The Evolution and Future of CDC Food Safety Consumer Education

Dr. Rob Tauxe
Director of Division of Foodborne, Waterborne and Environmental Diseases
Centers for Disease Control and Prevention
The Evolution and Future of CDC Food Safety Consumer Education

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USDA FSIS Virtual Public Meeting: Consumer Outreach and Education Today and for the Future

October 6, 2020
CDC’s Role in Food Safety Education

- Provide estimate of the overall health burden of foodborne illness
- Educate the public about what groups of people have a higher risk for severe foodborne illness
- Warn consumers quickly about specific contaminated foods during an outbreak investigation.
- Inform the public on how to reduce their risk of foodborne illness
- Share information on specific foods and practices most often linked to foodborne illness, based on CDC surveillance systems, outbreak investigations, and consumer research.
Using Outbreaks To Identify Where More Education Is Needed
Using Outbreaks To Identify Where More Education Is Needed

- Emerging pathogens may require a change in practices
  - In the 1980s, *Salmonella* Enteritidis inside intact eggs made traditional raw egg recipes unsafe
  - In the 1990s, rise of *E. coli* O157 in ground beef made traditional undercooked ground beef recipes unsafe
  - In the late 1990s, surge in *Yersinia enterocolitica* infections in pigs was connected to severe infection in infants
    - Fed formula prepared by someone also preparing pork
Using Outbreaks To Identify Where More Education Is Needed

- New product or kitchen technology may not seem risky
  - In the 2000s, recurrent outbreaks from not-ready-to-eat breaded pre-browned chicken products, that were microwaved

"THE RAW STORY"
Some frozen chicken entrees look like they’re cooked—but they’re not!
Recent Educational Activities
Recent Educational Activities

Tweet advising against washing chicken was CDC’s top 2019 tweet

Leafy greens have become a growing concern
Recent Educational Activities

CDC revamped food safety web pages

Google analytics chart

Example of new webpage

When to See a Doctor for Food Poisoning

See your doctor or healthcare provider if you have symptoms that are severe, including:

- Bloody stools
- High fever (temperature over 102°F, measured orally)
- Frequent vomiting that prevents keeping liquids down (which can lead to dehydration)
- Signs of dehydration, including little or no urination, a very dry mouth and throat, or feeling dizzy when standing up
- Diarrhea that lasts more than 3 days
Consumer Needs and Messaging Trends of 2020
COVID-19 Effects on Consumer Food Behavior

- **Food safety cooking questions/basics**
  - People are cooking more at home and eating out less often

- **Bleaching produce to clean it**
  - 19% of survey participants reported washing produce with bleach-based products

- **Fear of getting COVID from delivered food and/or meat**

- **Leaving perishable groceries outside**
CDC content to address current needs

**Web pages**
- Resources on proper cleaning of food
- Tips for meal kit and food delivery
- Not likely to spread through food or packaging


**Social media**
- Emphasizing basic food safety messages
Future Consumer Research Needs
Future Consumer Research Needs

- Testing more food safety messages with focus groups
- Research changing behaviors related to COVID-19 and consumer perception of food risks
- Consumer research on *Salmonella* and raw chicken
- Behavioral research on food safety
- Create messages that target behavioral motivators (e.g., norms) and test with late adopters
- Better understand the consumer acceptance of novel prevention technologies like food irradiation
Key Takeaways

- Emerging pathogens and new products can show need for new consumer education messages
- Traditions and deep-rooted values can make behavior change challenging
- Using the same words consumers use can help reach them
- COVID-19 has changed food consumption behavior and must be considered in messaging
- Research can improve messaging so that it is more targeted, relevant and motivates behavior change
Thank you!

For more information, contact CDC
1-800-CDC-INFO (232-4636)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
The New Era of Smarter Food Safety
Giving Consumers Actionable, Accurate Information

Frank Yiannas
Deputy Commissioner
Food Policy and Response
U.S. Food and Drug Administration
The New Era of Smarter Food Safety

Giving Consumers Actionable, Accurate Information

Frank Yiannas
Deputy Commissioner
Food Policy and Response

@frankyiannasFDA
#SmarterFoodSafety
“It seems to me that it has never been more important for all nations, all of the states in our great country, and all food safety professionals, whether public or private, to stand together to help keep people all over the world safe and healthy.”

Deputy FDA Commissioner
Frank Yiannas

World Food Safety Day
June 5, 2020
Food Safety Education Resources

https://www.fda.gov/food/resources-you-food/consumers
Resources for Health Professionals

Foodborne Illness Continuing Medical Education Program

Consumer Food Safety Educator Evaluation Toolbox and Guide

https://www.fda.gov/food/healthcare-professionals/foodborne-illness-continuing-medical-education-program
A Modern Approach for Modern Times

People-Led * FSMA-Based * Technology-Enabled
Welcome to FDA’s New Era of Smarter Food Safety

Tech-enabled Traceability

Smarter Tools and Approaches for Prevention and Outbreak Response

New Business Models and Retail Modernization

Food Safety Culture
“Alone, we can do so little; Together, we can do so much.”
Consumer Education and Outreach

Greg Hale
Vice President & Chief Safety Officer
Worldwide Safety and Health
Disney Parks, Experiences and Products
Consumer Education and Outreach

Greg Hale
Vice President and Chief Safety Officer, Worldwide Safety and Health

Disney Parks, Experiences and Consumer Products

Company Confidential
Safety Initiative

Share the availability of Disney-licensed safety technology and expertise for a safer and more accessible world.

1. Demonstrate Safety Leadership
2. Promote Guest/Cast Partnership in Safety
3. Build Credibility
4. Develop New Technologies

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Using Technology

Disney Parks is partnering with companies to develop innovative safety software solutions based on Disney patented cutting-edge technology.

- Streamlines the auditing skills and technical skills required to drive the right behavior, at the right time and place to the right person.
- Provides the ability for real-time compliance from farm to fork.
- Allows those responsible for serving food safely to move from hindsight to insight to foresight when studying data and trends over time.
Disney’s Enduring Commitment to Safety

Timeless Disney publications such as Donald Duck’s Safety Book in 1954 and Jiminy Cricket’s I’m No Fool series have been educating children about safety from the 1950s to the present day.
Engage families in storytelling that promotes safe behavior and demonstrates Disney’s commitment to delivering fun and safe experiences.

1. Use compelling characters to connect with Guests in Disney’s classic storytelling tradition.

2. Empower parents and children to take an active role in their own safety by delivering relevant, effective messages.

3. Share Disney’s long standing commitment to providing safe and magical experiences.
Using Characters to Engage Young Families

Goals

Families and Children
• Reduce risky behavior = safer Parks and Resorts
• Encourage families to join as partners and share responsibility for their safety
• Enhance brand equity by reinforcing Disney as a safety leader

Character Selection

Timon and Pumbaa from the animated movie The Lion King
• Top-tier Disney characters – popular, current, enduring
• Good dynamic – humorous, inquisitive, playful
• Physical characteristics necessary to illustrate safety messages effectively
• Appeal transcends age, gender and national boundaries

Message Approach

Illustrate safety messages through amusing “vignettes”
• Engage audience in ongoing story of “Timon and Pumbaa’s Adventures”
• Interject humor and catchy visual elements
• Show consequences of risky behavior
Promote Safe Behaviors

Research
Leverage internal multi-disciplinary expertise to identify and focus on guest behaviors that most commonly result in injury

Development and Testing
Ensure messages and illustrations connect with target audience
• Leverage talents of our marketing, Imagineering and animation teams in refining messages and developing images
• Formally test messages and images in focus groups including Cast Members and guests (particularly the parents of young children)

Partner in Safety
Identify a partner known for their safety expertise
Utilized UL’s century of expertise in safety knowledge

Leveraged Disney characters and storytelling capabilities

To...

• Teach safety and health to defined audience
• Use existing data, conduct benchmarking studies and formative research to identify gaps in knowledge and behavior
• Illustrate clear safety messages using creative approach
• Show consequences of risky actions
• Execute unique, engaging, empowering delivery
• Instill ‘safety smart’ behavior
Focus on Changing Behavior

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Message</th>
<th>Tip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Properly securing items on</td>
<td>Secure your belongings</td>
<td>Hold on to your gear!</td>
</tr>
<tr>
<td>attractions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No running, trip and fall</td>
<td>Walk, don’t run</td>
<td>Watch over your herd</td>
</tr>
<tr>
<td>hazard</td>
<td></td>
<td></td>
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<tr>
<td>Children getting lost or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>exhibiting unsafe behavior</td>
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Disney Wild About Safety App
## Engaging Guests and Cast Members in our Parks and Communities

### Pre-Arrival
- **Website**: disneywildabout safety.com
- **Social Media**

### Theme Parks
- **Safety Tip Cards**
- **Guide Maps**
- **Bus Advertisements**

### Resorts
- **In – Room TV Safety and Security PSA**
- **Activity Books**
- **Movie Under the Stars**

### Community
- **Safety Smart Community Outreach Program**
- **Eight Award-Winning Videos**
- **Disney VoluntEARS**
Engagement Opportunities in Parks and Resorts

Cruise Ships

Tip Cards

Transportation

Stroller Tag

Creative Guest Engagements

Guide Maps

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Program Expansion at Walt Disney Parks and Resorts

<table>
<thead>
<tr>
<th>Year</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>Disneyland Resort</td>
</tr>
<tr>
<td>2003</td>
<td>Walt Disney World Resort</td>
</tr>
<tr>
<td>2003</td>
<td>Disneyland Paris</td>
</tr>
<tr>
<td>2013</td>
<td>Shanghai Disneyland</td>
</tr>
<tr>
<td>2013</td>
<td>Hong Kong Disneyland</td>
</tr>
</tbody>
</table>

74 MILLION Engagements with Guests Annually
Engaging the Community

Safety Smart

• Award-winning Safety Smart animations: Parents Choice Gold, Teachers Choice, Environmental Media Award, Learning Magazine – Teachers Choice Award, Parents Choice Silver

• Eight different subject matters

• Children ages 5 – 9 years old

• Twelve to fifteen minute custom animations featuring Timon and Pumbaa from animated movie The Lion King

• Online training portal gives access to Safety Smart animations, activity sheets and training guides

• Offered in 34 different languages
Using Research to Tell Our Safety Smart Stories

- **Measure general safety awareness** knowledge and preparedness among children ages 5 to 9 years of age

- **Identify high-priority safety topic areas** those in which children have the lowest levels of knowledge and awareness

- **Test content** with children for reaction, recall and comprehension

Reassuring, clear and confidence-building messages is critical, warranted and justifiable
Versatile Delivery in the Community

Schools

Community Events

Government

Organizations

Radio Disney

Disney Channel
In Latin America and Turkey
Engaging the Community Around the World

Safety Smart at Disneyland Paris

- French Firefighters Federation school program
- 7,500 Safety Smart – About Fire! videos donated
- 52,200 elementary schools
- Reaching over one million children across France

Safety Smart at Shanghai Disney Resort

- 1,000 Safety Smart - About Fire! videos donated
- Every elementary school in Shanghai
- Over 800,000 children reached
Wild About Safety Around the World

1 BILLION Children, Adults and Educators Reached

25 DIFFERENT COUNTRIES WITH ACTIVATIONS

1 BILLION Children, Adults and Educators Reached
Lessons for Success

17 Years and Going Strong...

• Co-developed program with a partner who has shared values and goals
• Utilized partner’s subject matter expertise, Disney I.P. and storytelling
• Leveraged the Disney distribution network and character recognition
• Sustained program through an equal commitment from both partners
• Continuously finding new opportunities to develop content, programming and outreach
• Opens doors to develop relationships with new organizations
Sample Content Focus
Leverage food safety organizations as subject matter experts with Wild About Safety brand to develop an integrated marketing campaign(s) to support food safety education strategies.

Vehicles
Modular content utilized not only for education outreach but for marketing, social media, television, and other promotional vehicles.
“We have always tried to be guided by the basic idea that, in the discovery of knowledge, there is great entertainment — as, conversely, in all good entertainment there is always some grain of wisdom, humanity or enlightenment to be gained.”

- Walt Disney
How do Consumers Handle Meat and Poultry Products?
A Review of FSIS Consumer Behavior Research

Christopher Bernstein

Director, Food Safety Education Staff
Office of Public Affairs and Consumer Education
USDA Food Safety and Inspection Service
## FSIS: Using an Integrated, Holistic Approach
### Five-Year Consumer Behavior Research Plan

<table>
<thead>
<tr>
<th>Activity</th>
<th>Year 1 FY17 (Complete)</th>
<th>Year 2 FY18 (Complete)</th>
<th>Year 3 FY19 (Complete)</th>
<th>Year 4 FY20</th>
<th>Year 5 FY21</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Food thermometer usage</td>
<td>• If wash/rinse raw chicken before cooking</td>
<td>• Prepare not-ready-to-eat (NRTE) frozen chicken product</td>
<td>• Prepare hamburgers</td>
<td>• Intact beef</td>
</tr>
<tr>
<td></td>
<td>• Pathogen transfer</td>
<td>• Pathogen transfer</td>
<td></td>
<td>• Prepare ready-to-eat (RTE) food</td>
<td>• Leftovers</td>
</tr>
<tr>
<td>Focus Groups</td>
<td></td>
<td></td>
<td></td>
<td>• USDA recall notices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Thermometer use messaging</td>
<td></td>
<td>• USDA Meat and Poultry Hotline</td>
<td>• Manufacturer cooking instructions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Consumption of raw, undercooked meat &amp; poultry products</td>
<td></td>
<td>• Recall/outbreak awareness, fatigue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nationally Representative Web-based Survey</td>
<td></td>
<td></td>
<td>• Food safety information sources</td>
<td></td>
<td>Investigate topics gleaned from previous research and any emerging food safety topics</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Preparing/storing hot and cold foods</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **“Cook” Messages:**
  - Food thermometer usage
  - Pathogen transfer

- **“Clean” Messages:**
  - If wash/rinse raw chicken before cooking
  - Pathogen transfer

- **“Cook” Messages:**
  - Prepare not-ready-to-eat (NRTE) frozen chicken product

- **“Clean, Separate, Cook, and Chill” :**
  - Prepare hamburgers
  - Prepare ready-to-eat (RTE) food

- **“Separate and Chill” Messages:**
  - Intact beef
  - Leftovers

- **Focus Groups**
  - Thermometer use messaging
  - Consumption of raw, undercooked meat & poultry products

- **Nationally Representative Web-based Survey**
  - USDA Meat and Poultry Hotline
  - Recall/outbreak awareness, fatigue
  - Food safety information sources
  - Preparing/storing hot and cold foods
Year 1: Cook
Year 1: Cook (Results)

Thermometer Use

Thermometer Ownership and Use

![Bar chart showing thermometer ownership and use]

- Thermometer ownership (self-reported): 61% (Control), 63% (Treatment), 75%* (Overall)
- Used a thermometer: 34% (Control), 34% (Treatment)

Control (n = 201)  |  Treatment (n = 182)
---|---
Thermometer ownership (self-reported) | 61%  | 63%  | 75%*
Used a thermometer | 34%  | 34%  | 

* Differences between two groups statistically significant at $p < .001$

Correctly Used Thermometer

![Bar chart showing correctly used thermometer]

- Placed thermometer in correct location (among total attempts): 23% (Control), 52%* (Treatment), 73% (Overall)
- Checked both patties (among thermometer users): 82%* (Treatment)

Control  |  Treatment
---|---
Placed thermometer in correct location (among total attempts) | 23%  | 52%*  | 73%
Checked both patties (among thermometer users) | 82%*  | 

n = 322  |  n = 168  |  n = 60  |  n = 128
Year 1: Cook (Results)
Handwashing Attempts and Reasons for Unsuccessful Handwashing

Successful attempts: 26 out of 2,249 (1.15%)

Note: there may be multiple reasons for a handwashing event to be unsuccessful.
Year 1: Cook (Results) Prevalence of MS2 Contamination for Four Kitchen Locations and Salad Lettuce (All Participants)

- Refrigerator handle: 8% (5.50 ± 0.37a, n = 369)
- Spice containers: 49% (6.18 ± 0.82b, n = 369)
- Faucet handle: 12% (5.47 ± 0.52a, n = 369)
- Mobile device: 8% (5.73 ± 0.79c, n = 78)
- Salad lettuce: 6% (5.52 ± 0.45d, n = 367)

**Notes:**
- a Level of contamination ± SD, log genome copies/handle.
- b Level of contamination ± SD, log genome copies/bottle.
- c Level of contamination ± SD, log genome copies/device.
- d Level of contamination (SD), log genome copies/18–25g
• Address consumer food safety behaviors that could lead to the most serious consequences, especially:
  • Inadequate handwashing
  • Cross-contamination of kitchen surfaces or items
• Focus on proper and increasing food thermometer usage
• Clearly outline the potential risk of illness from not following recommended food safety behaviors
  • e.g. contamination of ready-to-eat foods like salads)
Year 2: Clean

Recruit Participants
- Control (n=158)
- Treatment (n=142)

Cooking Task
- Raw Poultry
- RTE Food

Video Recording

Real-Time Observation

Post-observation Interviews

Microsampling

Cleanup

Coding and Notational Analysis

Analysis of Microsamples

Final Report and Dissemination
Year 2: Clean (Results)

Poultry Washing

* Differences between two groups statistically significant at $p < .0001$

Reasons for Washing Poultry

- Remove skin, fat, blood: 30%
- Habit: 28%
- Family member does it: 19%
- Remove germs: 19%
- Remove chemicals: 11%
- Other: 2%
- Not relevant/no answer: 2%

Method Used to Wash Poultry at Home

- Rinse under running water: 62%
- Salt, lemon, or vinegar: 17%
- Running water with strainer: 9%
- Submerge in water: 5%
- Not relevant/no answer: 7%
Year 2: Clean (Results)
Cleaning and/or Sanitizing of Sink Among Poultry Washers

Cleaning and/or Sanitizing of Sink Immediately After Washing Poultry

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful</td>
<td>97%</td>
<td>80%</td>
</tr>
<tr>
<td>Unsuccessful</td>
<td>1%</td>
<td>20%</td>
</tr>
<tr>
<td>Did not attempt</td>
<td>2%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Prevalence of Contamination by Location: Nonwashers vs. Washers

- Nonwashers: n = 55
- Washers: n = 57

- Inner sink before cleaning: 48%
- Chicken prep area before cleaning: 7%
- Chicken prep area after cleaning: 7%
- Tap handle before cleaning: 0%
- Spice container before cleaning: 2%
- Sink before cleaning: 7%
- Sink 0-6" from sink before cleaning: 60%
- Sink 0-6" from sink after cleaning: 22%
- Tap handle after cleaning: 2%
- Spice container after cleaning: 5%

n = 94 control, 10 treatment

n = 55 for nonwashers and n = 57 for washers
Year 2: Clean
Implications for Message Development

• Updated frame of “don’t wash your poultry” messaging to focus on preventing contamination at sinks, where vegetables are often washed
  • Clarify that not washing poultry includes not rinsing as well
• Emphasize the importance of both cleaning and sanitizing
• Continue to emphasize handwashing and cross-contamination because improvements are needed in this area
Year 3: Cook

Recruit Participants
- Control ($n = 197$)
- Treatment ($n = 206$)

Cooking Task
- NRTE frozen, breaded stuffed chicken breasts
- Salad made from NRTE frozen corn and fresh produce

Video Recording

Post-observation Interviews

Coding and Notational Analysis

Final Report and Dissemination
Year 3: Cook (Results)

Observed Practices for Determining Doneness of NRTE Chicken Product

- All participants cooked chicken breasts in oven
- Among thermometer users, 86% checked both breasts
Year 3: Cook
Implications for Message Development (in progress)

- Manufacturer’s cooking instructions are important

- Food safety recommendations (e.g. using a food thermometer) may be more effective for meat and poultry products, rather than frozen vegetables
  - Only eight participants used a food thermometer to check for corn doneness, even though recommended by product packaging

- Handwashing, especially after handling frozen products, needs to be emphasized
Comparison of Multi-Year Outcomes
(Control Group)

<table>
<thead>
<tr>
<th></th>
<th>Year 1 (n = 185)</th>
<th>Year 2 (n = 154)</th>
<th>Year 3 (n = 196)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Handwashing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handwashing Event Required</td>
<td>1,195</td>
<td>1,299</td>
<td>695</td>
</tr>
<tr>
<td>(before or during meal preparation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% did not attempt</td>
<td>69%</td>
<td>68%</td>
<td>77%</td>
</tr>
<tr>
<td>% attempt</td>
<td>31%</td>
<td>32%</td>
<td>23%</td>
</tr>
<tr>
<td>% successful attempt</td>
<td>3%</td>
<td>0.7%</td>
<td>4%</td>
</tr>
<tr>
<td>(out of all attempts)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thermometer Use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% used thermometer on at least one item</td>
<td>34%</td>
<td>44%</td>
<td>77%</td>
</tr>
<tr>
<td>% checked temperature of multiple items (among thermometer users)</td>
<td>79%</td>
<td>76%</td>
<td>85%</td>
</tr>
<tr>
<td><strong>Cross Contamination of Salad Lettuce</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% observations contaminated</td>
<td>6%</td>
<td>26%</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Christopher Bernstein
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USDA Food Safety and Inspection Service
Christopher.Bernstein@usda.gov

For More Information:
FSIS Consumer Research