Hand Hygiene: Efficacy Data and Educator Tools

The Partnership for Food Safety Education

Thursday, February 11, 2016

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Presenters


Laura G. Brown


Dave Shumaker


Donald W. Schaffner


Shelley Feist

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Learning Objectives

- Awareness of effects of different hand hygiene interventions (e.g. plain soap and water; antibacterial soap and water; soap and water plus hand sanitizer, etc.).
- Awareness of recent research on hand hygiene and what it might mean in your work to communicate with consumers on hand hygiene as critical to disease prevention.
- Understanding of antibacterial products and the view of leading experts on whether these products lead to antibiotic resistance.
- Available evidence-based, free consumer education resources.

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Housekeeping

1. At any time, type your questions into the "chat" box. We will answer a few questions later in the webinar.
2. Please take the post-survey! It will help the Partnership to serve you better!
3. CEU certificates for CDR and NEHA are included here as attachments! Please download yours.

Thank you, BAC! Fighters, for your work to prevent foodborne illness across the United States!

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Recent Observational Research – 1

- Bruhn (2014) observed chicken preparation in the home and found that:
  - 65% did not wash hands prior to meal preparation
  - 40% did not wash hands after handling raw chicken
  - Just 10% washed hands for at least 20 seconds
  - 1/3 did not use soap to wash hands

Bruhn, C. (2014). Chicken preparation in the home: an observational study. *Food Protection Trends, 34*(5), 318-330.

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Recent Observational Research – 2

- Sneed et al. (2015) observed meal preparation in the home and found that:
  - Participants who received education on food safety messages (*clean* and *separate*) had higher handwashing scores than control group
  - However, most participants in all groups engaged in actions that led to cross-contamination

Sneed, J., et al. (2015). Consumer food handling practices lead to cross-contamination. *Food Protection Trends, 35*(1), 38-48.

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POLL #1

Is your organization developing initiatives intended to improve hand hygiene practices at home or at work?

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Laura Brown, PhD
Acting Team Lead
Natl. Ctr. for Environmental Health
Safe Food Team
US Centers for Disease Control and Prevention

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Hand Hygiene and Foodborne Illness

Laura G. Brown, Ph.D

February 11, 2016

National Center for Environmental Health
Division of Emergency and Environmental Health Services

Importance of hand hygiene

CDC says:

- **Regular handwashing, particularly before and after certain activities, is one of the most important steps we can take to:**
  - avoid getting sick, and
  - avoid spreading germs to others.
- **Many diseases and conditions are spread by not washing hands with soap and clean, running water.**
- **A body of evidence shows that improved hand hygiene leads to gastrointestinal and respiratory illness reduction.**

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How should you wash your hands?

- **Wet your hands with clean, running water (warm or cold), turn off the tap, and apply soap.**
- **Lather your hands by rubbing them together with the soap. Lather the backs of hands, between fingers and under nails.**
- **Scrub your hands for at least 20 seconds. Need a timer? Hum the "Happy Birthday" song beginning to end 2x.**
- **Rinse your hands well under clean, running water.**
- **Dry your hands using a clean towel or air dry them.**

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When should you wash your hands?

- **Before, during, and after preparing food**
- **Before eating food**
- **Before and after caring for someone who is sick**
- **Before and after treating a cut or wound**
- **After using the toilet**
- **After changing diapers or cleaning up a child who has used the toilet**
- **After blowing your nose, coughing, or sneezing**
- **After touching an animal, animal feed, or animal waste**
- **After handling pet food or pet treats**
- **After touching garbage**

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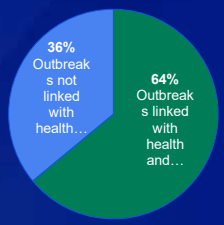
Hand hygiene and foodborne illness outbreaks

64% of foodborne illness outbreaks in restaurants are caused by failures in food worker health and hygiene



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Foodborne germs commonly transmitted by food worker hands

- **Viruses**
  - Norovirus
  - Hepatitis A
- **Bacteria**
  - *Salmonella*
  - *Shigella*
  - *Staphylococcus aureus*
- ***Parasites***
  - *Cyclospora*
  - *Giardia*
  - *Cryptosporidium*

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How does it happen?

Food workers can cause foodborne illness outbreaks when:

- **their hands are contaminated with germs**
  - obtained from their environment or other foods (e.g., raw meat)
  - they are infected with
- **they fail to adequately wash their hands**
- **they handle food**

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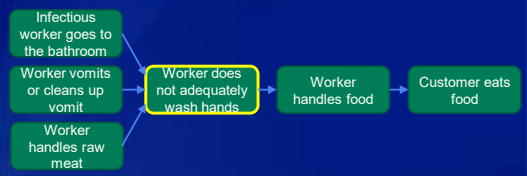
How does it happen?

- **Fecal-oral contamination**
- **Vomitus-oral contamination**
- **Cross contamination from contaminated food**



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How does it happen? Examples

A worker infected with *Giardia* used her bare hands to slice raw vegetables for salads; 27 customers became ill

A catering worker infected with *Salmonella* prepared cold dishes, which were then improperly stored over several days; 290 airline passengers and crew became ill

Two catering workers infected with norovirus mixed pasta salads by immersing their arms in the salad; 333 customers become ill

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Recommendations for improving hand hygiene in food service / restaurants

CDC research suggests that management should:

- Emphasize the importance of hand hygiene
- Ensure that staffing is adequate
- Ensure that workers are food safety trained
- Ensure that sinks and hand washing supplies are available and accessible to workers
- Organize food preparation activities to reduce the number of *needed* hand washings

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References

www.cdc.gov/handwashing/

Gould, H., et al. (2013). Contributing factors in restaurant-associated foodborne disease outbreaks, FoodNet Sites, 2006 and 2007. *Journal of Food Protection*. 76:1824-1828.

Todd, E., et al. (2007). Outbreaks where food workers have been implicated in the spread of foodborne disease. Part 3. *Journal of Food Protection*. 70:2199-2217.

Green, L., et al. (2007). Factors related to food worker hand hygiene practices. *Journal of Food Protection*. 70:661-666.

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Thank you!

Laura Brown
lrg0@cdc.gov
http://www.cdc.gov/handwashing/

For more information please contact Centers for Disease Control and Prevention
4770 Buford Hwy, NE, Atlanta, GA 30341
Contact CDC at: 1-800-CDC-INFO or www.cdc.gov/info

National Center for Environmental Health
Division of Emergency and Environmental Health Services

POLL #2

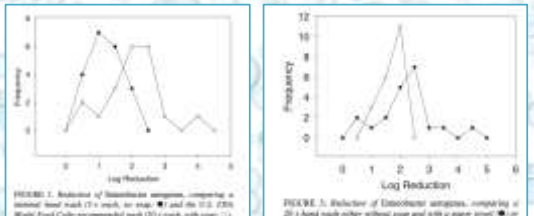
Please rate your satisfaction with the materials for hand hygiene outreach currently used in your organization.

Don Schaffner, PhD
Extension Specialist in Food Science
Rutgers University

Handwashing Efficacy, Antimicrobials, Sanitizers and Bulk Soap

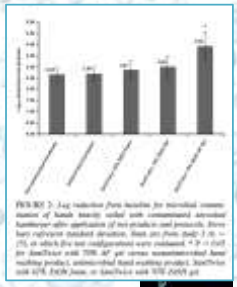
Donald W. Schaffner
Distinguished Professor and Extension Specialist
Rutgers University

Intervention Efficacy, JFP 2015, 4: 685–90



SaniTwice, JFP 2010, 2296–2300

- SaniTwice (a registered trademark with James Mann, Handwashing for Life, Libertyville, IL) is a two-stage hand cleansing protocol that is performed using ABHS when water is not available.



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FDA monograph, antibacterial soaps

- FDA CFSAN (Center for Food Safety and Applied Nutrition)
  - Food safety, FDA model code
- FDA CDER (Center for Drug Evaluation and Research)
  - Antibacterial soaps
  - December 2013 CDER issues a proposed rule to require manufacturers of antibacterial hand soaps to demonstrate that their products are safe for long-term daily use and more effective than plain soap and water in preventing illness and the spread of certain infections.

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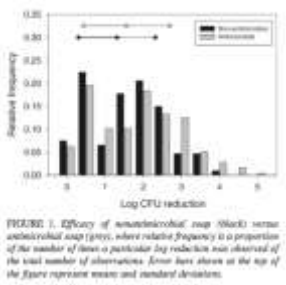
Antibacterial Soap, JFP 2011, 11: 1875-82



- Difference is small but real and significant
- Difference is greater when transient organisms are examined

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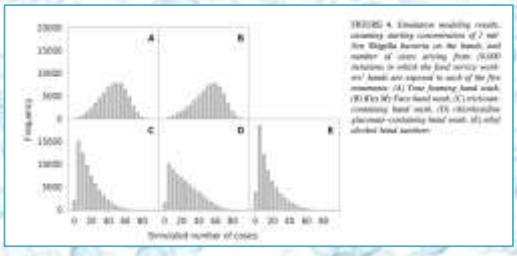
Antibacterial Soap, JFP 2014, 4:574-82



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Hand Sanitizers

- CDC guidelines hand hygiene in health care (not food service settings). Alcohol-based products are more effective than plain soap or antimicrobial soaps (health care workers)
  - Boyce, J. M., and D. Pittet. 2002. Guideline for hand hygiene in health-care settings. Morb. Mortal. Wkly. Rep. 51:1–56.
- FDA: hand sanitizers may not be effective against some pathogens that are transmitted in food service settings, level and types of soils in food service and health care are different.
  - http://www.fda.gov/Food/GuidanceRegulation/RetailFoodProtection/IndustryandRegulatoryAssistanceandTrainingResources/ucm135577.htm

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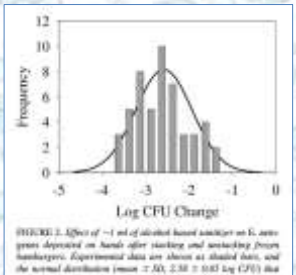
Hand Sanitizer, JFP 2007, 1: 109-113



- More than half of the participants (66%, 21 of 32) indicated that their hands felt dirtier than normal after handling frozen burgers.
- Investigators also noted that most (56%, 18 of 32) of the participants had visible debris on their hands after handling the frozen burgers.

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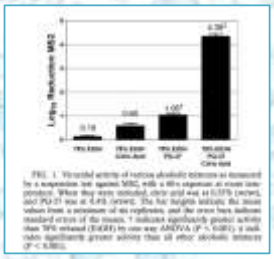
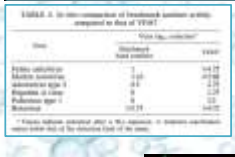
Viruses and Hand Sanitizers, AEM 2008, 5047–52



- Mechanism by which organic acid and polyquaterniums potentiate activity ethanol unclear, charge density may play a role
- Science vs. label claims



Bulk Soap Study – IAFP 2015 poster

- Soap in open, refillable bulk soap dispensers in public restrooms may become colonized with high levels of bacteria.
- Survey microbial quality of open refillable bulk soap sampled in three different states and four different food establishment types, and to determine the influence of formulation factors on the degree of contamination.
- More than 12% of samples contained high level of bacteria (typically <10^7CFU/ml)
- Samples with high TPC tended to have higher coliform counts
- **Solids content was correlated with high TPC and all samples with <4% solids had detectable TPC**.
- Bacteria were more prevalent in bulk soaps in grocery stores (16.7%) and fast food locations (15.6%) than in sit down restaurants (9.7%) or convenience stores (3.6%).

Bulk Soap

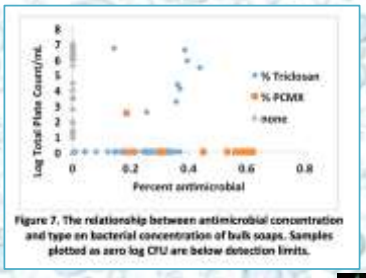


Figure 7. The relationship between antimicrobial concentration and type on bacterial concentration of bulk soaps. Samples plotted as zero log CFU are below detection limits.

Summary

- Hand washing is not magic, it's risk reduction (not elimination) and variability is important
- Antibacterial soaps for consumers may disappear (not cost effective for manufacturer)
  - Status for foodservice use TBD
- Data from our lab shows that antibacterial soaps are more effective
- Hand sanitizer works, and can work in the presence of food debris
- Hand sanitizer can be formulated to work better against viruses
- Bulk soaps may be contaminated

POLL #3

What do you think?

Must proper hand hygiene ALWAYS include washing hands with soap and water?

Dave Shumaker
Microbiology Scientist
GOJO Industries

Methods, Claims, Opportunities

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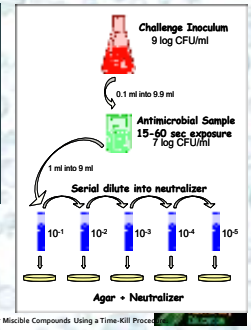
ASTM E2783 "Time-Kill"

- *In vitro* assay
- Measures rapid antimicrobial (killing) action of products
- Can test almost any microorganism by this method

***In vitro* results do not necessarily predict antimicrobial performance on hands**



ASTM E1174 "Healthcare Personnel Handwash"

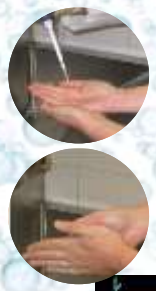
- *In vivo* assay
- Hands are contaminated with of 4.5 mL S. marcescens or E. coli
- Bacterial reduction is measured after "Wash 1" and "Wash 10"

≥ 2 log reduction (99%) required after Wash 1 and ≥ 3 log reduction (99.9%) required after Wash 10

ASTM E2755 "Healthcare Personnel Hand Rub"

- *In vivo* assay
- Hands are contaminated with 200 µL S. marcescens, S. aureus, or MRSA
- Bacterial reduction is measured after "Application 1" and "Application 10"

Method most appropriate for waterless hand hygiene products



ASTM E2946 "Food-Handler Method"

- *In vivo* assay
- Contaminate hands with beef broth or ground beef (knead for 2 min) containing E. coli
- Bacterial reduction is measured after 1 use

Method most appropriate for food handling where hands may be "soiled"

Photo courtesy of John Dyba, BioScience Labs

Hand Hygiene Product Claims

Acceptable	Unacceptable
"Kills germs that can cause illness or infection"	Claims against viruses such as "kills cold and flu viruses" or "effective against norovirus"
"Effective against a broad spectrum of germs or bacteria"	Promotions to treat or prevent illness from a specific organism such as "kills MRSA" or "kills E. coli"
"Reduces bacteria that can cause disease"	"Prevents illness"
	Long lasting barrier type efficacy such as "protects for 6 hours"

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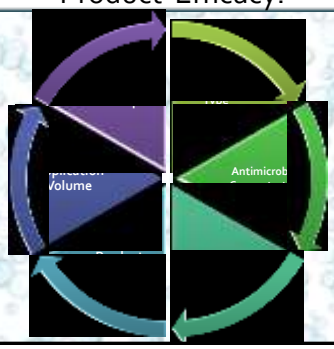
Factors Influencing Hand Hygiene Product Efficacy:



Opportunities for Industry

- Risk-based approach
- Understand motivations
- Risk-benefit of alternatives
- Antiviral testing capabilities / regulatory approval
- Revise education and training materials
- Improve Policy & Practices

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Question for Panelists

Name one area of research in hand hygiene that you think it is critical be explored.

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Hand Hygiene Resources for Consumers

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Hand Hygiene Resources for Consumers

- **Fight BAC! Resources:**
  - *Clean* Factsheet (Core Four Practice of *Clean, Separate, Cook, Chill*)
  - Kids' Coloring Page
  - Handwashing Song for Kids
  - Crib Sheet: Hand Hygiene with Young Children
  - Factsheet: Getting Children to Wash Their Hands

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Hand Hygiene Resources for Consumers

- **CDC Resources:**
  - Handwashing Factsheets
  - Handwashing Posters
  - Handwashing Videos
  - Handwashing Social Media Messages
  - More handwashing materials (buttons, stickers, podcasts)

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Hand Hygiene Resources for Consumers

– Scrub Club – play webisodes, including the *Good, the BAC and the Ugly*

http://www.scrubclub.org/home.aspx

Show Me the Science

CDC science behind handwashing info

- http://www.cdc.gov/handwashing/show-me-the-science.html

Questions?

Upcoming Events!

Mark your calendars!

Thurs. March 24 at 1 pm EST
All Things Egg – Knowledge Exchange

Thurs. June 16 at 1 pm EST
Nutrition Education and Food Safety Integration Webinar

Join our E-list at bottom of page www.fightbac.org

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