

## Flour and Cereal Grains – Outbreaks and Recalls: Tables and References

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Table 1. Outbreaks of foodborne illness associated with the consumption of flour and cereal grain products

Table 2. Recalls of wheat flour and wheat products, 2009 to present

Table 3. Recalls of non-wheat flour (nut, grain, or pseudocereal)

**Table 1. Outbreaks of foodborne illness associated with the consumption of flour and cereal grain products**

Product (source)	Pathogen	Year	Number of cases	Isolated from product?	Outbreak location(s)	Source
<b>Wheat flour</b>						
Flour (New Zealand)	<i>Salmonella</i> Typhimurium phage type 42	2008–2009	67	yes	New Zealand	McCallum et al., 2013
Flour (General Mills, Kansas City, MO)	<i>E. coli</i> O121, <i>E. coli</i> O26	2015–2016	63	yes	USA (24 states)	CDC, 2016; Crowe et al., 2017; US FDA, 2017
Flour (Ardent Mills, Saskatoon, SK)	<i>E. coli</i> O121	2016–2017	30	yes	Canada (6 provinces)	PHAC, 2017
Flour (Rogers Foods, BC)	<i>E. coli</i> O121	2017	6	yes	Canada (1 province: BC)	BCCDC, 2017; Beach, 2017; News Desk, 2017
<b>Wheat flour product</b>						
Cake mix, raw – in ice cream (USA)	<i>Salmonella</i> Typhimurium	2005	26	yes	USA (11 states)	Zhang et al., 2007
Frozen pot pies (flour could not be ruled out) (USA)	<i>Salmonella</i> serotype I 4,5,12:i:-	2007	396	yes	USA (41 states)	CDC, 2008a; Mody et al., 2014
Prepackaged, refrigerated cookie dough (USA)	<i>E. coli</i> O157:H7	2009	80	yes	USA (31 states)	CDC, 2009; Neil et al., 2012
Dough mix, dry (USA)	<i>E. coli</i> O157:H7	2016	13	yes	USA (9 states)	Gieraltowski et al., 2017
Cake mix (USA)	<i>Salmonella</i> Agbeni	2018	5	yes	USA (3 states: OR, OH, MD)	CDC, 2018b; Marler, 2018; US FDA, 2018
<b>Cereal grain product</b>						
Toasted oats cereal (USA)	<i>Salmonella</i> Agona	1998	400+	yes	USA (11 states)	CDC, 1998; Russo et al., 2013
Puffed rice or puffed wheat cereals (USA)	<i>Salmonella</i> Agona	2008	33	yes	USA (17 states)	CDC, 2008b; Hoffman et al., 2015; Russo et al., 2013
Puffed wheat cereal (USA)	<i>Salmonella</i> Mbandaka	2018	73	yes	USA (31 states)	CDC, 2018a

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## ADDITIONAL INFORMATION

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**Table 2. Recalls of wheat flour and wheat products, 2009 to present**

Date of recall mm/dd/yyyy (Reference)	Recall class	Product	Recalling firm	Reason given	Brand	Sub- recalls	Illnesses
01/23/2019 (20)	I	All-purpose, unbleached flour (5-lb bags)	General Mills (Minneapolis, MN)	<i>Salmonella</i> isolated in routine testing	Gold Medal (Better if Used by Date 20APR2020KC)		none reported
11/05/2018 (19)	I	Cake mixes (15.25- oz packs)	Conagra Brands (Chicago, IL)	<i>Salmonella</i> isolated in retail sample; linked to outbreak	Duncan Hines Classic Cake: White, Yellow, Butter Golden, Signature Confetti		5
06/14/2018 (18)	I	Puffed wheat cereal (23-oz and 15.3-oz boxes)	Kellogg Company (Battle Creek, MI)	<i>Salmonella</i> contamination; linked to outbreak	Kellogg's Honey Smacks		73
06/19/2017 (17)	II	Flour (20-kg bags), milled by Ardent Mills	Distributors: Flour Barrel (Guelph, ON); Hillcrest Home Baking (Floradale, ON)	Possible <i>E. coli</i> O121 contamination	Robin Hood - Super Keynote Strong Bakers Flour; Italian Style Flour		none reported
06/16/2017 (16)	II	Cookie dough, pie and tart shells	Various Canadian manufacturers	Possible <i>E. coli</i> O121 contamination	In-Dey-Go Fundraising Inc. (cookie dough); Apple Valley, Mildmay Cheese Haus		none reported
06/15/2017 (15)	II	All-purpose flour (bulk packs - various sizes)	Distributors: Country Bulk Inc. (Waterloo, ON) & Country Pantry Bulk Foods (Heidelberg, ON)	Possible <i>E. coli</i> O121 contamination	Robin Hood		none reported
06/15/2017 (14)	II	All-purpose flour (20-kg)	Ardent Mills (Brampton, ON)	Possible <i>E. coli</i> O121 contamination	Robin Hood - Baker's Hood	yes	none reported
06/07/2017 (12, 13)	II	All-purpose flour (10-kg bags)	Rogers Foods Ltd. (Armstrong, BC, Canada)	<i>E. coli</i> O121 contamination	Rogers		yes, 6 reported Feb–Apr 2017

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Date of recall mm/dd/yyyy (Reference)	Recall class	Product	Recalling firm	Reason given	Brand	Sub- recalls	Illnesses
05/31/2017 (11)	II	Durum wheat flour and wheat bran blends (20-lb bags)	Smucker Foods of Canada Corp. (Markham, ON)	Possible <i>E. coli</i> O121 contamination	Select Golden Temple, Swad, Maya		none reported
04/25/2017 (9, 10* recall list update to June 2, 2017)	II	Pie and tart shells (assorted sizes)	Harlan Bakeries (Edmonton, AB)	Possible <i>E. coli</i> O121 contamination	No name, Great Value, Apple Valley, Western Family		none reported
04/12/2017 (8)	II	Various flour and flour products	Ardent Mills (Saskatoon, SK, Canada)	<i>E. coli</i> O121 contamination; linked to outbreak	Brodie, Creative Baker, Golden Temple, Robin Hood	yes	yes, 30 reported in total: Nov 2016 – Apr 2017
04/04/2017 (7)	II	All-purpose flour (10-kg bags)	Smucker Foods of Canada Corp. (Markham, ON)	<i>E. coli</i> O121 contamination	Robin Hood	yes	yes, 1 reported March 2017
07/11/2016 (6)	II	Cake mix (2 flavors)	General Mills (Minneapolis, MN)	Made with affected flour recalled by General Mills	Betty Crocker Delights Super Moist		none reported
07/09/2016 (5)	II	Pancake mix (28-oz carton, 3.5-lb bag)	Continental Mills (Tukwila, WA)	Made with affected flour recalled by General Mills	Krusteaz (Blueberry)		none reported
07/01/2016 07/25/2016 (3, 4)	I	[expanded flour recalls]	General Mills (Minneapolis, MN)	<i>E. coli</i> O121 and/or O26 isolated from product; linked to multi-state outbreak	Gold Medal, Gold Medal Wondra, Signature Kitchens	yes	yes, 63 reported in total: Dec 2015 – Sep 2016
05/31/2016 (2)	I	All-purpose, quick-mixing, self-rising, or unbleached flour (13.5-oz carton; 2-, 4.25-, 5- and 10-lb bags)	General Mills (Minneapolis, MN)	<i>E. coli</i> O121 and/or O26 isolated from product; linked to multi-state outbreak	Gold Medal, Gold Medal Wondra, Signature Kitchens		yes, 38 reported Dec 2015 – May 2016
05/19/2009 (1)	I	Refrigerated cookie and brownie dough products	Nestlé USA (Solon, OH)	<i>E. coli</i> O157:H7 contamination; linked to outbreak	Toll House		yes, 80 reported

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## References (Table 2 – Recalls: wheat flour/products)

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**Table 3. Recalls of non-wheat flour (nut, grain, or pseudocereal)**

<b>Date of recall mm/dd/yyyy (Reference)</b>	<b>Recall class</b>	<b>Product</b>	<b>Recalling firm</b>	<b>Reason given</b>	<b>Brand</b>	<b>Sub- recalls</b>	<b>Illnesses</b>
04/06/2018 (2)	I	Amaranth flour, organic (22-oz bags)	Bob's Red Mill Natural Foods (Milwaukie, OR)	<i>Salmonella</i> contamination in 1 lot (sell-by date Nov. 26, 2015)	Bob's Red Mill Organic		none reported
03/23/2018 (1)	I	Coconut flour (16-oz pouches)	King Arthur Flour Co., Inc. (Norwich, VT)	<i>Salmonella</i> isolation in routine testing	100% Organic, Finely Ground Coconut Flour		none reported

**References (Table 3 – Recalls: non-wheat flour)**

1. U.S. Food and Drug Administration. 2018. King Arthur Flour Company, Inc. voluntarily recalls Organic Coconut Flour (16 oz.) because of possible health risk. Company announcement available at: <https://www.fda.gov/Safety/Recalls/ucm602489.htm>.
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