

# PR/HACCP RULE EVALUATION REPORT

## Thermometer Usage Messages and Delivery Mechanisms for Parents of Young Children

Final Report

3/01/02

### Purpose

Research Triangle Institute (RTI) is conducting a multiyear evaluation of the *Pathogen Reduction; Hazard Analysis and Critical Control Point (PR/HACCP) Systems; Final Rule* for the U.S. Department of Agriculture, Food Safety and Inspection Service (USDA, FSIS). As part of the evaluation study, RTI is conducting evaluations of specific FSIS consumer education programs. Previous reports describe focus group findings to test food safety messages and to identify effective delivery mechanisms for the general population<sup>1</sup> and for pregnant women, a high-risk population for listeriosis.<sup>2</sup> This report describes focus group findings with parents of young children to evaluate the Thermy™ educational materials used nationally to promote food thermometer usage. Food thermometer usage is one way to combat foodborne disease due to *E. coli* O157:H7 and other harmful bacteria.

In spring 2000, FSIS rolled out its Thermy™ campaign to educate consumers about the importance of using a food thermometer to ensure food has reached a high enough temperature to destroy foodborne bacteria. This campaign was initiated in response to findings from an Agricultural Research Service (ARS)/FSIS study<sup>3</sup> that found color is not a reliable indicator of doneness for hamburgers. Foodborne illnesses due to the bacterium *E. coli* O157:H7 in undercooked hamburgers have been a concern for FSIS

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<sup>1</sup>See "PR/HACCP Rule Evaluation Report, Focus Group Study on Food Safety Messages and Delivery Mechanisms," 12/14/00.

<sup>2</sup>See "PR/HACCP Rule Evaluation Report, Listeriosis Food Safety Messages and Delivery Mechanisms for Pregnant Women," 2/23/01.

<sup>3</sup>Research conducted by the ARS in 1998 found that one in four hamburgers turns brown before it has been cooked to a safe internal temperature.

in recent years, particularly in young children, a high-risk group for foodborne illness, who frequently eat hamburgers.

To help FSIS determine how to effectively reach parents of young children with food safety messages on food thermometer usage, RTI conducted six focus groups in three different locations.<sup>4</sup> The objectives of the focus group study were to (1) assess the effectiveness of providing Thermy™ educational materials, with and without thermometers, at changing consumers' behavior to use food thermometers; (2) evaluate the Thermy™ educational materials; and (3) identify effective delivery mechanisms for the Thermy™ educational materials. In addition, we collected information on participants' concerns about foodborne illness and their food handling practices. Thermometer usage in this study is primarily focused on meat and poultry.

This report presents our key findings and recommendations, describes the study design, and summarizes the results of the Prediscussion Survey<sup>5</sup> and the focus group discussions. The [Appendices](#) provide copies of the materials evaluated in the focus groups and participants' comments and suggestions for improving each item.

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<sup>4</sup>The PR/HACCP evaluation study provided funding for four of the focus groups, and FSIS's Food Safety Education Staff (FSES) provided funding for two of the focus groups.

<sup>5</sup>Participants completed the Prediscussion Survey—a 34 item questionnaire that collects information on current food handling practices, including their thermometer usage—one month prior to the focus group discussion (before receiving the educational materials) and immediately prior to the focus group discussion. This allowed us to make pre- and post-comparisons on thermometer usage.

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### Key Findings

Our key findings are summarized below and discussed in the Results section.

- Parents of young children expressed confidence in their ability to safely handle and prepare meat and poultry at home (as did the general population and pregnant women in previous focus group studies). Many report being more careful about food safety since having children and take a number of precautions when cooking at home to prevent foodborne illness, such as washing hands and surfaces often and promptly refrigerating leftovers. In addition, some participants purposefully *overcook* their meat and poultry to make sure it is safe to eat.
- Although participants were confident that they prepare meat and poultry safely, most were not aware of the importance of using a food thermometer when cooking meat and poultry. Some participants were unfamiliar with different types of thermometers, or, in some cases, how to use a thermometer.
- Participants who received a food thermometer with the Thermy™ educational materials were more likely to begin using a thermometer than participants who did not receive a thermometer.<sup>6</sup> In the groups that received only the Thermy™ educational materials (no thermometer), participants who already owned a thermometer were more likely to begin using a thermometer than those who did not own one.

- Participants suggested (1) focusing messages on thermometer usage on the health and safety of children, (2) emphasizing that using a food thermometer is the only sure way to know your food has reached a high enough temperature to destroy foodborne bacteria, and (3) promoting enhanced food quality as an important secondary benefit of thermometer usage.
- The magnet was the favorite item in the package of educational materials that participants received prior to the focus groups. Most had placed it on their refrigerators or oven hoods. Many participants referred to it when cooking and found it to be not only a useful reference, but a good reminder to use a thermometer.
- Participants generally liked the Thermy™ brochure, particularly the Temperature Rules table,<sup>7</sup> but were less enthusiastic about the public service announcement (PSA). Participants who disliked the PSA described it as “cheesy” and low budget and did not think it was very informative.
- Participants suggested educating children about thermometer usage in school so they would bring the message home to their parents. Participants also recommended repeating the thermometer usage message using a variety of delivery mechanisms to help people get in the habit of using one.

### Main Recommendations

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

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<sup>6</sup>We sent Thermy™ educational materials to all participants one month prior to the focus groups. Participants in three of the six groups also received a digital instant-read thermometer.

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<sup>7</sup>The Temperature Rules table provides proper cooking temperatures for different meat/poultry products.

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- Emphasize the benefits of thermometer usage in educational materials and promotional activities:
  - 1) Use a food thermometer to help keep your children healthy and safe.
  - 2) Using a food thermometer is the only sure way to know your food has reached a high enough temperature to destroy foodborne bacteria.
  - 3) Use a food thermometer to enhance food quality.
- Partner with local cooperative extension offices, thermometer manufacturers, and other organizations to conduct promotional activities that will get food thermometers and Thermo™ magnets into the hands of consumers (e.g., thermometer discount coupons, free magnets).
- Develop a Thermo™ brochure targeted specifically to parents of young children.
- Develop a new Thermo™ PSA that is higher quality and more informative.
- Educate children on thermometer usage at school so they bring the message home to their parents.
- Disseminate Thermo™ educational materials and thermometer usage messages through a variety of mechanisms.

### Study Design

RTI conducted a total of six focus groups—two groups in each of three different locations (Nashville, Tennessee; Minneapolis, Minnesota; and Portland, Oregon). Each focus group consisted of individuals who have children aged 10 and younger living in their households. In each location, we conducted one focus group with individuals who have a high school

education or less and one focus group with individuals who are college graduates.

We recruited participants to reflect the racial diversity of the area in which the focus groups were conducted. Participants had to meet the following eligibility criteria: have primary responsibility or share responsibility for cooking in their household; prepare food and cook in the home at least three times a week; eat meat and/or poultry; prepare meat and/or poultry in the home at least twice a week; and not regularly use a digital food thermometer when cooking at home. We attempted to recruit an equal number of thermometer owners and nonowners for each focus group. Each group included eight or nine participants, for a total of 49 participants.

We sent Thermo™ educational materials, including items evaluated in the focus groups, to all focus group participants one month prior to the focus group discussions. We instructed participants to review the educational materials upon receipt. Participants in three of the six groups also received a digital instant-read food thermometer.

When recruiting participants, we administered a survey to collect information on participants' current food handling practices, including their thermometer usage. We administered the same survey (i.e., the Prediscussion Survey) prior to the focus group discussions to allow us to make pre- and post-comparisons on thermometer usage. When reporting the results for the Prediscussion Survey, we also include the data for individuals that were recruited for the focus groups but did not participate in the focus group discussions.

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### Results

We highlight findings from the Prediscussion Survey and focus group discussions below.

#### **Concerns about Foodborne Illness**

Participants are somewhat concerned about getting foodborne illness from all foods they prepare at home, and take precautions when cooking, especially since having children. Over 90 percent of participants said that they are completely or mostly confident that the meat and poultry products they prepare at home are safe to eat. Participants discussed precautions they take at home to keep food safe, such as ensuring cleanliness, preventing cross-contamination, and cooking foods thoroughly. Some participants report that they overcook their meat and poultry to make it safe to eat.

#### **Food Thermometer Usage**

Most participants were not aware of the health or food quality benefits of using a thermometer. Although about half of the participants owned one or more food thermometers prior to being contacted for the focus group study, they did not regularly use it for all cuts of meat and poultry. Their thermometer usage was generally limited to large cuts of meat and poultry (e.g., roasts and whole poultry). Some participants who owned a thermometer never used it or only used it when cooking their Thanksgiving turkey. Most participants who owned a thermometer prior to the study owned a dial oven-safe thermometer or an instant-read dial thermometer.

We summarize changes in participants' thermometer usage, their reasons for becoming a user or remaining a nonuser,

and their preferences for the different types of thermometers below.

#### Changes in Usage

Participants who received a food thermometer with the Thermy™ educational materials were more likely to change their cooking practices compared to participants who did *not* receive one (see Table 1). Sixty-three percent of participants who received a thermometer started using a thermometer more often compared to 13 percent for those who did not receive a thermometer. Furthermore, participants who received a thermometer were also more likely to have tried using it to check the doneness of small pieces of meat. Fifty percent of participants who received a thermometer used it when cooking chicken breasts compared to 22 percent of participants who did not receive a thermometer. Forty-two percent of participants who received a thermometer used it when cooking hamburgers compared to zero percent who did not receive a thermometer.

In the focus groups participants discussed whether they had made any changes in their cooking practices since receiving the educational materials and, if so, what types of changes. In the groups that received only the Thermy™ educational materials (no thermometer), participants who owned a thermometer were more likely to change their cooking practices compared to those who did not own one. Some participants who owned a thermometer started using it on a regular basis (*"pulled it out of the back of the drawer"*) or expanded their usage to small cuts of meat/poultry. Only one participant who did not previously own a thermometer purchased one and used it.

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**Table 1. Respondents' Food Thermometer Usage After Receiving Educational Materials With and Without a Thermometer<sup>a</sup>**

Food Thermometer Usage	Percentage of Respondents (%) <sup>b</sup>		
	Received Thermometer (n = 24)	Did Not Receive Thermometer (n = 23)	All Respondents (n = 47)
Changes in frequency of usage since receiving educational materials			
Use more often	63	13	38
Use about the same frequency	12	43	28
Use less often	0	9	4
Do not use at all	25	35	30
Types of food participants used thermometer to check the doneness of since receiving educational materials <sup>c</sup>			
Chicken parts, such as breasts or thighs	50	22	36
Hamburgers	42	0	21
Roasts (beef, pork, veal, or lamb)	33	39	36
Whole chicken or turkeys	13	30	21
Leftovers containing meat/poultry	17	9	13
Casseroles containing meat/poultry	8	9	9
Egg dishes	4	4	4
Ham	4	4	4
Other food	4	4	4

<sup>a</sup>Because a probability-based sample was not used, the results from the Prediscussion Survey should not be generalized to the population of households with young children in any statistical sense. These questions were not included on the Prediscussion Survey for the Nashville groups.

<sup>b</sup>Includes data for individuals that were recruited for the focus groups but did not participate in the focus group discussions.

<sup>c</sup>Frequencies sum to more than 100 percent because respondents could select multiple responses.

### Users

Overall, 38 percent of all participants reported that they use a thermometer more often since receiving the educational materials. Some participants have started using a thermometer to check the doneness of chicken breasts, hamburgers, roasts, and

whole poultry. Few participants have used a thermometer when reheating leftovers, or when cooking casseroles, egg dishes, and ham (see Table 1). Some participants said they generally use a thermometer for checking the doneness of large cuts like roasts and whole poultry but viewed thermometer usage unnecessary for small

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pieces like hamburgers and chicken breasts.

Some said the information in the educational materials, particularly the ARS research on hamburgers, led them to start using a thermometer or to use one more often. One participant stated, *"I wasn't using one until I read all this information because I thought I was perfect in cooking the meat. But then I realized just because it's done in the middle, that doesn't mean it's right. So I started using the thermometer every time."*

Participants generally found using a thermometer to be easy now that they have started using one somewhat regularly. One participant said, *"I'm better at cooking I guess."* Another said, *"It takes the guesswork out of it."*

Some participants liked that using a thermometer improved the quality of the final product. One participant stated, *"I've tried it a lot, and I enjoyed it. Nothing's overcooked anymore."*

Many participants said they plan to continue using a food thermometer on a more regular basis. One participant echoed others' opinions when she described her experience using a thermometer, *"I loved it. It was great."* A few participants were not inclined to use food thermometers indefinitely. They said they would use a food thermometer a lot at first, but after awhile rely on experience to determine doneness.

### Nonusers

Overall, 30 percent of all participants reported that they have not used a food thermometer at all since receiving the educational materials (see Table 1). Among the nonusers, some speculated that they would try using a thermometer in the

future,<sup>8</sup> while others considered thermometer usage unnecessary and said they would be unlikely to start using one.

Some participants expressed that they plan to start using a thermometer. Several participants said they intend to buy a thermometer but just hadn't gotten around to it. One participant stated, *"I think I've been overcooking my meats because I keep thinking about that material and I haven't gotten a thermometer yet."* For some participants, getting into the habit of using a thermometer is difficult. One participant stated, *"...I try to remember to use it, but I haven't gotten into the habit."* Some participants viewed thermometer usage as time consuming and inconvenient and said they haven't had the time to try using one.

Some participants trusted their cooking experience and did not think thermometer usage was necessary. One participant stated, *"If you cook a lot of the same foods, you probably cook them pretty much the same way each time too, and you'll know how long they need to be in [the oven]."*

Several participants believed the risk of foodborne illness was not that great to warrant using a food thermometer and said they would probably not start using one unless they contracted foodborne illness. When asked if he would buy a thermometer, one participant stated, *"I still honestly feel like there's not enough of a risk. I feel like I've been cooking on my own for over 20 years and I don't get sick, so why now—I mean, you can read all you want about it, but I'm personally not getting, I don't feel like I'm getting sick from improper food cooking."*

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<sup>8</sup>Participants who did not receive a thermometer with the educational materials were provided one at the end of the focus group discussion.

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### Thermometer Preferences

Some participants were not aware of the different types of thermometers or, in some cases, how to use a thermometer. Among all participants, those who had a preference for a particular type of thermometer<sup>9</sup> preferred the disposable and digital instant-read thermometers. Participants liked the disposable thermometers because of their convenience. Many participants preferred the digital instant-read thermometer for its convenience as well. Most did not see its higher price as a barrier to purchasing one. A few participants liked the fork-style thermometer and thought it would be convenient for grilling. Some participants do not trust the accuracy of pop-up and disposable thermometers.

Participants identified grocery, department, discount, houseware, and home improvement stores (e.g., Home Depot) as locations where they would like to see thermometers sold. Participants suggested that grocery stores display thermometers in the meat department, utensil section, and checkout lines.

### **Messages on Thermometer Usage**

Participants identified the following as effective messages to include in educational materials.

***Use a thermometer to help keep your children healthy and safe.*** Most participants agreed that the best way to encourage thermometer usage by parents and guardians of young children is to advise them of the health risks to their children of not using a food thermometer. Participants noted, “You are concerned so much for your

*children, almost more than yourself” and “Parents don’t want their children getting sick...It scares you, something involving children.”*

Participants suggested that educational materials highlight the fact that children are a high-risk group for foodborne illness and that not using a thermometer might result in their child contracting foodborne illness. Although several participants viewed such an approach as “scare tactics,” most agreed that such messages would be effective in encouraging thermometer usage.

***Using a food thermometer is the only sure way to know your food has reached a high enough temperature to destroy foodborne bacteria.*** The vast majority of participants were not aware of the importance of using a food thermometer. Participants were surprised by the findings from the ARS research on hamburgers. As one participant stated, “I got to thinking, ‘The meat is technically cooked, but that doesn’t mean it got hot enough to destroy the bacteria, so it’s not like I’m serving raw meat, but I’m possibly serving bacteria’.” This new information led some participants to start using a thermometer or to use one more often, including for small pieces of meat like hamburgers.

***Use a food thermometer to enhance food quality.*** Some participants, particularly those in one group, found the quality message very persuasive. They suggested that educational materials address food quality, as well as safety concerns, to reach more people. One participant said, “I think it’s a good point that you don’t have to threaten them with the fact that they’re going to get sick, but they can also be better cooks.” Some participants thought consumers would be more apt to use thermometers if they knew usage would result not only in a safer but a tastier finished product. Participants suggested

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<sup>9</sup>The types of food thermometers we discussed with participants included digital instant-read, dial instant-read, dial oven-safe, fork, pop-up, and disposable.

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informing consumers that using a thermometer “takes the guesswork out of cooking,” avoids overcooking or undercooking, and preserves the appearance of the finished product (by not having to cut into the meat to determine doneness).

### ***Evaluation of the Thermometer™ Brochure***

Participants evaluated the full color, six panel brochure “Use a Food Thermometer,” featuring Thermometer™ and developed by USDA, FSIS (see Appendix A).

Participants generally liked the brochure, particularly the Temperature Rules table and the factual information provided in the “Why Is It Important?” section. Overall, participants

- found the brochure easy to understand and very informative,
- described the brochure as “to the point” and most did not think it was too long,
- liked the flow of the brochure and the ordering of the information, and
- liked the layout and use of colors and visuals.

Most participants identified adults, specifically parents, mothers, and whoever cooks in the household, as the target audience for the brochure but agreed it would attract the attention of children as well. A few participants thought the brochure could be targeted to children, while some suggested developing separate brochures for adults and children.

Although most participants thought the length of the brochure was just right, participants in one group considered it too long. They suggested condensing the brochure from six to four panels.

Most participants liked Thermometer™ and did not think it was inappropriate to use a cartoon-like character in a brochure targeted to adults. Participants described Thermometer™ as cute and said his slogan was catchy and memorable.

Most participants liked the use of graphics throughout the brochure. However, a few participants suggested using photographs of food rather than cartoon-like illustrations. A few participants suggested including pictures of people, particularly children, to emphasize the message that thermometer usage helps keep children healthy and safe.

A few participants suggested including disposable thermometers, discount coupons for thermometers, and/or stickers for children with the brochure.

Participants suggested some changes to improve the brochure. Appendix A provides a list of their suggested revisions to the title, cover, text, and Temperature Rules table. We summarize participants’ suggestions below.

- ***Change the title to more effectively get people’s attention.*** Participants suggested the following changes to improve the title:
  - Use a title that contains the word “safe” or “safety,” emphasizes family, and/or applies to cooking at home.
  - Word the title as a rhetorical question (e.g., “Why Use a Food Thermometer?”).
- ***Change the cover to more effectively get people’s attention.*** Although participants liked the use of color, they suggested using graphics and text to emphasize safety, urgency, families, and cooking at home. Several participants said they would be unlikely to pick up the brochure if they saw it in

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the grocery store and offered suggestions to make it more enticing such as using graphics and/or text to convey the seriousness of the topic and the benefits of thermometer usage.

- **Add the hamburger photograph from the research sheet.** Most participants liked the photograph used in the “Thermometers Are Key to Safety” sheet to illustrate the findings from the ARS research (see Appendix C). They suggested this photograph be used in the brochure because it is surprising to see that the hamburger that appears safe to eat, in fact, is not. One participant commented, *“I just thought brown hamburgers were done. It [the photograph] is kind of scary.”*
- **Revise the Temperature Rules table.** Participants found the Temperature Rules table very informative. One participant commented, *“I don’t think the chart can be overemphasized.”* Participants suggested the following changes to improve the table:
  - Make the table detachable so consumers can easily post it in their kitchen.
  - Clarify some confusing information; for example, discuss whether the cooking method affects the proper temperature and define “Meat Mixture.”
  - Add seafood and soups/stews to the table.
  - Include only the most commonly cooked foods in the table to make it shorter.
- **Revise brochure sections and text.** Participants generally liked the way the brochure was divided into sections and said the text was easy to read and understand. Some participants suggested using a bulleted format

throughout more of the brochure to facilitate quick reading and save space. Participants suggested several revisions to the text itself as outlined in Appendix A.

- **Revise the section entitled “Digital, Dial, and Disposable!”** Many participants agreed this section could be made more informative and visually appealing. They suggested including information on how to use each thermometer and a table showing a picture of each thermometer and for which cuts of meat/poultry its use is recommended.
- **Provide more information about foodborne bacteria and illness.** Participants liked the section entitled “Why Is It Important?” and suggested adding more facts such as the names of specific foodborne bacteria, information on foodborne bacteria, and the illnesses that they cause.
- **Enlarge the Fight BAC!™ logo on the back of the brochure.** Some participants suggested the brochure provide information on cleanliness and safe handling in addition to thermometer usage. Because the Fight BAC!™ logo (on the back of the brochure) addresses these issues they suggested it be enlarged so these topics are covered as well.

### Evaluation of the Thermy™ PSA

Participants evaluated the 30-second PSA featuring Thermy™ and developed by USDA, FSIS (see Appendix B).

Participants were divided as to whether they liked or disliked the Thermy™ PSA.

- Some liked its shortness, simplicity, and the way it highlighted the ARS research on hamburgers.

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- Others described it as “cheesy” and “low budget” and did not think it was very informative.
- Even participants who liked the PSA described it as low quality. Participants suggested using better music, animation, and lighting.

Many participants considered the PSA to be targeted to children and doubted they would watch it if shown on television. Participants said that an effective PSA would be more informative and serious in tone. Participants suggested providing

- information on foodborne bacteria and foodborne illness to get people’s attention,
- information on why it is important to use a thermometer (i.e., to prevent foodborne illness and enhance food quality), and
- a toll-free telephone number and web site address directing viewers to more information.

Appendix B provides a transcript of the PSA and suggestions for other PSA scenarios.

### **Evaluation of Additional Thermy™ Educational Materials**

Participants evaluated other Thermy™ educational materials including the research sheet “Thermometers Are Key to Safety,” the newspaper article “Cooking Ease,” the kids’ sheet “Thermy™ Rules,” Thermy™ magnet, Thermy™ beanbag doll, and Thermy™ thermometer packaging. In general, participants liked the additional Thermy™ educational materials and thought most of the materials would be effective at reaching consumers with the thermometer usage message. The Thermy™ magnet was by far the favorite item. Most participants started using it immediately. One participant summarized

the enthusiasm of others when he stated, “*It’s the best piece in the package.*”

Appendix C provides copies of the materials evaluated and a summary of participants’ comments.

### **Delivery Mechanisms**

The vast majority of participants agreed that it is important for the general population and, specifically parents and guardians of young children, to be educated about the importance of using a food thermometer. We summarize participants’ suggestions on how to disseminate information on food thermometer usage below.

**Participants suggested educating children about thermometer usage in schools so they would bring the message home to their parents.** Most participants agreed that an educational campaign should target children as well as adults because children will take the message home to their parents. They suggested educating children about thermometer usage in schools and sending educational materials home to parents and guardians. One participant commented, “*When it comes home from the school it’s like, ‘Hey, we’ve got to read this. It’s a warning.’ They’re telling us about something we need to know for our kids.*”

Parents suggested the following ways to disseminate information on thermometer usage in schools:

- nutrition lessons,
- educational materials for parents with activity sheets for children,
- home economics classes,
- school cafeterias and lunch menus, and

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- information integrated with class curriculum (e.g., science lab, essay contest).

**Participants identified the need for consumers to hear the thermometer usage message multiple times and via multiple sources.** Participants agreed that for thermometer usage to become ingrained in consumers' habits the message must be heard multiple times and from a number of sources. One participant speculated, *"If we left here today and did not hear anymore about a thermometer we would not think about it. We need to hear it more, over and over again."*

**Participants suggested distributing Thermy™ brochures in a variety of locations.** All participants agreed Thermy™ brochures should be distributed in grocery store meat departments and/or checkout lines. Other suggested locations (from most to least often mentioned) include the following:

- doctors' offices (including pediatricians, obstetricians/gynecologists, and dentists);
- points of purchase (where thermometers, cookware, and grills are sold);
- state fairs, health fairs, food festivals, and other local events;
- day care centers;
- health departments;
- drug stores and pharmacies;
- libraries;
- YMCAs and health clubs; and
- social services offices.

**Participants recommended a variety of delivery mechanisms for educating**

**parents of young children about thermometer usage.** Suggestions (from most to least often mentioned) include the following:

- Inform the public via television and radio commercials and through the news media.
- Provide cooking instructions, including times and temperatures, and information on thermometer usage on raw meat/poultry packaging.
- Advertise where grills and cookware are sold.
- Disseminate information through articles in magazines (e.g., women's and cooking magazines) and newspapers (e.g., the food section).
- Disseminate information through Women, Infants, and Children (WIC) and other government-aid programs.
- Partner with department stores, houseware stores, food companies, and thermometer manufacturers to promote thermometer usage and/or provide thermometer coupons on products.
- Display Thermy™ stickers on packages of raw meat and poultry.
- Disseminate information on the Food Channel and on television cooking programs.
- Advertise on billboards.
- Include disposable thermometers with raw ground meat products.
- Conduct grocery store demonstrations of thermometer usage and offer coupons.
- Disseminate information via the Internet.

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### Recommendations

We summarize our recommendations based on the focus group findings below.

**Emphasize the benefits of thermometer usage in educational materials and promotional activities.** We recommend that educational materials and promotional activities emphasize the following benefits of thermometer usage:

- Use a food thermometer to help keep your children healthy and safe.
- Using a food thermometer is the only sure way to know your food has reached a high enough temperature to destroy foodborne bacteria.
- Use a food thermometer to enhance food quality.

**Conduct promotional activities that will get thermometers and Thermy™ magnets into the hands of consumers.**

The study findings suggest that consumers are more likely to start using a thermometer if they have one; the educational materials alone were not as effective at encouraging behavioral changes. The refrigerator Thermy™ magnets also encouraged behavior change. When participants saw the magnets on their refrigerators, it reminded them to use a thermometer and provided them a handy temperature guide. We recommend that FSIS partner with local cooperative extension offices, thermometer manufacturers, and other organizations to conduct promotional activities that will get thermometers and magnets into the hands of consumers. Suggested activities include providing disposable thermometers with raw meat packaging, offering discount coupons for thermometers, conducting thermometer demonstrations and offering coupons, and distributing Thermy™ magnets at community and health-related events.

**Develop a Thermy™ brochure targeted specifically to parents of young children.**

We recommend that FSIS develop a Thermy™ brochure that highlights the benefits of thermometer usage as previously described. We also recommend that FSIS incorporate participants' suggestions for improving the brochure as summarized on pages 8 and 9 of this report and detailed in Appendix A.

**Develop a new Thermy™ PSA that is of higher quality and more informative.**

We recommend that FSIS develop a new PSA with improved music, animation, and lighting and that is more informative and highlights the benefits of thermometer usage. Appendix B provides participants' suggestions for alternative PSA scenarios.

**Educate children on thermometer usage via schools.**

Participants recommended that children be educated about thermometer usage in schools beginning at an early age. They suggested incorporating the thermometer usage message with other curricular activities. We recommend that FSIS work with teachers' associations to incorporate the thermometer message into nutrition, science, and health curricula.

**Disseminate Thermy™ educational materials and thermometer messages through a variety of mechanisms.**

Participants identified a variety of locations and mechanisms for disseminating Thermy™ educational materials to parents and guardians of young children. Further analysis is required to determine which approaches would be most cost-effective. Suggested delivery mechanisms for reaching parents and guardians of young children are summarized on pages 10 and 11 of this report.