

Clean Starts Here: Responding to Norovirus

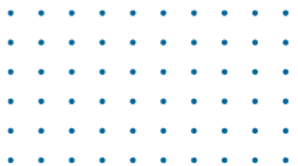


Poll Question



Which of these would you rather receive for Valentine's Day?

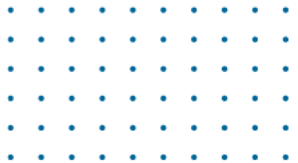
1. A romantic dinner where the chef actually uses a food thermometer 🍴 🥄
2. A bouquet of color-coded cutting boards 🌈 🗑️
3. A heart-shaped container of properly stored leftovers ❤️ 🏠
4. A serenade about the importance of handwashing 🎵 🧼
5. A handwritten vow to stay home when sick (especially with norovirus!) 🤒 🚫



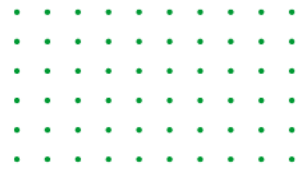
Welcome from PFSE



Katie Weston
Program Manager
Partnership for Food Safety Education
kweston@fightbac.org



Housekeeping

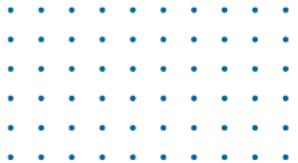


Join the chat! Or send a question during the webinar.

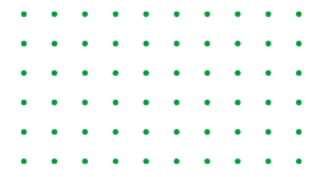
After the webinar, you'll receive a brief survey. Please complete it.



Help us improve!

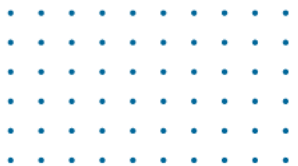


Continuing Education Units



One-hour CEU approved from ANFP, NCHEC & NEHA and Certificates of Completion available for other CEU-eligible organizations

- Download certificates from chat box
- Follow-up email
- Download at fightbac.org under “Free Resources” tab and “Recorded Webinars”
- Educators seeking NCHEC must complete online questionnaire by **Friday, April 4**



About the Partnership



We're an active network of...

- 13,000 health and food safety educators
- 40 Partner organizations
- Federal liaisons (CDC, FDA, USDA)

All working together to advance trusted, consistent, science-based behavioral health messaging.



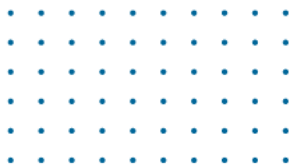
Did You Know?



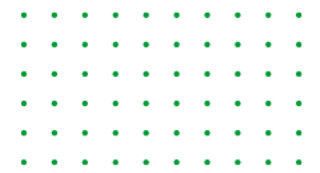
Every year in the United States...

- 1 in 6 people (or 48 million people) get sick from foodborne illness, commonly called food poisoning
- 128,000 are hospitalized
- 3,000 die from eating contaminated food

Following simple food safety steps can help prevent foodborne illness and the spread of germs.



2025 Consumer Food Safety Education Conference

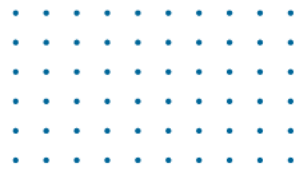


Let's tackle foodborne illness together:

Join us at the only conference in the U.S. dedicated to consumer food safety education!

- March 13-14 in Houston, TX
- Look forward to expert-led sessions, the latest research, and opportunities to connect
- 20% off registration now through February 14 with code **FoodLove**

Register today: cfsec.org/register



AFDO Healthy People 2030
Norovirus Workgroup

Laurie Farmer, Director Office of State
Cooperative Programs
Beth Wittry, CDC



Department of Health and
Human Services

Healthy People 2023

Healthy People 2030
Foodborne Illness Reduction

Norovirus at Retail

Department of Health and Human Services (HHS)

- Began Healthy People in 1980- set 1st iteration of 10-year objectives
- Includes targets to monitor progress and motivate and focus action
- Current iteration is Healthy People 2030
- Initiatives can be found at [HealthyPeople.gov](https://www.healthypeople.gov)

Department of Health and
Human Services

HHS Healthy People 2030

Healthy People 2023

- Launched in 2020
- Developed by:
 - public and private organizations
 - diverse group of federal and nonfederal subject matter experts
- Framework includes:
 - vision and mission
 - foundational principles
 - overarching goals
 - core objectives with targets
 - research and developmental objectives

Healthy People 2030
Foodborne Illness Reduction



Healthy People 2030

Norovirus at Retail

- Food safety goals:
 - Reduction of foodborne illness caused by pathogens

Department of Health and Human Services

AFDO Healthy People 2030 Foodborne Illness Reduction

Healthy People 2023

Healthy People 2030
Foodborne Illness Reduction

Norovirus at Retail

- Objective/Workgroups Created and Evolution:
 - Salmonellosis from poultry
 - STEC from produce
 - Norovirus at retail
 - Reduce the number of outbreaks of infections caused by norovirus
 - Developmental goal for HHS HP2030
 - Targeted Efforts – Model Charter & Strategic Planning

- New workgroups
 - One Health*
 - Root cause analysis*
 - Communications

- Workgroups report to the AFDO HP2030 Steering Committee and AFDO Board



Department of Health and
Human Services

Healthy People 2023

Healthy People 2030
Foodborne Illness Reduction

Norovirus at Retail

Norovirus at Retail

- To reduce the number of norovirus outbreaks
- Created developmental objectives
- Focus on research and science to drive strategic direction

NOROVIRUS:
YOU DON'T WANT IT.



Norovirus at Retail



Restaurants are the most common outbreak location



Norovirus is the most common pathogen



Ill food workers most commonly contribute to outbreaks

Norovirus in Retail Settings

- **Food Code Prevention Measures:**
 - exclude ill workers
 - no barehand contact with ready-to-eat foods
 - wash hands
 - clean and sanitize surfaces
- Challenge: implementation of employee health policies and practices



Norovirus Workgroup: Current Members

Inclusive Representation of Stakeholders

- Federal government
 - CDC: Centers for Disease Control and Prevention
 - FDA: U.S. Food and Drug Administration
 - EPA: Environmental Protection Agency
 - USDA: United States Department of Agriculture
 - NPS: National Parks Service
- Industry
 - NRA: National Restaurant Association
 - NRF: National Retail Federation
 - FMI: Food Marketing Institute
 - HAG: Holland America Group
 - EcoLab
 - Chick-fil-A
 - First Watch
 - McDonalds
- Associations
 - AFDO: Association of Food and Drug Officials
 - NEHA: National Environmental Health Association
 - NACCHO: National Association of County and City Health Officials
 - CFP: Conference for Food Protection
- Academia
 - NCSU: North Carolina State University
 - OSU: The Ohio State University
- Regulatory
 - RIDOH: Rhode Island Department of Health
 - SNHD: Southern Nevada Health District
 - NC DHHS: North Carolina Department of Health and Human Services
 - MA DPH: Massachusetts Department of Public Health
 - UT DHHS: Utah Department of Health & Human Services

Clean Starts Here: Responding to Norovirus

Lee-Ann Jaykus, Ph.D., Professor Emeritus
NC State University

Angela Fraser, Ph.D., VP, Food Safety and Quality
International Fresh Produce Association

NC STATE
UNIVERSITY

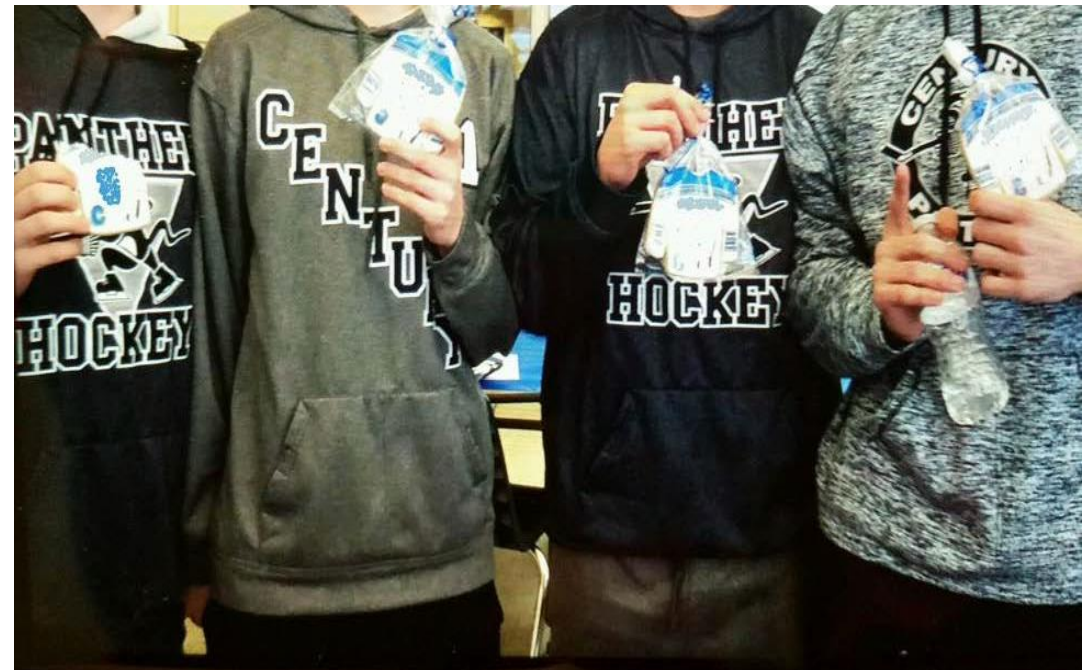
INTERNATIONAL
**FRESH
PRODUCE**
ASSOCIATION™

Learning Questions

- What is human norovirus?
- How is it transmitted?
- How do we control it?
- What is the difference between cleaning, sanitizing, and disinfection?
- When do we clean, when do we sanitize or disinfect?
- What can you do as an educator to prevent the spread of human norovirus?

High School Hockey Banquet (N=26)

- Catered by local grocery store deli -- investigation revealed **no** practices of concern.
- Cookies also provided, sourced from home bakery.
- Baker ill with diarrhea and vomiting but not handle food for 24 hours after symptoms resolved.
- Revealed son ill at same time and had vomited in bathroom—cleaning took place, but **no** disinfection.
- All equipment to produce cookies stored separate from personal use kitchen items.



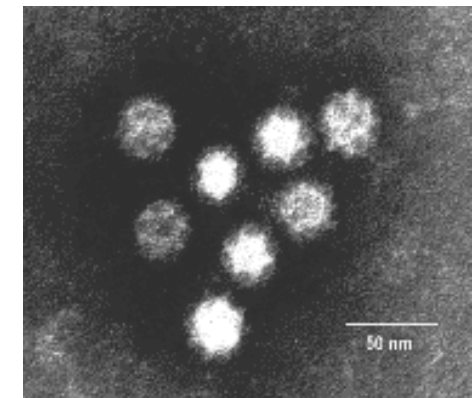
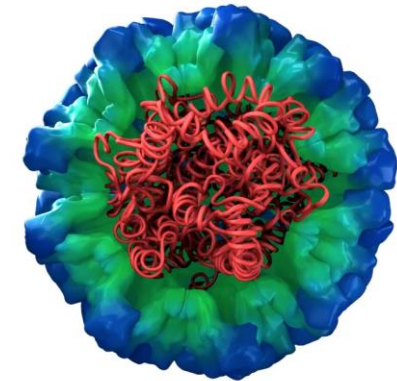
SOURCE: Hockey boys photo -- Olmstead County Public Health
Norovirus photos -- www.foodsafetynews.com/files/2015/12/norovirus.jpg

What's the Problem?

- **Norovirus is very contagious.**
 - Dose estimated to be 10-1000 particles.
 - Most contagious when sick with vomiting and diarrhea.
 - Infected person who vomits in a public place may expose many people.
- **Foodservice workers often go to work when sick.**
 - 1 in 5 foodservice workers report working while sick with vomiting and diarrhea.
 - Of outbreaks caused by infected food workers, 54% involve food workers touching ready-to-eat-foods with their bare hands.
 - Foodservice workers wash hands only 1 of 4 times they should.
- **HuNoV is hard to kill.**
 - Survives on surfaces for up to 2 weeks.
 - Resists many common antimicrobials and hand sanitizers.

Human Norovirus

- **Member of *Caliciviridae* virus family**
 - Obligate intracellular parasites
 - Small and simple in structure
 - Many strains, epidemic strain predominates
- **Common features**
 - Transmitted by fecal-oral route
 - Shed in vomitus
 - Infection initiated in GI tract
 - Human-specific
 - Difficult to cultivate *in vitro*



General Sources of Exposure

VIRUS TRANSMISSION

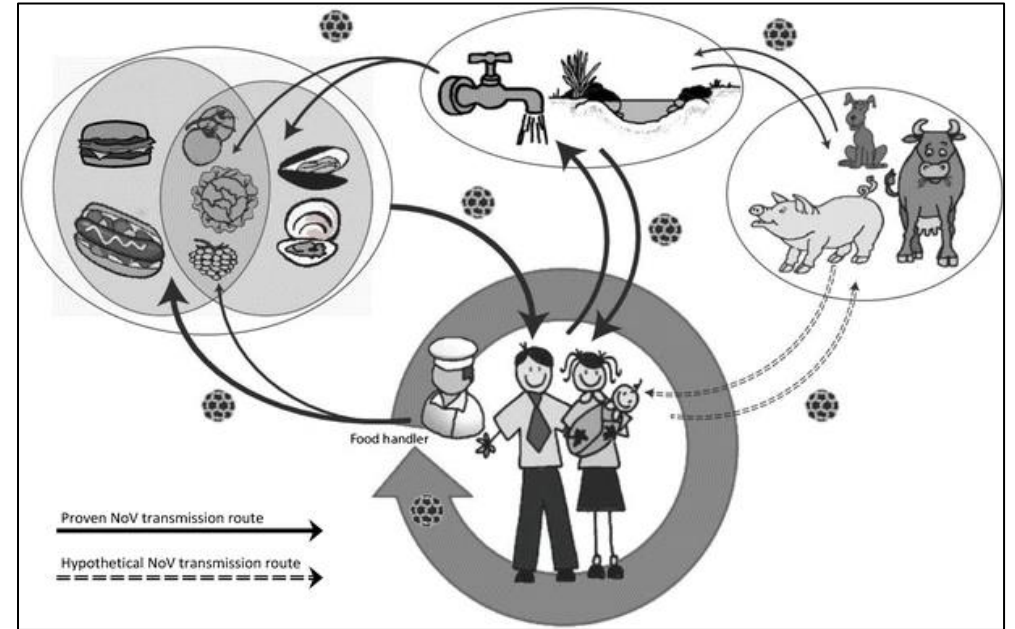
Drinking Water

FOODS

Person-to-Person
"Direct" (fecal)
"Indirect" (vomitus)

Fomites

Other
Recreational waters
Soil

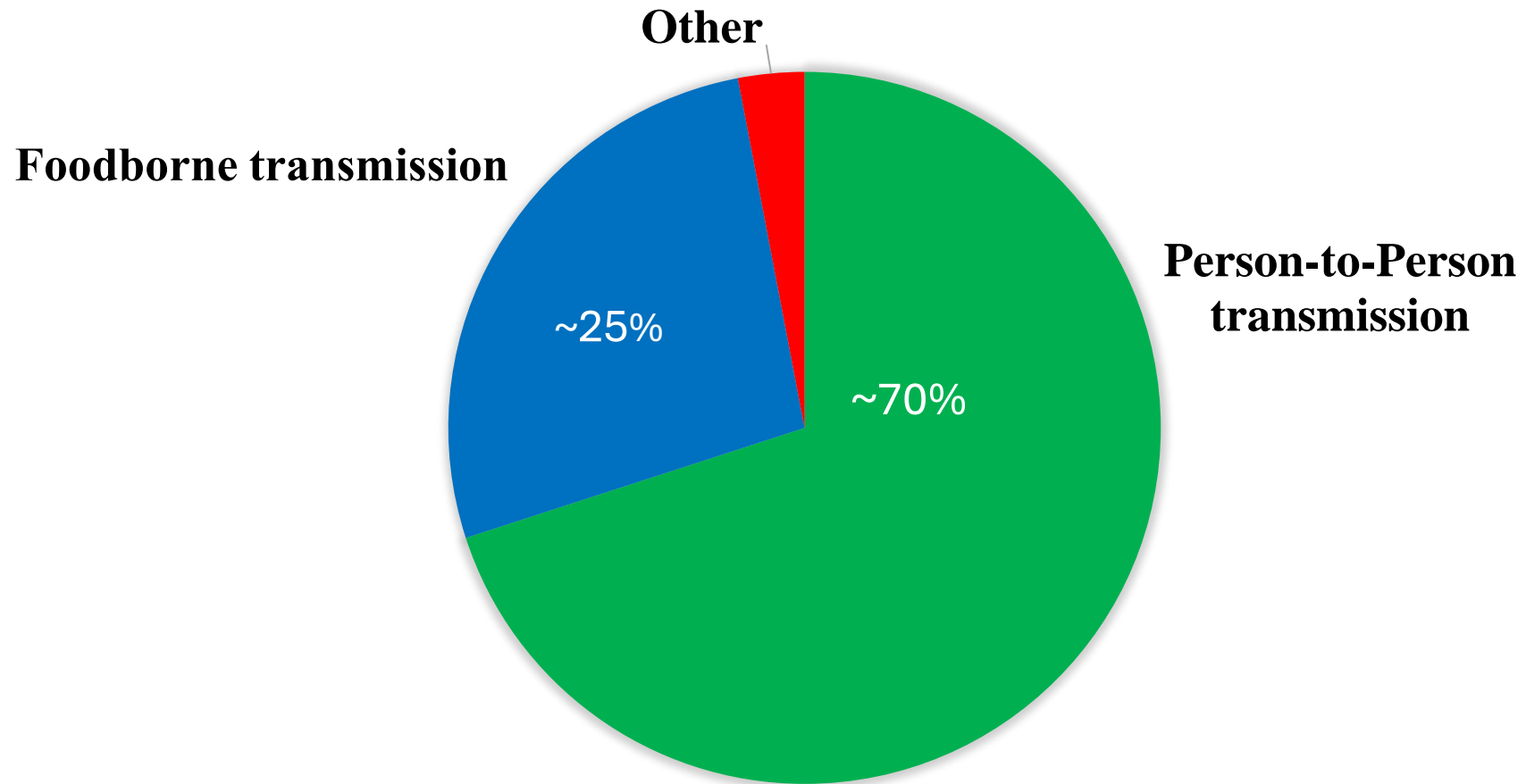


A Review of Known and Hypothetical Transmission Routes for Noroviruses

[Elisabeth Mathijs](#), [Ambroos Stals](#) , [Leen Baert](#), [Nadine Botteldoorn](#), [Sarah Denayer](#), [Axel Mauroy](#), [Alexandra Scipioni](#), [Georges Daube](#), [Katelijne Dierick](#), [Lieve Herman](#), [Els Van Coillie](#), [Mieke Uyttendaele](#) & [Etienne Thiry](#)

Food and Environmental Virology, **4**, 131–152 (2012) | [Cite this article](#)

Importance of Transmission Routes



SOURCE: Wikswo et al, 2022

The Norovirus: A Study in Puked Perfection

by Carl Zimmer

Today, [The Guardian](#) relayed one of those stunning medical stories that causes me to clean off my glasses and take another look to make sure I'm reading it clearly. They report that an outbreak of norovirus in Britain this winter has struck more than 1.1 million people with vomiting and diarrhea.

That's right: 1.1 million. In Britain alone.

ABOUT



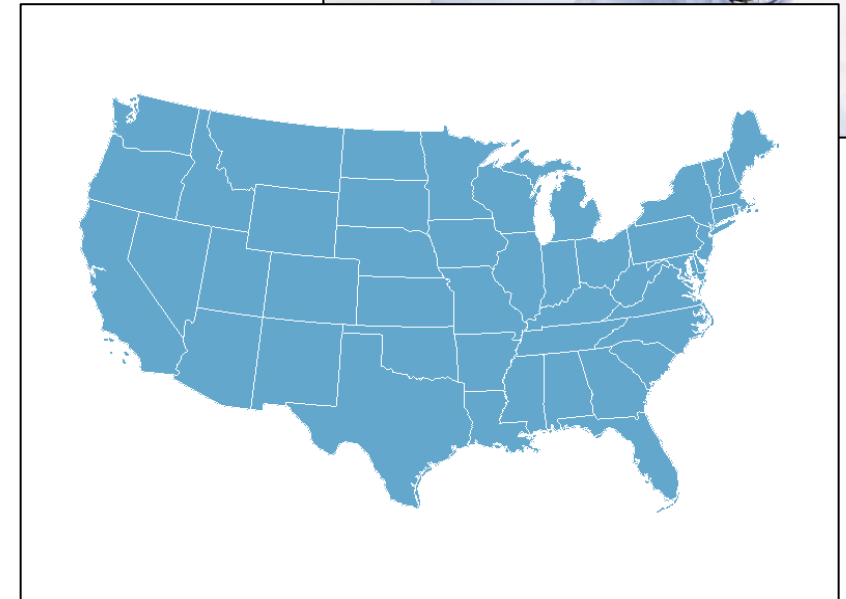
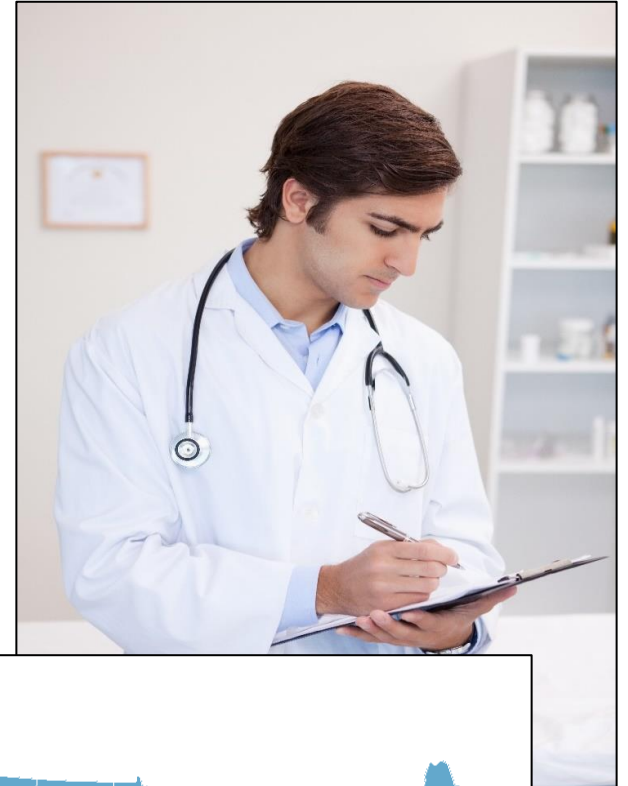
Carl Zimmer is an award-winning science writer whose work appears frequently in the

- “*Within a day of infection, noroviruses have rewired our digestive system so that stuff comes flying out from both ends*” – Carl Zimmer in a recent National Geographic article.
- Leading cause of acute gastroenteritis worldwide
- Low hospitalization and mortality rates
- All transmission sources (annually in U.S.)
 - 20-25 million cases
 - 70,000 hospitalizations
 - 800 deaths
- Responsible for >5 million cases of foodborne disease annually
 - 15,000 food-related hospitalizations annually [26%, 2nd in rank]
 - 150 food-related deaths annually [11%, 4th in rank]



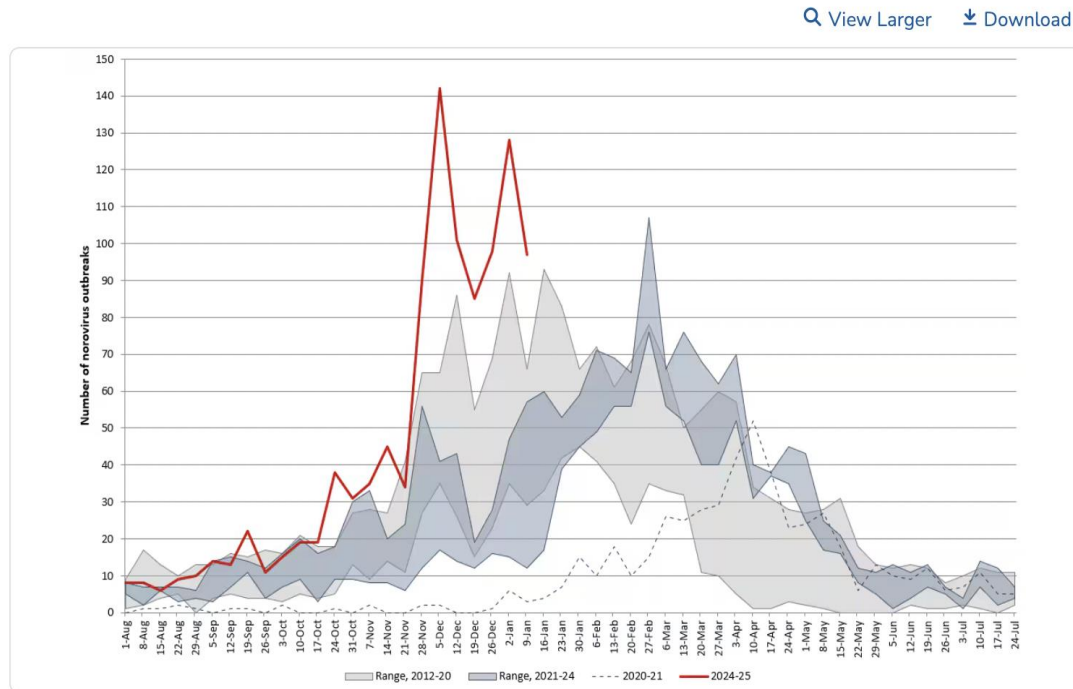
Epidemiological Surveillance

- Norovirus **not** a reportable disease in the U.S.
- Norovirus is **rarely** tested for in primary healthcare (no point-of care diagnostics).
- Few active surveillance systems used to:
 - Establish baseline rates of infection
 - Identify key features of outbreaks
 - Much is based on mathematical modeling
- Disease burden is poorly understood.



National Epi Surveillance System: NoroSTAT

Number of Suspected or Confirmed Norovirus Outbreaks Reported by NoroSTAT-Participating States Per Week, 2012–2025



This is a graph showing the number of suspected or confirmed norovirus outbreaks reported by NoroSTAT-participating states per week during August 2012–January 15, 2025.

- States investigate outbreaks but reporting to CDC is **voluntary** except:
 - NoroSTAT (Noro Sentinel Testing and Tracking Network) is a sentinel surveillance system
 - Select states (15 total) report norovirus outbreaks within 7 days of investigation into NORS
 - This data subset used to:
 - Compare disease incidence over time
 - Compare rates by region
 - By linking with CaliciNet, assess strain-specific characteristics of norovirus outbreaks

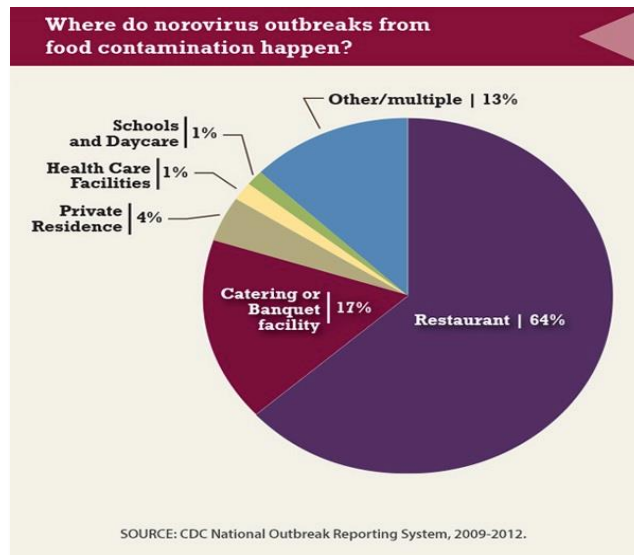
Risk Factors for Enteric Virus Contamination of Foods

Morbidity and Mortality Weekly Report

Vital Signs: Foodborne Norovirus Outbreaks — United States, 2009–2012

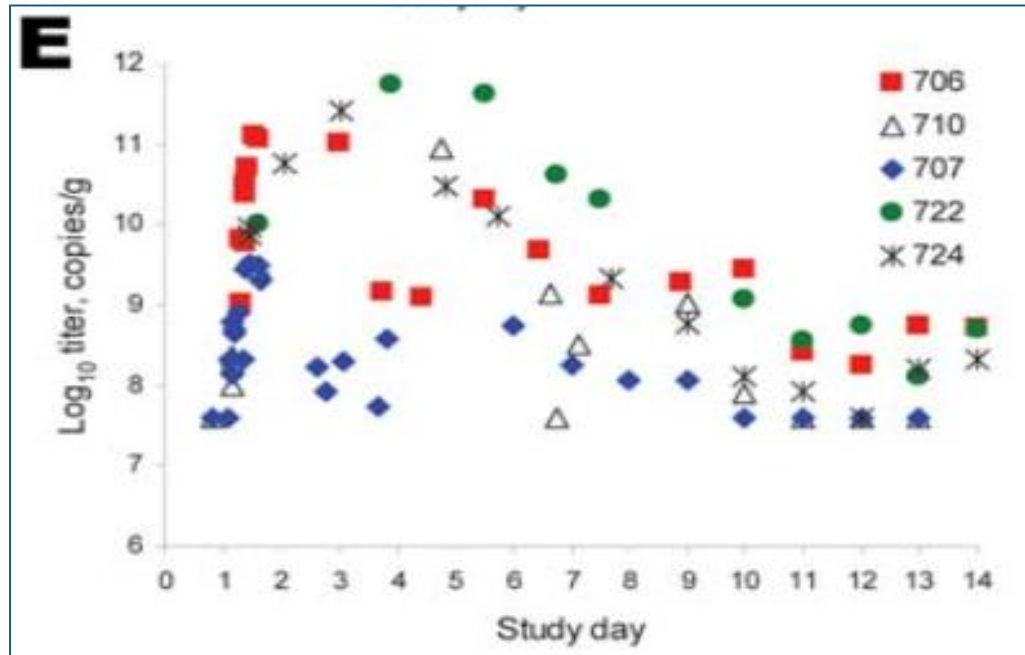
Aron J. Hall, DVM¹, Mary E. Wikswo, MPH¹, Kimberly Pringle, MD², L. Hannah Gould, PhD³, Umesh D. Parashar, MBBS¹
(Author affiliations at end of text)

On June 3, 2014, this report was posted as an MMWR Early Release on the MMWR website (<http://www.cdc.gov/mmwr>).



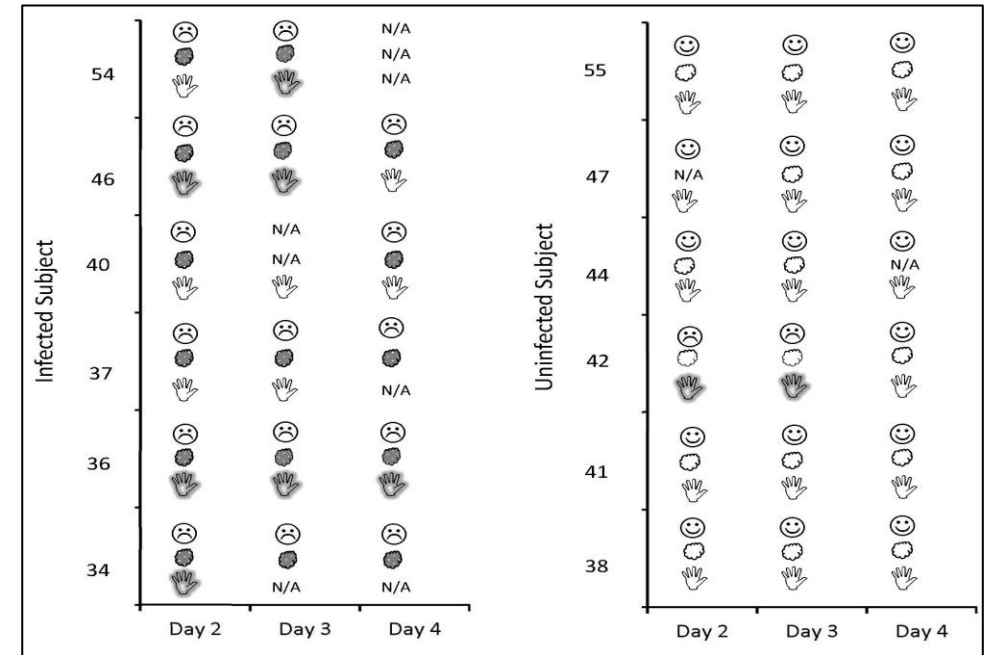
- RTE food **MOST IMPORTANT!!**
- Of 520 norovirus outbreaks associated with contaminated food, food workers were implicated **70% of the time**.
- Bare-handed contact with ready-to-eat foods was found in **over half** of these food worker-implicated outbreaks.
- FDA Food Code provides guidance to food service relative to preventing virus contamination
 - Hand hygiene protocols
 - No bare hand contact with RTE foods
 - Exclusion of ill food workers
 - Requirement for fecal/vomit clean-up guidelines

Features Contributing to High Transmissibility



SOURCE: Atmar, et.al. 2008. *Emerg. Infect. Dis.* 14(10):1553-7.

- Copious and prolonged shedding
- Low infectious dose
- Ease of transfer to hands
- Role of vomiting



SOURCE: Liu et al. 2013. *Appl. Environ. Microbiol.*, 79(24):7875-81.

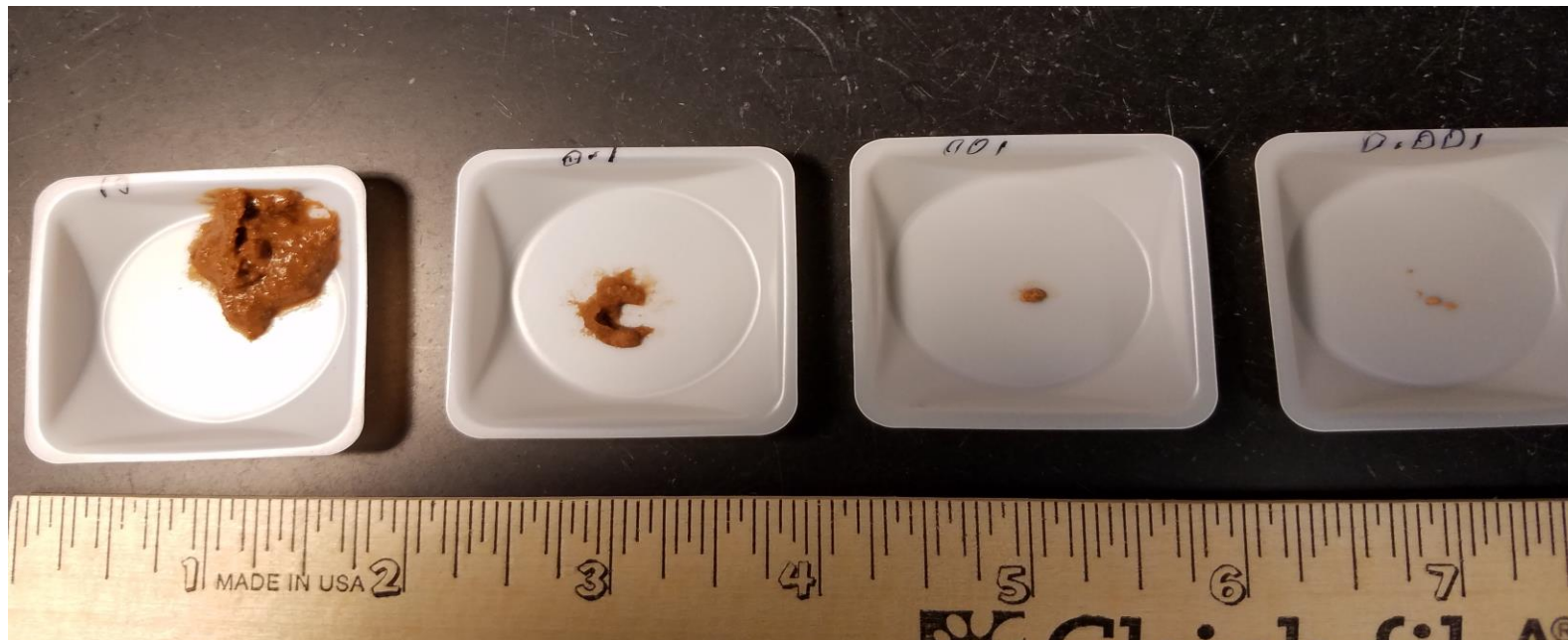
- Environmental persistence
- Resistance to disinfection
- Resistant to hand sanitizers

Estimated Virus Concentrations

hNoV conc': 1-100 million (M) 100,000-10 M 10,000-1 M 1,000-100,000

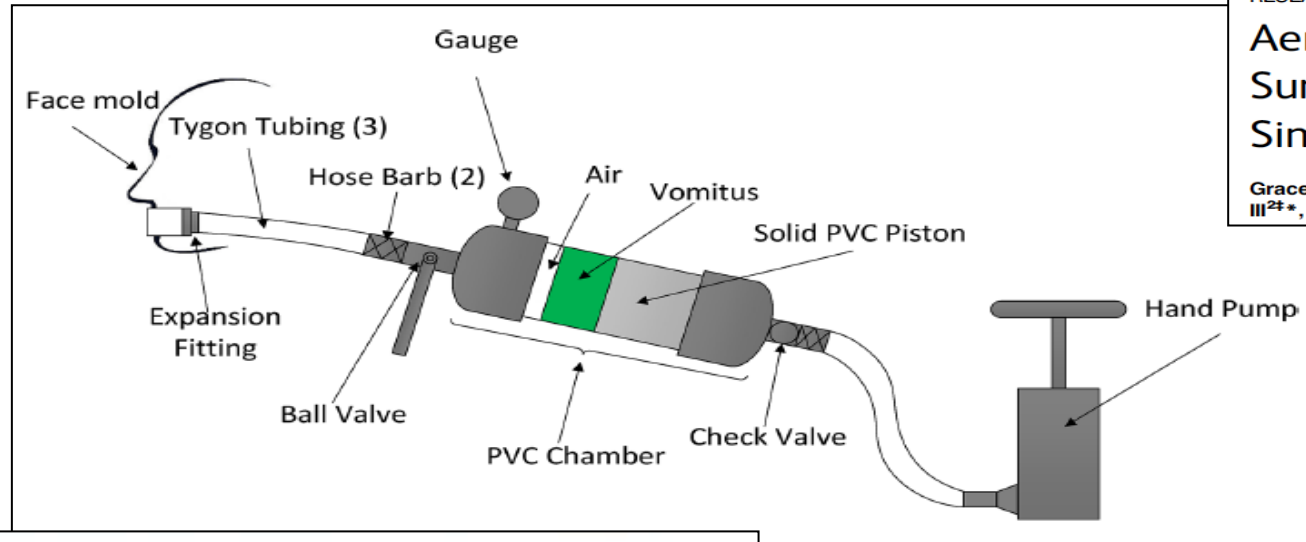
Fecal inoculum: 1 g 1/10th g 1/100th g 1/1,000th g

↓ >100 ID₅₀ ↓ >10 ID₅₀



Aerosolization of a Human Norovirus Surrogate, Bacteriophage MS2, during Simulated Vomiting

Grace Tung-Thompson^{1†}, Dominic A. Libera^{2†}, Kenneth L. Koch³, Francis L. de los Reyes, III^{2†*}, Lee-Ann Jaykus^{1‡}



“The Vomiting Machine”

Kirby et al. 2016. Apr 26;11(4):e0143759. doi: 10.1371/journal.pone.0143759

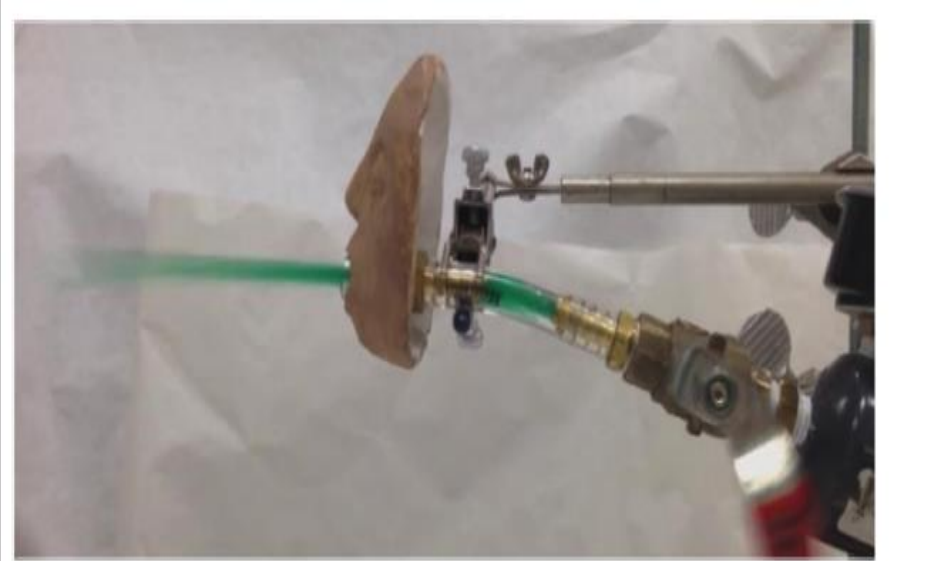


Fig 2. Photo of a Simulated Vomiting Episode. Projectile vomiting of colored simulated vomitus matrix.

# Emesis Specimens	% Subjects with ≥ 1 Positive Emesis	% Positive Samples	Sample Mean Titer ^c (GEC ^d /ml)(SEM ^e)	Subject Mean Cumulative Shed (GEC ^d)(SEM ^e)
16	50%	63%	5.8×10^5 (2.6×10^5)	1.3×10^8 (9.1×10^7)
20	75%	90%	9.2×10^5 (3.1×10^5)	3.1×10^8 (1.7×10^8)
36	64%	78%	8.0×10^5 (2.2×10^5)	2.3×10^8 (1.0×10^8)
8	25%	38%	1.6×10^5 (4.5×10^4)	1.8×10^7 (1.8×10^7)
4	2	13	5.0×10^3 (2.7×10^3)	2.3×10^5 (ND) ^b

Environmental Persistence--Experimental

TABLE 3. Survival of norovirus on various fomites and material surfaces^a

Surface	Temp (°C)	RH (%)	NoV genogroup	Time to first log decrease in GE (days)	Approx overall log decline	Reference
					of GE	
Ceramic	22	NG	I	ND	3 in 28 days	49
	22	NG	II	ND	0.4 in 42 days	49
	25	NG	I	ND	1 in 50 h ^b	71
	RT	NG	I	34 ^c	1.5 in 42 days ^b	20
	NG	NG	II	ND	1.2 in 42 days	52
	RT	NG	II	33 ^c	<1 in 42 days ^b	20
Formica	22	NG	I	ND	1.6 in 28 days	49
	22	NG	II	ND	0.6 in 42 days	49
	NG	NG	II	ND	0.8 in 42 days	52
	RT	NG	I	29 ^c	1.5 in 42 days ^b	20
	RT	NG	II	33 ^c	1.5 in 42 days ^b	20
PVC	7	86	II	ND	<1 in 56 days	42
	20	30	II	ND	2 in 14 days	42
	20	86	II	ND	2 in 35 days	42
Stainless steel	4	NG	I	>28 ^c	0.9 in 4 wk	50
	7	86	II	ND	2 in 56 days	42
	7	50	II	>70	<1 in 70 days	60
	20	30	II	ND	2 in 14 days	42
	20	86	II	ND	2 in 35 days	42
	22	NG	I	ND	1.5 in 28 days	49
	22	NG	II	ND	0.5 in 42 days	49
	25	NG	I	ND	1 in 50 h ^b	71
	RT	NG	I	34 ^c	1.5 in 42 days ^b	20
	RT	NG	I	21	1.5 in 28 days	50
	RT	NG	II	43 ^c	<1 in 42 days ^b	20
RT	50	II	30 ^c	3 in 70 days	60	
NG	NG	II	ND	1.1 in 42 days	52	
	37	NG	I	7	2.4 in 28 days	50

^a RH, relative humidity; GE, genome equivalents; NG, not given; ND, not determined; RT, room temperature; PVC, polyvinyl chloride.

^b Values estimated from graphical display of data.

^c T90 values.

SOURCE: Cook et al. 2016. *J. Food Prot.* 79:1273-1294

Year-Round Prevalence of Norovirus in the Environment of Catering Companies without a Recently Reported Outbreak of Gastroenteritis^v

Ingeborg L. A. Boxman,^{1*} Linda Verhoef,² Remco Dijkman,^{1†} Geke Hägele,¹
Nathalie A. J. M. te Loeke,¹ and Marion Koopmans²

APPLIED AND ENVIRONMENTAL MICROBIOLOGY, May 2011, p. 2968–2974
0099-2240/11/\$12.00 doi:10.1128/AEM.02354-10

TABLE 1. Detection of NoV in environmental samples from catering companies with and without association with recently reported gastroenteritis

Parameter	Value where NoV detected in samples from:					
	Kitchen		Bathroom		All	
	No./total	%	No./total	%	No./total	%
Prevalence study (not related to outbreaks)						
Companies (total)	13/832	1.6	26/832	3.1	35/832	4.2
Samples	9/832 ^a	1.1	26/832	3.1	42/2,496	1.7
	7/832 ^b	0.84				
Total	16/1,664	0.96	26/832	3.1	42/2,496	1.7
Outbreak investigations (2006–2008)						
Companies						
2006	7/23	30	11/14	79	14/27	52
2007	11/20	55	10/16	63	14/22	63
2008	7/20	35	12/19	63	16/23	69
Total	25/63	40	33/49	67	44/72 ^c	61
Samples						
2006	19/69	28	14/22	64	48/119	40
2007	22/72	30	17/33	52	51/121	42
2008	18/60	30	23/47	49	48/130	37
Total	59/201	29	54/102	53	147/370 ^c	40

^a Grips of refrigerator, mixing or cutting machines, and grip of bread knife.

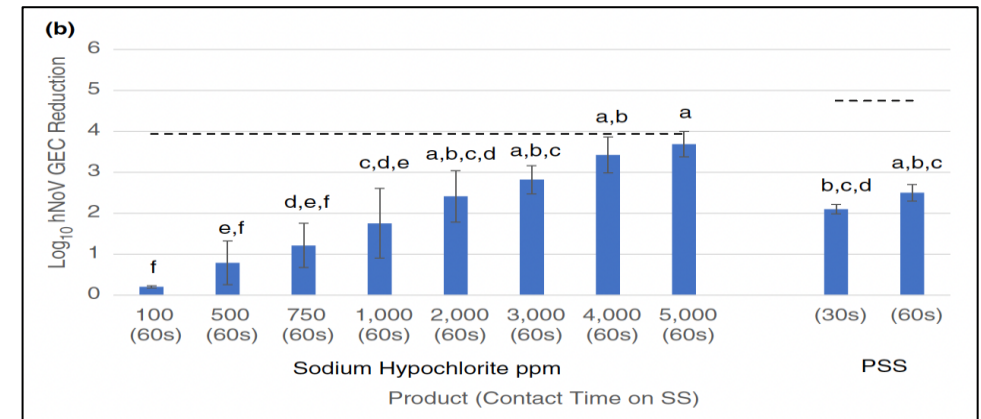
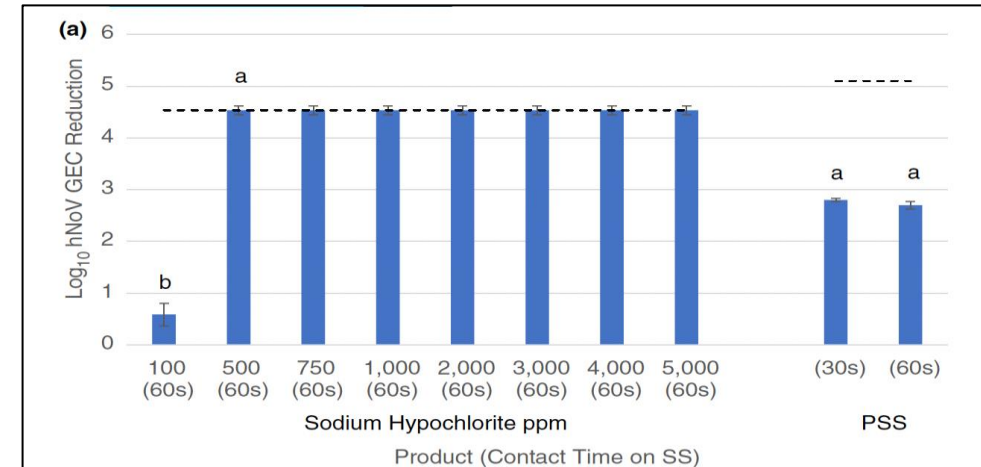
^b Salt-and-pepper set and soap dispenser.

^c During outbreak investigations, samples from other locations outside the kitchen and the bathroom were also collected, e.g., handrails, telephones, and door handles in restaurants.

Surface Disinfection

**CDC Guidelines:
1,000-5,000 ppm
hypochlorite**

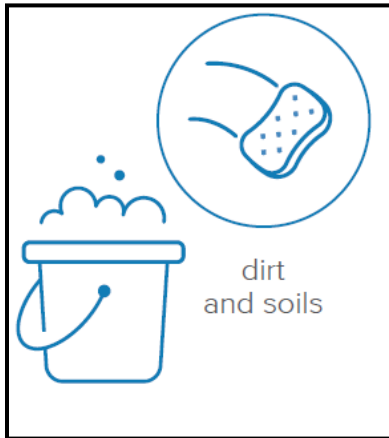
- Formulation and application matter
- Concentration and contact time matter
- Often, studies not comparable
- Commonly used actives:
 - Chlorine, 1,000-5,000 ppm
 - Benzalkonium chloride chloride
 - Alcohols??
- Other actives:
 - *Hypochlorous acid*
 - *Silver dihydrogen citrate*
 - *Activated hydrogen peroxide*
 - *Peracetic acid*
- Label claim issues
- Hand sanitizers



SOURCE: Escudero-Abarca et al., 2022 May;132(5):3590-3600

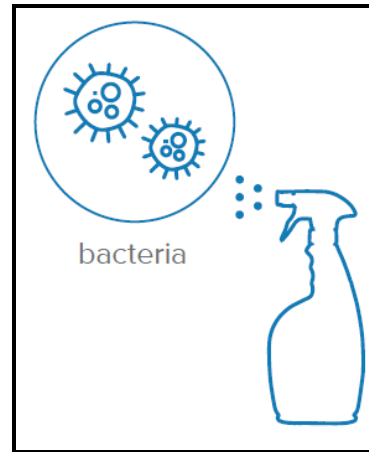
Virus Inactivation on Surfaces: The Context

Cleaning



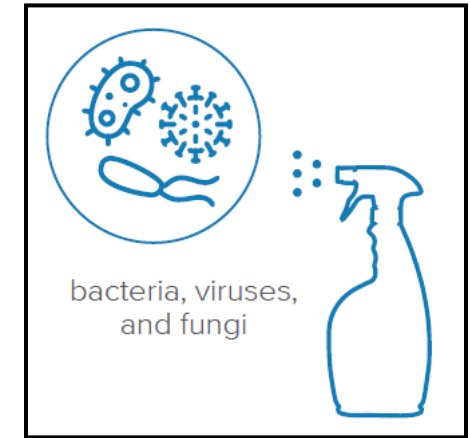
- No legal definition, though EPA's website² has a loose definition: a **cleaner** is a substance or mixture of substances (such as chemical or biological substances) that is intended to clean away or remove inanimate material from a surface, water or air, and that makes no pesticidal claims.
- Not regulated by EPA unless the cleaner implies a pesticidal claim (e.g., "removes germs")

Sanitizing



- *Legal Definition*¹: **Sanitizer** means a substance, or mixture of substances, that reduces the bacteria population in the inanimate environment by significant numbers, but does not destroy or eliminate all bacteria.
- Reduces bacteria on surfaces to a safe level
- Not intended to kill all bacteria

Disinfecting



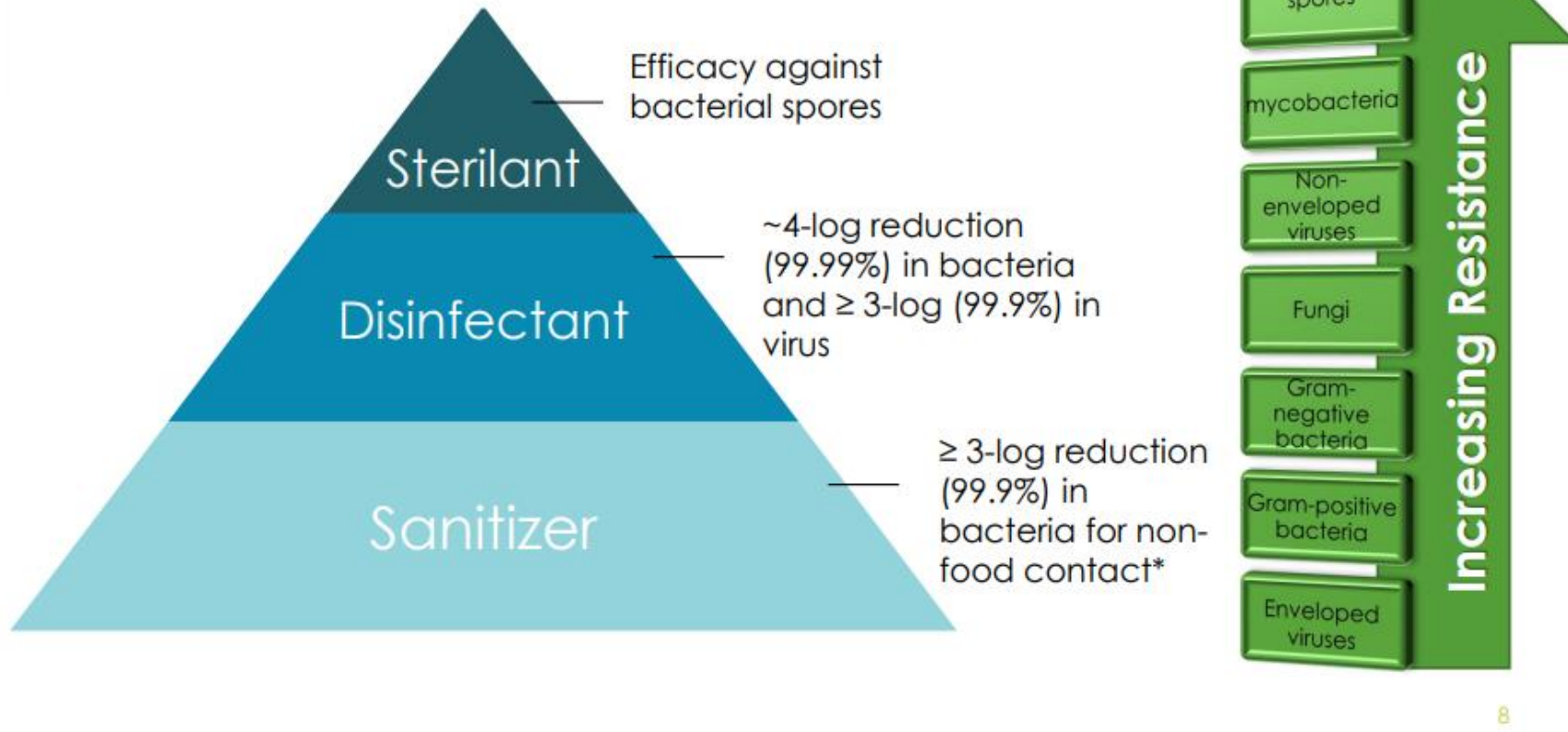
- *Legal Definition*¹: **Disinfectant** means a substance, or mixture of substances, that destroys or irreversibly inactivates bacteria, fungi and viruses, but not necessarily bacterial spores, in the inanimate environment.
- Higher level of efficacy than sanitizers
- Kills bacteria, fungi and viruses, but not necessarily spores

¹ Legal definitions are from 40 CFR § 158.2203 – Definitions

² <https://www.epa.gov/pesticide-registration/determining-if-cleaning-product-pesticide-under-fifra>



Levels of Efficacy and Hierarchy of Susceptibility



SOURCE: Dr. Kristen Willis, U.S. EPA

FDA Food Code Prevention Strategies

Call to Action for Industry: Using Food Safety Management Systems to Reduce norovirus

What does the FDA Food Code outline as norovirus prevention strategies?

The National Retail Food Risk Factor Study is based on the intervention strategies to reduce foodborne illness risk factors outlined in the Food Code. The Food Code targets prevention of norovirus by addressing the following:



SOURCE: <https://www.fda.gov/media/169439/download?attachment>

What is a Clean Surface?

- **No legal or universal definition of clean**
 - FDA Food Code
 - Code of Federal Regulations
- **Antimicrobials measurable standard**
 - Sanitizer – 5-log reduction in ≤ 1 min
 - Disinfectant – 6-log reduction in ≤ 10 min
- **Monitoring**
 - Visual observations
 - ATP
 - Fluorescent markers
 - Microbial assessment



Types of Cleaning

- **Routine** (remove visible soil)
 - Clean (then treat with antimicrobial if necessary) surfaces
- **Deep cleaning** (during outbreak or after bodily fluid event)
 - Wear personal protective equipment
 - Might use stronger antimicrobials
 - Might use specialized tools, such as ultra-low volume (ULV) foggers



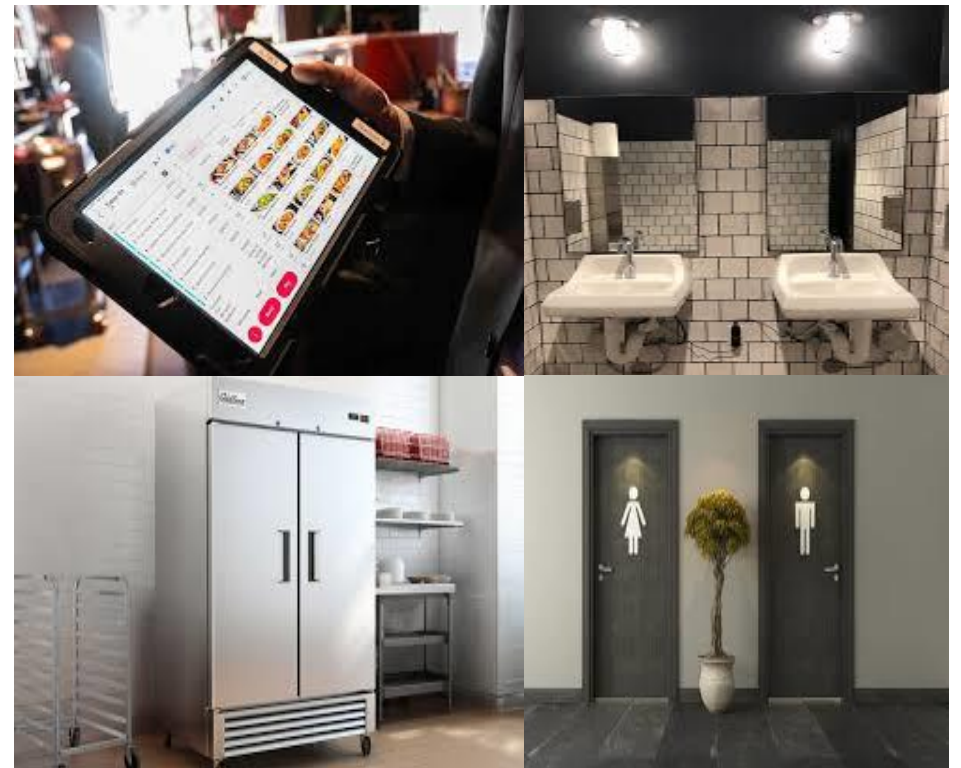
Two Types of Surfaces

- **Hard surfaces**
 - Immersion
 - Clean-in-Place
- **Soft surfaces**
 - Launderable (immersion)
 - Non-launderable (Clean-in-Place)

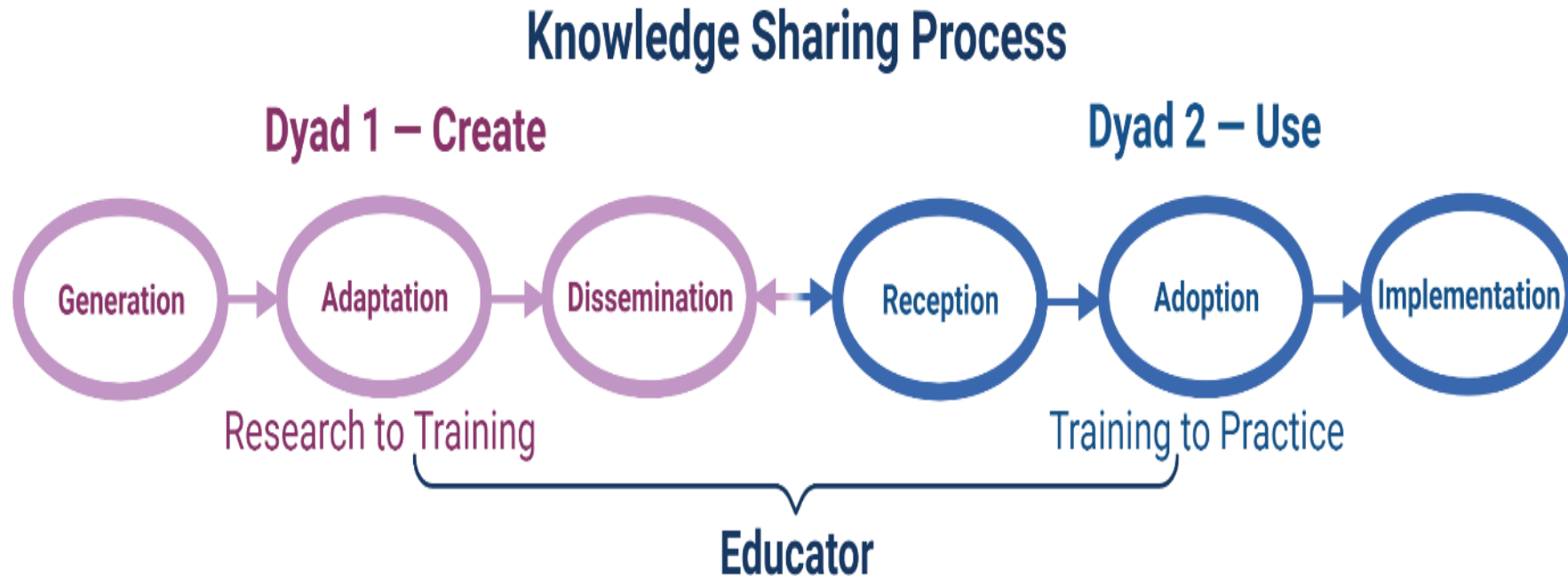


High-Touch Surfaces

- Frequently clean and “disinfect” high-touch surfaces.
- High-touch surfaces are often nonfood-contact surfaces (e.g., door handles, dining tables/chairs, and touchscreen ordering devices) so per the Food Code only need to be cleaned.
- Some high-touch surfaces are also food-contact surfaces so sanitized **not** disinfected.



Knowledge Sharing Model



SOURCE: Yeargin et al., 2021

Current Approach to Training

- Assume unsafe food handling practices because lack knowledge.
 - “*Dump*” a lot of information on learner in a single session.
 - Revisit a lot of common knowledge.
- Understanding relationship between knowledge, the organization, and its environment **could** improve implementation.



Role of Food Safety Educator

- Training outcomes dependent on a highly **credible** educator.
 - Strong argument → favorable thoughts when heard and scrutinized
 - Weak argument → cause a boomerang effect that will last over time, defy other efforts to change it, and affect subsequent behavior.
- Train-the-trainer activities need to improve.
- Educators need to:
 - Know the current science so can effectively present messages.
 - Skills needed – knowledge of food safety, good delivery strategies, **and** some industry knowledge

Norovirus at Retail

'putting research into action'

Information last saved: Just now focuses on the prevention of norovirus contamination of food and surfaces in retail settings. Activities will include identifying best practices, vulnerabilities, mitigation and prevention strategies, potential public health measures and identifying barriers at retail food establishments that will decrease the presence and spread of norovirus.

CURRENT TARGET

Increase the implementation of effective employee health policies and practices within the retail food industry.

EXPECTED OUTCOMES

Employee Health Toolkit*

- screening and reporting tools
- sick worker checklist and guide
- education resources
- environmental contamination tools

Target audience: retail food safety regulators and industry

SUMMARY

The AFDO HP2030 Norovirus at Retail group aims to improve employee health policies and practices at retail. The work focuses on employee health communication and screening tools, as well as agents to fight against environmental contaminants. The end product will be a comprehensive environmental health toolkit which will be used to control and reduce norovirus.



Telling the Story

Charge: Collect, assess, and develop employee health communication tools, that target industry and regulators, for the AFDO Norovirus Resource Center.

2023 Accomplishments: Created a [spreadsheet](#) with available employee health tools and resources with the language and resource type listed, and hosted discussion groups for industry and regulators to understand what resources are needed.

Next Steps: Complete a gap analysis that will be done in two parts and will focus on the collected resources and the analysis of the discussion groups. Organize resources on AFDO website so they are easily accessible.



Employee Health Reporting and Screening

Charge: Inform and assess the development of employee health reporting and screening tools targeting industry and regulators to exclude sick workers through engagement of various food safety stakeholders.

2023 Accomplishments: Email request sent to industry to share employee health reporting and screening tools. Industry shared concerns about communication around vulnerability of brand.

Next Steps: Assess the FDA Employee Health Reporting tool and provide feedback from the workgroup. Send the FDA Employee Health Reporting tool to food industry representatives for evaluation and feedback.



Environmental Contaminants

Charge: Identify and apply achievable, effective tools to aid in the fight against norovirus spread.

2023 Accomplishments: Hosted a [webinar](#) on the efficacy of surface sanitizers and disinfectants against norovirus.

Next Steps: Identify existing environmental contamination tools and resources; conduct survey to identify critical knowledge and research [gaps_and](#) collaborate with EPA concerning criteria for sanitizer and disinfectant labels. Develop toolbox for regulators and industry.

*resources can be found on [FoodSHIELD](#)



Healthy People 2030 & Coordinated Public Health Initiatives



Gina Kramer

Founder & CEO
Miss Gina, LLC

History of Norovirus Transmission & Impact



Lee-Ann Jaykus, Ph.D.

Professor Emeritus
North Carolina State University

Preventing the Spread of Norovirus



Angie Fraser, Ph.D.

VP, Food Safety and Quality
International Fresh Produce Association

Q&A Session Moderator



Katie Weston

Program Manager
Partnership for Food Safety Education



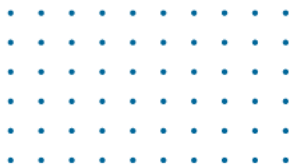
Continuing Education Units



****FINAL REMINDER****

One-hour CEU approved from ANFP, NCHEC & NEHA and Certificates of Completion available for other CEU-eligible organizations

- Download certificates from chat box
- Follow-up email
- Download at fightbac.org under “Free Resources” tab and “Recorded Webinars”
- Educators seeking NCHEC must complete online questionnaire by **Friday, April 4**



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Thank You for Joining Us!

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