

PR/HACCP RULE EVALUATION REPORT—Focus Group Study on Food Safety Messages and Delivery Mechanisms

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Purpose

The Research Triangle Institute (RTI) is conducting a multi-year evaluation of the *Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems; Final Rule* for the U.S. Department of Agriculture, Food Safety and Inspection Service (USDA, FSIS). As part of this evaluation, RTI is conducting a series of studies to evaluate consumer knowledge, behavior, and confidence, and consumer education programs. The first study was to conduct focus groups with adult consumers to (1) test FSIS food safety messages and (2) identify effective delivery mechanisms for these messages. In addition, we obtained information on participants' confidence in the safety of meat and poultry, their general food safety knowledge and use of safe handling practices, and their awareness of FSIS and government food safety initiatives.

This summary report is part of the Final Report, which provides detailed summaries of each focus group and an analysis of the Pre-Discussion Survey data. Participants completed the Pre-Discussion Survey—a short survey that included questions from the ongoing FDA/FSIS Food Safety Survey—prior to the focus group discussion.¹

Key Findings

Our key findings from the Pre-Discussion Survey and the focus group discussions are summarized below.

¹The FDA/FSIS Food Safety Survey is conducted every 5 years and collects information on consumer food safety perceptions, knowledge, and behavior. As part of our evaluation of the impact of the PR/HACCP Final Rule on consumer knowledge, behavior, and confidence we will compare the results from the Pre-Discussion Survey to the FDA/FSIS Food Safety Survey.

Consumer Confidence, Food Safety Knowledge, and FSIS Awareness

Participants discussed their confidence in the safety of meat and poultry, their knowledge and use of safe handling practices, and their awareness of FSIS. Participants

- Say their confidence in the safety of meat and poultry is increasing.
- Rely on a variety of sources for food safety information.
- Perceive that their knowledge and use of safe handling practices are increasing.
- Correctly identified meat and poultry as high-risk foods for foodborne illness.
- Are unfamiliar with the bacteria *Listeria monocytogenes* and *Campylobacter*.
- Are unaware that pregnant women are a high-risk group for foodborne illness.
- Have not heard of the Food Safety and Inspection Service (FSIS).

Food Safety Messages

Participants are familiar with and understand most of the food safety messages that we asked about, including expiration dates. However, there are some gaps in consumer awareness and understanding:

- Importance of using a food thermometer to check for doneness.
- Two-hour rule: refrigerate or freeze foods within 2 hours or less.
- Danger Zone graphic and concept: unsafe temperatures between 40°F and 140°F.
- Phrase “refrigerate leftovers immediately.”

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- Fight BAC!^{TM2}—unfamiliar with graphic; partially understand the four messages.
- Term “pathogens”—unfamiliar with term; prefer the phrase “harmful bacteria.”

Delivery Mechanisms

Participants recommended the use of multiple delivery mechanisms to increase their food safety knowledge. They also suggested the following:

- Use the safe handling label as a mechanism for educating consumers.
- Target school-age children as a way to get food safety messages to parents.
- Make it convenient to use a food thermometer (e.g., a refrigerator magnet that has a holder for storing a thermometer).

Main Recommendations

Our main recommendations are listed below and discussed later in the recommendations section of this report.

- Target the following areas for food safety education:
 - ✓ Prompt refrigeration of leftovers.
 - ✓ Two-hour rule: refrigerate or freeze foods within 2 hours or less.
 - ✓ Danger Zone concept: unsafe temperatures between 40°F and 140°F.
 - ✓ Pathogens and the dangers posed.
- Promote food thermometer usage:
 - ✓ Continue Thermy^{TM3} campaign.

²The Fight BAC!TM campaign was launched in October 1997 by the Partnership for Food Safety Education. The focal point of the campaign is BAC and the four food safety messages of clean, separate, cook, and chill (see Figure 1).

- ✓ Make thermometer usage convenient.

- Reach consumers with a variety of approaches.
- Reevaluate the safe handling label as a mechanism for educating consumers.
- Target pregnant women with information on listeriosis.
- Target children as a way to get food safety messages to parents.
- Redesign the Danger Zone graphic.

This summary report briefly describes the study design, discusses the results of the Pre-Discussion Survey and the focus groups, and presents recommendations for increasing consumer knowledge and use of safe handling practices.

Study Design

We conducted a total of eight focus groups—two groups in each of four different locations with four different populations. For each population, we conducted one focus group with individuals who have a high school education or less and one focus group with individuals who have some college education (most participants have at least a 4-year degree).

We targeted the following populations:

- Young parents—individuals between the ages of 20 and 35 with at least one child who is 6 years old or younger
- Young adults—individuals between the ages of 20 and 30 who have no children

³The campaign launched by FSIS in spring 2000, with ThermyTM as its food safety messenger, was designed to encourage consumers to use a food thermometer to ensure that food is cooked to a safe internal temperature (see Figure 3).

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- Seniors—individuals 60 years old or older
- General—individuals between the ages of 30 and 59

We conducted the focus groups in Raleigh, North Carolina; San Antonio, Texas; San Diego, California; and Annapolis, Maryland. We selected the sites to provide geographic diversity and semi-rural/urban representation. In Raleigh and San Antonio we recruited individuals who live outside the city limits to provide a semi-rural population. Also, San Diego and Annapolis were selected because these cities were sites of a Fight BAC!TM saturation campaign.

Each focus group included a mix of males and females. We recruited participants to reflect the racial diversity of the area in which the group was conducted. All participants have primary responsibility or share responsibility for cooking in their household, prepare meals at least three times a week, save or eat leftovers, and are not vegetarians. Each group included 7 to 9 participants, for a total of 67 participants.

Results

Findings from the Pre-Discussion Survey are highlighted below, along with the qualitative information gathered in the focus group discussions.

Consumer Confidence

Participants' level of concern about foodborne illness varied. Young adult participants are not concerned about foodborne illness because they have never experienced it. Participants in the other groups are somewhat to very concerned about foodborne illness. Media reports on foodborne illness heighten concern. Regardless of the level of concern, participants say they take measures at home to keep food safe.

Participants offered mixed opinions as to whether the rate of foodborne illness is increasing or decreasing.⁴ Some participants think it is increasing only because awareness of foodborne illness has increased and people are more likely to report it, while others attribute the increase to new bacteria. Some participants think the rate of foodborne illness is decreasing because consumers are more knowledgeable about safe handling practices and have made changes in how they handle food.

Most participants reported that their confidence in the safety of meat and poultry is increasing or about the same compared to 5 years ago.⁵ They attribute their increased confidence to increased awareness of safe handling practices, improved labeling, and prepackaging of meat and poultry. Two senior participants said that their confidence has decreased over the past 5 years citing concerns about the educational level of food handlers and the lack of proper sanitation procedures. One of the 67 participants expressed negative feelings about the government's ability to keep food safe.

About 86 percent of all participants (includes participants from all four locations) are mostly or completely confident that the meat and poultry they prepare at home is safe to eat. Participants are confident because they take precautions to handle and prepare meat and poultry safely and have confidence in the grocery stores where they shop. Several participants said they

⁴This topic was only discussed in the San Antonio and San Diego groups. We added questions to collect information on consumer confidence to use in our evaluation of the impact of the PR/HACCP Final Rule on consumer knowledge, behavior, and confidence.

⁵Ibid.

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know the meat they eat is safe because they overcook it.

Participants are more concerned about getting foodborne illness from eating out, especially at fast food restaurants, than from eating food prepared at home. They feel they have control over the safety of the food that they prepare.

Overall, consumer confidence in the safety of meat and poultry appears to be increasing. Most participants are confident that the meat and poultry they prepare at home is safe to eat. Participants are more concerned about getting foodborne illness from eating out because they have more control at home. However, discussions about their actual practices revealed that some participants unknowingly follow some improper handling practices when cooking at home.

Food Safety Knowledge

Most participants described themselves as being fairly knowledgeable about food safety and safe handling practices. They discussed the public's increased awareness about food safety. Some participants discussed how they have made changes in how they handle food after hearing about foodborne illness outbreaks.

Participants identified meat and poultry (83 percent of participants) and fish/shellfish (79 percent) as foods more likely to cause foodborne illness than other foods. About half of participants identified dairy products, eggs, and leftovers as high-risk foods.

Most participants understood that bacteria and improper handling of food are the causes of foodborne illness. Participants identified *E. coli* and *Salmonella* as bacteria that cause foodborne illness but had not heard of *Listeria monocytogenes* or *Campylobacter*.

Participants identified children, seniors, the immuno-compromised, and those with chronic illnesses (e.g., diabetes) as being at high risk for foodborne illness. Less than 25 percent of participants identified pregnant women as a high-risk population.

Participants rely on a variety of sources for information on food safety. The most common sources cited were

- family/friends,
- food labels/packaging,
- newspapers,
- magazines,
- television (news and news programs), and
- cookbooks and cooking shows.

Participants do not generally use the Internet or government sources (e.g., hotlines) for food safety information, although young adult participants suggested using the Internet to disseminate food safety information. Only one female participant recalled her doctor speaking with her about food safety while pregnant.

Safe Handling Practices

Participants discussed measures they take at home to protect their family from foodborne illness. The Pre-Discussion Survey also collected information on the prevalence of certain safe handling practices. The Pre-Discussion Survey findings on participants' use of safe handling practices are summarized below.

- 83 percent of participants wash cutting boards used for cutting meat or poultry with soap and/or bleach water before using the cutting board again; 5 percent use a different cutting board.

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- 76 percent of participants wash their hands with soap after handling raw meat or poultry.
- 43 percent of participants own a food thermometer; most own a dial thermometer.
- 22 percent of participants refrigerate leftovers like soup or stew containing meat or poultry immediately.
- 17 percent of participants always or often use a food thermometer when cooking large cuts of meat, like roasts or turkeys.
- One participant uses a food thermometer when cooking hamburgers.

These findings are consistent with the results of the 1998 FDA/FSIS Food Safety Survey. While the majority of participants follow proper cleaning practices most do not refrigerate leftovers immediately or use a food thermometer to check for doneness.

Awareness of FSIS and Government Food Safety Initiatives

Participants identified the FDA (49 percent) and the USDA (22 percent) as the government agency responsible for the safety of meat and poultry.⁶ No participants specifically mentioned the Food Safety and Inspection Service (FSIS). When asked, most participants considered this an appropriate name for the agency. Several participants suggested a shorter, simpler name or including “meat and poultry” in the name.

Most participants had not heard of any recent government initiatives to make meat and poultry safer. One participant had heard

⁶This topic was not discussed in the Raleigh groups. We added questions to explore the findings from the American Customer Satisfaction Index (ACSI) survey that consumers are not aware of FSIS.

of HACCP, and one participant knew the meaning of the phrase “farm-to-table.” Several participants guessed that “farm-to-table” meant eggs coming straight from the hen to the table (bypassing the grocery store) or produce fresh from the farm.

Understanding of Food Safety Messages

We asked participants about their awareness and understanding of the Fight BAC!™ concept (Figure 1). We also asked participants about key food safety messages. Some of these messages are part of the Fight BAC!™ campaign, while others are used on the safe handling label or FSIS educational materials.

Figure 1. Fight BAC!™



Fight BAC!™ One of the 67 participants had seen Fight BAC!™ prior to the discussion. Although participants were not familiar with Fight BAC!™, many liked the BAC character and the four-message graphic. Participants described it as colorful and eye-catching. They said that it covers the basic food safety messages and is easy to understand. Several participants offered

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suggestions for improving the “separate” quadrant of the graphic. Some participants said the Fight BAC!™ concept would be effective with the general population, while others suggested targeting it to a younger, more inexperienced population such as those less than 16 years of age, young mothers, and new food preparers.

Wash hands and surfaces often. Participants were familiar with the “clean” message and understood the importance of washing hands and surfaces to prevent the spread of bacteria.

Separate: Don’t cross-contaminate. Some participants were not familiar with the “separate” message or said that they had only recently learned about the importance of keeping raw and cooked foods separate. Those familiar with this message correctly discussed keeping raw meat and poultry products separate from ready-to-eat foods when cooking, when shopping, and in the refrigerator.

Cook to proper temperatures/Cook thoroughly. Some participants correctly defined “cook to proper temperatures” as cooking foods to a certain internal temperature to kill bacteria. Others thought “cook to proper temperatures” meant to cook to the temperature specified in the cooking directions or recipe, which is usually correct. A few participants confused internal temperature with oven temperature, which is incorrect.

Participants defined “cook thoroughly” as cooking meat until it is done or cooking all the way through. Participants discussed that consumers may have different preferences about doneness of meat; for example, to some a steak cooked rare is done.

Participants offered mixed opinions as to whether one phrase is more effective at conveying the message to cook meat and poultry to a temperature high enough to kill

bacteria. Some participants preferred “cook to proper temperatures” because this indicates that a food thermometer is required to check for doneness, while others, particularly young adults, said they would never use a thermometer to check for doneness.

Refrigerate promptly/Refrigerate leftovers immediately or discard. Participants defined “refrigerate promptly” as refrigerating or freezing food after returning from the grocery store and refrigerating leftovers after eating. Some participants thought that “refrigerate leftovers immediately or discard” meant to refrigerate leftovers *after* cooling to room temperature. Many participants incorrectly let leftovers cool before putting them in the refrigerator. No participants divide leftovers into several shallow containers before refrigerating which is the recommended practice. Some participants were surprised to learn that cooling leftovers to room temperature is an unsafe practice and that putting warm foods in the refrigerator will not damage the refrigerator.

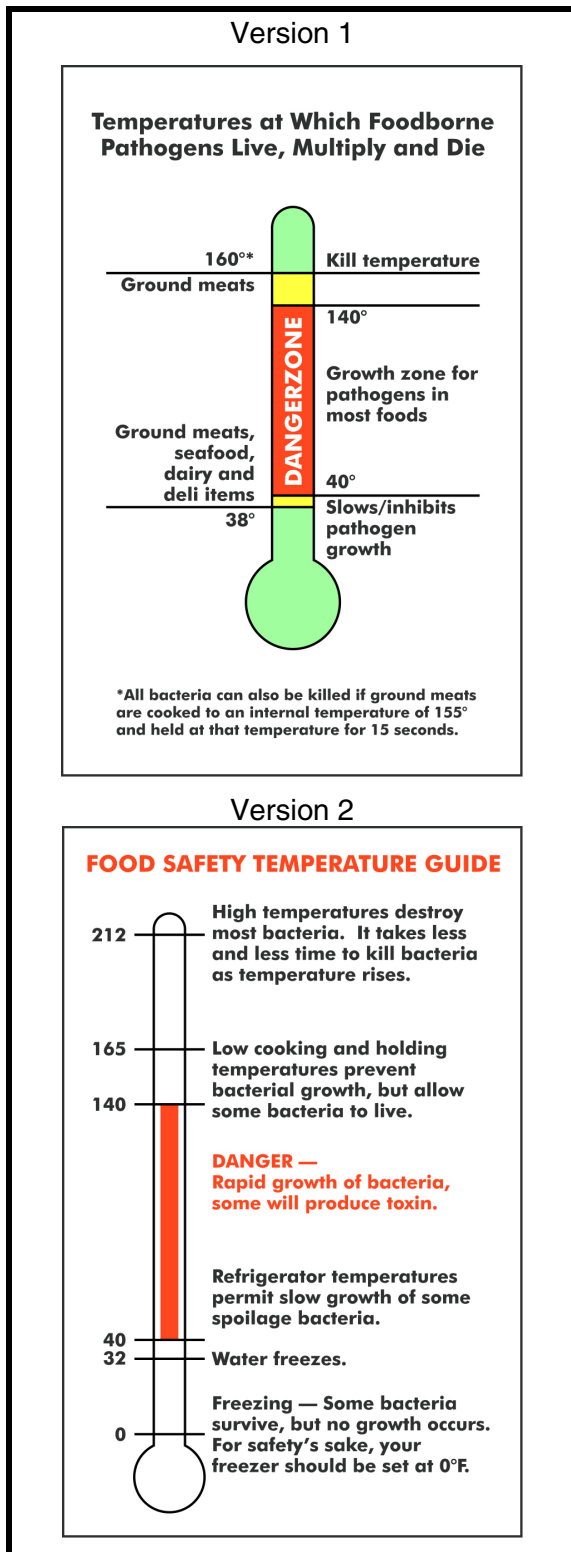
Danger Zone: unsafe temperatures between 40°F and 140°F. We showed participants two versions of the Danger Zone graphic currently used in FSIS educational materials and asked them to evaluate the graphics (Figure 2). Only one young adult participant who had recently completed a cooking class was familiar with the Danger Zone graphic and concept.

Participants found both versions of the graphic confusing and thought some combination of the two would be better. Participants did not mind that the thermometers used in the graphics do not resemble a food thermometer, saying the graphic used was the universal symbol for a thermometer. Some participants suggested integrating BAC or Thermy™ with the Danger Zone graphic.

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Figure 2. Danger Zone



Keep hot foods hot and cold foods cold. Although not all participants had heard this phrase, participants were generally familiar with this concept.

Two-hour rule. Most participants were not familiar with the two-hour rule—that is, to refrigerate or freeze perishables, prepared foods, and leftovers within 2 hours or less. Participants wanted to know whether the rule applied to raw or cooked meat.

Thaw in refrigerator or microwave. Most participants knew to thaw foods in the refrigerator or microwave and recall seeing this information on poultry packaging. Some participants said they sometimes thaw turkeys in water in the sink. Most participants do not thaw foods at room temperature; several participants admitted that until recently they used to do this.

When in doubt, throw it out! Most participants were familiar with this message and practiced it at home. Participants discussed that they label leftovers with dates so they know when to dispose of them. Some participants said they use disposable storage containers so it is easy to dispose of old leftovers.

We also asked participants about expiration dates and other words and phrases used in food safety educational materials.

Expiration dates. Most participants knew the meanings and understood the differences between the sell-by, best-if-used-by/before, and use-by dates. Many participants refer to this information when shopping.

Poultry. Participants defined “poultry” to include chicken, turkey, duck, game hen, and any animal with feathers.

Ground beef. When asked what comes to mind when they hear “ground beef,”

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participants said hamburgers, patties, and spaghetti.

Perishable. Participants correctly defined “perishable” as foods that spoil and foods that require refrigeration.

Pathogens. Some participants were not familiar with the term “pathogens.” Those who were knowledgeable defined pathogens as germs, bacteria, or organisms that cause illness. Most participants preferred using the phrase “harmful bacteria” to “pathogens.”

Participants had mixed opinions on whether it was effective to include the name of specific bacteria to get consumers’ attention. Some participants said this would be appropriate on educational materials, but not on product labels. Others did not think it was necessary.

Irradiation. With the exception of one focus group, one or more participants in each group had heard of irradiation, although some did not know what it meant. Nine of the 67 participants expressed concern about irradiation and wanted to know if irradiated products are labeled.

Elderly. Participants in the seniors groups said that “seniors,” “senior citizens,” and “60 plus” are the best terms to use when referring to this population. Seniors do not like to be referred to as the “elderly.”

Safe Handling Label

About 64 percent of participants recall seeing the safe handling label on raw meat and poultry products. Some participants compared it to the warning label on cigarettes—people see the label but they do not read it.

Suggestions for increasing the awareness and usefulness of the safe handling label included the following:

- Use color (e.g., red).
- Increase the size of the label and the font size of the text.
- Make the label a peel-off sticker that consumers can keep.
- Identify it as a warning by adding “Warning” in bold.
- Add instructions on the proper cooking temperature.
- Display a poster-size version of the label in the meat department.
- Use shorter phrases, like those used in the Fight BAC!™ graphic.
- Include Thermy™ on the label.

Using “Negative” Labels for Consumer Education

We asked participants what they thought about the following label:

“Cook to 160°F. Cooking ground beef to 160°F eliminates harmful bacteria which could cause serious or fatal illness.”

Participants had mixed opinions about the label. Some said the label would be effective at encouraging consumers, especially those just learning to cook, to cook ground beef to a safe temperature. Some said the label might be effective at first but that it would become like the cigarette warning labels that people do not pay attention to anymore. A few participants said such a label might discourage consumers from purchasing ground beef. Several participants said the label should be on all meat and poultry products, rather than singling out ground beef.

Promoting Thermometer Usage

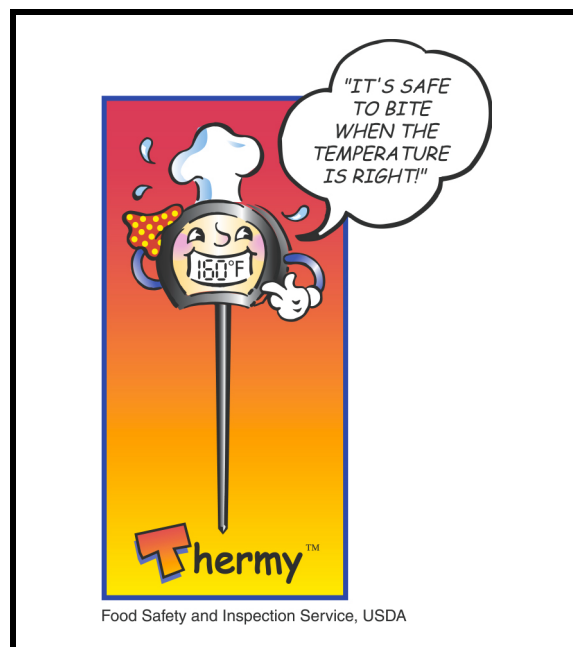
When discussing the proper cooking of meat and poultry, some participants reported that they generally overcook meats, particularly hamburgers, to ensure doneness. About 1 in 5 participants uses a food thermometer to check for doneness of large cuts of meat. Others cut the meat to check the color or judge doneness based on the cooking time.

We presented the results of the Agricultural Research Service (ARS)/FSIS research on color of ground beef as it relates to doneness. Many participants were surprised to learn that color is not always a good indicator of doneness. Several participants from the seniors groups said that they plan to purchase and start using a thermometer in light of this research. Some young adult participants were not swayed by the research and said that they would not start using a thermometer. They said using a thermometer is impractical and unnecessary. They believe they can trust their own experience to ensure that meat is cooked thoroughly.

We asked participants what they thought about the Thermy™ messenger and slogan, “It’s safe to bite when the temperature is right!” (Figure 3). Many participants liked Thermy™ and described it as cute, catchy, and attention-getting and thought it would appeal to the general population. A few participants described Thermy™ as too childish for such a serious subject and suggested targeting it to children.

Participants said that for them to start using a thermometer for all cuts of meat it would have to be easy and convenient. Even those who own a thermometer do not always use it, since it is often hidden in the back of a drawer. Participants suggested the following approaches for promoting thermometer usage:

Figure 3. Thermy™



- consumer education on the ARS/FSIS research on color of ground beef as it relates to doneness
- grocery store promotions at the store entrance or meat department; for example, display thermometers in the meat department and at the check-out line, offer free thermometers or discount coupons, or distribute literature/coupons/recipe cards in conjunction with food samples or cooking demonstrations
- promotional items; for example, magnets with proper cooking temperatures
- labels on raw meat and poultry packaging with proper cooking temperatures
- disposable thermometers attached to meat/poultry packaging
- refrigerator magnet that has a holder for storing a thermometer (for ease of use and accessibility)

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Delivery Mechanisms for Food Safety Messages

We asked participants about the best way to get information on food safety to them and others in their target population. Participants said that in this “information age” consumers are often overwhelmed with information, so the information provided must get their attention, be concise, and provide steps for immediate action. Participants suggested the following approaches for delivering food safety messages:

- television and radio commercials/public service announcements
- television news and news shows
- newspapers (weekly food section)
- magazines (e.g., cooking, women’s, and general interest)
- cooking shows
- grocery store promotions
- labels on meat and poultry packaging
- home mailings with food safety information
- Internet Web sites (to reach young adults, in particular)
- senior center programs (to reach seniors, in particular)

Participants, especially young parents, suggested targeting children in food safety educational efforts because children will bring the message home to their parents. Participants suggested that educational efforts should start in elementary school. Participants suggested the following approaches for educating children about food safety:

- workshops at school
- food safety day at school

- commercials/public service announcements during children’s programming
- free comic books/coloring books on food safety distributed via grocery stores
- literature distributed via school
- public service announcements using the *School House Rocks* format

Participants had mixed opinions about using cartoon characters like *Thermy™* and *BAC* to promote food safety. Many participants thought such characters would be effective, especially with children. Some participants in the young adults and the general population groups did not like the use of animated commercials, saying such commercials would not be taken seriously.

Recommendations

Recommendations based on the focus group findings are summarized below.

Target These Areas for Food Safety Education

The focus groups identified the following areas where additional educational efforts are needed:

- Prompt refrigeration of leftovers.
- Two-hour rule: refrigerate or freeze foods within 2 hours or less.
- Danger Zone concept: unsafe temperatures between 40°F and 140°F.
- Pathogens and the dangers posed.

Many participants cool leftovers to room temperature before refrigerating, instead of refrigerating them immediately. Most participants were not familiar with the two-hour rule or the Danger Zone graphic and concept. Future educational efforts should target these areas.

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Some participants were not familiar with the term “pathogens.” We suggest that FSIS use the phrase “harmful bacteria” instead of “pathogens” in educational materials. Participants had mixed opinions on whether it was effective to include the name of specific bacteria to get consumers’ attention.

Most participants were not familiar with the bacteria *Listeria monocytogenes* and *Campylobacter*. We recommend that FSIS educate consumers about the dangers of specific bacteria when necessary; for example, *Listeria monocytogenes* and the danger posed to pregnant women.

Promote Food Thermometer Usage

FSIS should continue their educational efforts on thermometer usage using Thermy™ as its “spokesperson” so that Thermy™ becomes a symbol of cooking food properly, like Smokey Bear or McGruff the Crime Dog. The Thermy™ campaign uses many of the ideas suggested by participants, such as grocery store promotions, refrigerator magnet with temperature chart, and educational materials on the ARS/FSIS research.

Participants said that for them to start using a food thermometer it would have to be easy and convenient. Even those who own a thermometer do not always use it. Possible approaches for making thermometers more accessible include disseminating refrigerator magnets that have a holder for storing a thermometer or providing disposable thermometers with meat/poultry packaging.

Reach Consumers with a Variety of Approaches

Participants suggested a myriad of ideas for promoting food safety, some of which are currently being used by FSIS. We

recommend that FSIS continue to use multiple sources to educate consumers. Possible approaches for delivering food safety information include the following:

- Broadcast public service announcements on radio and television.
- Disseminate information on safe handling practices through newspapers (food section) and magazines.
- Disseminate information on ARS/FSIS research on color of ground beef as it relates to doneness via television news or news shows.
- Incorporate safe handling practices on television cooking shows.
- Disseminate information through schools to reach parents of school-aged children.
- Disseminate brochures covering the basics of food safety to individual households.
- Use labels on meat and poultry packaging to educate consumers.
- Provide animated graphics and interactive features, such as a self-administered quiz on food safety, on health/nutrition and food safety Web sites (to reach young adults, in particular).

Further analysis is required to determine which approaches would be most cost-effective.

Reevaluate the Safe Handling Label

Although many participants are familiar with the safe handling label, some no longer pay attention to it. We recommend that FSIS reevaluate the safe handling label to determine if the label needs to be revised. To increase visibility and awareness of the label, add color and shorten the messages, making them consistent with the four Fight

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BAC!TM messages. We suggest that FSIS consider incorporating ThermyTM (as part of the label or a separate sticker) to get consumers' attention and to remind them to use a food thermometer to check for doneness. Any proposed changes to the safe handling label should be thoroughly tested with consumers.

Target Pregnant Women

About 75 percent of participants did not identify pregnant women as being at increased risk for foodborne illness. Also, participants were not aware of *Listeria monocytogenes* and the danger posed to pregnant women. We recommend that FSIS develop educational materials targeted to pregnant women. Additional research is required to determine how to effectively reach pregnant women with food safety messages.

Target Children

Participants suggested targeting children in food safety educational efforts because children will bring the message home to their parents. Possible approaches for educating children were listed earlier in the report (see page 10). Further research is required to determine the effectiveness of educating children as a delivery mechanism for food safety messages.

Redesign the Danger Zone Graphic

Many participants found the Danger Zone graphics confusing. We recommend that FSIS redesign the Danger Zone graphic, incorporating some of the changes suggested by participants.