Sprout Safety Task Force: September 11, 2023

Sprout Safety and Emerging Issues: An INTERNATIONAL SPROUT GROWERS ASSOCIATION (ISGA) Perspective

Presented to the Institute for Food Safety and Health (IFSH) Sprout Safety Task Force:

By Carmen Wakeling: President ISGA

What is the ISGA?

Our mission is to promote global collaboration among professional sprout growers and suppliers, in order to promote the health benefits of sprouts, and to work with researchers and government agencies to assure the safe production of sprouted foods.

ISGA International Sprout Growers Association

RELATIONSHIP BETWEEN ISGA AND IFSH

The ISGA has been a member of Institute for Food Safety and Health (IFSH) since IFSH's inception.

The IFSH team, along with producer representatives, have been very proactive in initiating and implementing many programs

Thank you for all you have done for us

We look forward to continuing this work

OVERVIEW OF SPROUT INDUSTRY 2023

- The exact number of sprouters globally is hard to figure out.
- Producers around the globe produce both green sprouts (alfalfa, broccoli, clover etc.) and Bean sprouts (Mung, Soy, etc.)
- Bean sprouts are consumed as a staple of many Asian countries, they are heavier and probably by volume are more popular than green sprouts.
- As the ISGA, our goal is to transfer knowledge to consumers, regulators and producers. There are lots of learning opportunities.
- Sharing ideas and information is essential.
- Not all countries think the same way and it is wonderful to learn the different concepts and rationale from each other.
- Our North American industry has had 2 voluntary recall in 2023 with no illnesses reported.
- Unfortunately, in 2022 we had 1 recall that was associated with 63 illnesses. There is evidence that sprout specific education and experience was lacking.
- Sprout producers continue to be one of the few produce types that can be grown anywhere year-round allowing local communities to benefit nutritionally.

<u>Why do people want to eat sprouts and microgreens?</u>

Sprouts and microgreens are a very nutritious and diverse food source.

They can be grown anywhere and provide both vitamins and minerals along with fiber.

Sprouts are delicious and fun to grow and eat.

What is the difference?

SPROUTS

A sprout is consumed with its roots attached.

Sprouts are generally grown in water.

MICROGREENS

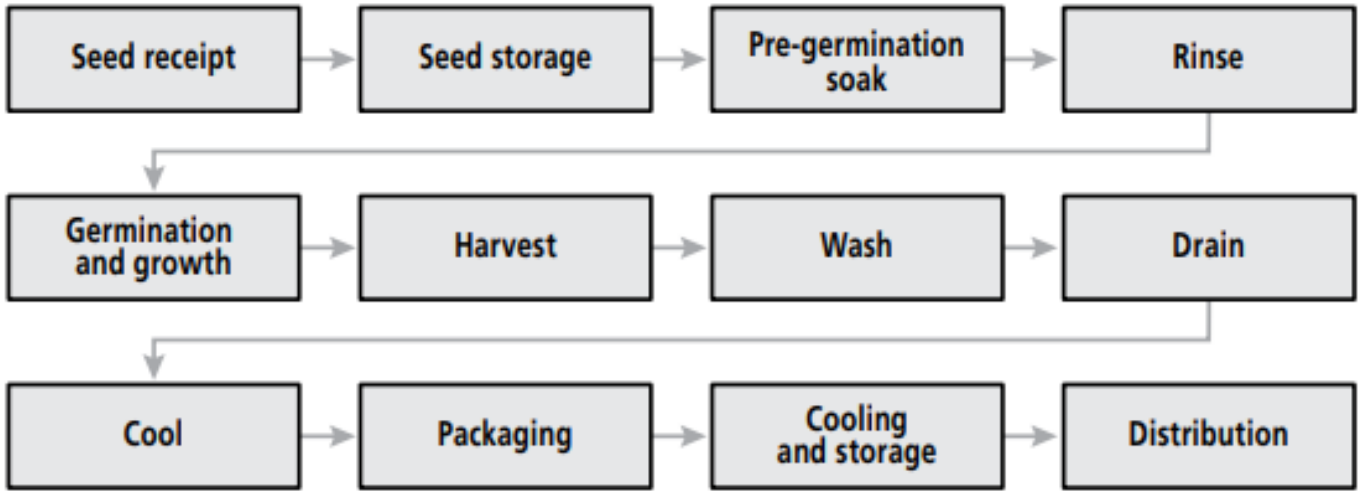
A microgreen is consumed with its roots removed. Microgreens are generally grown in a substrate.

OF NOTE……..FOR MICROGREEN PRODUCTION……

THERE ARE DIFFERENT RISKS TO CONSIDER IN ANY PRODUCT GROWN IN MEDIUM COMPARED TO WATER.

What does a process flow for sprouts grown commercially look like?

FIGURE 2 Typical sprout production process



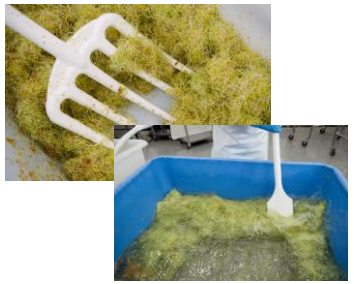
Source: Adapted from the National Advisory Committee on Microbiological Criteria for Foods (NACMCF, 1999). NACMCF (National Advisory Committee on Microbiological Criteria for Foods). 1999. Microbiological safety evaluations and recommendations on sprouted seeds. International Journal of Food Microbiology, 52(3):123 -153. https://doi.org/10.1016/ S0168-1605(99)00135-X

Growing steps at Eatmore Sprouts& Greens:

Seed receipt/ storage

Pre-germination treatment and soak

Germination and growth

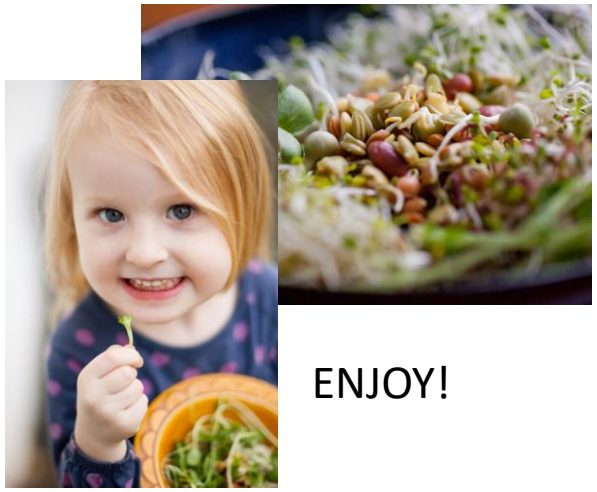


Wash/ drain

Prepare for harvest

Harvest

Cooling, storage and distribution



ENJOY!

What are the risks that can impact the safety of sprouts?

- Because sprouts are grown in warm moist indoor environments there are different risks associated with this produce compared to produce grown outside in soil or in a growing medium or hydroponic systems.
- Because sprouts are grown from seed that is grown in fields with potential for animal or water contamination, amplification by the warm moist growing environments can cause issues.

Potential sources of contamination for sprout producers

- Contaminated seed
- Contaminated water
- Contamination by workers
- Contamination by equipment

A little history about sprouts and food safety

- Most sprout producers got into the industry initially to grow healthy food for people.
- People really loved the food we were growing, and our businesses were thriving.
- As an industry we were a little naïve. Food safety was not the main focus for us in the 80s and early 90s. We were all about local healthy food.
- When collectively it was recognized that there might be a problem with this small but mighty food there was deep concern. It had a big impact and made us change the way we thought about our produce.
- 1996 and 1999 were tough years for us. 1996 there were two outbreaks resulting in 650 illnesses.
- We had to get to work to figure out what was going on.

- The ISGA was formed around this time. The information was shared through word of mouth.
- Of course, the most important thing was to figure out what was causing the issues.
- Seed was identified as the main issue. At that time there was much less control, limited preventative control programs, food safety programs were minimal at best and producers had a massive learning curve ahead.
- There was no internet, so communication and education were hard.
- Because we took this very seriously, people travelled from all over to have face to face meetings which they invited researchers and suppliers to.
- The goal was finding a solution to this issue of sprouts making people sick.
- Dramatic policies were put in place in 1999 to try and do something.
- Until very recently, seed sanitation with 20,000 ppm Chlorine has been the go-to for seed treatment.
- A warning label was issued for sprouts, and they went from a super health food to potentially fatal.

In 2006 we realized that we were not alone in the produce world.

"I sometimes think that sprouts with their differences were the thin edge of the wedge".

In a more and more contaminated world, it seems that this was an inevitable outcome. We now know that fresh fruits and vegetables have as much potential as sprouts to be contaminated. We have the benefit of growing in a controlled environment. We cannot become complacent.

FDA: Earthbound Farm brand spinach connected to E. coli outbreak

KAZU
Published September 16, 2006 at 4:11 AM PDT

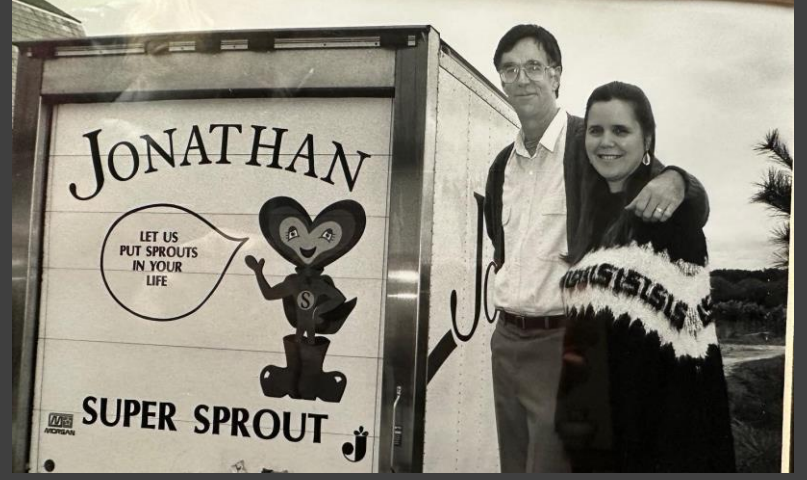
By Ben Adler

http://stream.publicbroadcasting.net/production/mp3/kazu/local-kazu-530091.mp3

San Juan Bautista, CA – The Food and Drug Administration has traced the recent outbreak of E. coli bacteria in spinach to the Salinas Valley.

San Juan Bautista-based Natural Selection Foods LLC says it's initiated a voluntary recall of all its spinach and spinach-containing products. It's best known for the organic brand Earthbound Farm, but it also has a hand in producing 30 others, including Dole and Trader Joe's.

The FDA's chief officer for food safety, Dr. David Acheson, says there's no hard scientific link to Natural Selection right now, but the epidemiological evidence points in that direction. KAZU's Ben Adler reports.



- Because of the hard work of engaged participants, we have come a long way.

WHAT HAVE WE DONE AS AN INDUSTRY (focus USA)?

- Since 1999 focus has been placed on training of sprout producers, testing and continuous improvement to our facilities and education of suppliers.
- The Sprout Safety Task Force was formed in 2009.
- In 2016 the Sprout Safety Training was initiated. To date
  ~431 individuals have participated in the grower training and
  ~40 individuals have participated in the lead instructor training.
- USA Best Practices document was released in 2019
- FSMA rule implemented over the last few years. This includes things such as Preventative Control Programs and Food Safety Management
- The ISGA has an annual convention: Education is provided on all aspects of sprout production. Our convention has been an opportunity to build relationships with all participating partners. In 2023 we had many researchers working with the sprout industry.
- Seed supplier guidance document “reducing microbiological hazards in seed for sprouting” issued in May 2022.
- We continue to build relationships with researchers to engage in finding solutions to our issues.

Continuous improvement timelines: North American Sprout Industry 1996-2023

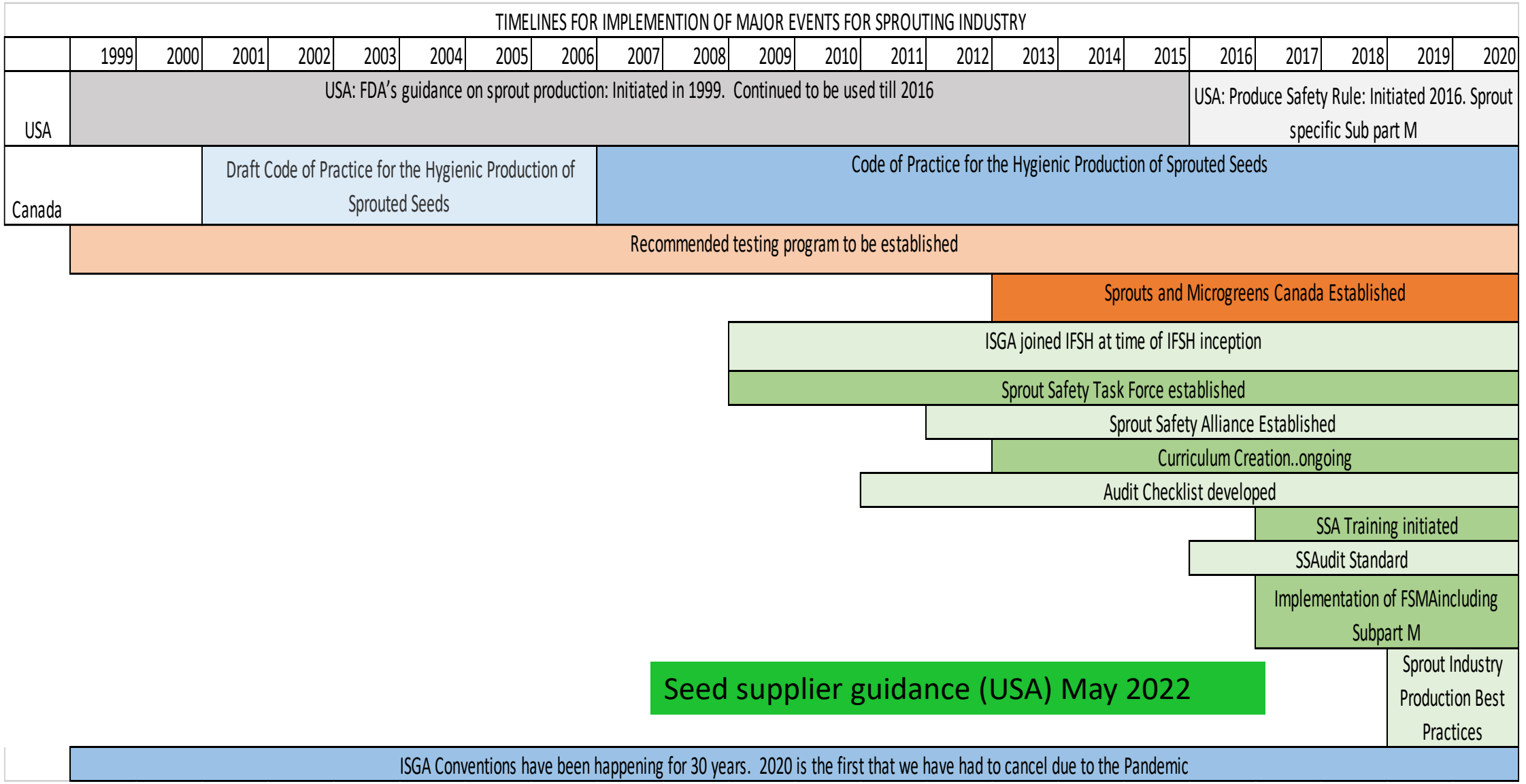


TABLE A2.2 Foodborne illness outbreaks associated with the consumption of contaminated sprouts. (cont.)

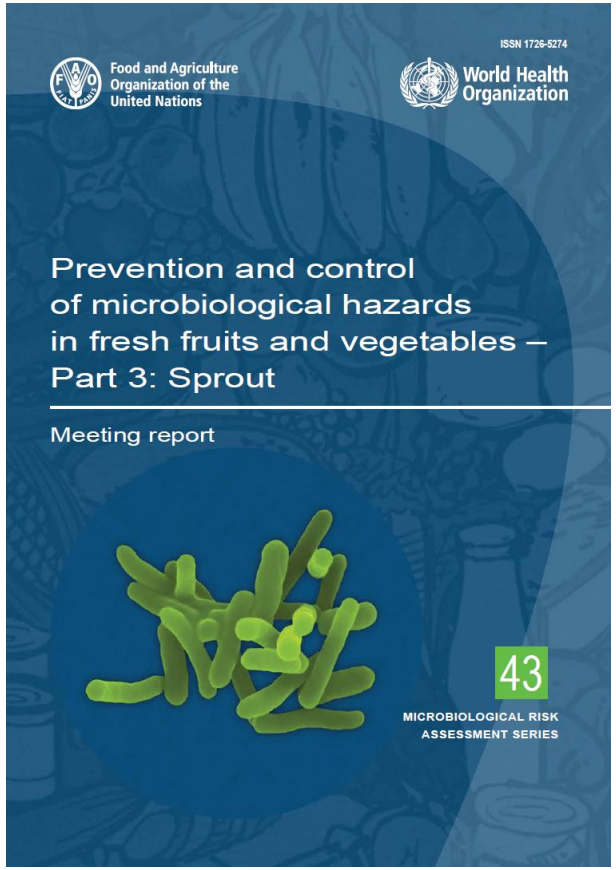
DATE	CAUSATIVE AGENT	NO. OF ILLNESSES REPORTED	TYPE OF SPROUT IMPLICATED	COUNTRY OF OUTBREAK	REFERENCE
Dec 2010	*Salmonella* Cubana	3	Alfalfa sprouts	United States of America (multistate)	CDC, 2022
Nov 2010 – Feb 2011	*Salmonella* serotype I 4,[5],12:i:-	140	Alfalfa sprouts	United States of America (multistate)	CDC, 2011b
Aug – Oct 2010	*Salmonella* Bareilly	231	Mung bean sprouts	United Kingdom	Cleary *et al.*, 2010
2010	*Salmonella* Kottbus	4	Bean sprouts	United Kingdom	EFSA, 2011
Mar – Jun 2010	*Salmonella* Newport	44	Alfalfa sprouts	United States of America (multistate)	CDC, 2010
Feb 2010	unknown	4	Sprouts, unspecified	United States of America (Colorado)	CDC, 2022
Aug 2009	*Salmonella* Typhimurium	14	Alfalfa sprouts	United States of America (Michigan)	CDC, 2022
Jun 2009	*Salmonella* Bovismorbificans	42	Alfalfa sprouts	Finland	Rimhanen-Finne *et al.*, 2011
Apr – Jul 2009	*Salmonella* Cubana	20	Onion sprouts and mixed onion/alfalfa sprout	Canada	Garcia and Hanodia, 2020
Apr 2009	*Salmonella* Cubana	2	Sprouts, unspecified	United States of America (Minnesota)	CDC, 2022
Feb – May 2009	*Salmonella* Saintpaul	256	Alfalfa sprouts	United States of America (multistate)	CDC, 2009a, 2009b
Feb 2009	*Salmonella* Oranienburg	25	Alfalfa sprouts	United States of America (multistate)	CDC, 2022
Sep 2008	*E. coli* O157:NM	21	Alfalfa sprouts; Iceberg lettuce, unspecified	United States of America (Colorado)	CDC, 2022
Jul 2008	*Salmonella* Typhimurium	24	Alfalfa sprouts	United States of America (multistate)	CDC, 2022
Mar 2008	*Listeria monocytogenes*	20	Sprouts, unspecified	United States of America (multistate)	CDC, 2022
2008	*Staph. aureus*	42	Bean sprouts	Denmark	EFSA, 2011
Jul – Oct 2007	*Salmonella* Wellaveiden	45	Alfalfa sprouts	Denmark, Norway and Finland	Emberland *et al.*, 2007

TABLE A2.2 Foodborne illness outbreaks associated with the consumption of contaminated sprouts

DATE	CAUSATIVE AGENT	NO. OF ILLNESSES REPORTED	TYPE OF SPROUT IMPLICATED	COUNTRY OF OUTBREAK	REFERENCE
Jan 2020 – Mar 2020	*E. coli* O103	51	Clover sprouts	United States of America (multistate)	CDC, 2020
Nov 2019 – Dec 2019	*E. coli* O103	22	Clover sprouts	United States of America (Iowa)	FDA, 2020
Dec 2017 – Jan 2018	*Salmonella* Montevideo	10	Sprouts	United States of America (multistate)	CDC, 2018
May – July 2016	*Salmonella*	30	Alfalfa sprouts	United States of America (multistate)	Beach, 2016
Apr 2016	*Salmonella* Saintpaul	244	Mung bean sprouts	Australia	Stokes, 2016
Jan 2016	*E. coli* O157	11	Alfalfa sprouts	United States of America (Minnesota)	CDC, 2016b
Nov 2015 – Jan 2016	*Salmonella* Muenchen	13	Alfalfa sprouts	United States of America (multistate)	CDC, 2016a
Sep 2014	*Salmonella* Enteritidis	115	Bean sprouts	United States of America (multistate)	CDC, 2015a
Jun – Aug 2014	*Listeria monocytogenes*	5	Mung bean sprouts	United States of America (Illinois and Michigan)	CDC, 2015b
May 2014	*E. coli* O121	19	Raw clover sprouts	United States of America (Washington and Idaho)	CDC, 2014a
Jul 2012	*Salmonella* Cubana	19	Sprouts, unspecified	United States of America (multistate)	CDC, 2022
Mar 2012	*Listeria monocytogenes*	6	Sprouts, unspecified	United States of America (multistate)	CDC, 2014b
Dec 2011 – Feb 2012	*E. coli* O26	29	Raw clover sprouts	United States of America (multistate)	CDC, 2012
Aug 2011	*Salmonella* Agona	7	Sprouts, unspecified	United States of America (Kansas)	CDC, 2022
Apr – Jul 2011	*Salmonella* Enteritidis	27	Alfalfa sprouts and spicy sprouts	United States of America (multistate)	CDC, 2011a
May – Jul 2011	*E. coli* O104:H4	4 025	Fenugreek sprouts	Europe, Canada and United States of America	Buchholz *et al.*, 2011; CDC 2012
Apr 2011	*Salmonella* Muenchen	7	Clover sprouts	United States of America (Michigan)	CDC, 2022
Dec 2010 – Jan 2011	*Salmonella* Newport	9	Clover sprouts	United States of America (Oregon and Washington)	CDC, 2022

TABLE A2.2 Foodborne illness outbreaks associated with the consumption of contaminated sprouts. (cont.)

DATE	CAUSATIVE AGENT	NO. OF ILLNESSES REPORTED	TYPE OF SPROUT IMPLICATED	COUNTRY OF OUTBREAK	REFERENCE
Jul – Aug 2007	*Salmonella* Stanley	44	Alfalfa sprouts	Sweden	Werner *et al.*, 2007
Apr 2007	*Salmonella* Mbandaka	15	Alfalfa sprouts	United States of America (multistate)	CDC, 2022
2006	*Salmonella* Barailly and Virchow	115	Mung Bean sprouts	Sweden	De Jong, Ekberg and Svenungsson, 2007
Feb 2006	*Salmonella* Braenderup	4	Bean sprouts	United States of America (Oregon)	CDC, 2022
2006	*Salmonella* Oranienburg	15	Alfalfa sprouts	Australia	OzFoodNet, 2007
Nov 2005	*Salmonella* Oranienburg	125	Alfalfa sprouts	Australia	ASWA, 2006
Nov 2005	*Salmonella* Braenderup	2	Mung bean sprouts	United States of America (Massachusetts)	CDC, 2022
Oct – Dec 2005	*Salmonella* spp.	648	Mung bean sprouts	Canada	Ontario Newsroom, 2005
Apr 2004	*E. coli* O157:NM	2	Alfalfa sprouts	United States of America (Georgia)	CDC, 2022
Apr 2004	*Salmonella* Bovismorbificans	35	Alfalfa sprouts	United States of America (Oregon and Washington)	CDC, 2022
Nov 2003	*Salmonella* Cheddar	26	Alfalfa sprouts	United States of America (multistate)	CDC, 2022
Jul 2003	*E. coli* O157:NM	13	Alfalfa sprouts	United States of America (Colorado)	Ferguson *et al.*, 2005
Feb 2003	*Salmonella* Saintpaul	16	Alfalfa sprouts	United States of America (multistate)	CDC, 2022
Feb 2003	*E. coli* O157:H7	7	Alfalfa sprouts	United States of America (Minnesota)	Ferguson *et al.*, 2005
Jan 2003	*E. coli* O157:H7	20	Alfalfa sprouts	United States of America (multistate)	CDC, 2022
Jul 2002	*E. coli* O157:H7	5	Alfalfa sprouts	United States of America (California)	CDC, 2022
2002	*Salmonella* Abony	13	Mung bean sprouts	Finland	EFSA, 2011
Apr 2001	*Salmonella*	35	Mung bean sprouts	United States of America (Florida)	CDC, 2022



Annex 2

Sprout-associated foodborne illness outbreaks and surveillance data

TABLE A2.1 Examples of bacterial contamination rates and their prevalence in sprouts sampled from the marketplace in three WHO regions for which surveillance data were available.

MICROBIAL HAZARD	AMR		EUR		WPR		TOTAL		REFERENCES
	PREVAL WAVG	POS RATE	PREVAL WAVG	POS RATE	PREVAL WAVG	POS RATE	PREVAL WAVG	POS RATE	
***Listeria* spp.**	1%	6/469	0%	0/15	--	--	1%	6/484	Abadias *et al.*, 2008; FDA 2
***Salmonella* spp.**	0%	0/471	0%	0/15	--	--	0%	0/486	Abadias *et al.*, 2008; Da Cruz *et al.*, 2019; FDA 2017
STEC	0%*	0/1383	40%	6/15	--	--	0%	6/1398	Abadias *et al.*, 2008; CFIA, 2022; FDA 2017
***Staphylococcus* spp.**	0%	0/2	--	--	17%	19/112	0%	19/114	Da Cruz *et al.*, 2019; Seo, Jang and Moon, 2010
Total	0%	6/2323	13%	6/45	17%	19/112	1%	31/2482	

Source: Authors' elaboration.

* WHO classifications: AMR, Region of the Americas; EUR, European Region; WPR, Western Pacific Region. Preval WAVG, Prevalence as a weighted average; Pos rate, sample positive rate.

World Health Organization published this document in 2022. It is quite short but worth a read.

Examples of regulation and engagement that has changed the way we work.

Canadian Regulation

Français

Government of Canada | Gouvernement du Canada

Search Inspection.canada.ca

MENU

Canada.ca > Canadian Food Inspection Agency > Preventive controls > Fresh fruits or vegetables

Preventive controls for the hygienic production of sprouted seeds

On this page

Introduction

This document provides information about good agricultural practices (GAP) and good hygienic practices for the production of sprouted seeds that may be consumed raw. It sets out specific recommendations for the production of

European Sprouted Seed Association (ESSA)

ESSA hygiene guideline for the production of sprouts and seeds for sprouting

(2017/C 220/03)

Abstract

The EU sprouted seeds market is a highly specialised niche segment of the fresh produce market with approximately 120 professional production establishments throughout the EU. After the EHEC crisis in 2011 and EFSA's 'Scientific Opinion on the risk posed by Shiga toxin-producing *Escherichia coli* (STEC) and other pathogenic bacteria in seeds and sprouted seeds', new EU legislation entered into force to enhance the safety of this product segment across Europe. Different national guidelines were created to help in the implementation of these specific rules. The purpose of this European guideline, written by the European Sprouted Seeds Association (ESSA), is to give comprehensive instructions on the hygienic practices for the safe production of sprouts and seeds for sprouting, and make this information available to sprout producers in European countries and beyond.

This guideline may be used to create checklists and schemes in order to facilitate the application of the guideline.

Scope of this guide

This guideline refers to the commercial production of sprouts and seeds for sprouting in accordance with applicable legislation of the European Union. The germination of seeds — moistening seeds to increase the water content in them and bring them out of dormancy, until a new plant starts growing upward — is primary production in the EU. This hygiene guideline covers activities that are part of primary production. Activities outside the scope of primary production are not covered, but alternative guidance may be available and listed in the references below. This guideline does not cover the production of other sprouted seeds, like microgreens, shoots, cress and products that are cultivated in growing media or soil in greenhouses. Sprouted seeds commodities excluded from the scope of this guidance are covered by Commission Recommendation – Guidance document on addressing microbiological risks in fresh fruit and vegetables at primary production through good hygiene [1].

Applicable EU legislation for the production of sprouts and seeds for sprouting

The general food safety requirements including the obligation to only place safe food on the market are laid down in Regulation (EU) No 178/2002. The hygienic production of foodstuffs in the EU is covered by Regulation (EC) No 852/2004 and in particular by Annex 1 Part A of this regulation. It obliges primary producers to make sure that primary products are protected against contamination, for example by putting measures in place that prevent contamination from the air, soil, water, fertilisers, plant protection products and biocides and the storage, handling and disposal of waste. The present guidelines give practical examples to supplement these general provisions.

More specific requirements for the production of sprouts are laid down in several additional EU regulations: Commission Implementing Regulation (EU) No 208/2013 on traceability requirements for sprouts and seeds intended for the production of sprouts, Commission Regulation (EU) No 209/2013 (amending Regulation (EC) No 2073/2005) on microbiological criterion for sprouts, Commission Regulation (EU) No 210/2013 on the approval of establishments producing sprouts and Commission Regulation (EU) No 211/2013 (amended by Commission Regulation (EU) No 704/2014) on certification requirements for imports of sprouts and seeds for sprouting into the EU. The requirements of these regulations are included in this guideline.

All pieces of EU legislation mentioned throughout this guide are referenced in Annex I of this guide. Annex II provides references to other relevant sources of information related to the production of sprouts.

This guideline covers the minimum requirements for production of sprouts in the EU. Some EU Member States may have more stringent requirements for the sprout producers established in these Member States. It is generally recommended that sprout producers keep in contact with their competent authority to keep informed about the applicable rules in their relative Member State.

Additional documents going beyond the present guidelines

Additional guidance is available through relevant publications of the Codex Alimentarius, general good agricultural practices (GAP) and hygiene practices (GHP) developed by different national authorities as well as guidelines from different private stakeholders and certification schemes. Information concerning guidance documents known to the European Sprouted Seeds Association (ESSA) has been included into the references and annexes of this

Australia and New Zealand

INTRODUCTION

Sprouted seeds are used as a source of food because of their taste, texture and nutritional value. However, they have the potential to cause food borne illness in people if the seed sprouts become contaminated with bacteria, such as *E.coli*, *Salmonella* and *Listeria monocytogenes*. Sprouted seeds represent a unique microbial food safety concern due to the potential for these bacteria to grow rapidly during the germination and sprouting of the seeds. Nearly all sprout related outbreaks have been traced to bacteria in seed. In the past 20 years, at least 39 major outbreaks of food borne illness across the United States, Canada and Europe have been caused by the consumption of contaminated seed sprouts. In Australia, a number of product recalls have taken place when sprouts have tested positive for these bacteria.

Sources of potential food safety hazards that may contaminate sprouts during sprout production, packing, handling, storage and transportation can be the seeds used, equipment, water and medium supporting sprout growth. Chemicals used or present in a sprout production environment, and metal, glass, wood or plastic objects present in or used for sprout production and handling, may present food safety hazards.

THE PRODUCTION AND PROCESSING STANDARD FOR SEED SPROUTS

In 2012, Food Standards Australia New Zealand (FSANZ) introduced a standard into the Food Standards Code: Standard 4.2.6 - Production and Processing Standard for Seed Sprouts. The Standard is a national standard that applies to sprout processors in all states and territories. In Victoria, the Standard created a new set of legal requirements under the *Food Act 1984* (the Act) for seed sprouts.

The Standard aims to minimise the risk of food borne illness by setting out requirements for managing the hazards associated with the production of seed sprouts. A hazard is anything that could cause harm to consumers, and could be biological (eg *Salmonella* or aflatoxin), physical (eg glass particles) or chemical (eg cleaning products).

There are six requirements covered in the Standard which are general food safety management, receiving of seed, inputs, decontamination, traceability and sale or supply.

Businesses must also address other requirements of the Food Standards Code, including those outlined in:

Standard 1.2.1: Application of Labelling and Other Information Requirements

Standard 1.6.1: Microbiological limits in food

Standard 3.2.2: Food Safety Practices and General Requirements

Standard 3.2.3: Food Premises and Equipment

Standard 4.1.1: Primary Production and Processing Standards – Preliminary Provisions

Does the standard apply to you and your business?

The Standard covers seed sprouts that are sold to consumers, but not directly to the public, with all or part of the seed, including,

FDA industry guidance for USA growers

About 10,400 results (0.33 seconds)

The requirements in 21 CFR Part 112, Subpart M (Sprouts) apply to the growing, harvesting, packing and holding of all sprouts except sprout that are grown in soil or non-soil substrates (e.g., mats, perlite or othe growth media) and that are harvested above the soil or substrate line without their roots (§ 112.141).

Food and Drug Administration (.gov)
https://www.fda.gov › media › download PDF

Determining Coverage under Subpart M of the FSMA Produce ...

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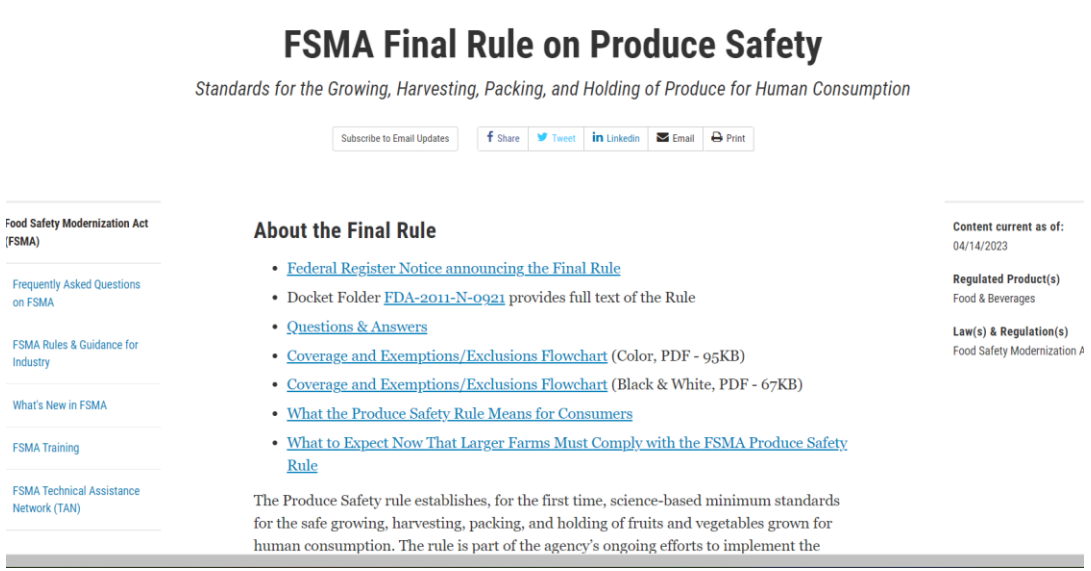

For seed suppliers.....

FDA Issues Final Guidance for Seeds Used for Sprouting

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Constituent Update

May 13, 2022

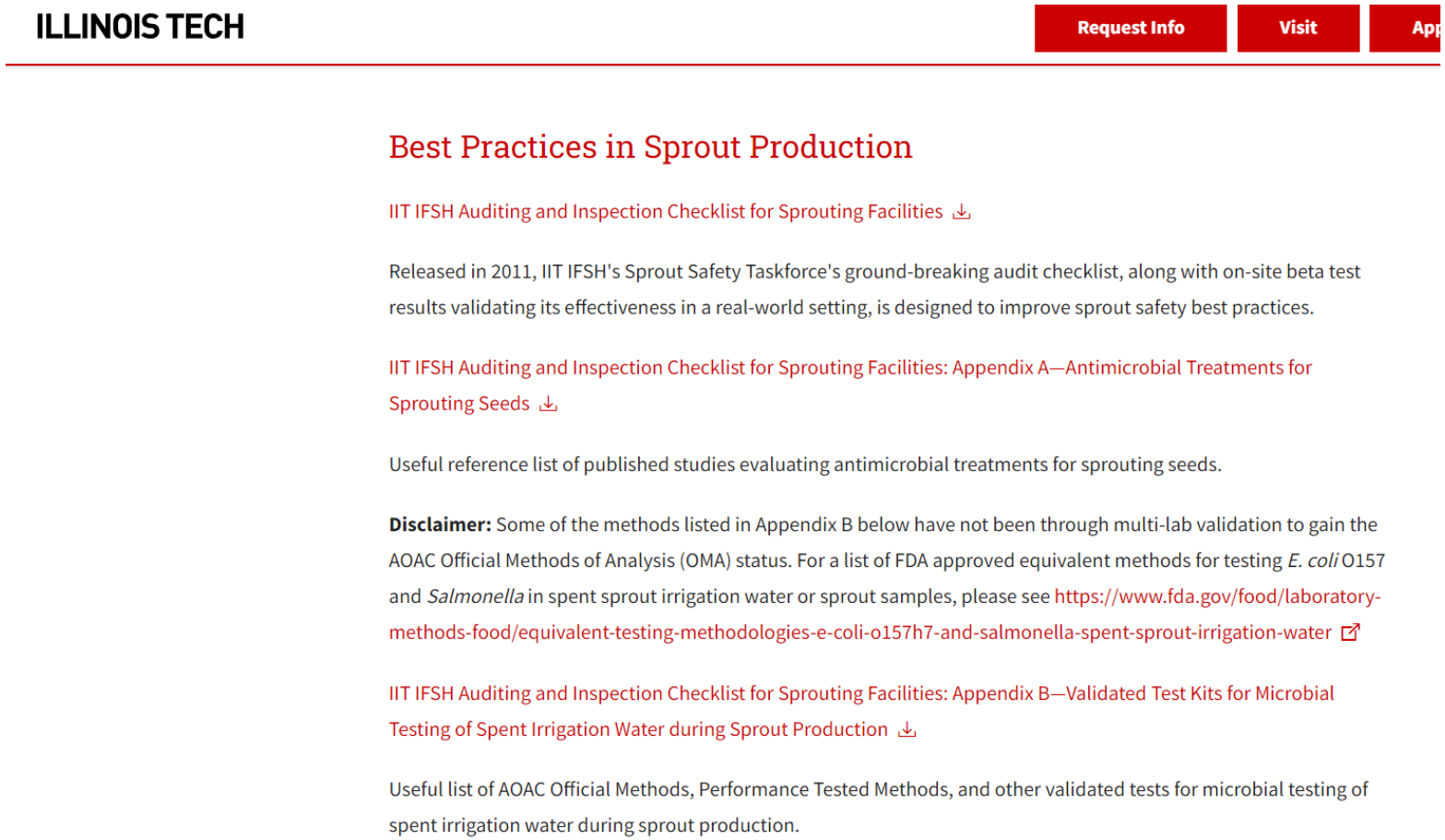
Today the U.S. Food and Drug Administration (FDA) issued a final guidance titled "Reducing Microbial Food Safety Hazards in the Production of Seed for Sprouting: Guidance for Industry." This guidance outlines FDA's serious concerns over foodborne illness outbreaks associated with the consumption of raw and lightly-cooked sprouts and provides firms with recommended steps to prevent adulteration throughout the production chain of seed for sprouting.

Between 1996 and 2020, there were 52 reported outbreaks of foodborne illness associated with contaminated sprouts, resulting in more than 2,700 cases of illness. Although contamination can occur at any point along the sprout supply chain, seed has historically

Content current as of:
05/13/2022

Regulated Product(s)
Food & Beverages

Best Practices created with industry and Regulatory participation.



HOW ARE THINGS GOING FOR THE SPROUT INDUSTRY IN 2023?

We have been doing quite well recently in North America (and elsewhere)

- With the intensive testing programs, we have in place we can identify and remove our products either before the hit the market or very quickly when they have gotten to market.
- We have been educating growers and suppliers through the work that we have engaged in.
- Through our conventions (that have been going on for 33 years) 1000's of people have met each other, and many relationships have been built.
- North American work with IFSH (Institute of Food Safety and Health) where the Sprout Safety Alliance and the Sprout Safety Task Force have worked as a team to enhance safety, educate growers and develop best practices documents and training in the USA, other countries are doing similar work.

Unfortunate News late 2022: USA

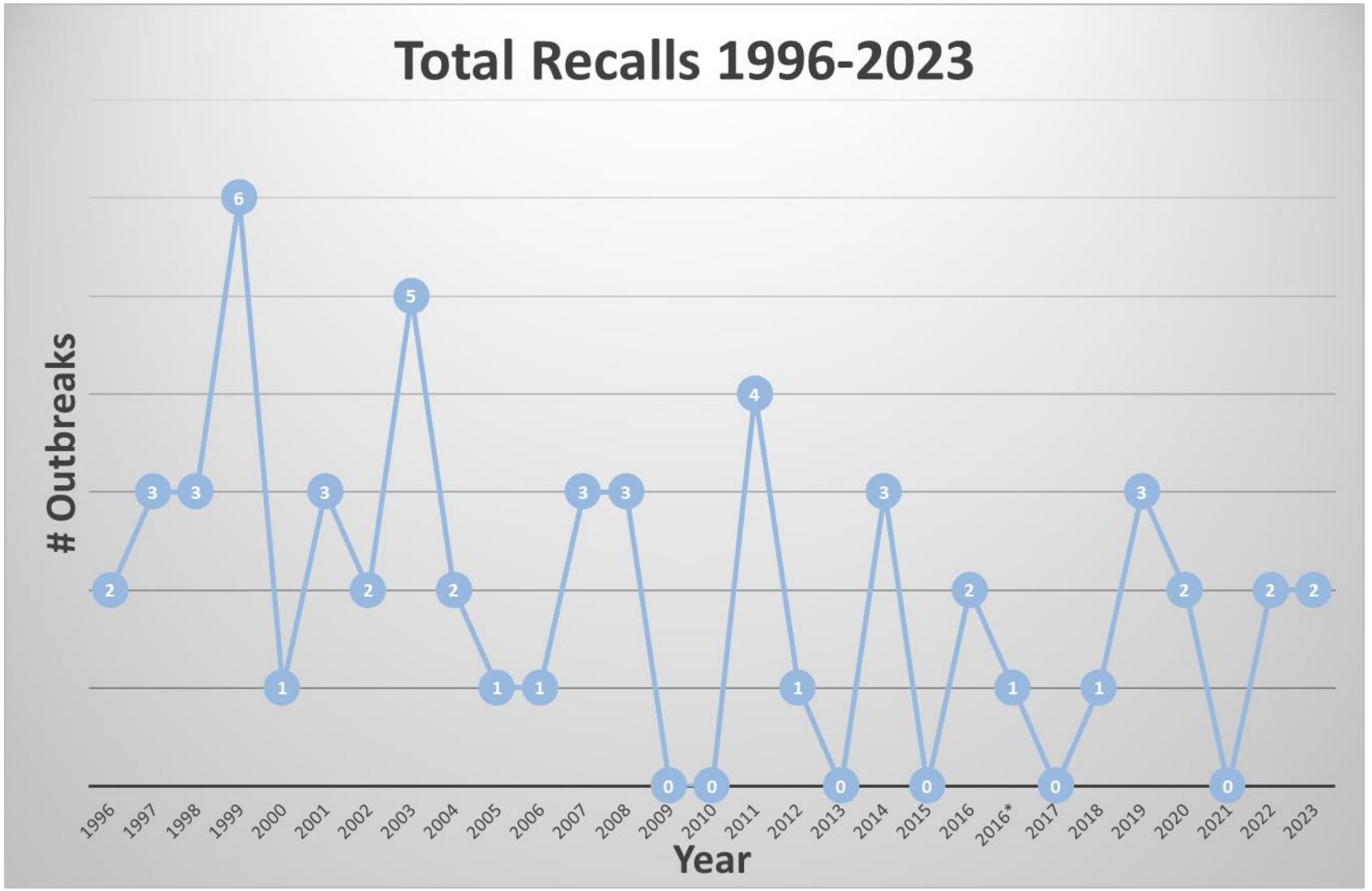
- Although we have had a few recalls in the last few years internationally, identified illnesses have been quite low.
- Late in 2022 a recall in the USA= 63 illnesses
- The company had a team that had food safety background but had not yet been exposed to the Sprout Safety Alliance training.
- By lacking sprout specific training, the risks that are specific to sprouts may not have been fully understood. This meant that reactions may not have been swift enough to avoid these illnesses or remove the products from market quickly.

United States of America Statistics for sprout recalls and illnesses

USA Total Recalls: 1996-2023

Sprouts Recalls and Illnesses 1996-2023		
Year	Recalls	Illnesses
1996	2	650
1997	3	277
1998	3	48
1999	6	389
2000	1	75
2001	3	88
2002	2	21
2003	5	52
2004	2	33
2005	1	2
2006	1	4
2007	3	59
2008	3	65
2009	0	0
2010	0	0
2011	4	72
2012	1	19
2013	0	0
2014	3	139
2015	0	0
2016	2	47
2016*	1	26
2017	0	0
2018	1	10
2019	3	22
2020	2	51
2021	0	0
2022	2	63
2023	2	0

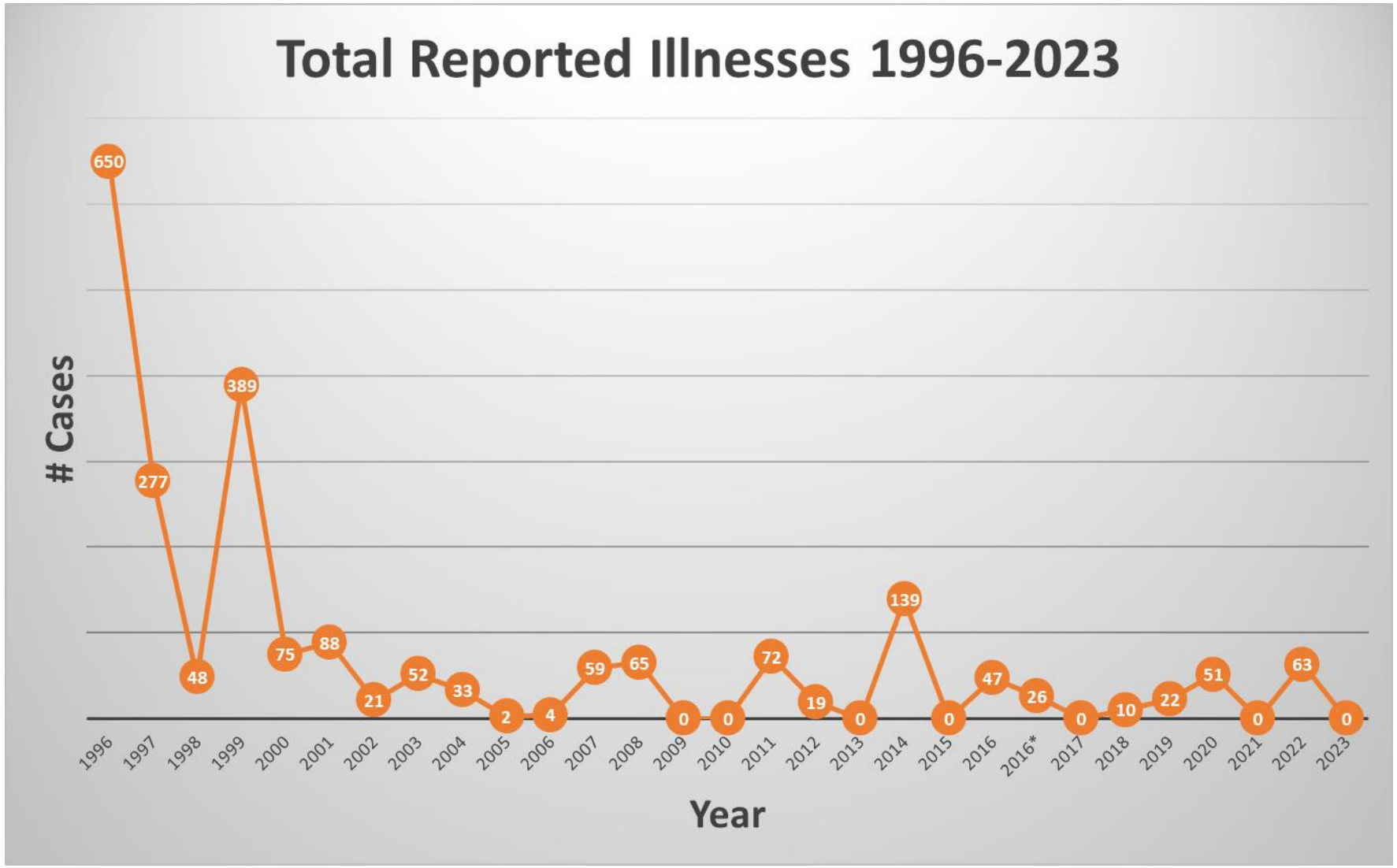
NOTE: 2016* two data points due to seed lot recall.



USA Sprouts Illnesses 1996-2023

Sprouts Recalls and Illnesses 1996-2023		
Year	Recalls	Illnesses
1996	2	650
1997	3	277
1998	3	48
1999	6	389
2000	1	75
2001	3	88
2002	2	21
2003	5	52
2004	2	33
2005	1	2
2006	1	4
2007	3	59
2008	3	65
2009	0	0
2010	0	0
2011	4	72
2012	1	19
2013	0	0
2014	3	139
2015	0	0
2016	2	47
2016*	1	26
2017	0	0
2018	1	10
2019	3	22
2020	2	51
2021	0	0
2022	2	63
2023	2	0

NOTE: 2016* two data points due to seed lot recall.



Climate change and supply chain issues are contributing to potential seed shortages. This impacts seed suppliers and growers

- The pandemic impacted seed availability: Consumer home sprouting and freight issues put more pressure on seed supply.
- The plant-based movement may be diverting seed as ingredients that could be used for sprouting.
- Climate change and the dramatic weather events we are seeing around the world will impact seed supply eventually.
- Supporting learning opportunities for seed producers about the sprouting seed industry may help grow access.

Labour shortages and loss of experienced sprouters

- Since the pandemic, most industry has been feeling the impact of lack of engaged workers.
- Many sprout producers and workers are aging and will be retiring in the next 5-10 years
- Sprouting is a very physical job, so people often are not fit enough to do it.
- Staff shortages can result in long days, tired workers and less attention to detail.
- Lack of experience can result in poor decision making relevant to sprout specific food safety steps.
- We need to do everything we can to continue to recruit and train people who are intelligent and care

Focus on traceability

- Over the last number of years focus in all countries on improving the traceability of foods has been underway.
- The sprout industry is embracing this and is much more readily able to connect with buyers and activate recalls.
- This makes a big difference in the reduction of product being in the market- place that needs to be removed.

Experience

Once you know something you can't un-know it.

Being part of the changes in the industry and understanding the rationale from them makes it easier to take it seriously.

Living through heartache associated with recall or illness and knowing how important it is to mitigate risk is an experience that teaches so much.

Many producers are aging, many retired, many working on succession, and some have passed away. The more we can share now the better.

Most pioneers of the industry will retire in the next 10 years.

It is essential that the knowledge is passed from generation to generation to maintain the understanding and allow it to be built on with new technology, knowledge and tools.

- We had a great convention that brought researchers, producers and people from outside the industry together to learn from each other.
- Many researchers continue to work on seed treatments and other aspects to continue to improve food safety in the sprout supply chain.
- Sprouters are being recognized as having a good track record with food safety improvement.
- We are engaging with other sector groups to build strong connections and learning opportunities.
- We are looking for funding to invest more resources into outreach and problem solving.
- We still have access to seeds.

Consumer Reports compiles a list of 10 ‘risky foods’ to watch out for

By Coral Beach on March 31, 2023

Consumer Reports is out with a new analysis of what it describes as risky foods consumers should know about.

The list was compiled after the organization looked at data from 2017 through 2022. The researchers focused on widely consumed foods that had recalls during the study period. They did not include recalled food related to allergens or extraneous materials. The report ranked recalls based on how many people died or became ill, as well as how widespread the outbreaks were and how many times a food was recalled.

The 10 foods that made the list are:

- Leafy greens
- Deli cheese and meat
- Ground beef
- Onions
- Turkey
- Chicken
- Papayas
- Peaches
- Cantaloupe
- Flour

- We are not specifically listed here
- We are not complacent
- We will continue to work hard

Opportunities

- We have a deep knowledge of our products and where applicable there is the potential for other industries to learn from our mistakes.
- There is a lot of research being done on sprouts. Researchers love working with our products as they grow in less than a week. This means that there is a lot of opportunity for us to engage with researchers to try new things and apply to real world situations and we can be a strong partner in innovation for the entire produce industry.
- We can feed people anywhere in the world.

WHAT RESEARCH IS NEEDED FOR OUR INDUSTRY?

Research focused more from industry perspective …….

- Improve growing methods
- Continue temperature research
- Testing methods for emerging pathogens
- More education on managing cross contamination in a wet active environment
- Continue to work on competitive exclusion concepts: Phage and other focus areas
- Nutrition research for sprouts
- Education of producers, regulators and consumers about the difference between microgreens and sprouts
- Seed treatments need to be evaluated for each seed type. Not all seeds respond to the same treatment in the same way
- Innovation in growing equipment including exploration of robotics

Research focused more from regulators perspective……

Consider completing another sample data capture but work with industry to establish protocols

Consider that not all positive results come from seed. Environmental factors should be evaluated more

Continued work to improve epidemiological tracking

Support companies to understand risk management and evaluation

Seed treatments need to be evaluated for each seed type. Not all seeds respond to the same treatment in the same way

Let's continue to collaborate to support the health of all humans

Our industry believes in the health benefits of the food we grow. That's why we are so committed

By making sprouts and microgreens the safest they can be we are able to help feed people across the planet


QUESTIONS

Thank you for your time

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