews-sickens-14>.