



Sprout Safety

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Introduction

The condition in which sprouts are produced is ideal for the growth of the foodborne pathogens, and if proper food safety practices and handling are not followed, sprouts can harbor pathogens when the seeds are sprouted. Many outbreaks of foodborne illness associated with consumption of raw sprouts have been reported in recent years, mainly by *E. coli* and *Salmonella*.

In the majority of these outbreaks, the primary source of contamination is contaminated sprout seeds. However, poor sanitation and lack of hygienic practices can also lead to contamination of the final product.

This publication provides general information and guidelines to reduce the food safety risk associated with sprouts.

Sprouts and outbreaks

Due to the high number of sprout-associated foodborne outbreaks, sprouts have been considered as a “high risk” food. Between 2006 and July 2019, the Centers for Disease Control and Prevention (CDC) have reported 14 foodborne illness outbreaks associated with the consumption of contaminated sprouts in U.S. These outbreaks resulted in 504 cases of illness, 118 hospitalizations and two deaths. Of reported outbreaks, 70% (10 out of 14) were related to Salmonellosis (Table 1).

The primary source of contamination in majority of these outbreaks was contaminated sprout seeds. However, poor sanitation and lack of hygienic practices when producing sprouts can also lead to contamination. The humid and warm growing conditions during the sprouting process are ideal for the growth of bacteria, including *E. coli*, *Salmonella*,

and *Listeria monocytogenes*. Even a very low initial level of contamination in seeds can multiply dramatically and increase to millions of cells per serving. In order to reduce the risk of foodborne disease from sprouts, persons with weakened immune systems, such as children, elderly, immunocompromised individuals, and pregnant women, should avoid eating raw sprouts of any kind.

At home sprout safety

Due to the benefits of healthy eating, more people have been consuming sprouts. While it is common practice for many consumers to prepare their own sprouts at home, they should understand some key aspects of safe food handling when growing and consuming sprouts. Sprouts should be carefully prepared and stored at the proper temperature (40°F/4.4°C or less), if they have been mishandled, the sprouts should be discarded. To reduce the food safety risk associated with sprouts, the following best handling practices should be considered:

- Use only seeds that have been pre-tested for pathogenic bacteria purchased from a reputable commercial source.
- Wash hands properly before and after handling raw sprouts.
- Clean all containers and contact surfaces of seeds and sprouts.
- Use only clean and potable water when rinsing and soaking seeds.
- Keep sprouts moist is critical in the process of sprouting, avoid standing water in the sprouting container.
- Rinse seeds and sprouts at least every 12 hours. For raw consumption of sprouts, rinse every 6 hours particularly in warm ambient temperatures, is recommended.

- Grow sprouts should be kept in a place far from the food production areas to avoid cross contamination of pathogens from raw foods.
- Seeds and sprouts should be kept away from pets.
- Before storing sprouts in the refrigerator, ensure sprouts are dry.
- Keep sprouts refrigerated (40°F or below).
- Store sprouts in clean containers.
- Consume sprouts within the recommended shelf life (4-6 days in refrigerator).
- Try to prepare small batches of sprouts, this will help ensure the freshness of the product and minimize risk of bacterial growth during storage.
- Wash sprouts with cool running water directly before use.

The University of California published a fact sheet, “Growing Seed Sprouts at Home” (accessible online at <https://anrcatalog.ucanr.edu/pdf/8151.pdf>), which recommends treating seeds by heating on the stove for five minutes in a 3% hydrogen peroxide solution preheated to 140°F (60°C).

Sprout safety at restaurant

Due to the numerous foodborne disease outbreaks associated with the consumption of sprouted seeds, many restaurants have taken raw sprouts off their menu, however still they are present in some salad bars and restaurants. The best safe practice is to request that raw sprouts not be added to your food. High-risk consumers should check the food they purchased from restaurants or delicatessens to make sure raw sprouts have not been added.

Commercially grown sprout and safety regulations

Producing any type of sprout for the purpose of sale must comply with regulations in the Food Safety Modernization Act (FSMA). According to the U.S. Food and Drug Administration (FDA), sprout operations subject to the Produce Safety Rule must comply with all applicable requirements in the Rule, including, but not limited to, all applicable requirements in Subpart M accessible online at <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfCFR/CFRSearch.cfm?CFRPart=112&showFR=1&ubpartNode=21:2.0.1.1.12.12>.

The FDA in cooperation with Illinois Institute of Technology’s Institute for Food Safety and Health (IIT IFSH), created the Sprout Safety Alliance (SSA) in 2012 to help sprout producers identify and implement best practices in the safe production of sprouts. The SSA is also developing a curriculum and training programs to assist sprout producers in understanding the sprout specific requirements outlined in the finalized rule on standards for produce safety.

More FDA guidelines and recommendations for the sprout industry are accessible online at <https://www.fda.gov/downloads/food/guidanceregulation/guidancedocumentsregulatoryinformation/ucm537031.pdf>.

When purchasing commercially grown sprouts;

- Buy only fresh sprouts that have been properly refrigerated.
- Do not buy sprouts if the sell-by date is expired.
- Do not buy sprouts with a musty smell or slimy appearance.
- Refrigerate sprouts (40°F or below).

Table 1. Sprout-associated foodborne illness outbreaks between 2006 and July 2019.

Product	Pathogen	Year	Cases	Hospitalizations	Deaths	Location	Reference
Raw Clover Sprouts	<i>E. coli</i> O26 (STEC 0126)	2012	29	7	0	Multistate Outbreak 11 states at Jimmy John's restaurants	https://www.cdc.gov/ecoli/2012/O26-02-12/index.html
Raw Clover Sprouts	<i>E. coli</i> O121 (STEC 0121)	2014	19	8	0	Multistate Outbreak 6 states	https://www.cdc.gov/ecoli/2014/O121-05-14/index.html
Alfalfa Sprouts	<i>E. coli</i> O157 (STEC 0157)	2016	11	2	0	Multistate Outbreak 2 states	https://www.cdc.gov/ecoli/2016/o157-02-16/index.html
Bean sprout	<i>Listeria monocytogenes</i>	2014	5	3	2	Multistate Outbreak 2 states	https://www.cdc.gov/listeria/outbreaks/bean-sprouts-11-14/index.html
Raw Sprouts	<i>Salmonella</i> Montevideo	2018	10	0	0	Multistate Outbreak 3 states	https://www.cdc.gov/salmonella/montevideo-01-18/index.html
Alfalfa Sprouts	<i>Salmonella</i> Reading and/or <i>Salmonella</i> Abony	2016	36	7	0	Multistate Outbreak 9 states	https://www.cdc.gov/salmonella/reading-08-16/index.html
Alfalfa Sprouts	<i>Salmonella</i> Muenchen and <i>Salmonella</i> Kentucky	2016	26	8	0	Multistate Outbreak 12 states	https://www.cdc.gov/salmonella/muenchen-02-16/index.html
JEM Raw Brand Sprouted Nut Butter Spreads	<i>Salmonella</i> Paratyphi B variant L(+) tartrate(+) bacteria, formerly known as <i>Salmonella</i> Java.	2015	13	0	0	Multistate Outbreak 10 states	https://www.cdc.gov/salmonella/paratyphi-b-12-15/index.html

Product	Pathogen	Year	Cases	Hospitalizations	Deaths	Location	Reference
Bean sprouts	<i>Salmonella</i> Enteritidis	2014	115	28	0	Multistate Outbreak 12 states	https://www.cdc.gov/salmonella/enteritidis-11-14/index.html
Organic Sprouted Chia Powder	<i>Salmonella</i> Newport, <i>Salmonella</i> Hartford, <i>Salmonella</i> Oranienburg	2014	31	5	0	Multistate Outbreak 16 states	https://www.cdc.gov/salmonella/newport-05-14/index.html
Alfalfa Sprouts and Spicy Sprouts	<i>Salmonella</i> Enteritidis	2011	25	3	0	Multistate Outbreak 5 states	https://www.cdc.gov/salmonella/2011/alfalfa-spicy-sprouts-7-6-2011.html
Alfalfa Sprouts	<i>Salmonella</i> I 4,[5],12:i:-	2010-2011	140	33	0	Multistate Outbreak 26 states and District of Columbia	https://www.cdc.gov/salmonella/2010/alfalfa-sprouts-2-10-11.html
Alfalfa Sprouts	<i>Salmonella</i> Newport	2010	44	7	0	Multistate Outbreak 11 states	https://www.cdc.gov/salmonella/2010/newport-alfalfa-sprout-6-29-10.html
Alfalfa Sprouts	<i>Salmonella</i> Saintpaul	2009	235	7	0	Multistate Outbreak 14 states	https://www.cdc.gov/salmonella/2009/rw-alfalfa-sprouts-5-8-2009.html

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