

"160°F FOR YOUR FAMILY": AN EMOTIONS-BASED APPROACH TO MOTIVATING
WOMEN IN WIC TO USE A FOOD THERMOMETER
IN GROUND BEEF PATTIES

By

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Abstract

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A food thermometer is the only scientifically validated method for consumers to accurately determine whether an internal temperature of 71°C is reached in ground beef patties and *Escherichia coli* O157:H7 are inactivated. Infants and young children are especially susceptible to *Escherichia coli* O157:H7 foodborne illness and suffer more serious complications than adults. The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) reaches many households containing infants and young children. Consumer use of food thermometers for ground beef patties is limited; “160°F For Your Family” is a campaign to increase the use of food thermometers for ground beef patties in WIC households.

Projective techniques were used in four focus groups with women and mothers participating in Washington WIC programs, and revealed these mothers feel an emotional need for security in their household and a need to be considered good mothers. Women and mothers value the security of a good life and desire a happy, loved, safe family protected from danger. Food thermometers are deemed unnecessary and a mother who uses food thermometers is perceived as overprotective. Mothers do not believe a food thermometer is an accurate,

important tool for preventing foodborne illness. Alternate safety methods are used which mothers feel are as safe as standard recommended methods. Therefore, three rack cards were developed, linking love for children and the emotional need for security to food thermometer use. The rack cards presented food thermometers as beneficial, necessary food safety tools. Rack cards developed were pre-tested with women and mothers in WIC and revised to include the material which resonated with the women and mothers. Photographs of young children, personal testimonies from mothers, practical recommendations, and emotional headings were included in the rack cards. Content was reviewed by food safety specialists. The emotions-based food thermometer rack cards were disseminated in 45 WIC clinics in 17 Washington counties over a period of two months. This approach will be evaluated to assess the effectiveness of the developed brochures. An emotions-based approach may motivate behavior change in a variety of consumer settings.

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Dedication

This thesis is dedicated to my dad,
who dedicated his WSU doctoral dissertation to little Kristen and me.

Also, to Rachel, who wasn't around yet to receive Dad's dedication.

And to Mom and Kristen,
because why should the best mom and middle sister in the world be left out?

CHAPTER ONE

LITERATURE REVIEW

Introduction

Seventy-six million people in the United States are estimated to contract foodborne illnesses each year, and each person at least once every 4 to 5 ½ years (Center for Disease Control [CDC], 2007; Redmond & Griffith, 2003a). In the US, foodborne illness hospitalizes at least 300,000 people and claims the lives of 5,000 annually. Furthermore, according to the Economic Research Service of the U.S. Department of Agriculture, the total cost resulting from foodborne illnesses is estimated to be more than \$6.9 billion every year (ERS-USDA, 2007). The financial costs include lost work time, health care expenses due to illness and hospitalizations, and funeral costs for the most unfortunate victims. Foodborne illness takes its toll not only financially but also on the quality of life of Americans (Athearn, et al., 2004; Trepka, et al., 2007).

For some consumers, foodborne illness is manifested as a mild to moderate illness, usually referred to as the “24-hour flu” or “stomach flu” (Swanger and Rutherford, 2004; Schlundt, et al., 2004). However, young children are more susceptible to severe cases of foodborne illnesses (CDC, 2007; Scheule, 2004; Trepka, et al., 2007). For young children, foodborne illness may lead to kidney failure or death. Importantly, foodborne illness and outbreaks are three times more likely to be traced to consumer homes rather than to restaurants or other commercial sources. (Patil, et al., 2004). Therefore, protecting young children, such as those in the U.S. Department of Agriculture's Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), is important.

Emotions-based messages are a promising, novel approach to promote consumer food thermometer behaviors. Consumers can directly prevent certain foodborne illnesses among young children in their household by cooking meats adequately (Redmond and Griffith, 2004; Trepka, et al., 2007; Patil, et al., 2004). The WIC program provides access to consumer households with infants and children. Through the WIC program, behavior changes can be promoted to reduce the incidence of foodborne illness.

Food Safety

Escherichia coli O157:H7

Prevalence, distribution, and outcomes of E. coli O157:H7 foodborne illness.

Enterohemorrhagic *Escherichia coli* (*E. coli*) O157:H7 is a pathogen which can enter the human food supply and cause foodborne illness. In 1999, Mead et al. reported approximately 73,500 cases of *E. coli* O157:H7 foodborne illness every year. Although the incidence of *E. coli* O157:H7 is considered low, it can be very serious and life-threatening for susceptible populations – such as infants and children – due to their immature or compromised immune system (Schlundt, et al., 2004).

Incidence of *E. coli* O157:H7 foodborne illnesses in developed countries is 0.1 to 2 cases per 100,000 people (Schlundt, et al., 2004). The United States Department of Agriculture (USDA) recognizes the public health impact of *E. coli* O157:H7 and therefore, the USDA has a zero tolerance regulation for *E. coli* O157:H7 in ground beef. If a sample of raw ground beefs tests positive for *E. coli* O157:H7, the batch is deemed adulterated, is recalled from the market, and destroyed. Undercooked ground beef has been a common vehicle for infection in several *E. coli* O157:H7 outbreaks (United States Department of Agriculture Food Safety and Inspection

Service, 2003a). *E. coli* O157:H7 infection in ground beef can be prevented by adequate cooking because *E. coli* O157:H7 is inactivated by temperatures of 71°C (160°F) (Schlundt, et al., 2004).

Ground beef is consumed frequently in the United States. According to the National Cattleman's Beef Association, United States consumers prepared and consumed 4 billion home-cooked ground beef patties in 2009 (Cattleman's Beef Board and National Cattleman's Beef Association, 2009). Compared to whole cuts of beef such as steaks or roasts, ground beef patties are of particular food safety concern because they are a mixed meat and any contamination from the surface extends throughout the beef (Schlundt, et al., 2004). Women participating in WIC are an important audience to whom to promote food thermometer use in ground beef patties, as the majority prepare ground beef patties in their homes. In a survey of 1,598 Women and Mothers in WIC across the United States, only 6.1% of women and mothers participating in WIC reported not cooking ground beef patties (United States Department of Agriculture Food Safety and Inspection Service, 2003a; Kwon, et al., 2008).

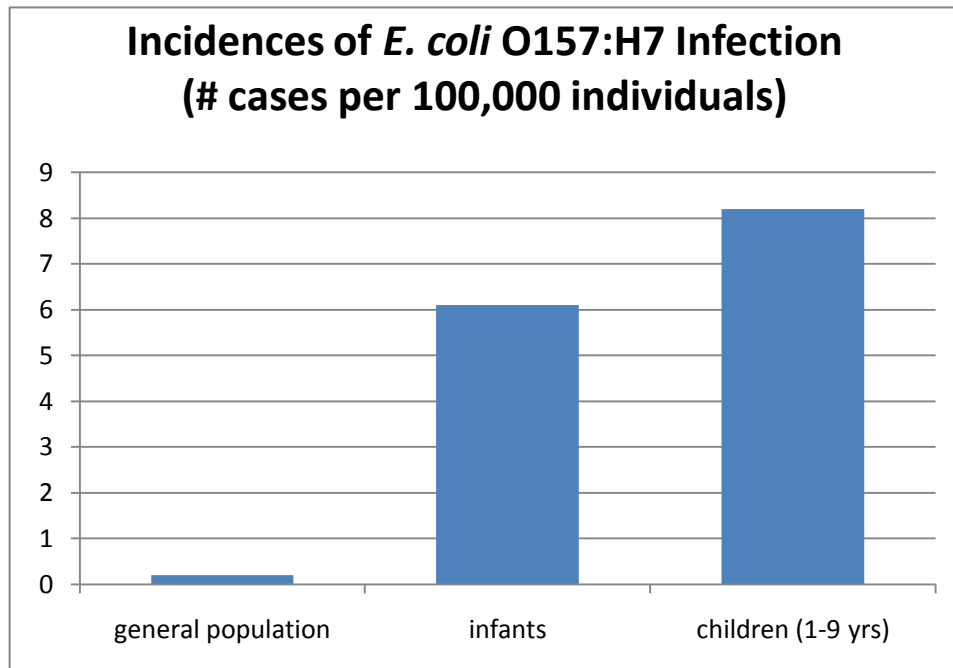
Less than 10 *E. coli* O157:H7 bacteria in the human body can cause illness (Schlundt, et al., 2004). In young children and the elderly population, fewer *E. coli* O157:H7 bacteria can cause illness. The incubation period for *E. coli* O157:H7 is 3 to 8 days and typical cases usually recover within 10 days (Schlundt, et al., 2004). Most cases of *E. coli* O157:H7 illness present with relatively mild symptoms such as abdominal cramps, diarrhea, fever, vomiting, and bloody diarrhea (Schlundt, et al., 2004; Buzby, 2001; Mead, et al. 1999.) An estimated 10% of *E. coli* O157:H7 victims progress from these mild symptoms to develop hemolytic uremic syndrome (HUS) (Schlundt, et al., 2004; American Dietetic Association, 2003). HUS is clinically characterized by acute renal failure, hemolytic anemia (destruction of red blood cells), and

thrombocytopenia (having too few platelets) (Schlundt, et al., 2004). Death is the result for 65 people each year in the United States, or 2% to 7% of HUS patients (Schlundt, et al., 2004; Mead, et al. 1999; American Dietetic Association, 2003). Additionally, 50% of consumers infected with *E. coli* O157:H7 develop long-term complications and 25% develop neurological complications such as seizures, strokes, and comas (Schlundt, et al., 2004).

Incidence of *E. coli* O157:H7 in children.

An estimated one third of all foodborne illnesses in the United States occur in children under the age of 10 (Athearn, et al. 2004; Lin, et al., 2005). The infection rate of *E. coli* O157:H7 in children is the highest among all age groups (Figure 1). Approximately 6.1 of 100,000 infants

Figure 1. Incidences of *E. coli* O157:H7 Infection (Buzby, 2001)



and 8.2 of 100,000 children aged 1 to 9 are estimated to become infected with *E. coli* O157:H7, compared to 0.1 to 2 cases per 100,000 people of the general population in developed

countries. Progression to HUS is more common in young children than in the general population (Buzby, 2001; Schlundt, et al., 2004)

Children are more susceptible to foodborne pathogens such as *E. coli* O157:H7 because their bodies are small compared to the number of *E. coli* O157:H7 present (Schlundt, et al., 2004; Buzby, 2001; Scheule, 2004; Athearn, et al., 2004). A child's immune system is not fully developed, increasing the likelihood of illness from *E. coli* O157:H7 bacteria than an adult with a fully developed immune system (Buzby, 2001; Athearn, et al. 2004; Lin, et al., 2005). Another reason young children are more susceptible to foodborne pathogens such as *E. coli* O157:H7 is because they lack knowledge about food safety and are dependent upon parents and guardians to ensure the safety of their food. Public health programs, such as WIC, can directly address parents regarding the food safety needs of their young children. Parents are an appropriate audience for educational efforts, since parents largely decide and have authority over a young child's diet.

The Role of the Consumer in Food Safety

Inadequate cooking of meat plays a major role in foodborne illness (Patil, et al., 2004; Takeuchi, et al., 2005; Takeuchi, et al., 2006). Foodborne illness instances and outbreaks are more likely to be associated, not to restaurants or commercial sources but, with individual households. Thus, consumers can have a direct impact on preventing such disease (Patil, et al., 2004; Redmond and Griffith, 2004; Trepka, et al., 2007). One essential preventive measure consumers can take in the home is to adequately cook meat using temperature as a guide for doneness, especially in ground meats.

Cooking meat to 71°C (160°F) is the only way to destroy *E. coli* O157:H7, which is the primary pathogen of concern in ground beef (Schlundt, et al., 2004). Many consumers are unaware that common methods often used to determine the doneness of cooked meats in the home are not adequate for assuring the safety of cooked meat. For example, color is commonly used as an indicator that meat is “done” and safely cooked. However, ground beef patties may turn brown *before* the safe temperature of 71°C is reached. On the other hand, ground beef patties may remain pink *after* reaching a safe temperature of 71°C (United States Department of Agriculture Food Safety and Inspection Service, 2003a). Thus, color is an inadequate indicator of safe cooking, and when consumers use a brown internal color as an indicator of doneness, the safety of cooked ground beef patties is compromised. In addition to safety issues, the quality of ground beef patties can be reduced if the consumer overcooks the meat until the pink has disappeared.

Food Safety and Ground Beef Patties: Premature Browning and Persistent Pink Color

The color of raw beef comes from myoglobin, a pigment in beef muscle which binds to iron atoms. When raw beef is exposed to air, the iron in myoglobin is oxygenated to form a ferrous iron-oxygen complex called oxymyoglobin, making raw meat appear red. Beef turns brown when it is cooked because the iron atom in myoglobin becomes attached to a water molecule, rather than binding to oxygen.

Raw ground beef can become brown in color from a variety of means, including time or temperature abuse. If beef is stored for long periods of time, is stored or thawed above temperatures of 40°C for too long, or is exposed to too much air, the oxygen bound to hemoglobin is replaced by water, producing a brown color (Hague, et al., 1994; Mancini and

Hunt, 2005; USDA-ARS/FSIS, 1998). A brown, well-done appearance before safe internal temperatures have been reached is termed premature browning (Seyfert, et al. 2004). Research has demonstrated that some ground beef patties look well-done at internal temperatures as low as 55°C (131 °F) (Hague et al., 194; Mancini and Hunt, 2005; USDA-ARS/FSIS, 1998).

Another color-temperature phenomenon in ground beef is persistent pink color. Persistent pink color means the beef has a pink, undercooked appearance when cooked to at least 71°C (Durham 2001). Persistent pink color can be influenced by a variety of factors including sex, pH, and fat content. Male cattle have a greater incidence of premature pink color because muscle in male cattle has greater myoglobin content and can have a more alkaline pH than meat from female cattle (Mendenhall, 1989). The rate at which muscle pigments denature is affected by pH. A pH of 6.0 in beef causes the myoglobin to take longer to denature than beef with a normal pH of 5.3 to 5.8 (Mendenhall, 1989). Premature pink color can also be observed more frequently as fat content in beef decreases, because lower fat beef is a poorer conductor of heat than fattier beef is. Decreased fat content can occur when less fat is added to ground beef mixtures or when ingredients are added to ground beef in the processing plant or in ground beef patty or meatloaf recipes.

Killinger et al. (2000) found premature browning in 47% of burgers tested by noting the color of raw and cooked ground beef patties using a 5 point visual scale and instrumentally using a Minolta Colorimeter. In another study, the USDA Agricultural Research Service cooked 360 pounds of ground beef patties and observed colors from red through brown for several endpoint temperatures (USDA-ARS/FSIS, 1998). The USDA researchers observed premature browning in 25% of all burgers and 66% in previously frozen ground beef. In their study of 360

pounds of ground beef, researchers at USDA observed persistent pink color in almost 50% of burgers.

Consumers may use internal color of ground beef patties to determine safety and doneness, however internal color is not a reliable indicator of doneness. At an internal temperature of 71°C, any *E. coli* O157:H7 bacteria are inactivated. However, findings of premature browning and persistent pink color in ground beef patties indicate internal color is not associated with internal temperature. The way to determine the safety of ground beef patties is through the use of a food thermometer to measure internal temperature.

Food Safety Knowledge and Practices among the General Population and Women and Mothers *in WIC*

Food safety knowledge and beliefs among the general population.

The North American population has knowledge of food safety issues. In a meta-analysis of food safety studies, Redmond and Griffith (2003a) found that 74-92% of Canadians and Americans surveyed knew there is a risk in consuming undercooked meat or chicken. Although one report found 15-20% of consumers did not know the recommended internal temperature for cooking meat, 93% knew that there was a recommended temperature (Redmond and Griffith, 2003a).

According to the 2000 Audits International Home Food Safety Study, 60% of consumers know safe food handling practices but 20% choose to ignore them and 40% do not follow the safe food handling practices because they are not thinking of the safe practice while cooking or preparing food (Research Triangle Institute, 2001). Forty percent of consumers did not know the safe food handling practices (Research Triangle Institute, 2001).

Food thermometer use among the general population.

The only scientifically validated method for determining the doneness and safety of cooked meats to prevent foodborne illness is using a food thermometer (Durham, 2001). In 1997, the United States Department of Agriculture Food Safety and Inspection Service (FSIS) began recommending that consumers use a food thermometer to check for doneness in ground beef patties (Research Triangle Institute, 2001). However, many reports show few consumers use food thermometers. In 1998, 46% of consumers in the United States reported owning a food thermometer (Research Triangle Institute, 2001). Only 7% to 24% of United States consumers regularly use a food thermometer (Redmond and Griffith, 2003a). Most of the use of food thermometers is with large cuts of meat such as roasts (Research Triangle Institute, 2001). Only 3% of consumers nationally reported using a food thermometer when cooking ground beef patties in 1998 (Research Triangle Institute, 2001). In 2005, only 15% of Washington and Idaho consumers had ever used a food thermometer when cooking small cuts of meat such as ground beef patties (Takeuchi, et al. 2005).

Food safety knowledge and beliefs among women and mothers in WIC.

Scheule (2004) surveyed WIC nutrition counselors in one Midwestern state and most indicated WIC clients need food safety education, with ninety percent of the WIC nutrition counselors rating client knowledge of food safety as “fair,” “poor,” or “very poor.” General food preparation safety, which includes cooking to a safe internal temperature, was among the four food safety issues reported as most important (Scheule, 2004). Most (72%) of the WIC nutrition counselors report giving food safety education to at least 20% of their clients each day (Scheule, 2004). Among the WIC nutrition counselors surveyed, 51% report that the primary reasons

discouraging them from giving food safety education to clients are a lack of educational materials, a feeling that food safety is not a focus of the WIC program, and a lack of time.

Focus groups of pregnant women and women up to six months postpartum revealed that these women were aware of many important food safety recommendations, including avoiding raw and undercooked meat. However, the women expressed opposition to using a food thermometer, the only valid method for assuring meat is not raw and undercooked (Athearn, et al., 2004).

Food thermometer use among the WIC population.

WIC consumers have dangerous food preparation behaviors, which is a concern as infants and children are at increased risk for foodborne illness because of their underdeveloped immune system. There is a lack of proper food safety behaviors among WIC women. Importantly, most of these women do not use a food thermometer to assure the safety of meat at the critical control point of cooking.

According to Trepka et al. (2007), few women and mothers in the Florida WIC program report owning a food thermometer (24.4%), and only 23.4% always or almost always use a food thermometer when cooking turkeys or large cuts of meat. The number of women and mothers who use a food thermometer when cooking thin cuts of meat such as ground beef patties was not assessed (Trepka, et al. 2007).

Kwon et al. (2008) surveyed the food safety practices of 1,598 women and mothers participating in WIC in 31 states nationwide. WIC was a source of food safety information for 78.7% of the women and mothers. Family, television, friends, and newspapers or media were additional sources of food safety information for 40-60% of the women and mothers. The

women and mothers indicated checking the color of the meat or juice was the best way to check doneness in ground beef patties (57%). The belief of 5.6% of women and mothers, is that doneness is confirmed by cooking ground beef patties until they are burned or dry. Checking internal temperature was reported as the best method to determine doneness by 23% of women and mothers and 37.7% report they have used a food thermometer. The survey did not differentiate between using a food thermometer in small cuts of meat versus larger cuts of meat such as roasts or turkeys.

Having ascertained the women and mothers' belief about the best method for checking for doneness in ground beef patties, the survey queried women about their practices, asking how the women and mothers check for doneness when *actually cooking* ground beef patties. The majority of women and mothers (77.4%) use color of the meat or juice to indicate doneness in ground beef patties. Only 7.7% of women and mothers use a food thermometer to check for doneness in home-cooked ground beef patties. Overcooking or burning ground beef patties is the method used by 5.7% of women and mothers to check for doneness.

Barriers to food thermometer use among women and mothers in WIC.

Women in the Pacific Northwest and Colorado who receive WIC services report several barriers to using a food thermometer, including not having time to use a thermometer, not knowing how to use food thermometers, and the expense of food thermometers (Takeuchi, et. al, 2005). Women in eastern Washington and Idaho expressed a belief that food thermometers are not needed to ensure ground beef patties and other thin cuts of meat are safe to eat. Few women in one study believed foodborne illness was a personal threat to themselves or their family (Scheule, 2004). According to the focus group findings of Athearn et al. (2004), most

pregnant women and new mothers do not find food safety during pregnancy a cause for concern. In fact, the women were confident that their practices were safe. Regarding food thermometer use, one mother said, "I haven't gotten sick yet, so I think my methods work" (p. 159).

From the WIC nutrition counselors' point of view, barriers between WIC clients and the use of food thermometers include client educational level, socioeconomic factors such as lack of refrigerators and electricity in homes, and the lack of ability to afford food thermometers (Scheule, 2004). To overcome the barrier of educational level, food safety handouts can be prepared according to low literacy standards and be tailored for the WIC population (Scheule, 2004). Based upon WIC participant input, Athearn et al. (2004) recommend informing clients why particular food safety recommendations are made.

Takeuchi et al. (2004, 2005) conducted focus groups and then administered surveys in Washington and Idaho to discover attitudes toward the use of food thermometers. In the focus groups, participants said that barriers included inadequate time, inconvenience, unfamiliarity with using food thermometers, and current preferable habits. Women also demonstrated an attitude that food thermometers are not needed. Athearn et al. (2004) also found this attitude. The women did not recognize foodborne illness as a threat and did not believe they were at a higher foodborne illness risk or that a foodborne pathogen which they consumed could harm a fetus.

On the other hand, according to Athearn et al. (2004), pregnant mothers in WIC report certain motivators for using a food thermometer. Some women proposed knowledge of foodborne illness and personal or fetal susceptibility would motivate them to use food

thermometers. The pregnant women also reported being willing to take care of the health of their developing fetus by whatever means necessary, so Athearn et al. (2004) suggested that knowledge of the effects of various foodborne illnesses on fetuses could be a motivator.

Food thermometer knowledge and beliefs related to practice and use.

Given the prevalence of foodborne illness, its severity in pregnant women and young children, and the inherent responsibility of a consumer to reduce the risk of foodborne illness in ground beef patties and other meats, there is a documented need for a behavioral change related to the cooking of meat (Athearn, et al., 2004; Redmond and Griffeth, 2003a; Takeuchi, et al., 2005; Trepka, et al., 2007). To encourage women and mothers in WIC to use a food thermometer, behavioral change programs need to include more than just food safety facts.

When asked, consumers insist that personal experiences with health threats will motivate them to make the appropriate, healthy behavior change. Jordan et al. (2007) reported that mothers of young children who discovered high levels of lead in their children's blood were motivated to make behavior changes to prevent lead poisoning. However, Takeuchi (2004) reports that study participants who indicated having food poisoning experience also indicated that they rarely use a food thermometer.

As a result of their meta-analysis of food safety knowledge and practices studies in the United States, Patil et al. (2005) found that none of the food safety behaviors studied corresponded with the participants' reported knowledge of that food safety behavior. For some behaviors, knowledge exceeded practice; but for others, practice exceeded knowledge. For example, knowledge of good hygiene such as hand washing exceeded practice by 10%. Reported good heating and cooking practices, however, exceeded knowledge by 10.6%. In the

meta-analysis, good heating and cooking practices were defined as bringing the food to the proper internal temperature.

Although assessing the extent of food safety knowledge among consumers is important, accurate knowledge is not necessarily correlated with food safety behaviors and practices (American Dietetic Association, 2003; Lin, et al., 2005; Patil, et al., 2005). Therefore, behavioral change programs would have to include more than just food safety education to increase knowledge; motivators and barriers to behavior change need to be addressed as well (Athearn, et al., 2004; Takeuchi, et al., 2005; Redmond and Griffeth, 2004).

Emotions-Based Approach to Behavior Change

Social Marketing

Social marketing is used to motivate consumers to make a behavior change, just as commercial marketing is an effective way to motivate consumers to purchase a product (Smith, 2000; Fox and Kotler, 1980). Social marketing is a process for motivating consumers to give up something in exchange for a beneficial behavior (Smith, 2000). What the consumer gives up in exchange for a beneficial behavior is often related to the consumer's barriers to the behavior. A consumer may give up their convenience, time, concepts, or money (Smith, 2000). Benefits and negative aspects associated with options in the exchange reflect the values of the consumer, and are therefore tied to emotions (O'Shaughnessy and O'Shaughnessy, 2003, p. 27).

A social marketing campaign generally involves six steps: problem description, market research, market strategy, intervention, evaluation, and implementation (Center for Disease Control and Prevention, 2007). In the first step, problem description, a social or health problem and its possible causes are identified. Potential audiences to receive an intervention related to

the problem are also identified. Then next step in a social marketing campaign is to conduct market research. Research questions about the problem are defined, a plan is made to answer the research questions, and then the market research plans are implemented. In the third step, market strategy, the list of potential audiences is narrowed and the audience needs and behaviors are assessed. Based upon the market research and audience assessment, behavior change goals are written and interventions are selected to meet the behavior change goals. Additional goals are written for each intervention. The fourth step in a social marketing campaign is to plan the intervention then pretest and pilot test the intervention. Fifth, an evaluation plan is written for the social marketing campaign intervention. Finally, the social marketing campaign is implemented. The campaign is evaluated and modified as needed throughout the life of the campaign (Center for Disease Control and Prevention, 2007).

Commercial marketing aims to influence consumers through a marketing strategy, including what the industry terms “the 4 Ps”: product, price, place, and promotion (Smith, 2000). These Ps are likewise useful in social marketing and are key components in planning a social marketing campaign. “Product” refers to the behavior social marketers want the consumer to adopt. “Price” refers to what consumers will need to give up in exchange for the behavior. “Place” is the location in which a consumer will perform the behavior or encounter the social marketing campaign (Center for Disease Control and Prevention, 2007). “Promotion” is the outreach used to connect the consumer to the social marketing message. This includes the channel or medium used for a particular social marketing message and the building or environment in which the consumer spends time (United States Department of Agriculture Food Safety and Inspection Service, 2003b).

Social marketers conduct market research and study the target audience of consumers so that the exchange for behavior change offered will be accepted by consumers (O'Shaughnessy and O'Shaughnessy, 2003, p. 21). Interviews, observations, focus groups, and surveys are all ways social marketers study consumers (Smith, 2000; Redmond and Griffith, 2003b). A consumer's core values are often very involved with their decisions, so uncovering their core values and aspirations can help to determine what might motivate a consumer to adopt a particular healthful behavior (Allicock, et al., 2008). Studying the beliefs, knowledge, habits, attitudes, aspirations, and emotions of the target population helps social marketers make marketing messages personally relevant to the target audience (Wilson, 2007; Scheule, 2004). Personally relevant messages have been shown to be more effective and more motivating than general messages (Wilson, 2007).

Emotional Decisions

Emotions are powerful regulators of behavior because they occur quickly (Fischer, et al., 2005). Emotions are a physiological response to external stimuli and are interpreted as feelings (Stewart, et al., 2007 p. 121). Consumers often make choices based on their emotions (O'Shaughnessy and O'Shaughnessy, 2003, p. 28).

Consumers make choices and engage in behaviors which maximize pleasure. Less often, consumers strive for the behavior with the highest perceived net benefit (Fischer, et al., 2005; Mellers, et al., 1999). Several food safety studies have also shown that understanding the rational benefits of food safety behaviors does not necessarily result in consumers' adoption of those behaviors (Fischer, et al., 2005; Patil, et al., 2005; Redmond and Griffith, 2003a; Redmond and Griffith, 2004; Rimal, et al., 2001; Trepka, et al., 2007). Additional motivators are needed

besides knowledge and awareness of benefits and risks. Social scientists say an emotions-based approach to food safety behavior modification may provide that motivation (Zaltman, 2003; Mellers, et al., 1999). Fortunately for social marketers, “rare is the product to which customers do not have some emotional, albeit usually hidden, connection” (Lajoie, 2004). The goal of an emotions-based approach to social marketing is to find that emotional connection. Once the social marketer has identified the emotions of a population of consumers, these emotions, or pulse points, should saturate each aspect of the market strategy (O’Shaughnessy and O’Shaughnessy, 2003, p. 32). A social marketing campaign to encourage a particular behavior should market that behavior in such a way as to fulfill the emotional need of the consumers.

Focus Groups

Focus groups have been used in many food safety studies and with mothers of young children to acquire qualitative data regarding food safety beliefs, barriers, and attitudes (Zaltman, 2003, p. 122; Redmond and Griffith, 2003b). Focus groups are small groups of human subjects gathered to share their opinions, emotions, and thoughts about a particular topic and who are selected to represent a wider population (Redmond and Griffith, 2003b).

There are some criticisms of focus groups. For example, compared to one-on-one interviews, a focus group allows for less speaking time per participant. If the speaking time per participant needs to be increased, the number of participants per focus group should be decreased. To achieve maximum speaking, two to four participants is advisable (Zaltman, 2003, p. 123). Another criticism is that it may be difficult for participants to be open and honest with a group of strangers such as those in a focus group (Zaltman, 2003, p. 123). There are many techniques a focus group moderator can use to help focus group participants feel comfortable

and give open, honest responses. One of these is the use of projective techniques. Another technique for open communication relates to the environment and setting of the focus group. Comfortable furniture, plants, refreshments, a friendly moderator, and warm-up questions all have been suggested to help focus group participants feel comfortable and encouraged to speak (Greenbaum, 1988).

After a focus group's conclusion, field notes and transcripts of focus group recordings are collected as data. The notes and transcripts are then analyzed. For validity, the transcripts should be analyzed or validated by multiple researchers (Zaltman, 2003, p. 124; Donoghue, 2000)

Projective Techniques

The fields of neuroscience and psychoanalysis have shown that the subconscious is responsible for the majority of behaviors, even ninety-five percent of behaviors (Zaltman, 2003 p.9; Wiehagen, et al., 2007). The subconscious refers to cognitive processes of which one is unaware or unable to articulate (Zaltman, 2003 p. 9). Direct, unambiguous questions in a survey, focus group, or interview may not be answered honestly because the consumer feels inhibited, cannot correctly articulate their emotions, or feels bound by the constraints of the question (Zaltman, 2003, p. 9; Donoghue, 2000; Wiehagen, et al., 2007). Projective techniques indirectly uncover the hidden emotions of consumers (Zaltman, 2003; Noble, et al., 2005; Donoghue, 2000; Wiehagen, et al., 2007; Bystedt, et al., 2003). Semi-ambiguous questions help consumers articulate what is in their subconscious, while remaining within the general confines of a particular topic (Zaltman, 2003; Donoghue, 2000). Because semi-ambiguous questions are asked, the goal of the researcher is less obvious, and consumers are less apt to perceive what

would be the “right” or “wrong” response (Donoghue, 2000). Once projective techniques uncover emotions, the emotions, reactions, and beliefs are then discussed in the focus group (Donoghue, 2000).

Projective techniques pose questions in such a way that the respondent can project their own emotions and beliefs into objects or actions such as pictures or stories (Noble, et al., 2005; Wiehagen, et al., 2007). There are five categories of projective techniques: association techniques, construction techniques, completion techniques, choice or ordering techniques, and expressive techniques. For association techniques, the consumer offers their first thought when presented with a visual or auditory stimulus. The Rorschach Ink Blot Test used in psychology is an example of association techniques. Construction techniques involve consumers responding to a picture or story or drawing or writing their own. Completion techniques have the consumer complete a phrase or story. Choice and ordering techniques have the consumer arrange items or words along a continuum or in a story progression. For expressive techniques, participants choose a form of expression in which to respond to a topic; often this form is role playing (Wiehagen, et al., 2007; Donoghue, 2000).

One disadvantage of projective techniques – as with all qualitative data collection methods – is that data analysis and interpretation is subjective (Donoghue, 2000). Triangulating focus groups with other methods such as individual interviews helps improve reliability (Donoghue, 2000). Having multiple researchers validate research conclusions also helps to improve the advantages of projective techniques (Donoghue, 2000). Once the results from focus groups are incorporated into social marketing messages, the messages should be tested using

scientific procedures to verify that data was interpreted correctly and accurately uncovered the emotions of the target group.

Most consumers are comfortable with straightforward, unambiguous questions and may be less comfortable engaging in the creative expression projective techniques require (Donoghue, 2000). Participants may not agree to participate or may try to keep their responses as reserved as possible, resulting in less accurate data than could otherwise be possible. However, with practice in administering focus groups and analyzing data, projective techniques can accurately reveal rich qualitative data (Donoghue, 2000).

Emotion versus Reason for Motivating Behavior Change

Emotions and beliefs are closely related and intertwined (Dean, et al., 2006). Although decisions are made largely based on emotions, cognition is also involved (Mellers, et al., 1999). Behavior change involves choosing to forfeit one behavior for another. Choosing among alternatives involves assigning values to the alternative. Assigning value is tied to emotions, which often happens at a subconscious level, but also involves internalizing facts (Zaltman, 2003). Facts influence a consumer's beliefs, which in turn affect their emotions (Petersen, 2002). Emotions filter facts and thus reinforce beliefs. Emotions and cognition are intertwined to produce choice and behavior (Petersen, 2002). Therefore, emotions and facts are both elements of emotions-based methods for motivating behavior change.

Emotions-Based Approach to Public Health and Nutrition Education

Thus far, food safety behavior change programs have mostly appealed to consumers' cognition by presenting facts and rational explanations for recommended behaviors. However, consumer food safety knowledge exceeds their food safety behaviors. A novel approach such as

an emotions-based approach is a promising method to apply to public health and nutrition education. An emotions-based message connects a desired behavior with an important value held by the target audience. Emotions-based messages present to the target audience a personally relevant, emotionally-stirring picture or photograph with words or phrases connecting the picture to the proposed behavior. The message focuses on emotional motivators, rather than cognitive reasoning.

Pulse Points in the Literature

Studies of the pulse points, motivators, and emotions of parents show common features. Parents generally desire the self-satisfaction and social status of being considered a good parent. This often involves not feeling guilty and a resistance to being seen as extreme or over the top. Parents also frequently reveal that they make choices which will maintain family traditions or remind them of their own parents. Additionally, many parents want to feel secure. Security includes protecting children from danger and trusting spokespeople. Pulse points of mothers of young children are similar despite other demographic differences such as age, race, and child age and gender (Morrongiello, et al., 2009; Jordan, et al., 2007).

Allcock et al. (2008) presented a list of eighteen core values to consumers via telephone interviews and the consumers selected four that were most important to them. The four main values were “family, to have a happy loving family,” “God’s will, to follow God’s plan for me,” “health, to be physically well,” and “spirituality, to grow and mature spiritually” (Allcock., et al., 2008).

After studying motivators for parents of pre-school age children to purchase healthy foods, Noble et al. (2005) eventually equated purchasing healthy foods with good parenting. In

this study, parents said good parenting was “a desire to raise happy, healthy children.” More specifically, good parenting included a sense of duty or responsibility toward their family, a parent’s love and affection for their children, spending quality time with children, feeling fulfilled and content, and a desire to educate their children and instill healthy habits in their children (Noble, et al., 2005). Parents associated good parenting with conformity to social norms and being perceived as a good parent. Motivators to purchasing less healthful foods were a desire to avoid conflict with their children and expedite a tiring chore, feeling guilty for not spending enough time with children and using unhealthful foods as a compensating treat, and a need to feel in control over what problems the children may cause at the grocery store. Parents accurately knew healthful and less healthful foods but admitted emotions or anticipated emotions may cause them to choose less healthful food. The parent’s emotions can override reason and cognition when making behavioral choices.

Morrongiello et al. (2009) gathered data to identify values and pulse points for mothers in order to produce persuasive messages to reduce childhood injuries. Mothers were divided into focus groups according to age and gender of their child. Results were consistent among all focus groups, suggesting mothers of young children have similar motivators and may have similar core values. Eighty percent of mothers liked explicit, graphic images of severe child injuries. Mothers also liked positive images of happy children. Mothers liked hearing personal testimonies from other mothers in the messages, and scenarios they could identify with, making the message personally relevant. Mothers did not like messages which made them feel guilty or like they were not good parents. Mothers felt torn between protecting and overprotecting their child, not wanting to hinder the child’s independence. It cannot be

determined whether the messages perceived as most motivating resulted in actual behavior change because an evaluation of the resulting persuasive messages has not been published.

Another focus group study to uncover the pulse points of mothers took place in Sydney, Australia with thirty-seven middle-class mothers of infants (Leask, et al., 2006). Pulse points brought out in the six focus groups included the desires to be a good mother, maintain family traditions, and have security (i.e. protecting children and trusting medical professionals), as well a desire to not be known as an extremist type of mother: “burn your bra types,” “hysterical,” and those “who go against it for rebellion’s sake” (Leask, et al., 2006). The researchers also saw that when mothers were emotionally aroused, emotions preceded reason. Interestingly, facts may solidify a consumer’s current supportive or opposing belief, regarding a particular health behavior such as vaccination (Leask, et al., 2006).

Jordan et al. (2007) conducted focus group with seventy-eight mothers to determine barriers and motivators toward behavior change. Themes revealed in data analysis were similar across all the focus groups, suggesting, as Morrongiello et al. (2007) did, that mothers of young children may have pulse points alike to one another. Barriers to behavior change included perceived unnecessary effort or unpleasantness with the proposed behavior, a lack of identification with the proposed threat, conflicting traditions, and the imposing demands of raising children amidst a busy lifestyle. Mothers seemed to be motivated to change when simple, fun recommendations were offered which could be adapted to the mother’s lifestyle and established habits. Emotional pulse points included love for their child.

Emotions-Based Nutrition Projects with Mothers of Young Children

Dietitians working in the WIC program and other public health nutrition institutions have realized that traditional, factual nutrition education messages do not effectively result in positive behavior change (Kling, 2007; Kallio, 2007). Emotions-based messages are offered as an effective tool for behavior change (Kling, 2007; Kallio, 2007). J. Kallio, a dietitian working in Boston, Massachusetts, writes, “Humans are *feeling* machines that *think* rather than *thinking* machines that *feel*” (Kallio, 2007). Kling used focus groups to reveal mothers’ feelings toward family meals. Kallio and her colleagues used emotions-based techniques for a variety of nutritional topics relevant to participants in the WIC program (Kling, 2007; Kallio, 2007; Pam McCarthy and Associates, Inc., 2006-2008). Both Kling (2007) and Kallio (2007) conducted marketing research with low-income mothers. The pulse points of Kallio and her colleagues’ research have not been published. Major themes in Kling’s (2007) research related to families included “acceptance,” “sharing,” “chaos” and “stress.” Mothers describe their family life as chaotic but positive (Kling, 2007). Women who indicated they do not enjoy meal preparation indicated mealtimes were stressful. Stress for these women resulted from the family’s complaints about food served and from the busy schedule of families. Some women also reported a preference for caring for their own needs to sitting down to a meal with children. Themes related to the ideal meal included “homemade,” “simple,” “quick,” “healthy,” and “attractive” (Kling, 2007). For effective nutrition messages, Kling recommends photographs depicting racially-diverse and non-traditional families and lettering that is large and colorful. In contrast to the findings of Nobel et al. (2005) and Morrongiello et al. (2005), Kling recommends that the text for emotions-based messages provoke guilt. She posits two emotional messages –

one evoking guilt and one evoking some other emotion– will motivate mothers to make the behavior change to have more family meals (Kling, 2007).

As of September 2, 2009, the Massachusetts Department of Public Health and the Massachusetts WIC program have developed thirty-three separate emotions-based messages as well as a procedure for personally and emotionally connecting to each mother in her WIC appointment (Pam McCarthy and Associates, 2006-2008; Kallio, 2007; Graney, 2009). The program developed is called “Touching Hearts, Touching Minds.” Each message, or hand-out, includes a full-color photograph of an emotional, child-related scene. Most photographs and messages are positive. The reverse side of each hand-out includes further information about the topic presented emotionally on the front side of the sheet. This factual information is also presented emotionally and includes items such as personal testimonies and snapshots of mothers of young children, recipes, and helpful hints or tips. The researchers for “Touching Hearts, Touching Minds” found that nutrition education in WIC was more effective using emotions-based materials and techniques and motivated families in Massachusetts WIC to make healthy behavior changes (Kallio, 2007; Graney, 2009).

In conclusion, foodborne illness is an important health issue in the United States which needs to be addressed, especially for young children. As a food and nutrition assistance program that reaches one quarter of the people 5 years old and under in the United States, WIC provides an excellent framework within which intervention can be made to reduce the incidence of foodborne illness for women, infants, and children and thereby increase the health of this underserved population (United States Department of Agriculture Food and Nutrition Service, 2009; U.S. Census Bureau, 2000). One aspect of food safety which consumers control is

proper cooking of meat, for which a food thermometer is the only accurate measurement. However, mothers of young children do not perform adequate temperature measurements to prevent foodborne illness although there is evidence that they are knowledgeable regarding such need. Because knowledge does not necessarily increase food safety practices, additional interventions are needed to motivate women and mothers in WIC to use a food thermometer in ground beef patties. Emotions-based data acquisition using projective techniques can lead to emotions-based messages, a promising behavior change approach for public health and nutrition education in general and for food thermometer use in ground beef patties in particular.

This thesis is part of a larger project to increase thermometer use among Women and Mothers in WIC, grocery store meat counter shoppers, and Hispanics in the Pacific Northwest. The goal of the research presented in this thesis was to identify motivational needs of WIC mothers and develop materials to increase the use of food thermometers for cooking ground beef patties by mothers participating in WIC in Washington. In order to accomplish this goal, there were three objectives:

1. To determine the motivational needs of WIC mothers related to food thermometers
2. To design attractive, motivating, emotions-based handouts about using food thermometers for ground beef patties at home
3. To implement a food thermometer campaign in WIC offices in Washington

METHODS

This thesis is part of a larger project, continuing a previous campaign to increase consumer use of food thermometers in small cuts of meat. The previous campaign, “Now You’re Cooking...Using a Food Thermometer,” assessed the needs of consumers in the Pacific Northwest and created several food thermometer educational materials. The “Now You’re Cooking...Using a Food Thermometer” educational materials included a bookmark, brochure, video, a high school home economics food thermometer teaching kit, and recipe cards.

The current food thermometer project is a social marketing campaign called “160°F For Your Family.” There are five components of this project, but the ultimate goal of “160°F For Your Family” is to increase use of food thermometers in ground beef patties among women and mothers in WIC, grocery store meat shoppers, and Hispanics in the Pacific Northwest. These three audiences were selected to reach the general population and two underserved populations in Washington and Idaho. The first step of “160°F For Your Family” was a telephone survey of the ground beef patty preparation and cooking practices of consumers in Washington and Idaho. The second part of the project was determination of the accuracy of six dial and digital instant read thermometer models when cooking ground beef patties using two popular consumer methods revealed through the survey of ground beef patty preparation and cooking practices. The third part of the project was a needs assessment of the WIC and grocery store meat shopper populations. The needs assessment was used to create motivational, emotions-based food thermometer-use messages to disseminate in WIC clinics in Washington and grocery stores in Idaho. A rack card and three recipe cards were created for the grocery store population, three rack cards and posters were created for the WIC audience, and a website and

video were created for the general population. The fourth component of the project was the development and execution of a consumer evaluation of the emotions-based food thermometer-use messages. The evaluation assessed food thermometer behaviors and attitudes to evaluate the effectiveness of the food thermometer educational materials. The final part of the project will be to perform a needs assessment of a Pacific Northwest Hispanic population, then design and evaluate the effectiveness of food thermometer educational materials written for this audience.

To accomplish the ultimate goal of motivating food thermometer use among WIC participants in Washington, methods for this portion of the project were developed for each of the following three objectives.

1. To determine the educational and motivational needs of women and mothers in WIC related to food thermometers
2. To design attractive, motivating, emotions-based handouts about using food thermometers for ground beef patties at home
3. To implement a food thermometer campaign in WIC offices in Washington

The phrase, “160°F For Your Family,” was selected as the title of the current food thermometer campaign to illustrate the fact that this is an emotions-based food safety education campaign. Grocery store meat shoppers and women and mothers in WIC revealed family as a strong emotional motivator, thus “for your family” was selected for the campaign title. To reinforce the essential food safety information needed among consumers, “160°F” was also included in the title. The number “160°F” implies the use of a food thermometer and reminds consumers of the target internal temperature of ground beef patties. Throughout the

“160°F For Your Family” WIC Campaign, the term “hamburgers” was used in lieu of “ground beef patties” when communicating with consumers.

Determination of Educational and Emotional Targets

Objective 1 was to determine the educational and motivational needs of women and mothers in WIC related to food thermometers. To accomplish Objective 1, a needs assessment was conducted with the two populations primarily involved in this project – professionals working with low income women, and women and mothers in WIC. Data was initially collected from experienced practitioners working with low income audiences (WIC counselors and Extension/EFNEP educators), to gain insight into the motivational needs of low income women, to find out what needs WIC programs have for food safety educational materials, and to gain the benefit of practitioners’ knowledge and experience working with low income populations. Second, data was collected from WIC participants directly, to understand their emotional motivators as mothers and their perceptions of food thermometer use in ground beef patties.

Following the needs assessment interviews with practitioners, emotions-based focus groups were conducted for a needs assessment with the target population of women and mothers in WIC. The purpose of the emotions-based focus groups was to determine emotional “pulse points,” or key emotional motivators, of low income mothers. One focus group was for pre-testing purposes and four additional focus groups (pulse points focus groups, PPFG) were conducted to collect data. PPFGs were conducted with 4-9 women or mothers in WIC and held in public locations familiar to the participants.

Needs Assessment Related to Emotions-Based Behavior Change

Interviews with WIC Counselors.

Interviews with WIC counselors had two main purposes. First, in order to implement the project and distribute the materials, an understanding was needed of the educational procedures within the state-wide WIC system, and the administrative procedures of WIC counselors' clinic offices in particular. The interview questions also asked about current food safety or food thermometer education in the WIC counselor's WIC clinics.

Another purpose of these interviews was to gain WIC counselor feedback on "Now You're Cooking" materials. The "Now You're Cooking" materials were developed by project members in a previous joint WSU-UI Extension project to motivate consumer use of food thermometers, and were to serve as the basis for designing new WIC materials for this project. Copies of "Now You're Cooking...Using a Food Thermometer" food thermometer educational materials were mailed to the WIC counselors. WIC counselors offered feedback and suggestions for improving these materials for low-income, WIC audiences. Telephone interviews were conducted with Annie Goodwin, R.D. of WIC in the Benton and Franklin Counties; Linda Burton, R.D. of WIC in King County; and Kathleen Paganelli, R.D. of WIC in Yakima County. WIC counselors from these counties were selected because these county WIC agencies had previously agreed to participate in the project. The interviews were conducted January 20, 2008; January 21, 2008; and February 12, 2008. Each interview was audio recorded and lasted for 30-60 minutes. Notes were taken during the interview to supplement the recording. The questions used in the interviews can be found in Appendix A.

Interviews with Extension educators.

A series of interviews were conducted with two Washington State University Extension educators and three Expanded Food and Nutrition Education Program (EFNEP) staff. The purpose of these interviews was to gain practitioner insight into educating low-income clientele.

Telephone interviews were conducted with Washington State University Extension educators Lizann Powers-Hammond of Benton County Extension and Sheila Ryan of Yakima County Extension. Interviews were also conducted with three members of the Expanded Food and Nutrition Program (EFNEP) staff in Yakima County. Interviews were conducted with nutrition Extension educators and EFNEP staff because they are field experts in nutrition education for a low-income population. Educators were asked to identify key educational methods and approaches which should be implemented when developing materials for low-income audiences. They were also asked what methods should be avoided or excluded for this audience. Extension Educator and EFNEP interviewees were mailed a copy of the “Now You’re Cooking...Using a Food Thermometer” food thermometer educational materials developed previously, and asked to comment on how these might be improved for use with a low-income population. Each interview was audio recorded and lasted 30 – 60 minutes. Interviews were conducted on October 15, 20, and 30 in 2008. Interview questions are shown in Appendix B.

Development and Pre-Testing of Pulse Points Focus Group

A moderator’s guide for the PPFs was created through the collaboration of the “160°F For Your Family” project team and Pam McCarthy (Pam McCarthy and Associates, Inc.) in the format of a semi-structured interview using projective techniques. Some questions and

activities were selected and adapted from “Moderating to the Max,” by Jean Bystedt, et al. (2003).

The PPFM moderator’s guide consisted of the following questions:

1. Introduction of the moderator and the focus group session: Designed to help the participants feel relaxed so they would provide genuine responses in the focus group discussions.
2. Warm-up question: A game to ease the participants from a formal grouping of strangers into a conversation among friends.
3. Six discussion questions
 - a. Hopes and Dreams: Photographs of doors were laid out, each participant chose a photo and the mothers were asked what their hopes and dreams for themselves and their children are. This question was designed to help the mothers visualize their hopes and dreams and open up about their emotions towards their families.
 - b. Safety Continuum: Mothers were asked to rank various safety objects (e.g. seat belt, baby gate, food thermometer) from essential to nonessential. Participants then discussed their reasoning for prioritizing items as they did.
 - c. Drawing Moms: Participants drew images of themselves, the perfect mother, and a mother who uses a food thermometer in ground beef patties. They discussed the similarities and differences between the three images. This question was designed to allow mothers to project their emotions through an image.

- d. **Playing Court:** Participants self-selected themselves into a group of pro-food thermometer moms and anti-thermometer moms. These two groups then debated the use of a food thermometer at home.
 - e. **Moms as Marketers:** Participants described how they would motivate other mothers to use a food thermometer in ground beef patties.
 - f. **Spokesperson:** Several photographs and drawings of people of various ethnicities, ages, and occupations were presented and the participants discussed who would and who would not be a credible spokesperson for food thermometers.
4. At the conclusion of the PPFG, participants are asked to fill out a short demographics survey (see Appendix C) and incentives were dispersed.

Participants for the pre-test of the pulse points focus group were recruited via flyers displayed at the Whitman County Health Department and WIC office in Pullman, Washington from May 15 – 30, 2008. The flyer stated the purpose of the PPFG generically and indicated the date and time, incentive, and recruiter contact information. The incentive was \$50 cash. Participants were screened to include only English-speaking mothers who are pregnant or have at least one child under the age of 5. A letter, driving directions, and a parking permit were mailed to participants one week before the PPFG. A reminder phone call was made to each participant the night before the PPFG, and 9 women and mothers ultimately attended the focus group. Pam McCarthy moderated the pre-test PPFG to train the “160°F For Your Family” project team in conducting emotions-based focus groups.

Following the pre-test pulse points focus group, four PPFs were conducted in Washington to collect pulse points data. A new moderator conducted the next four focus groups. The moderator’s guide was slightly revised to clarify discussion questions that caused confusion in the pre-test PPF and to be in the new moderator’s conversational tone. Suggested time limits for each discussion question were added in the margin of the moderator’s guide based on the time used in the pre-test PPF. Also, the final two questions of the moderator’s guide (questions 3e and 3f) were noted to be used as time allowed. See Appendix D for a copy of the revised moderator’s guide.

Pulse Points Focus Groups

Table 1. Pulse Points Focus Group Methods, by County

| | Thurston | Yakima 1 | Yakima 2 | Whitman |
|---|--|--|---|--|
| Date, time, & location | Thursday, Oct. 27, 2008, 1:30 pm; Thurston County Public Library | Saturday, Nov. 1, 2008, 9:30 am; Yakima WIC office conference room | Thursday, May 11, 2008, 1:30 pm; Yakima County Public Library | Sunday, July 12, 2009, 3 pm; Whitman County Public Library |
| Recruitment method | Flyers posted in WIC & Head Start offices | Flyers posted in WIC offices | Flyers posted in WIC offices | Flyers posted in WIC offices, library, and DSHS office |
| Recruitment respondents and participants | 11 responded; 9 participated | 9 responded, 4 participated | 9 responded, 10 participated | 3 responded, 3 participated |
| Incentive, time for group | \$25 gift card; 2 hours | \$25 gift card, 2 hours | \$50 gift card, 2 hours | \$50 gift card, 1.5 hours |
| Questions asked | Questions 1-3e | Questions 1-3c, e, f | Questions 1-3c, e | Questions 1-3c, e, f |

For each of the four PPFGs, date, time, location, and recruitment venues are listed in Table 1. Notable differences or similarities are as follows:

The first PPFG was held in Thurston County. The participants were recruited using 8 ½ x 11-inch color flyers and quarter-page copies of the flyers as hand-outs. See Appendix E for a sample flyer. The flyers were posted at Thurston county WIC offices and a Head Start facility in Thurston County. The flyer hand-outs were given to pregnant women and mothers at Thurston County WIC clinics. Flyers announced the date, time, and location of the focus group, along with a generic description of the event (“discussion group” to “talk about topics of interest to mothers of young children”), incentives (\$25 gift card to a local grocery store and refreshments), and recruiter contact information (email address and local telephone number). The focus group was held in a Thurston County public library meeting room on Thursday, October 27, 2008 at 1:30 pm. Eleven women responded to the recruitment and were screened to include only those English-speaking women who were pregnant or had at least one child under the age of 5 and who could arrange their own child care. Members of the “160°F For Your Family” project team and their co-workers called each woman the night before the focus group to remind the women to attend. Nine women attended the pulse points focus group in Thurston County. The Thurston County PPFG lasted two hours and was audio and video taped. Questions 1 – 3e were asked. Time did not allow for the question 3f.

The second PPFG was conducted in Yakima County (labeled “Yakima 1” in Table 1). Recruitment flyers were equivalent to the flyers used for Thurston County PPFG recruitment, except for the date, location, and time of the focus group as well as updated recruiter contact information. Recruiter information included the same email as with the Thurston County PPFG

but a local Yakima telephone number. The other three PPFs were held in public library meeting rooms, but Yakima 1 PPF was held in a WIC conference room as, suggested by the WIC counselor in contact with the moderator. Respondents to the recruitment were screened in the same way as for the Thurston County PPF. Yakima WIC staff made reminder telephone calls to the women the day before the focus group. Four women attended the focus group and one left for a prior engagement after one hour. The focus group was video and audio recorded.

The Yakima 1 PPF did not result in as much excitement and emotional energy from participants as did the pre-test PPF and Thurston County PPF. This may have been because the conference room was not private; a man was using a copy machine behind a temporary dividing wall in the conference room. Furthermore, having the focus group in a WIC clinic may have caused the women to feel like they were in a group WIC appointment and were being evaluated by WIC. Therefore, following the Yakima 1 PPF, all additional focus groups were held in public libraries.

Three additional PPFs were planned and recruitment was performed after Yakima 1 PPF, but no women responded. To increase response, the incentive was increased to a \$50 gift card. New applications to the Washington State University International Review Board were submitted indicating a change in incentive value. Two PPFs were planned and recruited for by offering a \$50 gift card incentive. No women responded to the recruitment.

The third pulse points focus group took place in Yakima County (labeled “Yakima 2” in Table 1). Mothers in WIC were recruited using flyers and handouts similar to those in previous PPFs, but with updated date, time, and location. Potential participants were screened in the same way as for the Thurston County focus group. The moderator and staff from WIC in Yakima

made reminder phone calls to the participants the day before the focus group. Nine women responded to recruitment. Nine women and one man participated in the focus group. Data from the man was excluded from data analysis. The focus group was audio recorded with two separate machines.

The fourth PPFG was conducted in Whitman County. Mothers in WIC were recruited via flyers and handouts at the Colfax and Tekoa, Washington WIC clinics and by snowball effect recruiting (requesting mothers invite acquaintances). Potential participants were screened in the same way as for the Thurston County PPFG. The moderator made reminder phone calls the night before the focus group. The PPFG was audio recorded with two machines.

Recordings from each PPFG were transcribed. The transcripts were coded for themes using The Ethnograph v5.0 software (Qualis Research, 1998). Drawings produced by the PPFG participants were scanned and included in the analysis. Thematic analysis was validated by two additional researchers.

Development of the Materials

Objective 2 was to design attractive, motivating, emotions-based handouts promoting food thermometer use for ground beef patties at home. It was decided handouts would be the best materials in order to reach the ultimate goal of increasing food thermometer use in ground beef patties among women and mothers in WIC. To complete the task of creating attractive, motivating, emotions-based handouts, the “160°F For Your Family” project team was trained in an emotions-based behavior change method and a traditional health social marketing method. Next, pulse points gathered from the focus groups and key food thermometer messages were

composed into emotions-based handouts. The composed drafts were pre-tested in focus groups (DraftFG) and interviews (DInt) with the target population of mothers.

Group Training

Two forms of social marketing training were conducted with the “160°F For Your Family” project team. Pam McCarthy, a registered dietitian of the consulting firm Pam McCarthy and Associates, Inc. (<http://www.innovationary.com>), was hired to train the project team in the emotions-based approach to behavior change. The training took place June 3 – June 5, 2008. Training in the CDCynergy Social Marketing Edition program was held October 17, 2008 and was conducted by team members Sandy McCurdy, Courtney Staszac, and Tiffani Nalivka.

Creation of emotions-based food thermometer messages: drafting, pretesting, and revising.

Emotional motivators or pulse points from the PPFs were identified by reviewing the PPF transcripts, field notes, and impressions from the team members who were present. This review was presented to and discussed with the entire project team. Based upon the pulse points, the project team created a list of 137 food thermometer message ideas, selecting five which were most likely to resonate with mothers. The project team composed the pulse points and message ideas into a creative brief, to convey the PPF results to a graphic designer. The creative brief also functioned to solidify the project’s marketing strategy. On January 7, 2009, the creative brief and message ideas were sent to YaM Studio graphics designer in Seattle, Washington. YaM Studio was asked to use the creative brief to create emotional messages related to food thermometer use. See Appendix F for a copy of the creative brief.

The emotions-based food thermometer messages also included facts about food thermometers and addressed barriers to using a food thermometer. Although the goal of this research was to use an emotions-based approach to motivate food thermometer use, food thermometer facts were included on the reverse side to assist women and mothers in using a food thermometer. The food thermometer facts were composed using an emotional approach and writing style. The emotional approach and style included presenting simple messages, and integrating pulse points into the text by referring to the emotional need that can be met when using a food thermometer. Testimonials were included to show that ordinary mothers use food thermometers to meet their emotional need. An activity for mothers to perform with their children -- preparing heart-shaped ground beef patties -- was also included to evoke further emotions.

The written content of the food thermometer educational materials was drafted from February to May 2009 based on key food thermometer facts, barriers, and motivators determined from the focus groups, previously published studies, and the previous educational materials, "Now You're Cooking...Using a Food Thermometer." The key facts incorporated into the written content were the following:

1. The color of cooked meat is not a reliable indicator of doneness (safety) in ground beef.
2. An internal temperature of 160°F kills *Escherichia coli* O157:H7 in ground beef patties.
3. The quality, taste and texture of ground beef patties improves when they are cooked using a food thermometer.

4. Thermometers should be inserted sideways into the patty for accurate measurement (so that the sensing area of a dial or digital instant-read food thermometer is in the center of the ground beef patty).

Pilot-test focus groups.

While the written content was being composed, the graphics designer returned mock-ups of four sets of three images and messages for the food thermometer campaign. See Appendix G for copies of these mock-ups. Mock-ups, as well as the drafts of the written content, were pretested with mothers in WIC through focus groups (draft focus groups, DraftFG). Three DraftFGs were planned and recruited for using 8 ½ x 11-inch color flyers and quarter page copies of the flyer posted and handed out in Spokane, Washington WIC clinics. See Appendix H for a copy of the DraftFG flyer. Potential participants were screened to include only those English-speaking women who were pregnant or had at least one child under the age of 5 and who could arrange their own child care.

A moderator's guide was created to discover which messages resonated with mother of young children and to determine whether the materials created had emotional resonance. See Appendix I for a copy of the DraftFG moderator's guide. The moderator's guide included some cognitive pre-test questions and projective techniques. The DraftFGs took place at 11:30 am and 1:30 pm on Wednesday, March 23, 2009 in a Spokane County public library meeting room. Each DraftFG lasted one hour, refreshments were provided, and participants were given a \$25 gift card to a local grocery store for participating. The DraftFGs were audio recorded with two machines. The same moderator who had moderated the pulse points focus groups (PPFGs) also moderated these draft focus groups (DraftFGs). There were two DraftFGs with a total of seven

participants. The results of the discussions were summarized and given to the graphics designer to further direct and modify their work and were also used to modify the drafts of the written content. One set of the graphics designers' emotional images and messages were selected based on target population feedback in the DraftFGs, and this feedback was submitted to the graphics designers on March 27, 2009.

Materials revision.

The text for the written content was revised and tailored to the images chosen for distribution, according to feedback from the DraftFGs with mothers of young children. The content was reviewed by two food safety experts at Washington State University. Revised image and message drafts were received from the graphics designer.

Pilot-test interviews.

The revised images, messages, and content drafts were arranged in mock-ups of the materials in bi-fold brochure format and pre-tested with mothers of young children. These pre-tests were conducted in the form of semi-structured one-on-one interviews. A convenience sample of seven Whitman County, English-speaking mothers with young children was recruited for these interviews. Each interview (Pilot-test Interviews, DInt) was conducted in the mother's home, lasted 30-60 minutes, and was audio recorded. Participants were given a \$25 gift card to a local grocery store for participating. The DInt interview guide is reproduced in Appendix J. One projective technique used in the DInt asked mothers to describe the perfect educational handout and then mark on a bull's-eye how the "160°F For Your Family" drafts rank compared to a perfect handout. For another question, mothers wrote down what a mother would say, think, and feel if presented with the "160°F For Your Family" materials in a WIC clinic. The

handouts used for these discussion questions are in Appendix K and were adapted from Bystedt, et al. (2003)

Further revision of materials.

Results from the draft interviews were used to make a final modification of the written content of the materials, which was sent to the graphics designer on June 2, 2009. The graphic designer formatted the written content and finalized the three rack cards June 19, 2009.


The cover of each finished card incorporated a picture of a child five years or younger and a commonly used household thermometer (mouth thermometer, outdoor thermometer, or bath thermometer). A picture of a ground beef patty with a food thermometer properly inserted, an emotional headline and graphic, and an emotions-based campaign logo tied all the cards together with a common appearance. The reverse side of the cards contained written information, with messages that were positive, simple and concrete, and emphasized the 'how' and 'why' of using thermometers with ground beef patties. Content was specifically designed to elicit the emotions of mothers with young children. For example, a fictitious testimony of a mother whose child contracted HUS from *Escherichia coli* O157:H7 in ground beef patties was composed based on the real-life testimony of a mother whose daughter developed HUS after consuming an undercooked ground beef patty (S.T.O.P., 2009). The content also included a ground beef patty recipe activity for mothers and their children; simple ideas for using thermometers in summer, including grilling tips for burgers; a cartoon depicting two mothers discussing myths and barriers to using a food thermometer; and emotional headlines. See Appendix L for a copy of the rack cards and Table 2 for a description of the rack cards.

The rack cards were 4"x9" in size. Bright, summer-time colors were used along with simple, eye-catching graphics. A common logo graphic and project title – "160°F For Your Family" – maintained campaign identity. Cards were printed in matte in full color on cardstock. Convenient bundles, containing one of each different card, plus a post card offering \$10 for completion of an evaluation of the materials, were held together by a rubber band.

Other campaign materials.

A website and video were created to supplement food thermometer information (available at <http://www.agls.uidaho.edu/thermometers/why.htm>). Digital versions of the three rack cards were included in the website for consumers and educators to download.

Table 2. Summary of WIC Rack Card Content

| Rack card cover | Title of written content | Topics included in written content |
|--|--|--|
|  <p>Sprinkler card</p> | <p>“Summertime Safety, Summertime Fun”</p>  | <ul style="list-style-type: none"> • Thermometers are easy and quick to use • Grilling tips for quality |
|  <p>Sick child card</p> | <p>“It happened to us...”</p>  | <ul style="list-style-type: none"> • Fictitious testimonial of a mom’s experience with children and <i>E. coli</i> • Color not good indicator of doneness; using a food thermometer is the only way to know for sure • Children are especially susceptible to pathogens in ground beef patties • Recipe for a child-friendly burger, encouraging parent interaction with children and involving child in cooking |
|  <p>Bath card</p> | <p>“Temperatures should be the least of your child's worries”</p>  | <ul style="list-style-type: none"> • Addresses the myth that using a food thermometer is time consuming • Addresses the pulse point of belonging; touches the myth that obsessive and anal moms use thermometer, not “moms like me” |

Campaign Dissemination

Objective 3 was to implement a food thermometer campaign in WIC offices in Washington. While the rack cards were being developed, WIC clinics were recruited as venues in which to offer the "160°F For Your Family" rack cards to women and mothers in WIC. WIC clinic input was sought for dissemination specifics such as the type of display unit and number of rack cards to offer at each WIC clinic. Campaign materials were mailed to each participating WIC clinic. The campaign was designed to be a two month, stand-alone behavior change campaign.

Recruitment of WIC Sites for Dissemination

Addresses of WIC offices in all 50 Washington State counties were obtained from the Washington list of WIC clinics by county (<http://www.doh.wa.gov/CFh/WIC/reports.htm>). Additionally, a contact name for each county was obtained from WSU Extension's Washington Farmer's Market website (<http://nutrition.wsu.edu/markets/wiccon.html>).

Invitations to participate in the study were written using a modified version of Dillman's Tailored Design Method (Dillman and Christian, 2008). The first contact was an email announcement, sent on April 1 and 2, 2009, alerting WIC educators that an invitation to participate would be forthcoming (see Appendix M for a copy of the email). One week later, a letter was mailed introducing the project (see Appendix N for a copy of the letter). The letter included a brief survey, asking if the recipients' county WIC would be willing to have the "160°F For Your Family" food thermometer materials in their WIC offices. Additional questions were asked for planning purposes, including whether or not staff could verbally offer the materials to clients, and in which rooms the WIC clinic could display the materials (i.e. waiting room, front desks, or clinic). Pictures of four display options were shown (i.e. countertop brochure stand,

spinning countertop racks, countertop easel) and the respondent was asked to indicate which would work best for WIC clinics in their county. Although there are fifty counties in Washington, only 33 letters were mailed out because one county had already indicated they were unable to participate, one had terminated several of their WIC programs, and ten counties seemed to have joint WIC clinics with other counties. Eighteen of the 33 surveys were returned within a week. A reminder email (Appendix O) went out to the remainder 15 counties with a link to an online version of the survey on May 1, 2009. Two counties responded to the email by taking the online survey. Two months later a final survey was received by mail.

In deciding the mode of dissemination, the survey responses were taken into account and ease for WIC staff was considered in many respects, while maintaining research validity and accuracy. Dissemination of the rack cards was self-serve by the women and mothers in WIC to keep WIC staff burden to a minimum. The display was designed to include a stack of rack cards and a larger image of the rack cards connected to it. The larger image would attract clients' attention without much staff involvement needed. Furthermore, WIC offices can be small and already full of literature, so a compact display stand was chosen which would fit in whatever location WIC offices had available. The small display stand would meet the needs of the smaller WIC clinics and was used in the larger clinics as well to keep the dissemination as standardized as possible.

A follow-up email (Appendix P) to participating WIC contacts was sent June 5, 2009, to explain the dissemination plan and to ask how many display stands each WIC contact wanted. A second email was sent to counties who had not replied (Appendix Q). After receiving this data, 80 display stands were purchased. The display stands purchased were acrylic sign holders,

13.125" x 8.5" with a literature pocket attached to hold literature such as brochures or rack cards up to 4 inches wide.

An estimated number of rack cards needed for printing and dissemination in each county was calculated based on the number of WIC clients served in each county during 2008. This information was obtained from the 2008 WIC Annual Report (<http://www.doh.wa.gov/CFh/WIC/reports.htm>). The numbers of WIC participants in each county participating in the campaign was rounded to estimate the number of women and mothers who would enter participating WIC offices during the 2-month dissemination period. A second number was then calculated for comparison: based on printing estimates, a total number of rack cards to be printed was decided upon and the number to disseminate per county was based upon relative WIC client load per county. Mathematical expressions of these calculations are in Appendix R.

WIC county offices were e-mailed on June 23, 2009 to confirm whether the estimated number of rack cards could reasonably be disseminated from their offices (Appendix S). Of the 17 county contacts, 13 responded to the rack card number suggestion and requested fewer or more rack card packets. For the remainder 5 counties, the suggested number of rack cards was sent.

Dissemination Kit

The food thermometer rack cards were packaged for mailing in a dissemination kit for each participating WIC contact. Each box of dissemination materials contained the calculated and confirmed number of rack card bundles, the county-requested number of display stands and a corresponding number of display inserts, one poster, and a letter. A diagram of a display

stand with the display insert and rack card packets is seen in Figure 2.

The rack card bundles were rubber banded together and consisted of one of each of the three 4x9-inch rack cards and one postage-paid business reply card inviting the reader to participate in an evaluation of the “160°F For Your Family” campaign. The bundles had the Sprinkler card on top and the picture of the child running through the sprinkler facing out. The next cards were the Sick Child card then the Bath card, and finally the business reply post card with the invitation to participate in an evaluation facing out and the mailing address facing in to the rack card bundle.

The display inserts and poster were enlarged versions of the front of the Sick Child rack card. An instructional letter (Appendix T) was mailed to each county along with the other campaign materials. The letter served as training for WIC counselors and included illustrated set-up instructions; general instructions about the campaign; color photocopies of the rack cards; small signs containing a statement for WIC staff to use to offer the materials; and a list of

Figure 2. Diagram of Materials Display



“Frequently Asked Questions” regarding the “160°F For Your Family” campaign, survey, and instant-read dial and digital food thermometers. While the campaign was designed to be carried out without much staff involvement, efforts were made to involve WIC staff where possible because campaigns are more effective if there is a personal element (Snyder, 2007). Campaign instructions sent to the WIC clinics recommended that WIC staff direct client attention to the rack cards. A three-sentence announcement was offered to the staff which they could speak to encourage women and mothers in the WIC clinics to pick up the materials.

WIC employees were instructed to insert rack cards into the display unit and set the display in a visible location of their choice within their WIC clinic. One poster was mailed to each participating county and the WIC counselor was invited to hang it in the clinic of their choice within the county. Each WIC clinic was asked to refill the display unit with rack cards as it emptied and to leave the display out in the clinic until the end of August.

Once dissemination kits were mailed, another email (Appendix U) was sent on July 28, 2009, to alert the counties that the dissemination materials had been mailed and to request acknowledgement of receipt. Another email (Appendix V) was sent three weeks into the project, on August 15, 2009, to remind WIC staff to offer the materials to WIC clients and to inquire how the campaign seemed to be progressing. Phone calls were made to the WIC counselors in the participating counties in November, 2009, to close the dissemination part of the “160°F For Your Family” campaign and thank the counselors for participating in the project.

RESULTS

Determination of Educational and Emotional Targets

The first objective was to determine the motivational needs of WIC mothers related to food thermometer behaviors. This was accomplished through interviews and focus groups with 1.) Professionals who work closely with or a similar population of low income mothers with young children and 2.) Women enrolled in WIC and mothers of children enrolled in WIC.

Needs Assessment Related to Emotions-Based Behavior Change

Interviews with WIC counselors.

WIC counselors indicated nutrition education at the WIC clinic was provided using handouts as well as posters and computers in the waiting rooms. Some of the WIC counselors indicated the WIC staff at their location liked to talk with the WIC women and mothers and welcomed new nutrition education opportunities. Others felt the WIC staff was already too busy with current duties to incorporate new nutrition education. Food safety education was not a key component in the WIC nutrition education program and few clinics incorporated food safety education regularly. WIC counselors believed WIC staff barriers to food safety education were a lack of WIC funding for food safety education and educational priority for issues related to a national WIC Food Package change in 2009.

Phone interviews with WIC counselors revealed that major national changes in the WIC program would be enacted in the fall of 2009 and preparing for this change would take much energy and time from WIC staff. The WIC counselors were apprehensive to have the “160F For Your Family” food thermometer campaign in WIC clinics since the campaign may take time away from duties related to the WIC change. The “160F For Your Family” food thermometer campaign

was designed with this apprehension in view, and the campaign was completed during the summer, before the changes came into effect in the fall.

Interviews with Extension educators.

The purpose of the Extension Educator and EFNEP staff guide was to ascertain the best way to present food thermometer education to a low income audience and also to gain feedback on food thermometer materials which were previously published by the “Now You’re Cooking” project. The Extension educators and EFNEP staff indicated emphatically that good educational materials for low-income audiences are colorful with many pictures, few words, and large fonts. Simple materials with one main point at a third grade reading level are preferred. Extension educators and EFNEP staff strongly recommended that food thermometer educational materials be accompanied by a free food thermometer.

Pulse points focus groups.

Pulse points focus groups (PPFGs) were conducted with women and mothers in the WIC program in Washington. The purpose of the PPFGs was to discover the emotional motivators to emphasize when developing emotions-based elements of the food thermometer campaign. The PPFG moderator’s guide was composed in the format of a semi-structured interview. See Appendix D for a copy of the PPFG moderator’s guide. To allow the moderator to appear empathetic towards and akin to the WIC participants, and to encourage participants to speak freely about their imperfect or unhealthy habits, calorie dense refreshments were served and the moderator wore a garment with a small stain and casual footwear. Several participants mentioned how much fun they had and one woman asked to be involved again in similar focus groups. Therefore, respondents enjoyed the pulse points focus groups and projective techniques.

A total of 24 women participated in the four pulse points focus groups (PPFGs). Approximately two-thirds of participants were between 25 and 34 years old and one-third were 18-25 years old (Table 3). One participant was between 35 and 44 years old. Half the participants were White/Caucasian by ethnicity, one-third were Hispanic, a few were African American, and one participant indicated her ethnicity as White/Caucasian, Hispanic, and Native American. The majority (83.4%) of participants had completed high school, obtained a GED, or completed some college. Over the course of the focus groups, three women volunteered that they were currently attending college. A few completed some high school and a few had graduated from a 4-year university.

Table 3. Sociodemographic Characteristics of PPFG Participants

| Sociodemographic Characteristics of Pulse Points Focus Group (PPFG) Participants | | | | | | | | | | |
|---|-------------------------|----------|---------------------------|----------|---------------------------|----------|---------------------------|----------|--------------------------|----------|
| Characteristics of Participants | Total (n=24) | | Thurston (n=9) | | Yakima 1 (n=4) | | Yakima 2 (n=8) | | Whitman (n=3) | |
| | n | % | n | % | n | % | n | % | n | % |
| Age | | | | | | | | | | |
| 18-25 | 7 | 29.2 | 1 | 11.1 | 2 | 50 | 4 | 50 | 0 | 0 |
| 25-34 | 16 | 66.7 | 7 | 77.8 | 2 | 50 | 4 | 50 | 3 | 100 |
| 35-44 | 1 | 4.2 | 1 | 11.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Race/Ethnicity | | | | | | | | | | |
| African American | 2 | 8.3 | 0 | 0 | 1 | 25 | 1 | 12.5 | 0 | 0 |
| Hispanic | 8 | 33.3 | 1 | 11.1 | 1 | 25 | 6 | 75 | 0 | 0 |
| White/Caucasian | 13 | 54.2 | 8 | 88.9 | 2 | 50 | 1 | 12.5 | 2 | 66.7 |
| Mixed Race | 1 | 4.2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 33.3 |
| Education Completed | | | | | | | | | | |
| Some high school | 2 | 8.3 | 0 | 0 | 0 | 0 | 2 | 25 | 0 | 0 |
| High school or GED | 7 | 29.2 | 5 | 55.6 | 0 | 0 | 2 | 25 | 0 | 0 |
| Some college | 13 | 54.2 | 4 | 44.4 | 3 | 75 | 4 | 50 | 2 | 66.7 |
| Completed a 4-year university | 2 | 8.3 | 0 | 0 | 1 | 25 | 0 | 0 | 1 | 33.3 |

Determination of Pulse Points (Emotional Targets for Education)

There were five goals of the pulse points focus groups. Themes emerged from the PPFGs in the areas of these goals, as shown in Table 4. No theme entirely surfaced from any single question in the PPFG moderator’s guide (Appendix D). Themes and pulse points related to each goal emerged from multiple questions in the PPFG. Certain questions did result in a fuller discussion, however, and the primary association of goals, PPFG questions, and themes are outlined in Table 4. The overarching theme in the four pulse points focus groups was security,

including both protecting children and the security of living a good life. Other unexpected themes also emerged from the PPFs, including the use alternative safety methods instead of standard recommendations and a demonstration of food safety knowledge.

Table 4. Major Themes from Pulse Points Focus Groups

| Goals for PPFG Discussion Guide | Primary Corresponding PPFG Question | Corresponding Theme |
|--|---|---|
| 1. To discover the hopes and dreams that drive behaviors of women and mothers in WIC in Washington. | <ul style="list-style-type: none"> ● 3a Hopes and Dreams ● 3c Drawing Moms | <ul style="list-style-type: none"> ● Live a good life (happiness, health, material success, peace from both chaos and worry, and positive relationships) |
| 2. To uncover how Washington mothers of young children feel about the relevancy of food thermometer-related messages to themselves. | <ul style="list-style-type: none"> ● 3b Safety Continuum ● 3c Drawing Moms | <ul style="list-style-type: none"> ● Thermometers perceived as unnecessary because there are alternatives for keeping meat safe ● Using a thermometer would make me an anal, overprotective mom |
| 3. To find out what would make food thermometer behaviors (for ground beef patties) a higher priority in the lives of mothers of young children. | <ul style="list-style-type: none"> ● 3b Safety Continuum ● 3c Drawing Moms | <ul style="list-style-type: none"> ● An experience with foodborne illness ● If a respected “good mom” used one |
| 4. To ascertain the best way to deliver thermometer-related messages to Washington mothers. | <ul style="list-style-type: none"> ● 3e Moms as Marketers ● 3f Spokesperson | <ul style="list-style-type: none"> ● Statistics and Fear ● Relate it to children and to being a good mom |
| 5. To identify the perceived benefits to a Washington mother for changing thermometer-related behaviors. | <ul style="list-style-type: none"> ● 3b Safety Continuum ● 3d Playing Court | <ul style="list-style-type: none"> ● Barriers to thermometers <ul style="list-style-type: none"> ○ Unnecessary ○ Suitable, alternate methods ○ Makes me look overprotective ● Protects kids ● Warm food for good taste |
| Other themes | | <ul style="list-style-type: none"> ● Alternative safety methods ● Food safety knowledge |

Goal 1: To discover the hopes and dreams that drive behaviors of women and mothers in WIC in Washington.

Throughout the entire focus group, one major theme emerged among the hopes and dreams that drive behaviors of women and mothers in WIC in Washington: the desire to live a “good life”. The term “good life” was mentioned during the Thurston County PPFG, but related ideas came up in all the focus groups among all women for all questions, but especially in responses to PPFG questions 3a (Hopes and Dreams) and 3c (Drawing Moms). One woman in the Thurston County PPFG described her dream of a good life for her children:

Mother: Maybe...more of an education. Do things, have a job that pays more, and that they would learn from my mistakes. They would choose good people, good husband or wife; they would have a good life.

Moderator: Do your hope and dreams, will they change as your children get older?

Mother: I don't think so. I just want to get them a good foundation. Be the best they can be. (Thurston County, 250-263)

Aspects of a good life mentioned by the women included happiness, health, material success, peace from both chaos and worry, and positive relationships. The women and mothers in the focus groups especially indicated a desire for a good life for their children. In each of the PPFGs, mothers said that they make many of their decisions based on what would be best for their children. Children are their highest priority. *“I just want what's best for [my daughter], you know? Family wise and educational wise”* (Yakima 2, 334-335).

Several women explicitly mentioned they want happiness: five in the Thurston County PPFG; four in the first Yakima PPFG, and one in the second Yakima PPFG. In the first Yakima

PPFG, one mother mentioned the happiness behind the door picture she chose: *“I’m walking up to the house and knowing it’s my kids inside and just picturing what they’ve done. If I’m not alive but knowing they’ve become successful and they are happy.”* (Yakima 1, 59-63)

Mothers in the PPFs wanted their children to have a good life and expressed pride related to how their children were doing currently and anticipated pride over their family in the future. *“I think it would be a good feeling if they achieve their goals. Not that I accomplished something but I helped them accomplish... but being there for them and being a good mother. It’s a nice feeling being there for them”* (Yakima 1 133-138).

Health was also mentioned frequently by mothers in the PPFs (n=11). Mothers wanted their children to be healthy and a few (n=2) also expressed a desire for their own health.

The good life was further characterized by a condition of peace from chaos and worry. A mother in the first Yakima focus group described her drawings of mothers: *“In the background is a scene of nature because I relate that to peace. I being a perfect mother would have peace.”* (Yakima 1, 542-545). Another woman said, *“Well at the end of the day I just want to know that my kids are secure....At the end I just want peace of mind.”* (Thurston County 1529-1531, 1539-1540).

Several mothers referred to the busyness of a mother’s life. A few of the perfect mothers drawn in each PPF had busy schedules:

“[The perfect mother] pretty much is always put together. Every day. She doesn’t look tired. She has her time scheduled and everything, and in everything you could possibly be in. Like take your children to play dates. And I don’t know. Just. Art classes. Is on the PTA. Just is out there and all pretty much. And still, she’s saying dinner is ready. She cooks

home meals every night. She never microwaves the meal ever (laughs)” (Whitman, 598-609).

Almost all mothers in all PPFGs made at least one comment about wanting to protect their children and had many comments about the ways they protect their children. Safety tools and safety methods enable mothers to feel peace rather than worry for their children. *“You just do it. You find the time, because you don't want a sick or deathly ill child on your hands”* (Whitman, 900-903). *“I'd rather my son be safe. Take the extra time. Not have him get sick”* (Thurston County, 1831-1833).

Positive relationships were also a hope and dream for the women and mothers in WIC. Children and other family members were the most important relationships to many mothers. In response to PPFg question 3c, the women and mothers drew something they valued in their hand and in the hand of a proverbial perfect mother. Seventeen women drew their family or children, two drew friends or relationships in general and one drew a heart. The remaining four women either did not complete their drawing or drew something other than relationships in their hand. PPFg conversations also indicated that the women and mothers wanted their children to be around “good people” and to feel loved.

“My neighbors are so much drugs and just bad people that I don't let my kids go play outside cause I don't want them around – I hate to say it – bad kids. You know? If my kids, if something bad's gonna happen, I want it to be from me, you know, like that I spanked them, that I messed them up, not my neighbors. You know?” (Thurston County, 369-378).

In conclusion, discussions following several questions from the PPFG moderator's guide indicated the hope and dream of women and mothers in WIC is desire to live a good life. For these women, a good life includes happiness, health, material success, peace, and positive relationships for themselves and their children.

Goal 2: To uncover how Washington mothers of young children feel about the relevancy of food thermometer-related messages to themselves.

The use of food thermometers was especially discussed in questions 3b (Safety Continuum) and 3c (Drawing Moms) of the PPFG. Discussions about food thermometers indicated that the women and mothers participating in the PPFGs felt strongly that protecting their children was very important, but many mothers felt food thermometers were unnecessary. As one woman said, the person who could convince mothers to use a food thermometer is someone who *"knew how to kill a dead horse"* (Yakima 2, 2042-2044).

In each PPFG there were some women and mothers who described the woman they believed would use a food thermometer as an overprotective mother (n=5), even someone who was anal or obsessive. The women and mothers in the PPFGs were asked to draw and describe a mother who *"is very concerned about what her child eats. She washes fruits and vegetables before giving them to her family, uses a food thermometer when cooking hamburgers, and keeps raw chicken separate from the cold salad."* Respondents said this kind of mother – a mother who uses a food thermometer whenever she cooked hamburgers -- was on the one hand protective and on the other hand overprotective. In describing her drawing of a mother who uses a food thermometer, a mother in the Thurston County PPFG called the food thermometer mother a perfect mother:

“And then the perfect person has a food thermometer in her hand because she sticks it in everything and she has a fridge and everything is separated and she washes the vegetables and stuff and she always says ‘be safe’ and ‘wash your hands.’ Kind of like the anal mom.” (Thurston County, 909-917).

Some women and mothers in the PPFs indicated the mother who used a food thermometer was commendably looking after her family:

“She's really concerned about this, or...that you take the extra step to check your food with a food thermometer. It would just stand out, because I don't know very many moms who do that. Take the time to check the meat.” (Whitman, 766-772).

Others said the food thermometer mother was “weird” and “anal.” At least one mother in each of three PPFs used the term “anal” in the course of conversation about a mother who uses a food thermometer. Other negative terms women and mothers in the PPFs used to describe this overprotective mothers were “O.C.D.,” “crazy,” and “weird.”

“I don't think that I would see it as negative because I've used a thermometer once in a while. But I think I know some people who would, who would think you were being kind of anal. Or like, ‘You don't know how to cook.’ Like a judgment kind of thing. I know people who would do that.” (Whitman, 774-782).

When asked how the children of a mother who used a food thermometer would describe her, one mother in the first Yakima PPF said:

“They are gonna say, ‘my mother drives me crazy. She is a worrywart. I can't do anything. Can't even eat an apple before she washes it.’ The perfect mother, I think her

kids would be happy with her if she really is perfect. Or, oh my mother is so perfect she drives me crazy” (Yakima 1, 700-709).

A mother in the Thurston County PPFG similarly said, *“Mom needs to relax. She’s a freak”* (Thurston County, 930-931). Women and mothers in all four PPFGs expressed a desire to protect their children without going to an extreme.

There is a balance to be achieved between being a protective mother and having a good life. Respondents agreed that being overprotective results in less than a good life. As one mother said, mothers need *“the proper precautions. And be able to balance on the rest of your life. The ability of kids to go outside and play and their need for that. They will get dirty.”* (Yakima 1, 773-778)

The women and mothers in the PPFGs were concerned about the protection of their children, and admitted some dangers were out of their sphere of influence. The women and mothers said there are ways to protect children from some uncontrollable dangers but not all uncontrollable dangers. A woman in the Whitman county PPFG compared nonessential food thermometers and child leashes to essential seat belts and fire alarms:

“I mean like there’s other ways to check if meat is done, but there’s not another way to keep your kids in their seat in a car accident. There are other ways to keep a kid near you but there’s no other way to protect them in a fire.” (Whitman, 320-326).

House fires were an example of a danger mothers could not control, but could offer protection for. Mothers believed seat belts and fire alarms were essential tools to protect against uncontrollable car accidents and fires. One woman explained why fire alarms were essential safety tools: *“Fire alarms. You can’t really control that [house fires]. Like, you can’t. Even if you*

are in the house sleeping. I mean you can't watch for fire all the time." (Whitman, 265-268).

Foodborne illness was an uncontrollable danger against which some women said they could not protect their families. Mothers were not convinced that food thermometers were a sure protection against foodborne illness in ground beef. In fact, after a discussion in the Thurston County PPFG about the details of some foodborne illnesses in beef, a woman concluded there is one sure method for protecting against foodborne illness: *"I was vegetarian once; I think I'll just go back"* (Thurston County, 710).

Women and mothers felt food thermometers were unnecessary because there were other methods of checking for doneness and safety in meat besides using a food thermometer. One of these other methods was checking the internal color of the meat. *"I think that if you, if there's a question I always just cut it open in the oven or on the stove, ok it's still pink? I'll cook it more."* (Thurston County, 497-500).

A few women and mothers overcook or burn their meat instead of using a food thermometer to make sure the food is cooked thoroughly. One woman used the term "burn," a few mothers nodded in agreement when asked if they similarly burn their meat, and one cooked until the food was "rock hard."

I don't want to eat undercooked chicken so I just cook it enough so you can tell. It's rock hard. I'd rather it be rock hard than undercooked. I put mine [food thermometer card] right there [near the essential end of the continuum of safety tools]. I do think it's important it's just I don't use it because of my other emergency methods (Yakima 1, 325-342).

Another reason the women and mothers gave for not using a food thermometer was because their usual cooking methods or eating habits do not warrant using one. Some women said they do not cook ground beef patties at home, some dice or shred their meat, some boil meat, and others say they do not cook. All of these were given as reasons why using a food thermometer is unnecessary in their household.

"I don't think it's impossible. For me, it would be really hard because I don't bake so I don't really have a use for it. Like I said earlier on my meat, like my pork and stuff I always boil it. And, you know steaming little pieces, or if it is in a big chunk, throughout cooking, I cut it, not into halves or anything, just slicing it enough to make sure it's getting cooked. And then after that I fry it. So I just, I just don't have a use for it. I don't make hamburgers. I don't bake in the oven and stuff. It would be hard to convince me to use." (Yakima 2, 1346-1361).

Goal 3: To find out what would make food thermometer behaviors for ground beef patties a higher priority in the lives of mothers of young children.

Goal 3 was primarily addressed by the women and mothers in PPFQ questions 3b (Safety Continuum) and 3c (Drawing Moms). Women and mothers in the focus groups said they believed mothers do not use food thermometers because using food thermometers is not a common practice or other "good moms" do not use a food thermometer. *"I assume it's safe because everyone in the universe has never had an issue... I hardly ever see anyone use that and I never see a child gets sick from not using it"* (Yakima 1, 646-648, 650-653). On the contrary, one mother explained that she will sometimes perform an unsafe behavior if a fellow good mom was unsafe.

“Foolish but I have done that [not used seatbelts] before. Why? Because I know a woman who is a very, very good mother. She has done that. But I guess it is a memory of that one good person. But just this one. But then I am like- that was stupid. ... It is not that big of a deal. I really looked up to her. Even the best people make mistakes.” (Yakima1, 1146-1170).

One may suppose that if a mother were to have an experience with a foodborne illness, that would cause them to begin to use a food thermometer. A mother in the first Yakima PPFPG said,

“I was just thinking what I think you guys were trying to get to when you were saying what would have to happen to make it more important, is if maybe someone you knew or someone actually died from like a food poisoning thing or was hospitalized sick from something like that maybe I would be more, would make it more important to you because, you know you want to watch out for, somebody sick.” (Thurston County, 594-605).

A woman in the Thurston County PPFPG said her grandfather had trichinosis and she did indicate she uses a food thermometer, however she does not regularly use a food thermometer in thin cuts of meat and she is not convinced of food thermometer accuracy:

“When you're talking about smaller pieces of meat, I know a lot of times I won't pull it [the food thermometer] out just for the fact of you know you've got meat that's maybe this thick and I'm cooking a pork chop or something and the thermometer is this long, you don't know if you are getting it to close to the edge, you don't know if it's really accurate, you know.” (Thurston County, 1431-1443).

Mothers are willing to pay the price for things that are important to them. One mother in the Thurston County PPFG said she would purchase an additional inexpensive shirt for her child if there were no clean shirts available at home. Another mother in the Thurston County group mentioned her children have prepaid cell phones and two mothers agreed that purchasing cell phones for a child is a good idea. A third mother in the Thurston County group summed up the idea of paying a monetary price when it is important:

“Well, it's a priority thing, you know? It's like toilet paper. I mean, if you really think about it, are you really going to go without it? I mean, if it's something... You show to people -- ‘this is really important; this is really good for your kids.’ -- you're gonna spend.”
(Thurston County, 1954-1962).

Food safety is something the women and mothers expressed being willing to pay the price for:

“Because I'd rather my son be safe. Take the extra time. Not have him get sick. I accidently got myself really sick with meat one time and I just thank God that I didn't feed it to my son and he could get really like deathly sick.” (Thurston County, 1831-1837).

Goal 4: To ascertain the best way to deliver thermometer-related messages to Washington mothers.

There was not much enthusiasm in the discussion related to how to convince mothers to use a food thermometer (Question 3e, Moms and Marketers, in Appendix D). Also, within and between focus groups, there was little agreement between mothers. One woman in each of three PPFGs suggested scare tactics and a few mothers suggested the use of disgust. After the PPFGs were completed, question 3e was recognized to actually be a direct question rather than

one using projective techniques. This direct question was the question soliciting the least enthusiasm and emotion, indicating projective techniques may elicit more data related to emotions than direct questioning does.

When asked how to convince fellow mothers how to use a food thermometer, a few women answered “scare tactics” or “scare them” (n=3 women in 3 PPFGs). Women and mothers also believed disgust would motivate mothers to change their behavior to incorporate food thermometer use.

“You know, pork, if you don't cook it: trichinosis. It's pretty nasty. If you know what that is, it's kind of gross. You know, the live organisms in your meat and stuff. It, it kind of changes it for me. I'm more likely to cook it through knowing the potential of there being creepy crawlies that you don't know about.” (Thurston County, 607-619).

After the Thurston County PPFg participants discussed contamination of meat, there was a collective sense of disgust and one participant stated, *“I was vegetarian once, I think I'll just go back.”* Although the women expressed that fear and disgust may convince them to use a food thermometer, this approach may convince consumers to give up meat altogether rather than finding an alternate, safer method for cooking meat.

Goal 5: To identify the perceived benefits to a Washington mother for changing thermometer-related behaviors.

More barriers than benefits were identified in the PPFGs. Perceived barriers to using a food thermometer have been discussed under Goal 3 and are summarized in Table 5. Mothers in WIC do not use food thermometers in ground beef patties because of conflicting societal pressure and personal values, a lack of perceived control over foodborne illness, mistrust of

food thermometers, lack of identification with perceived – but inaccurate – uses of a food thermometer, and cooking or other lifestyle habits which do not seem to warrant use of a food thermometer.

Table 5. Perceived Barriers of Mothers in WIC to Using a Food Thermometer in Ground Beef Patties

| Barriers to Food Thermometer Use | |
|--|--|
| Related to societal pressure | Fear of a negative image, e.g. if mother uses a food thermometer, others will think she is overprotective or weird |
| | No food thermometer users among their respected acquaintances |
| Related to the mother’s values | Preventing foodborne illness is not a high priority and not a concern |
| Related to perceived behavioral control | Feel helpless against foodborne illness |
| Related to the function and purpose of food thermometers | Do not believe food thermometer is accurate, sure protection against foodborne illness |
| | Misconceptions about food thermometer purpose (e.g. believe food thermometer should be used to judge if food is cool enough to feed a young child) |
| Related to the mother’s lifestyle | Food thermometers do not fit mother’s lifestyle (e.g. cooking habits) |

Few benefits to food thermometers were discussed in the PPFGs. Most comments about the benefits of a food thermometer were mentioned during Question 3d of the PPGF. This question forced the women and mothers to think of benefits to using a food thermometer. Question 3d of the PPGF discussion guide was used only in the Thurston County focus group. The first Yakima PPGF and the Whitman PPGF each had too few participants available for Question 3d (n=3 for both groups). In the second Yakima group, time did not allow for Question 3d.

Question 3d divided the women and mothers in two teams to think of and then argue pros and cons of food thermometers. Over the course of the discussion for Question 3d in the Thurston County PPF, the women and mothers thought of several ways for a low-income audience to acquire a food thermometer. The women and mothers suggested one could obtain a necessity at the food bank and use the money saved to buy a food thermometer or could use online resources such as EBay and Craig's List to acquire used food thermometers. Other benefits listed by the women and mothers included giving peace of mind (n=1) and protecting children (n=2). One mother said a good cook should not need to rely on a food thermometer, another indicated a food thermometer could help someone know when her meat was done cooking. *"I don't think a lot of people would be like that. Because you do think like, whoa, like, is this done? I mean, it's in the back of your mind when you cook meats"* (Whitman, 797-801). Another mother said a food thermometer was *"really not important for your kids. It's important for you if you don't know how to cook"* (Yakima 2, 542-544).

Other themes.

Two other themes which emerged from the PPF discussions were alternative safety tools or methods women and mothers used and food safety knowledge which the mothers had.

Mothers in WIC want safety:

"Well at the end of the day I just want to know that my kids are secure... You know this [safety tool or method] gives me peace of mind. I don't have to worry. Better safe than sorry. Whether it's wearing the helmet or grandma just wanting to pop the kids in the

car for a quick ride down the road, you know? At the end, I just want peace of mind”

(Thurston County, 1529-1531, 1532-1540).

However, the way to achieve that safety is not the same for all women.

The mothers discussed safety tools and methods and believe that for a given danger, there is more than one way to protect children. Some mothers use the recommended method or tool to protect their children, while other mothers described what methods or tools they use instead. The women and mothers adapt the recommended safety method or tool to work for them so that they feel they are protecting their children but without the inconvenience or other barrier of the recommended practice. For example, mothers said they teach safety to their children instead of using physical tools such as poison warning stickers or cupboard door locks. Some mothers mentioned using diluted hydrogen peroxide or vinegar instead of commercially available produce-wash. To keep children from eating poisons, some mothers use cupboard door locks, some raise the poisons to cabinets out of reach of the children, some watch their children at all times, and some use poison warning stickers.

Safety recommendations are taken as suggestions, optional advice or guiding principles rather than essential obligations, mandatory constraints or indispensable requirements. Women and mothers in the PFIGs felt strongly that they need to protect their children, but they protect them in their own way and tailored to their personal situation and lifestyle – not necessarily according to the recommendation. The mothers follow the safety recommendation when they see the recommendation is a sure protection against a true, viable danger. It may also be that mothers follow safety recommendations when the recommendation is actually a law. There are laws enforcing certain safety methods, such as seat belts and car seats. There is no law

mandating consumers use food thermometers and mothers in the PPFs do not see the food thermometer a sure protection against a true, viable, danger.

“You put them in your food and it takes forever to get the temperature so if you have your food out of the oven, you don't know if it's cooling down while you're using the food thermometer. So I don't know. I don't know how accurate they are anyway.” (Whitman, 281-288).

For food thermometers specifically, mothers have worked out alternative methods to substitute for a food thermometer. Looking for a certain color in meat, checking meat texture by feeling or tasting, and overcooking or burning the meat were all mentioned as safe methods for assuring the safety of home-cooked meat.

“Yeah, I think...the leash is nonessential as far as you can get by without a leash. I mean, it's nice if you have one, but you can get by without it. And with a food thermometer...it's probably more safe if you check all your food but you can get by without it. Some things you can't get by without.” (Whitman, 308-316).

Although touching the emotions is the way to motivate women and mothers in WIC to consider changing behavior, facts supporting the suggested behavior also need to be communicated so that the behavior adopted is the correct behavior. Because many mothers select and adapt safety methods and safety recommendations, they may perform behaviors according to misconceptions and contrary to benefit. As with many safety recommendations, some women and mothers do not use a food thermometer because food thermometers do not fit their lifestyle. However, sometimes the reason the food thermometer does not fit into their lifestyle is because of misconceptions about what is the proper use of a food thermometer. A

few mothers (n=3) remarked that they only use a food thermometer in whole turkeys or they do not use a food thermometer because they do not cook roasts and other large cuts of meat, indicating they suppose a food thermometer is only for use in large cuts of meat. Women and mothers in the PPFs believed small cuts of meat such as cubed or shredded meat, pork chops, and ground beef patties are too small to use a food thermometer accurately.

A few other mothers (n=2) indicated they believe a food thermometer functions to test whether foods are cool enough to feed a young child without burning the child. *“I think it's not [essential] because you can obviously tell if the food is hot or not and you're gonna test if the food is too hot”* (Yakima 1, 315-323).

Comments made by the women and mothers in the PPFs indicate that women in WIC in Washington have some food safety knowledge. The women know there are harmful bacteria on counters and floors and that disinfectants can kill them. Products mentioned as disinfectants included Lysol, vinegar, hydrogen peroxide, bleach, hand sanitizer. Women also know hand washing is important. The women have heard of food safety food recalls and knew foodborne illness could result from undercooked meat. Foodborne illnesses or pathogens the women and mothers in the PPFs mentioned by name were “mad cow,” “trichinosis,” and “salmonella.”

The only food the moderator named in conjunction with a food thermometer was hamburgers (ground beef patties). However, the women and mothers in the PPFs indicated an ability to transfer the idea of using a food thermometer to other meats and other foods. Although the moderator used the term hamburgers, the women and mothers responded by speaking of using a food thermometer in vegetables, chicken, steak, and beef roast as well as hamburgers. Although the “160°F For Your Family” campaign rack cards only portray and speak

of ground beef patties, women may be able to similarly transfer the food thermometer message in the “160°F For Your Family” campaign rack cards from use in ground beef patties to other meats and other uses.

Development of the Materials

The second objective to meet the project goal was to design attractive, motivating, emotions-based handouts about using food thermometers for ground beef patties at home.

Pre-Test Focus Groups (DraftFGs)

Demographics of the women and mothers participating in the DraftFGs are shown in Table 6. A variety of ages were represented in the DraftFGs, from 18 to 44 years. The majority of the participants identified themselves as Caucasian. Over two-thirds of the participants had a high school education or less.

Table 6. Sociodemographic Characteristics of DraftFG Participants

| Sociodemographic Characteristics of Pre-Test Focus Group (DraftFG) Participants | | | | | | |
|--|--------------------|----------|-------------------------------------|----------|-------------------------------------|----------|
| Characteristics | Total (n=8) | | 1st session (n=5) | | 2nd session (n=3) | |
| | n | % | n | % | n | % |
| Age | | | | | | |
| 18-25 | 1 | 12.5 | 0 | 0 | 1 | 33.3 |
| 25-34 | 4 | 50 | 3 | 60 | 1 | 33.3 |
| 35-44 | 3 | 37.5 | 2 | 40 | 1 | 33.3 |
| Race/Ethnicity | | | | | | |
| African American | 1 | 12.5 | 0 | 0 | 1 | 33.3 |
| White/Caucasian | 7 | 87.5 | 5 | 100 | 2 | 66.7 |
| Education Completed | | | | | | |
| Some high school | 3 | 37.5 | 2 | 40 | 1 | 33.3 |
| High school or GED | 3 | 37.5 | 2 | 40 | 1 | 33.3 |
| Some college | 1 | 12.5 | 0 | 0 | 1 | 33.3 |
| Completed a 4-year university | 1 | 12.5 | 1 | 20 | 0 | 0 |

Of the four sets of food thermometer messages, women and mothers participating in WIC indicated a preference for the series entitled “Scene_1.” Scene_1 included three pieces which were each an 8 ½ inch by 11 inch, full-color photograph of a child and a household thermometer. Also on each piece was a photograph of a ground beef patty with a food thermometer inserted into it. Each piece read, “You already use one of these. It’s just as easy to use one of these,” juxtaposing a familiar household thermometer with a food thermometer to send the message that good moms who protect and care for their children use a food thermometer.

Women and mothers in the focus groups liked several things about “Scene_1.” The women and mothers were drawn to these messages because they included a large photograph

of a child. They were especially drawn to one photograph which depicted a child lying down in bed, overlaid by a photograph of a mouth thermometer. In fact, of all the women participating in the Pre-test focus groups and the Pre-test Interviews, only one did not choose the photograph of the sick child as her favorite from among all pre-test food thermometer messages presented to her. A few mothers voiced that the photograph of the sick child caused her to imagine the content would be related to caring for a sick child or vaccinations. Women and mothers in the DraftFGs also imagined their child would notice the image of the sick child and ask about the photograph.

Some mothers (n=3) voiced that they did not understand the message of the photograph of a baby in a bathtub with a bath water thermometer. Recommendations were made to the graphics designer to enlarge the photograph of the bath water thermometer and to change the photograph of the child to a photograph of a younger infant.

Recommendations were made to the graphics designer to change each instance of Celsius in the photographs to Fahrenheit. The pre-test food thermometer message photographs included an oven thermometer inserted into a ground beef patty. A dial food thermometer was mailed to the graphics designer to use in photographs for the messages instead of the oven thermometer. The graphics designer incorporated these DraftFG suggestions into the thermometer messages.

While the DraftFGs were being conducted with WIC women and mothers, interviews were being conducted with grocery store shoppers to pre-test the food thermometer messages with a grocery store population. A description of these methods and results will be presented elsewhere by other members of the “160°F For Your Family” project team. Results from the

WIC DraftFGs and grocery store interviews indicated that these two populations had slightly different emotional motivators and therefore separate emotions-based materials would be created for the two target populations. Further revisions to the food thermometer messages and associated content were subsequently tailored to the WIC population. Another set of food thermometer messages were created for the grocery store population and are described elsewhere. (See thesis from Courtney Staszac, University of Idaho, forthcoming.)

Several modifications were made to the written draft of the materials based upon the comments from the DraftFGs. Additional photographs and illustrations were added to the materials. Recipes in the materials were taken out because recipes did not fit with the emotions-based objective of the campaign. Cooking activities were added in place of recipes, offering ground beef patties as a way for mothers to spend loving time with their children. A mother's testimony of using a food thermometer despite having been taught otherwise by her mother was removed because the DraftFG participants did not pay much attention to it, illustrating that it was not an effective emotional message.

Pre-Test Interviews (DIInt)

Pre-test interviews were conducted with 7 mothers. Mothers in the DIInts indicated a preference for the "160°F For Your Family" rack card with the photograph of a sleeping child and a mouth thermometer compared to the rack card with the photograph of the child playing outside or the child taking a bath. Mothers remarked that photograph caused them to look further at the rack card because they were reminded of a time when their own child was ill and wanted to find out whether the child in the photograph was well.

When presented with two experiential stories of *E. coli* O157:H7 foodborne illness, mothers responded more emotionally to a story of a child with foodborne illness compared to a story of a mother with foodborne illness. One mother said the story with a child becoming ill caused her to consider whether the ground beef patties she cooked recently were fully cooked. Therefore, a story of a child becoming ill from *E. coli* O157:H7 in ground beef patties was included in the final materials.

Mothers appreciated the practical recommendations for food thermometer use on each rack card and also said they liked the repetition of “160°F” on each rack card. Mothers indicated these helped them feel empowered to protect their children. One of the rack cards for pre-testing had two ground beef patty-related activities for mothers and children to do together. Mothers recommended using only one activity in the rack card to keep the rack card simple. One mother misunderstood the message of the rack cards to say a mouth thermometer could be used in ground beef patties as a food thermometer. Recommendations and findings from the DInts were incorporated into the final draft of the “160°F For Your Family” rack cards.

Since a goal of the overall “160°F For Your Family” project was to change behaviors, an evaluation of the materials to promote behavior change was planned. A postage-paid business reply post card was created to invite mothers who pick up the rack cards during the dissemination to participate in an evaluation of the “160°F For Your Family” WIC campaign.

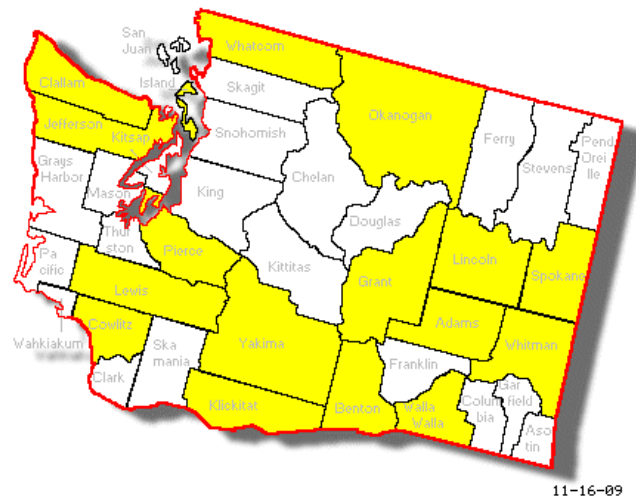
Campaign Dissemination

The third objective was to implement a food thermometer campaign in WIC offices in Washington. Implementation first involved planning where the materials would be disseminated. Additionally, campaign rack cards were printed, display materials were procured,

and WIC staff training was developed. Finally, dissemination kits were mailed to the WIC clinics to be given to mothers of young children.

During the project planning stage, three WIC directors in Washington had agreed to allow the dissemination aspect of the food thermometer campaign in the WIC clinics in their three counties. Due to major changes within the WIC program nationally, one director felt her county WIC clinics could no longer participate. The sample size of the project was reduced to English-speaking mothers in the WIC program in two Washington counties. To increase the sample size, participation was opened to all counties in Washington. Seventeen counties agreed to participate in the campaign. Figure 3 shows the counties participating.

Figure 3. Counties with WIC Clinics Participating in “160°F For Your Family” (source: Adamson)



For each of the counties participating in the campaign, a dissemination kit was sent which included display stands with display inserts and posters. The display inserts and poster were enlarged versions of the front of the Sick Child rack card. This rack card was chosen as the face of the campaign because it was the image that was picked as the favorite among all the mothers except one in the DraftFGs and DInts. Evaluation results will be reported separately in another component of the over-arching project.

DISCUSSION

The target population for this part of the “160°F For Your Family” food thermometer campaign was women enrolled in WIC and mothers of children enrolled in WIC. Women and mothers in WIC represent a high risk population because they have immunocompromised members in their household. Furthermore, women and mothers in WIC represent a segment of the low-income United States population. The “160°F For Your Family” food thermometer rack card messages target women who love and care for their children but do not fully perceive the risk of using methods other than a food thermometer to check the doneness of ground beef patties.

Many of the themes and pulse points unveiled through the pulse points focus groups (PPFGs) were similar to themes and pulse points which other researchers also unveiled. Women in the PPFGs expressed the same desires as parents interviewed by Allicock et al. (2008) and Nobel et al. (2005) – they wanted their children and family to be happy and healthy. A few women and mothers in the PPFGs mentioned how they like to be with their children and wished they could stay home to be with the children. Nobel et al. (2005) also heard parents express a desire to spend quality time with their children. Parents told Nobel et al. (2005) that a good parent loves their child, and Jordan et al. (2007) found that love for their children motivated parents to adopt healthier behaviors. Love for children was also a theme in the focus groups for the “160°F For Your Family” research. These basic desires of love and a happy and healthy family provide a strong emotional connection between consumers and behaviors from which to motivate food thermometer use.

Parents want to keep their children safe and teach their children healthy habits. Just as some women in the PPFGs mentioned using poison warning stickers or other methods to teach their children healthy, safe habits, parents in focus groups with Nobel et al. (2005) said they want to teach their children healthy eating habits. Similar to mothers in the PPFGs, mothers in focus groups with Morrongiello et al. (2009) and Leask et al. (2006) wanted to protect their children. The simple fact that parents in focus groups with us and with others were able to have a discussion about protection, safety devices, and safety tools shows parents have some level of concern for the safety of their children.

However, there is a struggle within parents between protecting and overprotecting their children. In our PPFGs and in focus groups with Leask et al. (2006), fear of being labeled anal, weird, or otherwise extremist mothers was related to the avoidance of overprotection. The women and mothers in the pulse points focus groups (PPFGs) indicated that a good mom maintains a balance between living a good life and being overprotective. This was an important message to incorporate into the emotions-based food thermometer messages. Food thermometer messages for women and mothers in WIC should normalize thermometer use, and portray using a food thermometer as something every good mother does. Women and mothers in WIC who read food thermometer messages should feel the woman or mother who uses a food thermometer is a good mom who loves her children and is able to live a good life, someone who protects her children without being so uptight and overprotective that she would be labeled weird or anal.

Parents told Morrongiello et al. (2009) overprotection was avoided because it may hinder a child's independence. Women and mothers in the PPFGs expressed a desire for

successful, educated children and success and education are related to independence; however, the relationship between overprotection and independence was not actually mentioned in the PPFGs so independence was not addressed in the “160°F For Your Family” rack cards.

There are times a parent’s emotional desires override their rational knowledge about what constitutes healthful behaviors. Women and mothers in the PPFGs felt food thermometers were unnecessary because the risk of foodborne illness is not great and alternative methods such as checking meat color are similarly valuable. Likewise, consumer focus groups about food safety found that 20% of consumers interviewed are aware of food safety recommendations but choose not to perform them (Research Triangle Institute, 2001). Nobel et al. (2005) found the parents they spoke with knew what foods are healthy, but during emotionally trying times decide less healthy foods are best for their children. Leask et al. (2006) observed that when a mother’s emotions were heightened, the mothers made decisions based on emotion rather than reason.

The “160°F For Your Family” food thermometer campaign was a small-scale behavior change campaign with women and mothers in WIC in Washington. However, the themes uncovered in pulse points focus groups were also uncovered in other focus groups and interviews with parents conducted elsewhere. Furthermore, according to Maslow’s hierarchy of needs, the underlying pulse point of security uncovered in the PPFGs is universal for all individuals (Maslow, 1943). The “160°F For Your Family” food thermometer campaign messages were designed to motivate food thermometer use by linking food thermometer use to child and family security. If all humans have a basic need for security, the findings of this research and the

food thermometer rack cards developed may be applicable to other populations of mothers with higher income, who live outside Washington, or who have older children.

Parents in previous studies mentioned they like personally relevant educational materials. For example, mothers told Morrongiello et al. (2009) they liked hearing other mothers tell personal experiences. Morrongiello et al. (2009) also report mothers liked seeing safety recommendations within scenarios they could identify with; therefore, the food thermometer rack cards placed common household thermometers with a food thermometer on the front of the rack card. In an effort to further portray food thermometers in a personally relevant manner, the reverse side of the rack cards included scenarios mothers could identify with: two mothers with their children in a park, playing in the sunshine and a personal testimony of a mother's experience with a child sick from *E. coli* contracted while eating outdoors. Instead of using facts to stress the risk of undercooked meat, such as "8 out of 100,000 children will contract *E. coli*," we chose stories to make our messages relevant and individually meaningful. During the draft focus groups (DraftFGs), the beneficial use of a personally relevant scenes was confirmed when one woman remarked the photograph of the child sleeping reminded her of a time when her own child was ill.

Mothers in our focus groups recommended the use of fear and disgust to motivate mothers to use a food thermometer. Morrongiello et al. (2009) found only 20% of mothers interviewed did not like seeing graphic images of children getting hurt and Morrongiello et al. found graphic images caused a definite emotional reaction from the mothers. In theory and in practice, fear appeals are correlated with behavior change (Cameron, 2008; Wilson, 2007). A meta-analysis cited in Wilson, 2007 concluded fear appeals in public health messages are

effective when the consumer is convinced the threat is severe, feels vulnerable to the threat, and are convinced they are powerful over the threat. Many women and mothers participating in the “160°F For Your Family” food thermometer campaign research were neither convinced foodborne illness is a serious threat nor convinced food thermometers are the solution to foodborne illness threats. Snyder (2007) reviewed multiple health campaigns and concluded fear appeals and other negative emotional messages have less impact on behavior change than do messages evoking positive emotions. Fear appeals were avoided in the “160°F For Your Family” food thermometer campaign rack cards. Instead, a mother’s personal testimony about her experience with *E. coli* O157:H7 was written to evoke maternal emotions such as love, concern, and sympathy.

Over the course of the focus groups and interviews for this segment of the “160°F For Your Family” food thermometer campaign, some food safety and food thermometer knowledge and practices of women and mothers in WIC were revealed. Similar knowledge and practices have been seen elsewhere in the general population and in women and mothers in WIC (Kwon, et al., 2008; Research Triangle Institute, 2001; Trepka, et al., 2007). Color is often cited as the method many consumers and WIC participants use to check the doneness of meat, and the women and mothers in WIC in the “160°F For Your Family” PPFs likewise use color as an indicator of doneness when cooking meat (Kwon, et al., 2008; Research Triangle Institute, 2001). Furthermore, consumers in the general population and in the WIC program infrequently use food thermometers in ground beef patties and other small cuts of meat (Research Triangle Institute, 2001; Trepka, et al., 2007). When food thermometers are used for cooking meat, the meat is often whole poultry or large cuts of meat instead of small cuts such as ground beef

patties (Research Triangle Institute, 2001; Trepka, et al., 2007). Women and mothers in the “160°F For Your Family” PPFs similarly expressed a lack of food thermometer use with ground beef patties and a tendency toward using food thermometers with whole poultry or large cuts of meat if a food thermometer was used at all.

A few women in the PPFs indicated overcooking meat as a safety precaution. Kwon et al. (2008) found 5.7% of women and mothers in WIC surveyed also use burning or dryness as an indicator of doneness in ground beef patties. To motivate consumers to use a food thermometer for quality as well as safety of their ground beef patties, the 160°F For Your Family” food thermometer rack cards recommended using a food thermometer to ensure safe ground beef patties that are not burnt.

Results from the PPFs, DraftFGs, and Dints were incorporated into the text for each of the “160°F For Your Family rack cards. Figures 4-6 show how the pulse points and other results were used to create emotions-based food thermometer materials.

Figure 4. Incorporation of Focus Group and Interview Results into Sprinkler Rack Card

Sprinkler Card

Summertime Safety
Summertime Fun

Kids love the sunshine. But parents recognize that kids need protection from too much heat or sun. Unlike kids, burgers need to be hot.

Next time you get ready for a family picnic or BBQ, pack a food thermometer along with the sunscreen. Using a food thermometer only takes 30 seconds – less time than putting on sunscreen. **160° F** is just right for making safe hamburger. **160° F** is just right for making safe hamburger.

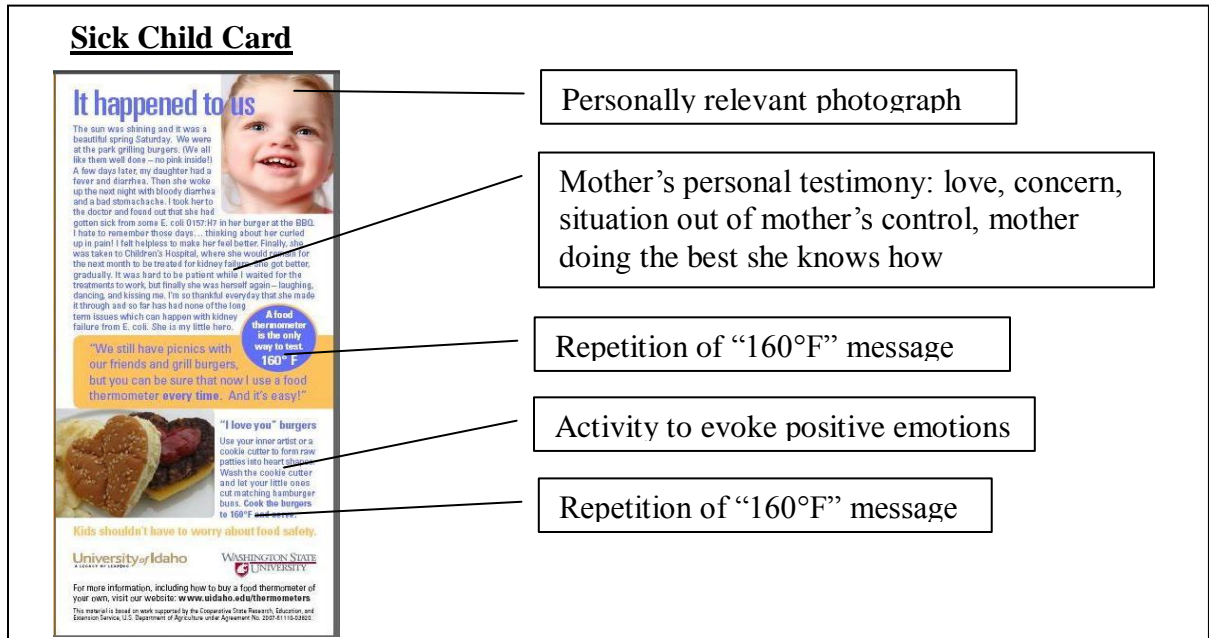
GRILLING TIPS for tender, juicy burgers for your family
Heat your grill to medium-high heat. That means you should be able to hold your hand at cooking height for 4 seconds before your hand is too hot and pulls away.
If the grill is too hot, you'll burn the outside before the inside is cooked to 160°F. Just right and harmful bacteria are killed but the meat is still juicy and tasty.

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For more information, including how to buy a food thermometer of your own, visit our website: www.uidaho.edu/thermometers
This material is based on work supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture under Agreement No. 2005-01115-03852

- Personally relevant photograph
- Scenario mother can identify with
- Repetition of “160°F” message
- Appeal to a mother’s love for her kids, children as priority, and willingness to pay the price to protect children
- Reference to overcooking meat
- Repetition of “160°F” message

Figure 5. Incorporation of Focus Group and Interview Results into Sick Child Rack Card



Sick Child Card

It happened to us

The sun was shining and it was a beautiful spring Saturday. We were at the park grilling burgers. (We all like them well done – no pink inside!) A few days later, my daughter had a fever and diarrhea. Then she woke up the next night with bloody diarrhea and a bad stomachache. I took her to the doctor and found out that she had gotten sick from some E. coli O157:H7 in her burger at the BBQ. I hate to remember those days... thinking about her curled up in pain! I felt helpless to make her feel better. Finally, she was taken to Children's Hospital, where she would probably stay for the next month to be treated for kidney failure. She got better, gradually. It was hard to be patient while I waited for the treatments to work, but finally she was herself again – laughing, dancing, and kissing me. I'm so thankful everyday that she made it through and so far has had none of the long-term issues which can happen with kidney failure from E. coli. She is my little hero.

A food thermometer is the only way to test. 160°F

"We still have picnics with our friends and grill burgers, but you can be sure that now I use a food thermometer every time. And it's easy!"

"I love you" burgers

Use your inner artist or a cookie cutter to form raw patties into heart shapes. Wash the cookie cutter and let your little ones cut matching hamburger buns. Cook the burgers to 160°F.

Kids shouldn't have to worry about food safety.

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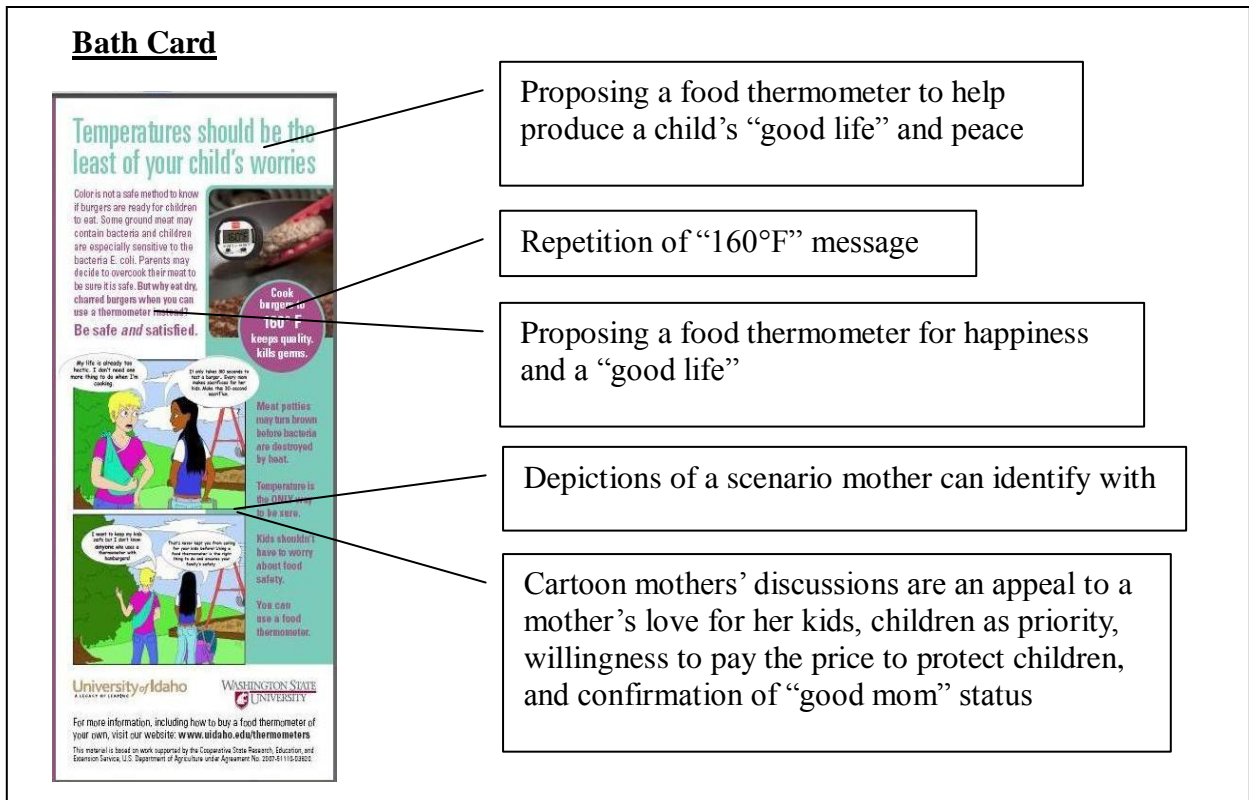
For more information, including how to buy a food thermometer of your own, visit our website: www.uidaho.edu/thermometers

This material is based on work supported by the Cooperative State Research, Education and Extension Service, U.S. Department of Agriculture under Agreement No. 2007-01110-03822.

Annotations:

- Personally relevant photograph
- Mother's personal testimony: love, concern, situation out of mother's control, mother doing the best she knows how
- Repetition of "160°F" message
- Activity to evoke positive emotions
- Repetition of "160°F" message

Figure 6. Incorporation of Focus Group and Interview Results into Bath Rack Card



Bath Card

Temperatures should be the least of your child's worries

Color is not a safe method to know if burgers are ready for children to eat. Some ground meat may contain bacteria and children are especially sensitive to the bacteria E. coli. Parents may decide to overcook their meat to be sure it is safe. But why eat dry, charred burgers when you can use a thermometer instead?

Be safe and satisfied.

Cook burger to 160°F keeps quality, kills germs.

Meat patties may turn brown before bacteria are destroyed by heat.

Temperature is the ONLY way to be sure.

Kids shouldn't have to worry about food safety.

You can use a food thermometer.

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For more information, including how to buy a food thermometer of your own, visit our website: www.uidaho.edu/thermometers

This material is based on work supported by the Cooperative State Research, Education and Extension Service, U.S. Department of Agriculture under Agreement No. 2007-01110-03822.

Annotations:

- Proposing a food thermometer to help produce a child's "good life" and peace
- Repetition of "160°F" message
- Proposing a food thermometer for happiness and a "good life"
- Depictions of a scenario mother can identify with
- Cartoon mothers' discussions are an appeal to a mother's love for her kids, children as priority, willingness to pay the price to protect children, and confirmation of "good mom" status

Equivalent key food thermometer messages were incorporated into the “160°F For Your Family” emotions-based food thermometer rack cards as were addressed through the logic based “Now You’re Cooking...Using a Food Thermometer” materials. As was presented in the Methods section of this manuscript, four key food thermometer messages were included in the text of the “160°F For Your Family” emotions-based food thermometer rack cards. Following is a description of the treatment of key food thermometer messages using the logic-based method in the “Now You’re Cooking...Using a Food Thermometer” materials or the emotions based method in the “160°F For Your Family” materials.

1. Key message: The color of cooked meat is not a reliable indicator of doneness (safety) in ground beef.
 - a. Logic-based: Citation literature and photographs illustrating premature browning and persistent pink color.
 - b. Emotions-based: Appealed to mother’s love for her children and desire for security and control over dangers: “Meat patties may turn brown before bacteria are destroyed by heat. Temperature is the ONLY way to be sure. Kids shouldn’t have to worry about food safety. You can use a food thermometer.”
2. Key message: An internal temperature of 160°F kills *Escherichia coli* O157:H7 in ground beef patties.
 - a. Logic-based: Statements of fact.
 - b. Emotions-based: Used mother’s personal testimony to address inactivation of harmful bacteria.

3. Key message: The quality, taste and texture of ground beef patties improves when they are cooked using a food thermometer.
 - a. Logic-based: Statements of fact referring to research showing that meat may be safely cooked even when color is still pink, therefore overcooking can easily occur when relying on color alone as indicator of doneness.
 - b. Emotions-based: Implied food thermometer use is related to happiness and a “good life” by resulting in ground beef patties with satisfying taste.
4. Key message: Thermometers should be inserted sideways into the patty for accurate measurement (so that the sensing area of a dial or digital instant-read food thermometer is in the center of the ground beef patty).
 - a. Logic-based: Illustrated and described the measurement of a food thermometer’s sensing area
 - b. Emotions-based: Saved text space for other emotional messages; educated consumers how to insert a food thermometer through multiple photographs of sideways-inserted food thermometers

As described in Table 7, the components of logic-based and emotions-based materials may be similar, but the presentation is different. Logic-based materials such as the “Now You’re Cooking...Using a Food Thermometer” materials are composed primarily of statements of fact, but emotions-based materials such as “160°F For Your Family” rack cards link facts to emotional pulse points.

Table 7. Contrast between Food Thermometer Materials Components

| Components of Food Thermometer Behavior Change Materials | |
|---|--|
| “Now You’re Cooking...Using a Food Thermometer” ¹ | “160°F For Your Family” |
| Logic-based | Emotions-based |
| Concrete suggestions, Actionable recommendations | Maintained concreteness and action but simplified messages |
| Repetition of concepts | Repeated key concept: 160°F |
| Addressed barriers and motivators to food thermometer use | Linked emotional pulse points to food thermometer use |
| Specific intervention messages to reach individuals in all five Stages of Change. | Incorporated messages for consumers in precontemplation and contemplation Stages of Change because most consumers do not use a food thermometer in ground beef patties |
| Scientific reasons why color is not a good indicator of doneness | Noted color is not a good indicator of doneness, but did not explain scientific research |
| Emphasized need to inactivate harmful bacteria with thorough cooking using a food thermometer when cooking small cuts of meat | Included concept of inactivation of harmful bacteria, but emphasized that good moms who love their children care for them by using a food thermometer |
| Text and photo descriptions about how to insert a food thermometer when cooking small cuts of meat | Photographs of sideways-inserted food thermometers; Grilling tips |
| How to choose an appropriate food thermometer for small cuts of meats | Was not addressed |
| Simple recipes, including instructions for how and when to use a food thermometer | Food presentation activity to illustrate family love |
| Recommended end point temperatures for a variety of small cuts of meat | Simplified message to one number: 160°F for ground beef patties |
| Cooking instructions for skillet, broiler and indoor and outdoor grills | Simplified to included only outdoor grilling instructions |
| Photograph of a thermometer inserted into the prepared meat | Included equivalent photograph |
| ¹ components of “Now You’re Cooking...Using a Food Thermometer” materials as written in McCurdy et al., 2006 | |

The “160°F For Your Family” food thermometer campaign did not include free food thermometers or discounts for thermometers in the campaign. While it is true that the

audience needs the material resources to accomplish the desired behavior of a social marketing campaign, consumers may be willing to acquire those resources themselves (Viswanath and Bond, 2007). In order to use a food thermometer, women and mothers in WIC need to have the resources available to acquire a food thermometer and the time to use the food thermometer. However, the pulse points focus groups showed that when women and mothers in WIC perceive a great need for something, they will pay the price to achieve or acquire it.

In deciding the mode of dissemination, ease for WIC staff was considered in many respects. Phone interviews with WIC counselors revealed that major national changes in the WIC program would be enacted in the fall of 2009 and preparing for this change would take much energy and time from WIC staff. The WIC counselors were apprehensive to have the “160°F For Your Family” food thermometer campaign in WIC clinics since the campaign may take time away from duties related to the WIC change. The “160°F For Your Family” food thermometer campaign was designed with this apprehension in view. Dissemination of the rack cards was self-serve by the women and mothers in WIC to keep WIC staff burden to a minimum. The display was designed to include a stack of rack cards and a larger image of the rack cards connected to it. The larger image would attract clients’ attention without much staff involvement needed. Furthermore, WIC offices can be small and already full of literature, so a compact display stand was chosen which would fit in whatever location WIC offices had available. The small display stand would meet the needs of the smaller WIC clinics and was used in the larger clinics as well to keep the dissemination as standardized as possible. For these reasons, as we prepared the “160°F For Your Family” campaign, our goal was to make the campaign easy for WIC staff while maintaining research validity and accuracy.

While the campaign was designed to be carried out without much staff involvement, efforts were made to involve WIC staff where possible because campaigns are more effective if there is a personal element (Snyder, 2007). Campaign instructions sent to the WIC clinics recommended that WIC staff direct client attention to the rack cards. A three-sentence announcement was offered to the staff which they could speak to encourage women and mothers in the WIC clinics to pick up the materials.

Social marketing campaigns need repetition before they can have a major impact on society (O'Shaughnessy and O'Shaughnessy, 2003; Snyder, 2007). The "160°F For Your Family" food thermometer campaign needs to be expanded upon to repeat the emotional message to women and mothers in WIC and other consumers until using a food thermometer in ground beef patties and other foods is an established practice. Repetition can be achieved through additional food thermometer campaign and presenting food thermometer messages in a variety of locations through a variety of channels. Repetition will also be achieved if workers in WIC and other public health arenas make "food thermometer" part of their regular vocabulary with consumers. Repetitions of the "160°F For Your Family" campaign message were achieved through posters and rack card displays that are viewed both upon entering and exiting the clinic, as well as repetition of "160°F" throughout the materials. Because the rack cards are small and can be taken home, there is increased the possibility that participants would see the message again in their home. Other portions of the overall "160°F For Your Family" campaign, including a website, evaluation questionnaire, and evaluation thank you letter, offered opportunities for repetition if the woman or mother in WIC chose to visit the website or complete the evaluation.

The effectiveness of the “160°F For Your Family” emotions-based rack cards was evaluated by additional members of the project team and will be presented elsewhere. Following analysis of the rack card evaluation, there may be a need to revise the materials according to evaluation results. Evaluation of women and mothers’ attitudes, beliefs, and behaviors related to food thermometer use in ground beef patties after exposure to the rack cards will show effectiveness of the rack cards at motivating behavior change. Additional evaluation through focus groups with women and mothers in WIC to compare the “160°F For Your Family” emotions-based rack cards with the “Now You’re Cooking...Using a Food Thermometer” logic-based materials would reveal whether the “160°F For Your Family” rack cards resonate emotionally with mothers.

CONCLUSION

Women and mothers in WIC in Washington have an emotional need for security in their household. These women want their children to be protected and they want to live a good life, filled with happiness, health, and success. For the health of infants and young children in WIC households, a food thermometer should be used to determine doneness of ground beef patties cooked at home. However, women and mother in WIC perceived food thermometers as unnecessary safety methods which may be inaccurate and may interfere with the mother's good life and "good mother" status. Therefore, food thermometer educational materials were developed linking a mother's emotional need for security to food thermometer use. The resulting emotions-based food thermometer rack cards were disseminated in WIC clinics throughout Washington.

In this segment of the "160°F For Your Family" food thermometer campaign, projective techniques were used to unearth emotional pulse points of women and mothers in WIC. The utility and effectiveness of projective techniques in uncovering pulse points may be evidenced by the agreement of PPFPG pulse points with Maslow's hierarchy of needs and emotional themes observed through the work of other qualitative researchers.

Currently there are no scientific studies evaluating an emotions-based approach to nutrition messages. An emotions-based approach to nutrition messages such as food thermometer use may motivate healthy behavior change when logic-based approaches result in few behavior changes. However, multiple developments and evaluations of emotions-based materials should be conducted to confirm the value of this novel approach.

An emotions-based approach to health messages could be used by dietitians and public health practitioners to create health messages to motivate positive behavior change in a variety of consumer settings. As with any message development, a needs assessment of the target population should be conducted. Pulse points may be ascertained at this time or previously revealed pulse points may be confirmed with the target population. In order to motivate consumers to make the desired behavior change, facets of the behavior would be linked to emotional needs and pulse points of the target audience.

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APPENDIX A

WIC Counselors Interview Guide

Objectives: To learn: 1.) About their curriculum and education procedures 2.) Educational needs of WIC part relating to food safety and thermometer use 3.) Types of food safety materials used 4.) Feedback about the appropriateness of our previously developed materials with the WIC curriculum

1. How would you describe your clients, in terms of age, education, family make-up, and socioeconomic background?

What is your job there at WIC?

2. Could you please describe how nutrition education is provided at your WIC clinic? I.e. When is it performed, how do you decide which education is for which woman, who actually does the educating?
3. We would like to make our materials available to your clients without imposing too heavy of a burden on your employees; what methods of distribution would you recommend? For example, employees handing them out to clients at their “WIC check” appointments, or making them available in the waiting area, or both?
4. What are the needs you have seen in your clients for food safety or thermometer education, if any?

Does your WIC site do any food safety education currently?

5. What do you foresee as barriers to that education, for you or for your clients?
6. If I were to design some educational approaches for WIC to promote food thermometer

use, what do you think would motivate moms to use the food thermometer?

7. (You see there is a need, but it seems like you can't meet the need. What if you could? If there were no problems, no barriers, how would you meet that need if you could do anything?)
8. Did you get to look at the packet of our brochures and recipe cards I sent you? What would your clients think about them? How about you, what do you think of them?

Would you use posters, bulletin board information, or videos?

9. Thank you for all your comments! We'll use them to modify the materials I sent you to make something I hope you can use and give to the women in your clinic. I just have one more question.

We want to find out what the WIC women think about these materials. To get their input we are considering two options and would like to hear what you think:

1. After the client receives the materials, one of you would then ask her to fill out a consent form asking her for her contact information so we can survey her later.
2. The WIC client mails in a prepaid postcard with her contact information and we contact her for the survey.

What do you think of these two options?

APPENDIX B

Extension Educators Interview Guide

Objective: To help guide development of materials for a low-income audience

1. How would you describe clients you work with, in terms of age, education, and socioeconomic background?
2. I'd like to know what factors affect the cooking of persons with low income; in your experience, what kind of living environments are they in, what are their kitchens like, what are their cooking practices, etc?
3. Did you get a chance to look over our materials I sent you? How can I modify them for a low-income audience?
 - a. Do the meat products and ingredients that are mentioned seem appropriate for a low-income audience?
 - b. Do you think a low-income audience would read it?
 - c. What [else] would you change?
 - d. How about "Is it *done* yet?" and the Thermymaterials?
 - e. Do you think this audience will like this format of education, meaning recipe cards, brochures, and magnets?
4. I have some questions about writing educational materials for this population in general.
 - a. When designing materials for low-income audiences, what kinds of things (particular words, design, format) should we watch out for or avoid?
5. What kind of things are vital to include?
6. If I were to design some educational approaches for WIC to promote food thermometer use, what do you think would motivate moms to use the food thermometer?

APPENDIX C

WIC Moms Discussion Group -- Demographic Information

1. What is your age?

- | | | |
|---------------------------------|--------------------------------|--------------------------------|
| <input type="checkbox"/> 18- 24 | <input type="checkbox"/> 45-54 | <input type="checkbox"/> 75-84 |
| <input type="checkbox"/> 25-34 | <input type="checkbox"/> 55-64 | <input type="checkbox"/> 85-94 |
| <input type="checkbox"/> 35-44 | <input type="checkbox"/> 65-74 | |

2. What is your level of formal education have you completed?

- | | |
|--|--|
| <input type="checkbox"/> Elementary school | <input type="checkbox"/> Completed junior college |
| <input type="checkbox"/> Some high school | <input type="checkbox"/> Completed a 4-year university |
| <input type="checkbox"/> Completed high school | <input type="checkbox"/> Graduate school, type _____ |
| <input type="checkbox"/> Some college | |

3. Please list the ages of people living in your home. For example, for a four person household (35, 32, 9, 3 yrs of age)

4. What is your ethnic background?

- White/Caucasian
- Hispanic
- Native American
- African American
- Asian
- Other, please indicate _____

APPENDIX D

WIC Moms “Pulse Points” Focus Group Discussion Guide

Note to moderator – Drink regular (not diet) soda and eat some of your chocolates! Look and feel relaxed.

Discussion goals: To answer these questions:

- I. What are the hopes and dreams that drive behaviors of women and mothers in WIC in Washington with children under 5?
- II. How do women and mothers in WIC in Washington feel about the relevancy of thermometer-related messages?
- III. What would make thermometer-related behaviors a higher priority in their lives?
- IV. Who are credible spokespeople for thermometer-related messages?
- V. What is the best way to deliver thermometer-related messages to women and mothers in WIC in Washington?
- VI. What’s in it for women and mothers in WIC in Washington to change thermometer-related behaviors?

1. Introduction:

Thanks for coming tonight. I know how busy you are and I really appreciate your time. To show my appreciation for your time and insights tonight, I’ll be giving you \$25 in in a giftcard to Safeway at the end of our time together two hours from now. We will end on time—or before. Help yourself to soda and refreshments anytime. Rest rooms are... *[give directions]*. Feel free to visit them anytime you want during our time together.

I know you all must be a little exhausted because a mom is an incredible job! I hope you’ll relax and enjoy our time together. Sit back, put your feet up if you want, and get ready for a fun time.

Before we get started, I want to tell you that I am taping our conversation today. Sometimes I think I have the memory of an ant, and tapes will help me later. But no worries. No names will be attached to any comments so you can say anything you want and no one will know you said it. You’re in a safe haven here. Also, we’ll just be using first names today so there’s no way anyone will know who was here or who said what. I’m passing out consent form now for your signature. Basically, it says that you will get \$25 gift card for your time tonight and that anything you say is confidential and no one will know who says what. Please take just a minute to review and sign it. *(Collect consent forms.)*

[Name] is here with us to run the tape recorder. Thanks, *[Name]*, for your help.

Any questions before we started?

Discussion guide:

2. Let's start with a fun introduction game with those chocolate kisses in front of each of you. We'll go around and say something about yourself – you can say something you think other people might have in common with you, or something you think is unique just to you. Then, everyone who has NOT had that experience will give you one of their kisses. Everyone who HAS that in common with you keeps their kisses. I'll start, and show you how it works. [Once, when I was washing dishes at somebody else's house, I put liquid dish soap in the dishwasher and turned it on. Soap suds eventually were oozing out and it took too days to clean up.] So if you did that too when you were at someone else's house, you get to keep your chocolate, but if that hasn't happened to you, then you give me one of your chocolates! Who wants to go next and share something with us?

5
min

3.

- a. That was fun! You've all had quite the experiences! And the kisses are yours, so feel free to eat them! (*Lay out pictures of doors from around the world on the table.*) As you can see, there are lots of pictures of doors. Behind one door is an Ipod, behind a second door is a cookbook, and behind a third door are all the hopes and dreams you have for yourself and your family. Which door would you choose? (*Doors with hopes and dreams is the one they'll choose.*) OK—pick a door that looks like the one that has your hopes and dreams behind it.
Thanks. Now unlock the lock, if there is a lock, open the door and walk through. What hopes and dreams are waiting for you behind your door? [*Have tissues handy and offer them if/when some get emotional*]

20
min

Probes, as necessary:

- Are the hopes you have for your children and family different than the ones you have for yourself?
- Have your hopes and dreams changed since you had children?
- Will your hopes and dreams for your children change as they get older?
- If you had to pick just one hope and dream to come true, which would it be?
- How would your life be different if your hopes and dreams really came true?

- b. Thanks for sharing that information. I feel like we have known each other for a lifetime. Now let's have some fun. We'll play some more games.

15
min

(Unroll a long roll of white paper along the table. On it you have already drawn a line down the middle of the unrolled paper and labeled one end “essential” and the other end “unnecessary.” Spread out before the moms one set of note cards (seat belts, electrical plug in covers, food thermometer, regular (mouth) thermometer, medicine container with child-proof cover, “leash” used to control small children, child-sized bicycle helmet, items that keeps kitchen cupboards closed so children can’t access, poison warning sticker, etc)

There are endless things out there to help moms keep children safe. I’ve listed a few of them on these cards. I haven’t had kids of my own so have I missed anything that should be added to a note card? OK. Now, working together, I would like you to arrange these cards along this long continuum. As you can see, one end is labeled “essential” and the other end “unnecessary.” Please place the cards along the continuum where you all think they should fit. Please feel free to discuss where they should go among yourselves. *(Allow about five minutes or less.)* OK—Let’s talk about where you put each item.

- Which items rated placement closer to the ‘essential” end? What makes them more important than those that you positioned at the other end?
- Tell me about how you feel when you use the items on the “essential” end. OK—now tell me how you feel when you use—or don’t use—the items at the other end?

They may have already discussed the food thermometer, but if not, ask these questions:

- Why did you rate the food thermometer “essential” or “unnecessary?”
- What would cause you to reconsider the food thermometer as “essential” — something every great mom used everyday?
- What would you say to another mom who asked you why you used a food thermometer?

c. Now, onto drawing fun. Are you having a good time? Please take a piece of white paper. *(Paper is 11X16)* Draw two lines down the middle of the page. *(Moderator demonstrate this as we go.)* On the right side, draw a stick person who **represents you**. Everyone done? No fancy art needed; a stick figure is fine. Now, please put something in your hand that represents your lifestyle. Next, draw a word bubble out of your mouth and write in it something you say often. In the background, draw something that represents your lifestyle. *(People usually understand these directions easily, but if not moderator will do it with them, completing the drawing as Madonna might.)* OK. Thanks.

30
min

Now, I'd like you to do the same thing on the center section, only this time you will be drawing the perfect mother—the ideal mother you would like to be. First, draw a stick figure that represents this perfect mom. Next, put something in her hand that represents something she values. And third, put something in the background that says something about her lifestyle.

Now let's go on the final section, the one on the far left of your paper. In this section, draw a stick figure that represents a different person, one that I'll describe now. This mom is very concerned about what her child eats, making sure it is safe. She washes fruits and vegetables before giving them to her family, uses a food thermometer when cooking hamburgers, and keeps raw meat separated from cold salad so her food is safe. That's all I know about her, so I need your help to fill in the spaces. First, draw another stick figure to represent this mom. Now draw something that represents her values and put it in her hand. Now, add a word bubble and write in a phrase she says often. And last, draw something in the background that represents her lifestyle. Thanks.

Who wants to show us their drawing first?

Probes:

- How are you like the other two moms on your picture?
- How are you different?
- Do all the moms love their children the same?
- What words would the other mom's children use to describe them?
- At the end of the day when all the moms collapse into bed, do they feel the same way? If not, how do the other mothers feel?

d. I'd like you to divide yourselves into two groups now. Please move to this side of the room if you feel it is very important to use a food thermometer whenever you cook burgers and that mothers should make it a priority. You don't have to be using one at home to be over here, just if you believe the statement. Please move to this side of the room if you feel differently. Maybe using a food thermometer is a nice thing to do, but not really a priority. OK, does everyone have a side? OK. Thanks. Now, I want you to take five minutes and come up with arguments for your position – pros and cons. Ready? Let's "play court." The goal of "playing court" is to convince the other "team" that your position is best. Which team wants to go first?

15
min

(Let the two teams present their statements and arguments, encouraging a dialog between the two teams.) (Listen to the "arguments" used to convince the other side, noting to yourself which statements are most persuasive.)

Note the time. If there are only 15 minutes left, ask Question 6. If you have more time, add

the question 7.

10
min

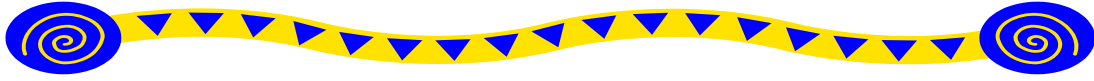
- e. Fast forward your life a few years. Let's say your kids are in school, everybody's happy and you decide to go out and get a job, or get a different job if you're already somewhere. Someone wants to hire you for a job that pays \$150,000. Are you interested? The only thing you have to do in your new job is figure out a way to get every mom in America to use a food thermometer for hamburgers. So what would you do? How would you convince moms?
- f. (*Show pictures of people.*) Here are photos of some people. Pick a picture of someone you feel would be a good coach for this journey. What you would be looking for in a lifestyle coach, someone every mother would want to have as a coach in their journey towards happy food thermometer land.

OK, now tell me why you chose the one you did?

4. Conclusion

- a. Thanks for being my friend for the night. I had a great time and hope you did too. I've been asking more of the questions tonight and now it's your time. Do you have something to share that you didn't get a chance to share—or any questions to ask?
- b. Thanks again. This \$25 gift card is a small token of my gratitude for your wise words and insights.

APPENDIX E



\$50 for 2 hrs of fun?

If you are a mom in WIC, please join our discussion group.

- enjoy snacks
- talk about topics of interest to mothers of young children.
- leave with a \$50 gift card to Safeway!

Sorry—no child care or transportation is available.

This study has been reviewed and approved by the WSU Institutional Review Board for human subject participation.

Where: Colfax Public Library
When: Saturday, July 12 at 3-5pm

To sign up, contact:
Amy at (509) 432-1759 or aterickson@yahoo.com

Mom discussion group
 Amy at 509-432-1759
aterickson@yahoo.com

Mom discussion group
 Amy at 509-432-1759
aterickson@yahoo.com

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APPENDIX F

Creative Brief

Target Audiences:

1. WIC: Loving, concerned moms of young children.
2. Associated Food Stores (Chain of ~600 small grocery stores in the Mountain West US): Loving, concerned female shoppers.

Pulse Points:

- 1st Security
- 2nd Belonging, Status, Self-fulfillment, Recognition
- 3rd Achievement

Objective:

WIC: Use a food thermometer when cooking hamburgers for their children to protect their children.

AFS: Use a food thermometer to cook hamburgers to ensure safety and quality.

Feel proud when using a food thermometer to cook hamburgers to 160°F.

Think a food thermometer is valuable.

Feel using a food thermometer is the right thing to do and increases security of their family.

Thermometer is a quick, easy, valuable thing to do; worth the extra 30 seconds of time.

Feel secure.

(WIC) Think and feel food thermometer will help them protect their children.

(AFS) Think and feel food thermometer will help them protect guests and vulnerable populations (children, elderly, pregnant women).

(Feel confident about using a food thermometer to cook hamburgers to 160°F.)

Obstacles:

Don't want to be perceived as being obsessive

They think using thermometer is OCD, unnecessary.

Other risks or dangers are higher priority

Color is not an indicator of doneness of ground beef, but people believe it is.

I know there are many things that could harm my kids but I can't prevent everything, no matter how hard I try. I have to prioritize.

I only have 2 hands. Don't need one more thing to do when I'm cooking. My life is hectic.

I think food thermometers take too much time to use.

I want to keep my kids safe, but I don't know anyone else like me who uses one.

I don't want to look unusual or uptight.

Consumers do not know the safe cooking temperature.

Consumers do not know how to use a thermometer.

Consumers are unsure which thermometer to buy.

Consumers feel like they must overcook food to make it safe.

Consumers would rather overcook or give up meat than use a food thermometer.

Key Promise:

I will have peace of mind.

Prevent foodborne illness. I can take control to prevent foodborne illness.

Feel like a loving, secure mom that protects her kids in an uncontrollable world.

Protecting my children and my family.

Gate keeper.

I'll belong to the "good mom's club."

I feel like my family will appreciate my food more if I use a food thermometer to prevent overcooking.

I can take control of the situation.

When a mom uses a thermometer she'll feel she is protecting her children and is more secure

Support Statement:

Kills germs and prevents possible death or illness.

Emotional benefits of security and belonging.

I would rather make the sacrifice to take 30 seconds to use a food thermometer than have my child get sick.

Science in the kitchen: use the opportunity to teach your kids.

Passing on traditions to your kids.

Tone:

Emotional, touch the heart in a powerful way; touching on the protective nature of mothers.

Edgy

Humor, light, fun

Catches attention, unusual, attractive

Inspiring

Empowering

Openings:**Print in May**

WIC: Time – Summer 2009

Place – Made available at WIC offices (Materials will be stand-alone materials with brief, 30 second education from WIC educators at the most)

AFS: Time -- Summer 2009/ Grilling season

Place – Associated Food Stores grocery stores in Idaho, at the meat counters

Creative Considerations:

AFS: Format may be: small brochures for meat counters and stickers for meat packages. Recipe books?

AFS would rather we focus on quality than safety.

A website will be developed for this campaign.

We need to show impact of program and materials.

Ideas for Deliverables:

Magnets (with the message and "160°F")

Stickers for meat packages
Smaller brochures for meat counters
Magnet to stick thermometer on fridge
Recipe book
*logo
8x11 sheet



You already use one of these
to make sure she's dressed for the right temperature.

It's just as easy use one of these
to make sure her burger is cooked to the right temperature.

160°F

The image features a woman in winter clothing, including a fur hat and a heavy coat, standing in a snowy environment. A large thermometer is overlaid on the left side of the image, showing a temperature of approximately -20°C. In the bottom right corner, there is an inset image of a cooked burger with a thermometer inserted into it, showing a temperature of 160°F.

“Scene_1”




**You already
use one of these**
to make sure your child is safe.

160°F




**It's just as easy
to use one of these**
to make sure her burger is safe.

“Scene_1”




You already use one of these
to make sure your child does not get burnt.

iStockphoto



It's just as easy use one of these
to make sure his burger does not get burnt.



160°F

"Rixk_1"

A man with a mustache, wearing a dark suit, a red tie, and a black hat, is sitting at a green poker table. He is looking down at his cards in his left hand, while his right hand is held out palm up. On the table in front of him are several stacks of colorful chips (white, blue, red, green, black) and a pink card. The background is a brown, textured wall. A large, semi-transparent watermark "photo photo" is visible across the middle of the image.

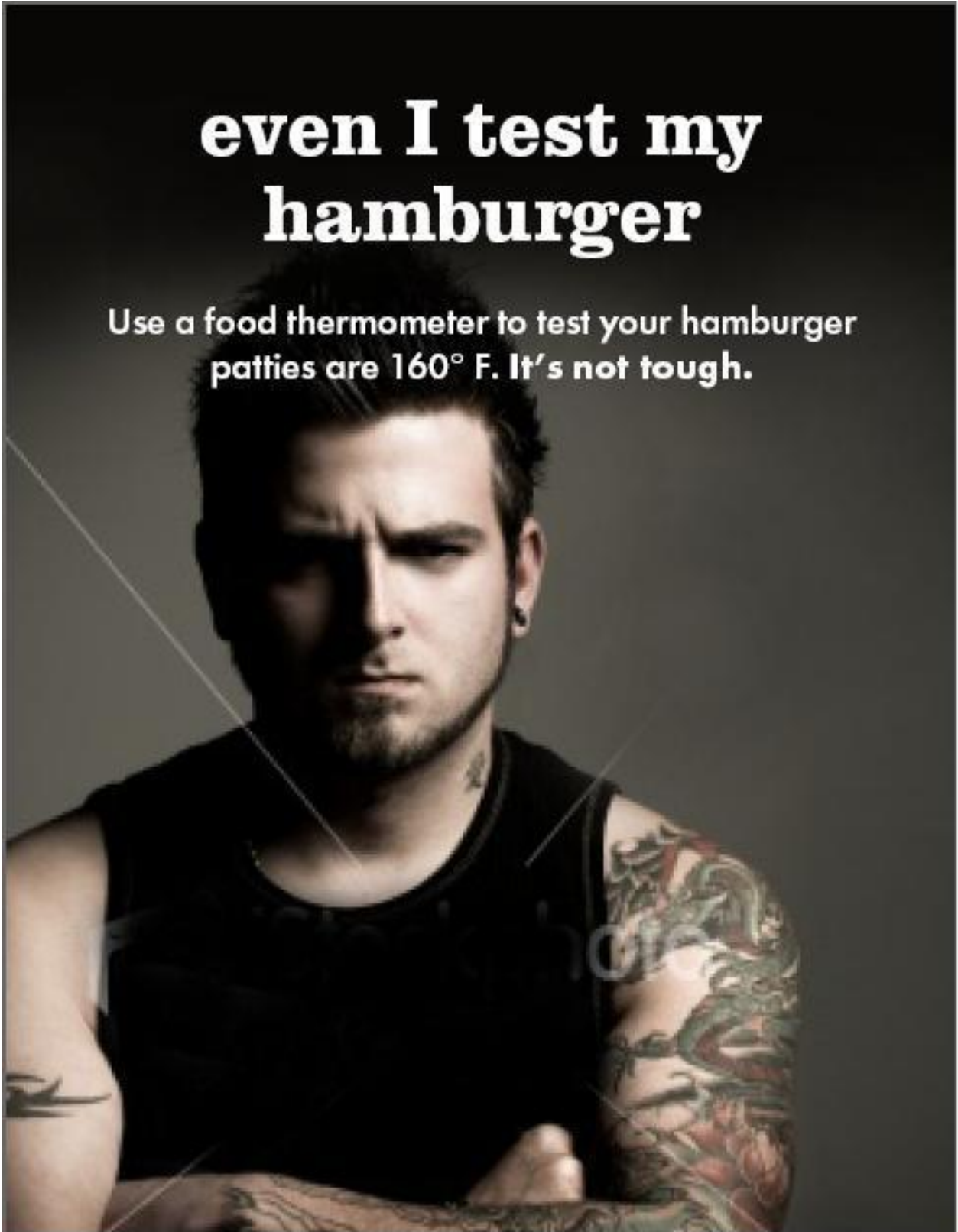
**even I wouldn't
risk not testing
my burger**

**Use a food thermometer to test your hamburger
patties are 160° F. It's not worth the risk.**

"Rixk_1"

even I test my hamburger

Use a food thermometer to test your hamburger
patties are 160° F. It's not tough.



“Rixk_1”

**even I make sure
my burger is safe**

Use a food thermometer to test your hamburger
patties are 160° F. **Take the leap.**





Name ETHAN

What is your favorite food?

HAMBURGER

How does your Mom cook it special?

COOKS TO 160°

How do you help your Mom?

Tell her I love her



Using a food thermometer to test your hamburger patties are 160° will reward you in more ways than one.



Name Ella

What is your favorite number?

160

Why?

how hot Mom cooks my burgers

How many shoes are in your closet?

7



Using a food thermometer to test your hamburger patties are 160° will reward you in more ways than one.



Name Timmy

What do you like to do with your family?

Picnic

What does your Mom do to show she loves you?

COOKS burgers to 160°

Who do you spend the most time with?

pet snake when I can find him



Using a food thermometer to test your hamburger patties are 160° will reward you in more ways than one.

Which helps make a perfect burger?



BOTH: Make using a food thermometer to test your hamburger patties are 160° part of your routine. It's easy.

Which helps make a perfect burger?



BOTH: Make using a food thermometer to test your hamburger patties are 160° part of your routine. It's easy.

Which helps make a perfect burger?



BOTH: Make using a food thermometer to test your hamburger patties are 160° part of your routine. It's easy.



Moms: Want \$25 dollars?



If you are a **WIC mom** to a **child 5yrs or younger**, please join our 1 hour discussion group.

We will be talking about topics of interest to mothers of young children

We'll have some refreshments & you'll get a **\$25 grocery gift card!**

Sorry - no child care or transportation is available.

Where: Shadle branch - Spokane Public Library
When: Monday, March 23th

Sign up for one time:
10:30-11:30 am
12:30-1:30 pm
2:30-3:30 pm

Contact Amy at () - or @yahoo.com

To sign up:

- or

@yahoo.com

APPENDIX I

Focus Group Script for Pre-testing of Thermometer Materials

Objective: Make sure our materials have emotional heat

- I. Introduction of self and study. Sign consent form. Remind of incentive to come at end.
 1. Intro, easy, ice-breaker question: ...about cooking? Kids? Cute thing your kid did recently?

- II. I have some materials here and would like to know what moms like you think of them. You all are here today because you are moms, and that is really valuable to me. These materials will be published and handed out someday, so what you all tell me today is huge. What you tell me today will influence what moms all across Washington will see.

So it is really important to me that you all do two things today: 1. Speak loudly and speak one at a time, so that both I and the tape recorder can hear everything everyone says. And 2. Be honest and say what you think. You won't hurt my feelings, so tell me anything and everything so these materials can be as close to perfect as possible. What you are thinking is probably how some other moms out there somewhere (or here) would react to the material. There are no wrong answers and no right answers. I am here to get your reactions.

- III. (Give everyone their own stack of the materials: Yam's sketches and stories, facts, recipes, etc text possibilities). Here are the materials. Please open the folder and

look through the materials. I'm also laying them all out here across the table. There are [4 sketches, 3 recipes, 3 stories, and 2 Myth Busters]. Can you see them all?

1. First, I'd like to hear what your best friend would say if she saw these. What is her reaction? Tell me more about that.

IV. What about you? What is your immediate reaction to what you see here?

1. Probes:

a. Someone please share what you like here.

b. Anyone else?

c. Who agrees with her? How so?

d. Who disagrees with her? Please tell me why.

2. Which ones don't you like?

That was great! Thank you all for sharing your opinions. I appreciate your honesty.

V. (Hold up the "complete" samples) If this was set up in the WIC waiting room, would you pick one up?

1. Pretend you are in the waiting room. Talk me through what you are thinking when you see it.

VI. Now I want to take this again from a slightly different angle. You know how sometimes you try and say something and it just comes out all wrong and you are completely misunderstood? Well, we'd like to prevent that from happening! I'd like to make sure the sketches are being interpreted the way the designers hoped they would be. Someone please think out loud for me: talk me through what you thought when 1st saw this one. (point to a picture).

1. How does this make you feel?
 - a. What does this make you think of?/How do you interpret this?
 - b. Is that a positive or negative image?
 - c. What is the message you get from this?/What does it say to you?/[What is this telling you to do?]/What is your reaction to this?
 2. Who has something else to add?
 3. I am really happy you all are sharing your thoughts with me. Thank you!
 4. Let's do it again. Talk me through your first impressions of this one. (Point to another one) (Repeat for all sketches.)
- VII. If you were given one of these, what would you do with it?
- a. What would you do with it when you got home?
- VIII. Is there anything you would add to this?
- a. Is there something you expected to see but didn't?
- IX. What parts would you change?
- a. Words
 - b. Font
 - c. Pictures
 - d. Color
 - e. Layout
 - f. Shape and size of the "complete" material
 - g. Recipes: good recipes? Any other ideas you would rather see?
 - h. If this were a magnet, would you use it?

- i. There is a web site here you can go to for more information. Would you go there?
- X. Putting yourself back at home, in the kitchen, with your kids. Let's say it is dinnertime and you are cooking up some burgers on the stove – do you think you would use a food thermometer?
 - a. ...That is a good point and I had wanted to ask about that too. Do these materials make you want to go to a store to purchase a food thermometer?
- XI. Let's stack all these papers up now. I'll take them. Thank you. I have two more questions for you, but first everyone stand up. Please walk over there and take a piece of paper and a pen. Have another cookie or Coke, too, if you want to. You can stretch a little bit.

Ok. Everyone please come back and take a seat. Now, on your piece of paper, write down the first two things that come to mind when you think about all the papers we saw today. ... Everyone have at least one? Ok. Please share with us what came to mind for you.
- XII. What else stands out in your memory?
- XIII. [Do any of these make you want to use a thermometer when you cook burgers at home?]
- XIV. Finally, for my last question, see the note here on the back of the material asking you to take a survey about the materials? Would you like this survey to be by phone or on the internet? Is it better for you if the survey were mailed to your house?

Would you make the effort to take the survey?

XV. Conclusion

Thank you all for coming today. I had a lot of fun and learned a lot. It seems to me that you all (summarize: for example, “think this one is really great, and would put this and this on the back of it, but would get rid of this one because it is not as striking as the other ones.

Am I right?)

Here are your thank you gifts for coming.

(Make note if and which specific materials they want to take home.)

APPENDIX j

Interview Script for Pilot-Test Interviews of Thermometer Materials

- Objectives:
1. Find out if moms like the text of our materials
 2. Have moms choose (a) picture tagline and (b) E coli story
 3. Make sure our materials have emotional heat

Introduction: Thank you for agreeing to meet with me! As I mentioned when I called you, I am really eager to learn more about life as a mother of young children and how that relates to our project. This should take about 30-60 minutes and I'll give you a \$25 gift card when we're done. Are you ready to get started? First, here is a consent form for you to sign. Basically, it says that you will get \$25 gift card for your time and that anything you say is confidential and no one will know who says what. Please take just a minute to review and sign it. It also says that I will record this conversation – is that ok with you?

It is really important to me that you be honest and say what you think. You represent all of the mothers of young children who I can't talk with. By sharing freely you make sure their voices are heard! You won't hurt my feelings. I really want to know whatever you are thinking.

1. Let's start with your typical day. Pretend you are on a phone call to your best friend describing how your day went yesterday. What would you say?

- Probes: Where did you go? Who did you see? What did you do?

2. (Lay out about 10 door pictures): I have several pictures of doors with me. Behind one door is a cookbook, another an ipod, and another all of the hopes and dreams you have for your child(ren). Which door would you choose? The hopes and dreams? Ok! Quickly choose the door that represents all of the hopes and dreams you have for your child. Please unlock the

door, open it, and walk in. Could you please tell me what are the hopes and dreams for your child(ren) waiting for you inside?

3. It's obvious you are a loving, caring mom that wants the best for her child(ren). Next let's do an activity called hitting the mark (hand out the bullseye paper). There are a lot of flyers, pamphlets and handouts available to today's mom. What qualities would a handout need to have to "hit the mark" for you or be a perfect target? Take some time to write those things down. Good-tell me about what you wrote down.

Now, I'm going to show you a few handouts (show mockups of thermometer materials, labeled *, #, \$). Quickly look at them and mark them on the bullseye using their label to show how close they come to meeting your target of a perfect handout.

Tell me why you placed * where you did? What would need to happen for you to move it from where it is to the target? Tell me about the mom who would pick this up...what is she like? How does she feel about this handout? (Repeat with all the thermometer materials)

4. (Give participant a word bubble template.) Suppose someone handed these materials to a WIC client. What would she say? What would she be thinking? What would she be feeling? (Repeat with all of the handouts.)

5. Now I'd like you to look at our logo ideas. What do you think about these?

- Which do you like better?
- Why?
- What do you not like about the other one?

6. Now I'd like to find out what format you would like for these materials. Here is a sample of a fold-out card size and here is a sample of a brochure size. Which do you like better?

- Why?

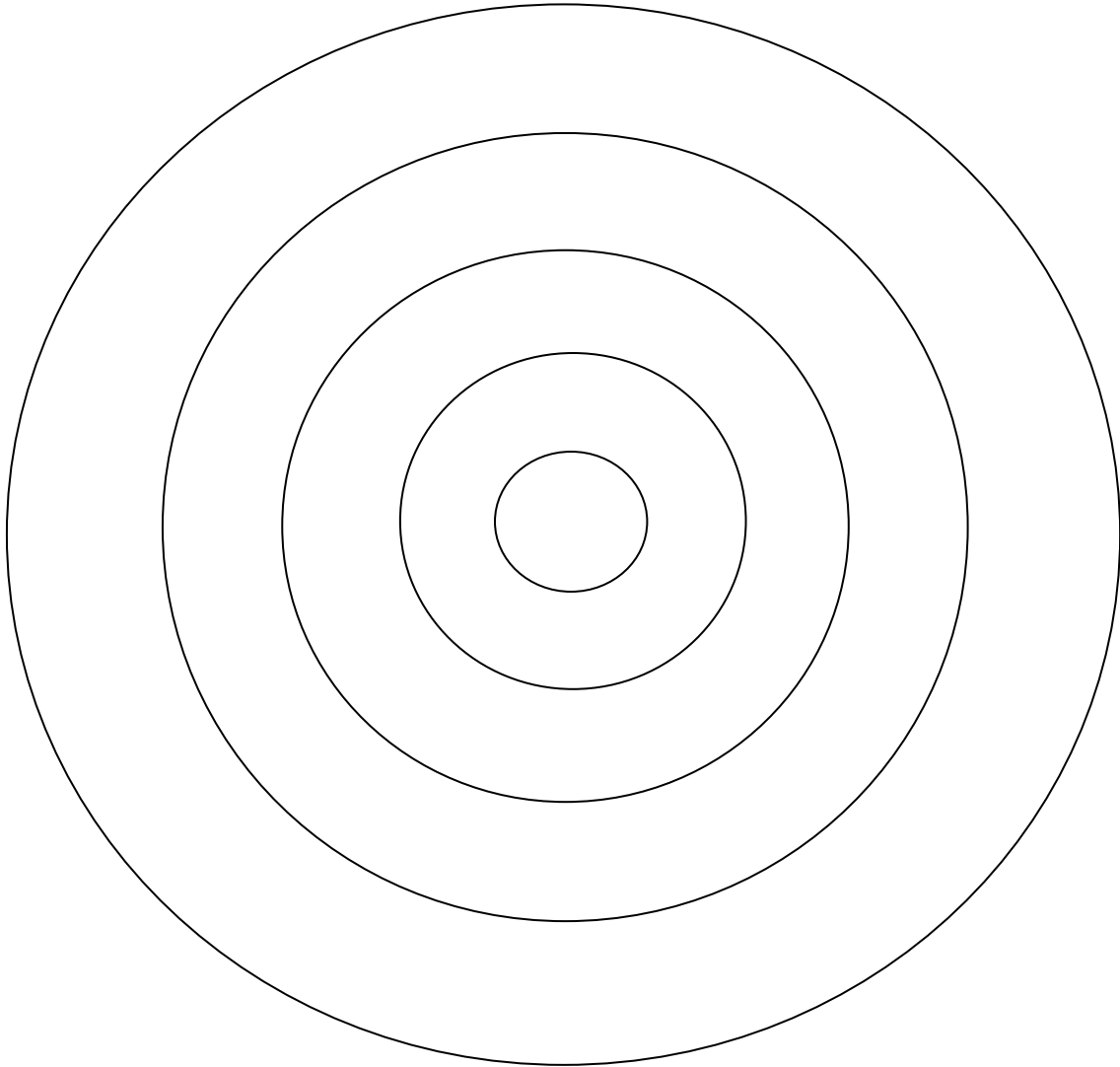
7. The pictures I showed you had this tagline: "You already use one of these..." Here are some other options. I'd like you to look at them for a minute. (Lay out strips of paper with one of the additional tagline ideas on each them.)

- What do you think about these other options for (1.) the sick child picture?
- Which do you like? Why? (Repeat question for (2.) the bath picture and (3) the sprinkler picture.)

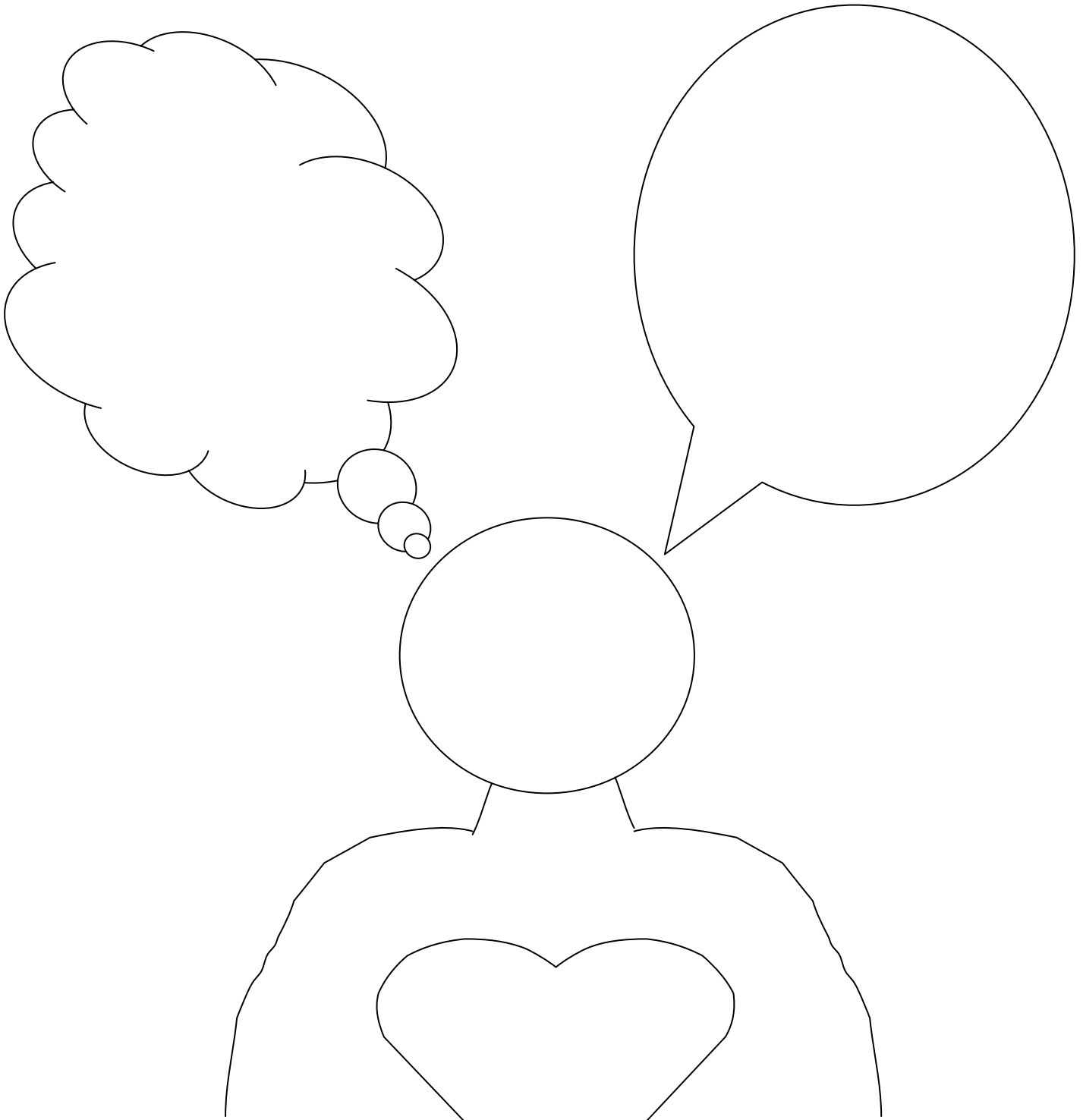
8. One last question: This business reply card will be attached to the materials. Please read it for me and let me know if it makes sense.

Conclusion: This has been fun. I really learned a lot about what it takes to be a loving, caring mom. I've asked all the questions until now -- Do you have any questions for me? Here is your \$25. Thank you for your comments and for sharing with me. I really appreciated your time.

APPENDIX K (1 OF 2)



APPENDIX K (2 OF 2)



APPENDIX L

You already use one of these
to make sure they're dressed for the right temperature.



It's just as easy
to use one of these
to make sure the burger is cooked to the right temperature.



160°F FOR YOUR FAMILY
accuracy celebration tradition

Summertime Safety Summertime Fun



Kids love the sunshine. But parents recognize that kids need protection from too much heat or sun. Unlike kids, burgers need to be hot.

160° F
is just right for
making safe
hamburgers.

Next time you get ready for a family picnic or BBQ, pack a food thermometer along with the sunscreen. Using a food thermometer only takes 30 seconds – less time than putting on sunscreen! **Aren't your kids worth it?**



GRILLING TIPS for tender, juicy burgers for your family

Heat your grill to medium-high heat. That means you should be able to hold your hand at cooking height for 4 seconds before your hand is too hot and pulls away.

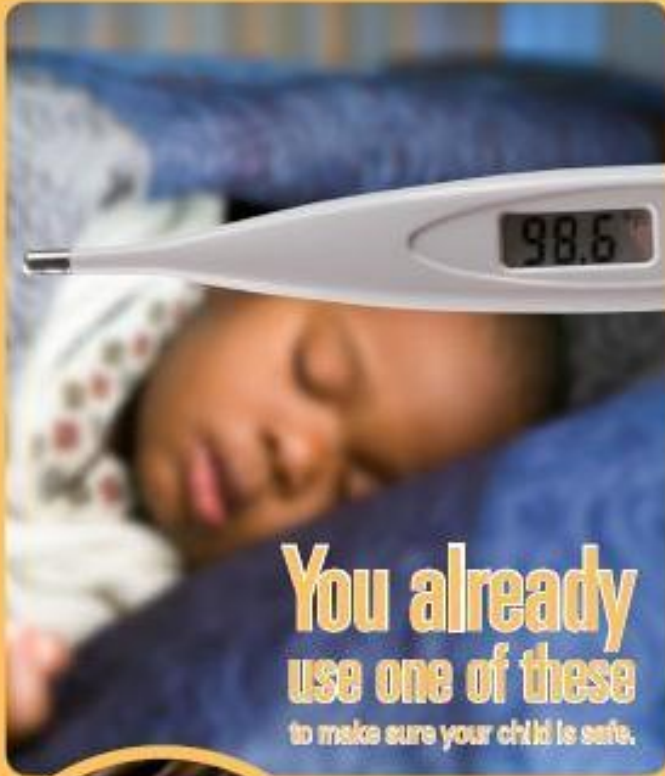
If the grill is too hot, you'll burn the outside before the inside is cooked to 160° F.

Just right, and harmful bacteria are killed but the meat is still juicy and tasty.



University of Idaho A LEGACY OF LEARNING WASHINGTON STATE UNIVERSITY

For more information, including how to buy a food thermometer of your own, visit our website: www.uidaho.edu/thermometers
This material is based on work supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture under Agreement No. 2007-81110-03820.



**You already
use one of these**
to make sure your child is safe.



**It's just as easy
to use one of these**
to make sure your
child's burger is safe.

It happened to us



The sun was shining and it was a beautiful spring Saturday. We were at the park grilling burgers. (We all like them well done – no pink inside!) A few days later, my daughter had a fever and diarrhea. Then she woke up the next night with bloody diarrhea and a bad stomachache. I took her to the doctor and found out that she had gotten sick from some E. coli O157:H7 in her burger at the BBQ. I hate to remember those days... thinking about her curled up in pain! I felt helpless to make her feel better. Finally, she was taken to Children's Hospital, where she would remain for the next month to be treated for kidney failure. She got better, gradually. It was hard to be patient while I waited for the treatments to work, but finally she was herself again – laughing, dancing, and kissing me. I'm so thankful everyday that she made it through and so far has had none of the long term issues which can happen with kidney failure from E. coli. She is my little hero.

**A food
thermometer
is the only
way to test.
160° F**

"We still have picnics with our friends and grill burgers, but you can be sure that now I use a food thermometer **every time**. And it's easy!"



"I love you" burgers

Use your inner artist or a cookie cutter to form raw patties into heart shapes. Wash the cookie cutter and let your little ones cut matching hamburger buns. Cook the burgers to 160°F and serve.

Kids shouldn't have to worry about food safety.

University of Idaho
A LEGACY OF LEARNING

WASHINGTON STATE
UNIVERSITY

For more information, including how to buy a food thermometer of your own, visit our website: www.uidaho.edu/thermometers

This material is based on work supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture under Agreement No. 2007-61110-03620.

You already use one of these
to make sure your baby does not get burnt.



It's just as easy
to use one of these

to make sure the burger does not get burnt.

Temperatures should be the least of your child's worries

Color is not a safe method to know if burgers are ready for children to eat. Some ground meat may contain bacteria and children are especially sensitive to the bacteria E. coli. Parents may decide to overcook their meat to be sure it is safe. But why eat dry, charred burgers when you can use a thermometer instead?

Be safe *and* satisfied.



Cook burgers to 160° F keeps quality, kills germs.

My life is already too hectic. I don't need one more thing to do when I'm cooking.



It only takes 30 seconds to test a burger. Every mom makes sacrifices for her kids. Make this 30-second sacrifice.

Meat patties may turn brown before bacteria are destroyed by heat.

Temperature is the **ONLY** way to be sure.



I want to keep my kids safe but I don't know anyone who uses a thermometer with hamburgers!

There's never kept you from caring for your kids before! Using a food thermometer is the right thing to do and ensures your family's safety.

Kids shouldn't have to worry about food safety.

You can use a food thermometer.

University of Idaho
A LEGACY OF LEARNING

WASHINGTON STATE
UNIVERSITY

For more information, including how to buy a food thermometer of your own, visit our website: www.uidaho.edu/thermometers

This material is based on work supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture under Agreement No. 2007-61110-03620.

Click to show pages side-by-side

Would you like to earn \$10?

YES, I'll take a 10 minute survey about these materials and receive a \$10 gift card.

To take the survey, you must be 18 years or older and cook hamburgers at home. Limit one per household. This offer expires on September 30, 2009.

Choose one of these 3 easy ways to receive the survey:

1. Visit our website www.uidaho.edu/thermometers and click on the survey link at the top of the page.
2. Call toll free at 1-877-542-3019 to take the survey by phone.
3. Fill out this card, drop it in a mailbox, and receive a survey by mail.

NAME _____

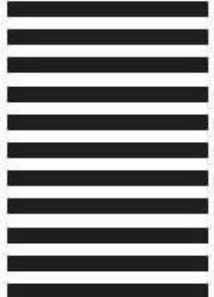
ADDRESS _____

CITY _____ STATE _____ ZIP _____

University of Idaho
A MEMBER OF THE



We will not sell your name to any list or use your information for any purpose other than for this survey.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 163 MOSCOW ID

COLLEGE OF AGRICULTURAL AND LIFE SCIENCES
SOCIAL SCIENCE RESEARCH UNIT
UNIVERSITY OF IDAHO
875 PERIMETER DR
MOSCOW ID 83843-9958

POSTAGE WILL BE PAID BY ADDRESSEE



4290

APPENDIX M

WIC OFFICE CONTACT #1, AS EMAIL

<<Greeting Line>>

A few days from now you will receive in the mail a request to fill out a brief questionnaire to ask your interest in participating in an important research project being conducted by Washington State University.

It concerns making a new food safety educational material available to Washington WIC clients.

If you are not the contact person for WIC in your county, please let us know who we should contact and we will forward it on to that person. Please also provide us with their contact information, if you have it.

I am writing in advance because we have found that many people like to know ahead of time that they will be contacted. The study is an important one that will help determine whether this new educational material is enjoyable and effective for WIC moms, and whether it is pleasing to WIC staff.

Thank you for your time and consideration. It is only with the generous help of people like you that our research can be successful.

Sincerely,
Miriam Ballejos, PhD, RD
and
Amy Erickson, graduate student

APPENDIX N

WIC OFFICE CONTACT #2, AS LETTER

Tuesday, March 30, 2009

Miriam Ballejos
(address)
Pullman, Washington 99164

«Name»
«Company»
«Address»
«City»

«GreetingLine»

I am writing to ask or your help in a study to test new food safety education materials. This study will show us if the materials we have designed to appeal to the emotions of women really have the desired effect.

It is my understanding that you are a WIC coordinator for «County». We would like to expand our dissemination of the materials to include any WIC clinics in Washington which would like to participate. If you would agree to it, I would like our materials to be set up in «County» WIC offices.

We will mail you the materials and any display items you will need. We will also give you a brief script of a few sentences which you can use to offer the materials to your clients.

Who: Any WA WIC clinic who would like to participate

What: Have new, food safety education materials at your WIC clinic

When: June through August, 2009 (*Note that we will be done before you need to start the new WIC foods package)

How: Return the enclosed questionnaire to us indicating if you can participate

Our materials will be small, colorful messages to encourage moms to use a food thermometer when cooking hamburgers. We have conducted focus groups with WIC women in Washington to compile a list of key motivators that we can use to develop eye-catching materials that will resonate with moms in Washington and help them make the behavioral change to use a meat thermometer when they cook burgers.

We have chosen to focus on hamburgers to simplify our message to one, specific food and because hamburger is a ground meat with the possibility of foodborne pathogens, such as *E coli* O157:H7, all throughout the meat instead of just on the surface. It is important for mothers to cook ground beef thoroughly, and recent studies have shown that the color of the meat is not a reliable test for doneness; a food thermometer must be used. We have chosen to focus on moms because mothers are often the gatekeepers of food for the family. Furthermore, the young children of these mothers are at increased risk of becoming sick from *E coli* O157:H7 and they can also have worse cases of *E coli* infection than other populations. WIC, of course, targets both moms and young children.

Some counties I have already contacted will be handing out our materials in the clinic room, others will hand them out at the front desk. And others are allowing us to place the materials at the front desk or in the waiting room for clients to pick up. My preference is that, wherever the materials are set up, they go along with a short, personal message from WIC employees, such as “Have you noticed these new recipes cards we have? They were just developed this year and the authors would like to know what you think of them. Please take one and call the number on the back or go online to tell them if you like them. They’ll give you something for your opinion.”

We expect to disseminate the materials we are developing and evaluate them in **June through August, 2009**. Our project will be completed, or at least winding down immensely in August, before the new WIC foods package comes out in the fall. Hopefully this timeline will work well for you and you can participate. We would really like for you to participate and would like to work with you to make this project easy for «County». Please let me know if you would like these materials in your office.

We are very excited about these materials we are creating and hope you would like to participate!

Sincerely,

Miriam Ballejos

Enclosures:

Questionnaire; Stamped reply envelope

Questionnaire

WIC Thermometer Education

Please complete this questionnaire and return it to us in the enclosed envelope by May 15, 2009.

1. Would you be willing to have our new materials at your offices? Yes No
2. Would your employees be able to say a few sentences to offer the packet of materials to clients? Please select all that apply.

___ This would not work for our offices

___ The front desk employees could do this

___ The employees in clinic rooms could do this

___ Other: (please describe) _____

3. Where could the materials be set up in your WIC clinic? Please select all the locations that would work for you.

___ At the front desk


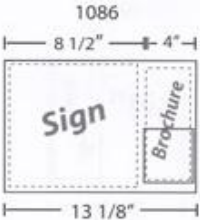
___ In the waiting room

___ In the clinic offices

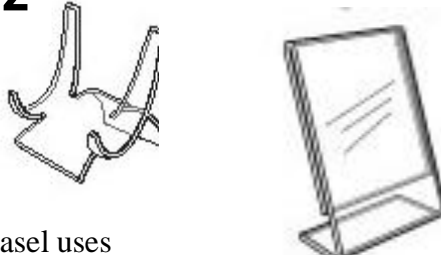
___ Other: (please describe) _____

4. The materials will be postcard size (6x4 inch) **and** will have a larger, 8 ½ x 11 inch sign to go along with them. We have a few display options in mind for the materials.

Which of these 4 display options would work in «County»? Please circle all that apply.


| | | |
|----------|--|--|
| 1 |   | <p>This sign holder is a total of ~13 inches wide and has the sign and materials in one display.</p> |
|----------|--|--|

2




Easel uses approximately **4-in diameter** counter space and is **3 ½ in.** high. Will be **accompanied** by an **8 ½x11** inch sign holder next to it.

3a




Approximately **8-in diameter** counter space. Spinner top rotates freely. Rack can be **topped** **8 ½x11** inch sign, making it taller

3b OR this can be **accompanied** by an **8 ½x11** inch sign holder next to it.




4a



Spinning countertop rack. Rack is **25"** high with a **12" diameter**. This display can either be **topped** with an **8 ½ by 11** sign, making it a total of **33 ½ inches high,**

4b OR the rack can be **accompanied** by an **8 ½x11** inch sign next to it.



Comments:

- «Name»
- «Company»
- «Address»
- «City»
- «Phone»

«email»
«County»

APPENDIX O

WIC OFFICE CONTACT #3, AS EMAIL

«GreetingLine»

About a month ago a questionnaire seeking your involvement in a study involving new food thermometer educational materials was mailed to you. You were selected because we believe you are a WIC director in «County».

If you have already completed and returned the questionnaire by mail to us, please accept our sincere thanks. If not, we are sending you an online version of the questionnaire for you to fill out. You may, of course, send in your paper copy instead. If you would like a paper copy and did not receive one, or if it was misplaced, please call us at (phone number) and we will get another one in the mail to you. If you did not receive the letter that accompanied the paper survey and introduced this study to you, please also give us a call and we will send that letter to you.

We are especially grateful for your help because it is only by asking people like you to become involved in our research project that we can get our materials out to women all across Washington.

Sincerely,
Miriam Edlefsen Ballejos, Ph.D., R.D.
Associate Professor
(phone number)
(email address)

Amy Erickson
Graduate Student
(email address)F

APPENDIX P

WIC OFFICE CONTACT #4, AS EMAIL

«GreetingLine»

We have received your questionnaire telling us that you would be willing to have our food thermometer materials at your WIC offices in «County». Thank you for your interest in our project. We are excited to get our materials out to moms and also are excited to work with you for this project.

We asked several other Washington County WICs if they would also be willing to display our brochures and all of those who agreed to work with us wanted to have the materials displayed using the acrylic display stand, seen in the picture below, so this is the display stand we will use. We will be sending you the display stand and materials within the next few weeks. We will let you know when you will receive the materials when we are closer to that date.

Until then, we have a few questions to ask you. Please reply to this email with your answers or call us if you have any questions. Please get back to us by June 10th so we can order the materials for you.

- How many display stands would you like for your county? In other words, how many WIC offices in your county would like to have our brochures available, on display, and how many display stands would each office need?
- Where would you like us to mail the materials? We can mail them all to you («Address», «City») and you can deliver them to «Satellite_wic» satellite WIC offices, or we can mail the materials to each individual WIC site. Please send us the addresses you would like us to use.

Set up of the display will involve setting the display stand in the visible location of your choice in your WIC office or offices, and posting the suggested script for employees to use to offer the brochures somewhere near the employees. We would also need someone at your office to refill the brochures as they run out.

We have attached the front cover of the brochures for you to look at if you are curious what we are creating. WIC moms I've talked to consistently rate the sleeping child as their favorite, so that photo will be the one printed in 8 ½ x 11 for the sign holder. The 3 brochures will be bundled together with a business reply card into one packet and placed in the brochure pocket of the display stand. The business reply card offers the moms \$10 if they contact us to fill out an evaluation of the brochures.

It is a pleasure working with you. Please feel free to contact us if you have any questions.

Sincerely,

APPENDIX Q

WIC OFFICE CONTACT #5, AS EMAIL

«GreetingLine»

Last week we sent you an email asking how many display stand we should order for you.

Perhaps our email did not actually get to you, or if you have already replied to us, the email may have gotten lost or redirected because I have not received it. I have copied the original email below for you to reply to. Please reply to this email with your responses. If you have any questions, please give us a call or email us.

We are happy to be working with you!

Sincerely,

Miriam Edlefsen Ballejos, Ph.D., R.D. and Amy Erickson, R.D

APPENDIX R

Calculations to estimate the number of rack cards to disseminate in each county:

(% of participating clients for county A) = (total WIC clients for fiscal year 2008 for county A) x
[Σ (total WIC clients for fiscal year 2008 for county A, B, C...Q)]

Method 1:

(estimated number of mothers in county A) = $1/3$ x (% of participating clients in county A)

→ (estimated number of mothers entering WIC office in county A over 2 month period) =

$2/3$ x (estimated number of mothers in county A)

Method 2:

(\$ available for printing)/(printing cost) = (6,000 total rack cards)

→ (# of rack cards to send to county A) = (6,000 total rack cards) x (% of participating clients for county A)

APPENDIX S

WIC OFFICE CONTACT #6, AS EMAIL

«GreetingLine»

We are getting ready to print our food thermometer brochures. Data that we have shows how many WIC clients are in «County», but you know your WIC best so we'd like to check our numbers with you.

We have the budget to print 10,000 copies of each of the 3 brochures. The materials will be out in 16 counties and according to our records «M__served»% of the WIC clients in these 16 counties are in «County». Therefore, we would like to send you brochures for **«rounded_dissemination»moms** to pick up in July and August. These would be divided among the «M__stands_needed» brochure stands for your WIC offices.

Does this number sound reasonable to you? Please reply to this email or call us to let us know. Thanks for all your help!

Sincerely,

Miriam Edlefsen Ballejos, Ph.D., R.D.
Associate Professor
(phone number)
(email address)

Amy Erickson, R.D.
Graduate Student
(email)

APPENDIX T

160°F For Your Family – Instructions

Materials for this campaign:

- Display stand(s)
- Packets of rack cards

Each packet contains one of three rack cards and a business reply card. See the last three pages of this letter for a copy of what is in each packet.

- 8½ x11display inserts to go in each of the display stands.
- Instructions and Frequently Asked Questions

Set up of the campaign in WIC offices:

- Insert one of the 8 ½ x 11 sized pictures of the sick child in each of the display stands. Put a few rack card bundles in the card pocket. Place this stand in a visible location in the WIC office.



You had mentioned you would put them at the front desks, waiting room, or in the clinic rooms. This sounds good to us! We would just like them to get as much exposure as is possible, and as is convenient for you.

- Please check the display stand regularly to make sure it is stocked with rack card bundles.
- If you would like to say something to the moms to offer these materials to them, we suggest this script:

“Have you noticed these new cards we have? Please take one and call the number on the back or go online to tell the authors if you like them. They’ll give you \$10 for your opinion.”

- Please leave the display stand up **through the end of August**. If you would like to leave the materials out longer, you may leave them out as long as you like! However, the \$10 incentive to the moms expires September 30.
- If you run out of rack card bundles, we have some extra here at WSU and would be happy to send you more. Just let us know!
- The posters, display stands, and rack cards are for you to keep. You do not need to return any of the items to us at the end of the campaign.
- We will be contacting you in a few weeks to find out if everything is going smoothly and to see if you have any questions. Feel free to contact us at anytime during the length of the campaign if you have any questions.
- Enclosed is a list of FAQ about the project and about food thermometers. We hope we have enclosed enough copies for each of the clinics. Feel free to make copies of this list for staff to refer to if moms have questions. You may also refer moms to our website for more information. The address, printed on the return post card and on the back of every rack card, is www.uidaho.edu/thermometers.

Thank you all for your help. We certainly couldn't do this without all of you!

Sincerely,

Miriam Edlefsen Ballejos, Ph.D., R.D.
Associate Professor
(phone number)

Amy Erickson
Graduate Student
(email address)
(phone number)

Suggested Script for Offering Materials to Clients

Each box below is a copy of the same script. If the script is helpful to you, you may cut these apart and tape them where WIC employees can easily refer to them, such as the back of the display unit, or on the counter.

“Have you noticed these new cards we have? Please take one and call the number on the back or go online to tell the authors if you like them. They’ll give you \$10 for your opinion.”

“Have you noticed these new cards we have? Please take one and call the number on the back or go online to tell the authors if you like them. They’ll give you \$10 for your opinion.”

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“Have you noticed these new cards we have? Please take one and call the number on the back or go online to tell the authors if you like them. They’ll give you \$10 for your opinion.”

Frequently Asked Questions



- **\$10 and the evaluation survey**

Q. When will I receive my incentive (gift card)?

Your gift card will be sent to you within 4 weeks of taking the survey.

Q. Where can I use my gift card?

You can use your gift card at any Wal-Mart or Safeway (Carrs, Dominick's, Genuardi's, Pavilions, Randalls, Tom Thumb, and Vons).

Q. What will they use this information on the post card and from the survey for?

We will be using the data we gather from this survey to evaluate the effectiveness of the food thermometer campaign and will also be assessing whether or not there was any behavior change in regards to thermometer use. This information will also help us to better develop educational materials about using a food thermometer when cooking hamburger patties.

Q. Will they sell my contact information?

We will not sell or use your contact information for any other purpose besides this survey. All your personal information will be kept confidential and stored safely and securely.

Q. How long will the survey take?

The survey should take approximately 10 minutes of your time.

Q. What kind of questions will they ask in the survey?

This survey will be asking you questions about this food thermometer campaign you see. Questions will ask about the educational materials on the display, your use of a food thermometer, your thoughts and feelings towards thermometer use, and will finish with some general demographic questions.

- **Thermometer questions**

Q. Where can I buy a thermometer?

You can buy a dial or digital food thermometer at most grocery stores, kitchen specialty stores, hardware stores, department stores, and Drug/Variety Stores (like Wal-mart or K-Mart). \$5 is the cheapest these authors have seen them but they're

usually around \$7-10.

Q. Why should I use a food thermometer?

There are two main reasons: One, young children are especially able to get sick if the hamburgers you cook have bacteria in them, but to kill bacteria like E. coli is easy if you just cook the burger to 160°F.

The other reason is that some ground beef stays pink longer than others so if you check the color, it won't look done and you might keep cooking. Some patties can still be pink even at 180°F, but when they're that hot they're not very juicy anymore.

Patties cooked to 160°F are safe *and* taste good.

Q. Why does some ground beef stay pink longer than others?

It has to do with the way the cattle were slaughtered and how you store and prepare your patties. If you just use a food thermometer though, you don't have to worry about the color.

Q: How can I use a thermometer with such a skinny thing like a hamburger?

Insert the probe (the long, pointed stick) of the thermometer sideways into the center of the patty.

Wait about 10-20 seconds for the temperature to stabilize.








Q. What is a meat thermometer?

I have a thermometer for roasts, is that what you are talking about?

In this campaign, we are focusing on hamburgers. There are two types of thermometers that can be used easily for thin cuts of meat like burgers and take the temperature quickly. These are dial and digital instant-read thermometers. To focus this campaign we have decided to focus on these two thermometers.

Dial and Digital Instant Read Thermometers

| OUR FOCUS | | Not Discussing |
|---|---|---|
| Dial | Digital | |
|  |  |  |
| <ul style="list-style-type: none"> - Pointer Display - Bimetallic Coil Sensor - 2 to 2.5 inch sensing area at the tip of the probe | <ul style="list-style-type: none"> - Digital display front - Thermistor Sensor - ½ inch sensing area at the tip of the probe | <p>OVEN SAFE - ROAST: roast thermometers usually have larger display heads and may be oven safe.</p> |
| | |  |
| | | <p>OVEN: These thermometers are safe to be used in the oven while product is cooking.</p> |
| | |  |
| | | <p>CANDY: Used for making candies and jams.</p> |

APPENDIX U

WIC OFFICE CONTACT #7, AS EMAIL

I just wanted to check in to see if the box of materials has arrived yet to you. The printer said he shipped them out last week.

When you get the box, could you send me a note? And if you have any questions about anything, don't hesitate to contact us, please! I'd like this to be an easy project for you.

Thanks!

Miriam and Amy

Miriam Ballejos: (email address)

Amy Erickson: (email address)

(phone number)

APPENDIX V

WIC OFFICE CONTACT #8, AS EMAIL

To all the WICs in Washington helping us with our project,

We are halfway into August and so far the campaign seems to be going well. At the last count, 70 people had contacted us to take the survey about our “160°F For Your Family” rack card packets. If I were to assume half of all our rack cards have been passed out, that 70 is about a 2% response rate. I’m so happy! Considering that not all women who take the materials will go on to contact us and take the survey, I think you all are doing a wonderful job of keeping the display stands stocked and helping us get our message out! Thanks.

How is the campaign going for you? Have you had any problems? Any good experiences you’d like to share? Any questions?

These materials were created and are being passed out as part of a research project. Could you remind all your staff to help us keep good research by bearing in mind the following?:

- Our target population is moms in WIC, or more generally moms with young children and who are low-income. These are the people who we want to read our materials and take the survey.
- Our survey evaluates the rack cards as a bundle. We would like the moms to receive the rack cards and not just the \$10-offer post card. Furthermore, we’d like them to receive all 3 rack cards.

We appreciate you for giving us your time (and counter space) amidst all the food package change activity.

Miriam, Amy, and the rest of the “160°F For Your Family” project team