A Mixed Methods Approach to Food Safety Knowledge, Beliefs and Practices in Hispanic Families with Young Children in Nebraska

Kristen M. Stenger
University of Nebraska-Lincoln, kstenger85@gmail.com

Follow this and additional works at: https://digitalcommons.unl.edu/cehsdiss

Part of the Bacterial Infections and Mycoses Commons, Community Health and Preventive Medicine Commons, Dietetics and Clinical Nutrition Commons, Education Commons, Nutritional and Metabolic Diseases Commons, Public Health Education and Promotion Commons, and the Social and Behavioral Sciences Commons

https://digitalcommons.unl.edu/cehsdiss/154

This Article is brought to you for free and open access by the Education and Human Sciences, College of (CEHS) at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Public Access Theses and Dissertations from the College of Education and Human Sciences by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.
A MIXED METHODS APPROACH TO FOOD SAFETY KNOWLEDGE,
BELIEFS AND PRACTICES IN HISPANIC FAMILIES
WITH YOUNG CHILDREN IN NEBRASKA

by
Kristen M. Stenger

A THESIS

Presented to the Faculty of
The Graduate College at the University of Nebraska
In Partial Fulfillment of Requirements
For the Degree of Master of Science

Major: Nutrition and Health Sciences

Under the Supervision of Professor Julie Albrecht

Lincoln, Nebraska

July, 2012
A MIXED METHODS APPROACH TO FOOD SAFETY KNOWLEDGE, BELIEFS AND PRACTICES IN HISPANIC FAMILIES WITH YOUNG CHILDREN IN NEBRASKA

Kristen M. Stenger, M.S.

University of Nebraska, 2012

Advisor: Julie Albrecht

This mixed methods study addresses food safety for Hispanic families with young children in Nebraska. A convergent mixed methods design was used, where qualitative and quantitative data were collected in parallel, analyzed separately and then merged in analysis and interpretation. A quantitative food safety knowledge survey (n=90; 52 from focus groups, 38 from piloting the survey), was used to assess the FightBac!™ concepts: Clean, Separate, Cook, Chill, and two additional concepts: foods that increase risk, and groups at increased risk. Qualitative focus groups explored food safety handling beliefs and practices through the lens of the Health Belief Model. Focus groups (6 groups, 52 participants total) were held with the primary food handler in Hispanic families with children 10 years old and younger across Nebraska. Also explored by both data sets, were effective strategies to reach Hispanic families with targeted information to prevent foodborne illness. The survey was administered at the beginning of the focus group. Participants were recruited by convenience from six different community sites and churches (Lincoln [two sites], South Sioux City, Columbus, Lexington and Grand Island, Nebraska). Strong qualitative themes include: knowledge of cleanliness and hygiene, lacking resources and the belief that foods are more fresh and more “natural” from home countries when compared to foods from the US. Results from the 90 completed
knowledge surveys show low levels of knowledge (M=72%, SD=11%), and good
correlation value (KR20, r=0.659). Six different mixed methods themes were developed
surrounding food handling control, fresh vs. packaged foods, and high frequency foods
(chicken). Effective strategies for delivering health information that emerged include
having workshops or classes, and a need for materials in Spanish. These findings are
important because Hispanics have higher rates of foodborne illness and poorer food
safety practices than other groups. The results from this study will help to develop an
educational project designed to reduce foodborne illness rates in Hispanic communities in
Nebraska.
Author’s Acknowledgements

Special thanks to:

Dr. Julie Albrecht, Carol Larvick, M.Ed., Dr. Ian Newman, Dr. Kaye Stanek Krogstrand, Dr. Vicki Plano Clark, Dr. Christina Perry, Kara Vlasin-Marty, Maggie Siebert, M.S., Lindsey O’Connell, M.S., Grant Orley (NEAR Center), staff at El Centro de Las Americas (Lincoln, NE), UNL Extension, USDA, and all of the Hispanic participants and interpreters across Nebraska.
## TABLE OF CONTENTS

OVERVIEW .......................................................... 1
PURPOSE ...................................................................... 3
RESEARCH QUESTIONS ................................................. 5
RESEARCH FOUNDATIONS .............................................. 6
LITERATURE REVIEW .................................................. 10
METHODS .................................................................... 23
RESULTS ...................................................................... 29
DISCUSSION .............................................................. 47
REFERENCES ................................................................ 55

### MULTIMEDIA OBJECTS

FIGURE 1. CONVERGENT PARALLEL MIXED METHOD DESIGN DIAGRAM ............. 4
FIGURE 2. HEALTH BELIEF MODEL DIAGRAM ....................................................... 9

TABLE 1. PARTICIPANT DEMOGRAPHICS ................................................................. 30
TABLE 2. QUALITATIVE THEME SUMMARY .............................................................. 33-34
TABLE 3. HISPANIC & AMERICAN FOOD FREQUENCY ........................................ 34
TABLE 4. QUANTITATIVE SURVEY FREQUENCIES ................................................. 36-40
TABLE 5. T-TEST RESULTS ................................................................................. 41
TABLE 6. MIXED METHODS THEME SUMMARY ................................................... 45-47
TABLE 7. CONCEPT, CONSTRUCT & THEME SUMMARY ......................................... 51

APPENDIX A. FOCUS GROUP SCRIPT ................................................................. 62
APPENDIX B. CONSENT FORM .......................................................................... 66
APPENDIX C. KNOWLEDGE SURVEY ................................................................. 68
APPENDIX D. DEMOGRAPHIC FORM .................................................................. 80
APPENDIX E. PILOT SURVEY CONSENT FORM .................................................. 84
APPENDIX F. FOCUS GROUP SUMMARIES ......................................................... 86
APPENDIX G. ITEM-TOTAL STATISTICS ............................................................. 90
A Mixed Methods Approach to Food Safety Knowledge, Beliefs and Practices for Hispanic Families with Young Children in Nebraska

Overview

The CDC estimates that each year roughly one in six Americans (or 48 million people) gets sick, 128,000 are hospitalized, and 3,000 die of foodborne diseases (Scallan et al., 2011). The objectives of the Healthy People 2020 include reducing the infections caused by pathogens transmitted commonly through food (Campylobacter, E. coli O157:H7, Listeria, Salmonella, Vibrio, Yersinia, and Postdiarrheal hemolytic-uremic syndrome (HUS) in children under five years of age)(USDHHS, 2011). Children are of high priority when considering foodborne illnesses because they get sick easier and more frequently than adults (Pew Health Group, 2009). This is due to their lower body weight, less acidic stomachs, under developed immune systems, and lack of control in food preparation.

In a previous University of Nebraska-Lincoln (UNL) project titled “Food Safety for Families with Young Children” (Meysenburg, 2009), researchers focused on all families with children 10 and under which mainly reached white families. Not only is there a gap in our research at UNL on food safety with diverse populations, but moreover, other research suggests a need to focus on Hispanic populations. Hispanics have higher rates of foodborne illnesses than other groups (Voetsch, Angulo & Jones, 2007). Also, Hispanics have poorer food safety practices when compared to other groups (Lay, Varma, & Marcus 2002; Dharod, Perez-Escamilla, Paciello, Bermudez-Millan, Venkitarianarayanan, & Damio, 2007; Palmeri, Auld, Taylor, Kendall, & Anderson, 1998; Taylor, Serrano, Anderson, & Kendall, 2000).
The increase in population growth of this group in America justifies this research. Hispanics/Latinos are the fastest growing ethnic minority group in the United States. This group grew by 43% during the 10-year span between 2000 and 2010. Hispanics are estimated to comprise over 30% of the United States population by the year 2050 (U.S. Census Bureau, 2010).

This project utilized both a qualitative component and a quantitative component with an element of mixing these methods together. A mixed methods design was chosen for this project due to its ability to capture a broader picture of an area that is not well understood. This means that the qualitative quotes and themes can open up ideas that do not appear on the quantitative instrument, thus enhancing the meaning of the project as a whole. Using a mixed methods design allows these two data types to be linked together through analysis of the same concepts in each that enriches the data, giving deeper understanding. The typologies identified for the reason for mixing methods in this study are defined by Bryman (2006) as completeness, different research questions, explanation, unexpected results, and illustration.

As a result of the research findings, a multifaceted food safety educational approach to reach Hispanic families with young children will be developed. The educational component will use a social marketing framework [(Social Marketing Assessment and Response Tool) SMART](Neiger & Thackeray, 2002). This will be the means of achieving the ultimate goal of the project: to reduce foodborne illness occurrence among Hispanic families. Reducing foodborne illness among Hispanic families should increase quality of life, and decrease time, money and resources used to treat foodborne illness within the Hispanic community. Other benefits to the target
audience include a feeling of security when handling and storing food, and the ability to teach others how to be safe with food.

**Purpose**

This mixed methods study addresses food safety for Hispanic families with young children in Nebraska. A convergent mixed methods design was used (see Figure 1), where qualitative and quantitative data are collected in parallel, analyzed separately and then merged (Creswell & Plano Clark, 2011). In this study, qualitative focus groups explored cultural contexts of food handling through the lens of the health belief model. A quantitative food safety knowledge survey was used to assess the FightBac!™ concepts from the Partnership for Food Safety Education: Clean, Separate, Cook, and Chill (http://www.fightbac.org). Two additional categories assessed by the quantitative component are; identifying foods that increase risk and groups at increased risk. Both tools (qualitative and quantitative) were used to determine effective strategies to reach Hispanic families with targeted information to prevent foodborne illness. The reason for mixing methods is to use the qualitative and quantitative data together to bring a synergy to the analysis that would not be obtained by either type alone. This mixed data allows for interpretation of knowledge scores alongside stories to yield a more complete picture for data comparison. The qualitative portion (focus groups) of this project has priority over the quantitative portion (survey) due to the exploratory nature of this topic within this cultural group. The quantitative findings are used to show where knowledge supports or diverges from the qualitative themes. Qualitative quotes explore cultural themes and other beliefs and practices that may not be present in the quantitative instrument.
Figure 1. Convergent Parallel Design for a Mixed Methods Study of Food Safety Knowledge, Beliefs and Practices of Hispanic Families with Young Children in Nebraska

<table>
<thead>
<tr>
<th>PROCEDURES</th>
<th>QUAL data collection</th>
<th>quan data collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>semi-structured open-ended focus groups n=6 groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRODUCTS</td>
<td>6 focus group transcripts n=52 participants</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROCEDURES</th>
<th>29-question Knowledge survey on 4 FightBac! concepts + 2 additional food safety concepts and demographics n=90</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTS</td>
<td>n=90 surveys and demographics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROCEDURES</th>
<th>coded for FightBac!, HBM and cultural themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTS</td>
<td>Themes + Themes not present in Quan data</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROCEDURES</th>
<th>descriptive and Correlational statistics in SPSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTS</td>
<td>descriptive statistics: frequencies, means &amp; scores Corelational statistics: KR20/alpha r value</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROCEDURES</th>
<th>Compare common qual themes with quan results</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTS</td>
<td>Broader picture and understanding of the meaning of certain results</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROCEDURES</th>
<th>Consider how merged results produce a better understanding</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTS</td>
<td>Discussion Recommendations Limitations</td>
</tr>
</tbody>
</table>

Modified from Creswell & Plano Clark, 2011
Research Questions

Based on the research objectives, the following research questions were addressed in this project.

Qualitative Research Questions

• What food safety cultural beliefs, barriers and motivators to implementing safe food handling practices are present in Hispanic families with young children in Nebraska?
• What food safety practices and attitudes are present in this cultural group?
• What are effective strategies to reach Hispanic families with young children with food safety information?

Quantitative Research Questions

• What is the food safety knowledge level of the primary food handler in Hispanic families with young children in Nebraska related to the FightBac!™ food safety concepts?
• What items within the FightBac!™ concepts are the least and most understood by this population?
• What are effective strategies to reach Hispanic families with young children with food safety information?

Mixed Method Research Questions

• To what extent do food safety knowledge assessments compare (support/diverge) with food safety barriers, motivators, beliefs and practices in Hispanic families with young children in Nebraska?
• Are there any qualitative themes that present themselves that are not present in the quantitative instrument?

**Research Foundations**

**Background**

In a previous University of Nebraska-Lincoln USDA funded project “Food Safety for Families with Young Children” (Meysenburg, 2009), researchers focused on all families with children 10 and under (infants to elementary school children) which mainly reached white families. In the focus groups, there was very limited diversity but the participants from diverse families (mostly Hispanic) provided insight into their cultural beliefs which impact their food handling practices and safety of their foods which differed from the “traditional white” participant. In this previous study, only a few participants were Hispanic (14%), where most were Caucasian (80%). The average score amongst Hispanics for the quantitative knowledge survey component in this study was only 56%. From these results, further research needs to address the Hispanic population and other ethnic populations as well.

A nationwide survey using the Health Belief Model (Lum, 2010) was conducted and only 79% participants reached the food safety objectives of Healthy People 2010 for safe food handling practices. Approximately half of the participants (53%) reported high perceived severity for their children if they contracted foodborne illness. The three main barriers to safe food handling identified in the Lum study were insufficient time, lots of distractions and lack of control of the food handling practices by other people in the household. In this survey project, only 7% of the findings came from Hispanics.
Another interesting finding from the previous research from “Food Safety for Families with Young Children” is that a Hispanic focus group participant stated that it was a tradition that mom gave a raw egg yolk with sugar to kids, believing it develops the immune system and makes the child stronger (Meysenburg, 2009). This type of comment from the field suggests that culturally held beliefs within a population have significant implications for reaching Hispanic families with culturally appropriate food safety messages.

Families with young children are at risk for foodborne illness. Questions such as “where and how Hispanic families with young children receive food safety information to prevent foodborne illness” may be different in various cultures. The primary food handler in busy families may eat out more often, may prepare less food at home, and may have less experience with handling food. When they do prepare food, it may be for special occasions such as family gatherings around holidays, birthdays and other events. Different cultural backgrounds with non-scientifically based cultural food beliefs, that are transferred informally in the culture, may impact the safety of the food prepared and eaten in Hispanic families. Some of these cultural food beliefs in Hispanic families could include soul loss (susto), hot/cold theory, and the use of herbalists (yerberos) and lay healers (curanderos) (Batty & Kurko, 2009). Hispanic families and particularly with children 10 and under may be at an increased risk for foodborne illness if improper food handling techniques are used.

**Worldview**

For this project, the researchers have identified with a pragmatic research worldview. This means that the researchers have a “whatever works” attitude to get the
project completed, of course keeping in mind ethical, practical and reliable standards. The pragmatic approach is reflected in the sampling techniques used (convenience and snowball), and the locations used (Hispanic churches and community centers) due to the homogeneity of the target participants (primary food handler in a Hispanic family with children 10 years old and under). This study was designed around the research questions with intent of answering these questions by whatever ethnical and practical scientific means available. The pragmatic worldview is inherent in this study because the study was planned with a problem centered, real-world goal in mind.

Theoretical Frameworks

The theoretical lens for the qualitative portion of the project is a logic model for investigating health behaviors based on specific health beliefs called the Health Belief Model (Rosenstock, Strecher & Becker, 1988)(see Figure 2). The Health Belief Model is based on the idea that one will only change their health behavior if given a good reason to change it (DiClemente, Crosby & Kegler, 2009; Greene & Kreuter, 2005). Ideally, by identifying different health beliefs one can predict health behaviors, and see possible avenues for changing negative health behaviors. The constructs of the Health Belief Model that are identified to have an effect on behavior change are: perceived susceptibility, perceived severity, perceived costs and benefits (barriers and motivators), self-efficacy and cues to action. Self-efficacy is a concept similar to confidence. Cues to action basically means that an event happens to the person, and this experience triggers the change. For this case a likely cue to action would be the person contracting a foodborne illness and learning from the experience that it is a subject to be taken seriously. Similarly, someone close to the person could get sick from food (i.e. their
Based on DiClemente, Crosby & Kegler, 2009
child, spouse) and change behavior due to that experience as well. Moreover, an educational or social marketing campaign could also be a cue to action.

The quantitative portion of the project is based on the FightBac™ food safety concepts identified by the Partners for Food Safety Education (includes CDC, FDA and USDA). These concepts are: Clean, Separate, Cook, and Chill. These concepts emphasize practices such as washing hands and other surfaces often, do not cross contaminate food items, cook food to the proper temperatures, and prompt refrigeration. These topics have been identified as critical consumer behavior points in preventing foodborne illness. Using these concepts for the quantitative knowledge survey allows items to be organized not only individually, but as grouped concepts as well. Two additional concepts (groups at increased risk, and foods that increase risk) were added to the quantitative portion due to interest in understanding these items further. The foods that increase risk questions are intended to unveil deeper cultural understandings of traditional Hispanic foods.

**Literature Review**

The literature is divided into four main groups: general consumer food safety, food safety related to Hispanics, food safety tool and instrument development, and mixed methods references. The information will be presented in this order to give a basis for this study in context to other research.

**General Consumer Food Safety**

Byrd-Bredbenner et al. (2007) conducted a two-phase study with the purpose to examine food safety knowledge, psychosocial factors involved in food safety, and self-reported food safety behaviors of college students. The purpose of the second phase was
to develop, implement, and evaluate a social marketing campaign based on the results of phase one. The first phase was completed by using an online survey among a convenience sample of 4,343 college students. Knowledge and practice results were about 50 and 60% respectively. Other results included a limited intake of high-risk foods, internal locus of control concerning food safety, positive food safety beliefs and positive self-efficacy. Participants at higher levels of the stages of change performed better in all areas than those at lower stages.

A quantitative study by Byrd-Bredbenner et al. (2007) used an observational method to examine food safety among students at a large northeastern university. Food handling practices were recorded using a checklist based on the FightBac!™concepts: Clean, Separate, Cook, and Chill. The recruitment process started with an online convenience screening, where 1,228 participants were screened to 432 qualified participants. Of these, 154 participated in the actual study. Participants were observed preparing 2 recipes, one with a raw meat, and one with a raw vegetable to be eaten raw with a meat sauce. The observations occurred in model laboratory kitchens. Participants were instructed to prepare the recipes and then store them for later use. The food safety checklist was reviewed by an expert panel and pilot tested before use. Research observers were trained to use the checklist in a uniform fashion and underwent a practice observation. Results of the observations included: only 60% washed their hands at the start, only 40% washed their hands after handling raw chicken, 33% did not keep raw chicken separate from other food, 97% did not use a thermometer to test doneness of chicken, and only 35% thawed the chicken in a safe way.
Food preparation at home is a source of foodborne illness, and that cross-contamination is a leading cause of foodborne illness. The purpose of a study by Slader and Humphrey (2004) was to assess food safety practices concerning cross-contamination through observation in a model home kitchen in England and Wales. Participants were chosen due to higher foodborne risk levels (elderly, mothers with young children, and single young men). Ten people from each group were recruited (30 participants total). Participants were asked to prepare a recipe with raw chicken as they would at home and store the leftovers. The participants were unaware that they were being watched for food safety habits. *Salmonella* and *Campylobacter* were tested in the kitchen and the food before preparation and after preparation. Participants were video recorded during the cooking sessions. Results indicated that elderly adults practiced more poor food safety habits than both mothers with young children and single young men. Results also showed that 80-86% of unsafe food handling behaviors were associated with cross-contamination.

A study by Lin, Jensen and Yen (2004) had the purpose of assessing the awareness of the four most common foodborne pathogens in the US (*Salmonella, Campylobacter, Listeria, and E. coli*). Phone interviews conducted by a random dialing service contacted 4,482 eligible adults, yielding 2,992 valid surveys, including participants from the 48 continental states and the District of Columbia. Most American consumers had heard of *Salmonella* (94%) and *E. coli* (90%) as problems in food, but only 32% had heard of *Listeria* as a problem, and only 7% for *Campylobacter*.

A study on low socioeconomic status (SES) related to food safety was conducted by Koro, Anandan, and Quinlan (2010) to ascertain the difference in the level of food
safety and microbial content of foods available to low SES populations versus high SES groups. Many different microbial measurements were taken from six retail grocery stores (3 low SES, 3 high SES). Each store was visited one time per month for 15 months. The same items were purchased from each store. The results from stores in low SES areas showed higher microbial loads with significant differences on ready to eat greens, strawberries, and cucumbers. Chicken and ground beef were tested for the presence of *E. coli*, *Salmonella*, and *Campylobacter*, but no significant differences were found for these pathogens. Aerobic plate count for ground beef from high SES stores were actually significantly higher than low SES stores. This study suggests that produce available in low SES grocery stores may be of poorer quality.

After analyzing some general population food safety trends in current research literature, it is necessary to explore what recent data has been collected for the target population: Hispanics and Latinos in America.

**Food Safety and Hispanics**

An article by Perez-Escamilla (2010) explores the available research on Latinos and how acculturation may be contributing to poor dietary practices. Hispanics and Latinos are the fastest growing group in the country, accounting for half of the growth between 2000 and 2006. Then, it is noted that this group has a much higher rate of many health disparities, poverty, and food insecurity. Acculturation (to American culture) is having negative influences (i.e. obesity, diabetes) on the diet of Latinos of all ages. A negative connection between acculturation and breastfeeding was reported. Food insecurity was also associated with higher levels of acculturation. This study suggests
that dietary health of Hispanics and Latinos is being negatively influenced by acculturation.

A mixed methods study by Diaz-Knauf et al. (1993) was conducted with the purpose of exploring the connection between acculturation and food safety attitudes among Hispanics in California. The method was a pre-test and a post-test before and after short videos regarding food safety and farming practices (specifically pesticide use). Focus group discussions were held after tests and video viewing. All materials and sessions were bilingual (English and Spanish). Ninety-one participants were recruited through local organizations and churches in central and northern California. Researchers reported that English-speaking respondents were more confident in the safety of American grown produce (83%) than Spanish-speaking respondents (67%). There was a positive correlation between the length of residency in the US and food safety confidence. The main findings are that there are differences between Hispanics based on acculturation level, but more importantly this study suggests that there is a large knowledge deficit in this group independent of acculturation status.

A study by Taylor, Serrano, Anderson, and Kendall (2000) utilized abuelas (Hispanic grandmothers) as educators for an educational program because traditionally Hispanics place decision-making authority in their elders. The purpose of the study was to assess the effectiveness of the educational program with abuelas as educators in southern Colorado. The program was based on 12 focus group sessions with 3 separate target participants for the focus groups (1) Hispanic mothers, and then (2) professionals and (3) paraprofessionals who work with Hispanics in nutrition and health. Abuela educators attended a 2-day training session to prepare them to teach nutrition education
classes for Hispanics. Abuela educators were evaluated with pre-tests and post-tests. Participants for the classes were recruited through local community agencies by convenience. Thirty-six abuela educators were used to teach 337 class participants. Class participants completed a follow-up survey 6 months after classes had finished. The results of the posttests show that abuelas are effective as educators in the Hispanic community regarding nutrition. Results of the follow-up test show that information was retained after 6 months, although response rate for the follow-up test was low (24%).

There are some particular foodborne illness outbreaks involving *Listeria* and raw Mexican-style cheese that have affected Hispanic groups. In 1985, a large *Listeria* outbreak affected mostly Hispanic people (96%) in southern California and resulted in 48 deaths (20 fetuses, 10 neotates, and 18 adults) (Linnan et al., 1988). Another *Listeria* outbreak was reported by MacDonald et al. (2005) that involved 13 patients, all Hispanic who became ill with *Listeria* in 2000 and 2001 in Winston-Salem North Carolina. The purpose of the study was to find the source, identify the strains, and understand risk factors for contracting the *Listeria* infection. Twelve of the patients were female, and 11 of them were pregnant. The *Listeria* outbreak resulted in 5 stillbirths, 3 premature deliveries, and 3 infected newborns. A case-control study was done where control subjects were matched based on age, ethnicity, sex and pregnancy status. The researchers reported that case patients had eaten fresh cheese made at a local dairy. The *Listeria* obtained from 10 case patients matched the fresh cheese.

*Listeria* is one of the leading causes of death from foodborne illness in the US. A study by Voetsch et al. (2007) involved a population-based surveillance of *Listeria* from all the laboratories in the Foodborne Diseases Active Surveillance Network from 1996-
2003. The purpose was to report the incidence results of *Listeria* during this time period and they reported an overall reduction of 24%, with pregnancy associated *Listeria* (a decrease of 37%). Incidence of *Listeria* among Hispanics was higher than any other group.

The purpose of a study by Bermudez-Millan, Perez-Escamilla, Damio, Gonzalez, and Segura-Perez (2003) was to investigate food safety behaviors and beliefs in the Puerto Rican community. This study utilized quantitative and qualitative data collection through household observations (10), surveys (100) and focus groups (2). The participants were recruited from local community centers. In the household observations, 90% of the participants did not wash their hands with soap, and none of them used a thermometer to check the temperature of meat. Researchers reported that 89% of the quantitative survey participants use the same cutting board for meat and vegetables. Survey results supported that thermometers are not used in this community. Very few (5 of 100) gave a proper definition of cross-contamination. Unsafe thawing procedures (outside of the refrigerator) were described in the focus groups.

A study by Dharod, Perez-Escamilla, Bermudez-Millan, Sugura-Perez, and Damio (2004) was conducted with the purpose of examining the effect and level of consumer satisfaction with the FightBac!™ Campaign (USDA, PFSE, 2011) among a Puerto Rican community in Connecticut. The FightBac!™ Campaign was delivered to the target community in many different media forms including: radio, television, newspaper, posters, stickers, brochures, plastic bags, and coloring books. The design used to evaluate the campaign included pre-surveys and post-surveys. Participants for surveys were chosen by house-to-house convenience after answering filter questions. The
researchers reported that individuals exposed to the campaign had a higher level of knowledge when compared to those not exposed. The posttest evaluation revealed the FightBac!” logo was 4 times more likely to be recognized after the campaign.

McArthur, Anguiano, and Nocetti (2001) explored the central phenomenon “food habits” as the purpose of a qualitative study. They define food habits as, “a standardized set of dietary behaviors adopted by most members of a cultural/ethnic group that are passed on from generation to generation” (McArthur et al., 2001, p. 310). Focus groups and interviews were used to gather information from 33 male and female Hispanic participants. Participants were recruited through purposeful sampling with announcements at various community centers. Focus groups, interviews, and written materials were available in both English and Spanish. Data analysis consisted of identifying common themes amongst the interviews and focus groups by the researchers. Specific results revealed that Hispanics perceive food in the US to be more “clean” than food from Mexico because of our labeling/packaging system. Hispanics purchase more meat items than they did in Mexico, because it is more affordable for them here. It was also reported that Hispanics purchase more frozen foods in the US vs. Mexico.

A research problem identified by Palmeri, Auld, Taylor, Kendall, and Anderson (1998) was the unknown needs of low-income Hispanics related to nutrition education. The purpose of this qualitative study was to identify the best delivery methods for information, identify the nutrition education needs of low-income Hispanics, identify the barriers and motivators for change, and determine the effectiveness of abuelas as educators. Data were collected through nine focus groups; one with professionals (n=10), three with paraprofessionals (n=26), and five with low-income Hispanic women (n=29).
The main results included a “need for information on child nutrition, healthy preparation methods and countering the negative influences of acculturation” (Palmeri et al., 1998, p. 306). The major barriers identified by the low-income Hispanic women were: lack of time and money, family traditions and preferences, and confusion with conflicting nutrition messages. Results among the professionals and paraprofessionals demonstrated an agreement for the need of cultural sensitivity training, nutrition recommendations, continued support, and necessary materials.

Dharod et al. (2007) identified a research problem as the disagreement between a self-reported behavior and an observed behavior amongst Latinas associated with food handling procedures. The purpose of this study was to compare self-reported data with the observed behaviors and measure the differences. The data collection consisted of in-home observations of Latinas and a closed-end questionnaire designed to compare “what they think they do” and “what they actually do”. The results show over-reporting of certain behaviors such as hand washing, and cutting board washing. Significant correlations include a relationship between proper thawing methods and prior food safety education, using a cutting board and higher income, and washing tomatoes and having a positive attitude about food safety. These results indicate that self-reported data can be skewed with a subject such as food safety. It is hard to admit that hygienic practices are not being followed, when the participant knows they should be.

A qualitative study performed in Pennsylvania by Cason, Nieto-Montenegro, and Chavez-Martinez (2006) used 12 focus groups (n=117) with the purpose of analyzing the nutrition knowledge and practices of Hispanic migrant workers. Focus groups were taped and performed in Spanish. The primary goal of the focus groups was to identify
barriers that exist to prevent good nutrition in this community. They used a semi-structured interview to explore several main topics: favorite foods, food choices, what effects food choices, dietary acculturation, food sufficiency and food maintenance practices, and nutrition education. Responses revealed that many Hispanics have changed their diets after living in America which include eating more fast foods and eating less traditional foods. Also, they reported eating fewer fruits and vegetables due to low quality and high cost.

**Food Safety Tool and Instrument Development**

The following research studies report techniques used to develop different tools and instruments for food safety evaluation, including the study (Byrd-Bredbenner et al., 2007) that created the original knowledge survey used in the University of Nebraska project “A mixed methods approach to food safety knowledge, beliefs and practices in Hispanic families with young children in Nebraska”.

An article by Byrd-bredenner, Schaffner, and Mauer Abbot (2010) describes the process that was taken to validate a tool to measure food mishandling in home kitchens. The “Home Kitchen Check-Up” educational tool was initially used as a research tool. It is based on foodservice inspection and has now been adapted to be used in home kitchens. Experts in many areas including nutrition, food service, food microbiology, sanitation, and environmental health reviewed the tool for use in home kitchens. After being reviewed and edited by the expert panel, it was tested in 6 home kitchens. Changes and refinements were made to the tool according to the results. The expert panel again reviewed modifications. This tool is based on the same principles (from the CDC
surveillance data) that was used to assess food safety knowledge in the current UNL project.

The purpose of a study by Byrd-Bredbenner et al. (2007) was to discuss the process of creating a valid and complete food safety knowledge survey. First, key food safety concepts were identified from reports and food safety experts. The key concepts that were identified are: cross contamination prevention/disinfection procedures, safe times/temperatures for cooking/storing food, groups at greatest risk of foodborne illness, food that increase the risk of foodborne illness, and foodborne pathogens. A list of knowledge questions related to these concepts was developed that was modified by a group of experts. A pretest was administered among 180 young adults, and refined accordingly. It was pilot tested with 126 participants, and refined. The expert panel then reviewed and refined it again. Finally, 4,343 young adults from 21 colleges across the United States completed the survey. This is the knowledge survey that was the starting point for the knowledge survey adapted for Hispanic audiences in the University of Nebraska project.

The objective of a quantitative study by Bradford, Serrano, Cox, and Lambur (2010) was to create and evaluate a valid and reliable checklist related to nutrition, food safety and physical activity. This checklist paired with lessons was designed to be used among Expanded Food and Nutrition Education (EFNEP) and Food Stamp Nutrition Education program (FSNE) members. An expert panel developed the instrument, and then pilot tested it with 3 individuals from the target population for clarity. Seventy-three participants were active in all three aspects (pre-test, lesson, post-test). The results indicate that the nutrition and physical activity portions had acceptable test-retest
coefficients (0.87 and 0.77 respectively). The food safety portion scored below the cutoff point at 0.51 for Pearson correlation coefficient. This low score in food safety indicates that it is not a reliable tool to measure food safety, although this could be attributed to inconsistent food safety practices by the participants.

This literature review demonstrates a need for research with Hispanic families surrounding food safety practices, beliefs and knowledge, especially in the Mid-west, where research of this kind has not been conducted.

Mixed Methods References

**Definition.** Creswell and Plano Clark (2011) define mixed methods as:

A research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis and the mixture of qualitative and quantitative approaches in many phases of the research process. As a method, it focuses on collection, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone. (p. 5)

A convergent parallel mixed methods design (Creswell & Plano Clark, 2011) as described before in the purpose section was used for this study (Figure 1). The purpose of this design is “to obtain different but complementary data on the same topic” (Morse, 1991, p. 122). This design entails that the quantitative and qualitative data are collected concurrently (time wise, though not necessarily together) and before any analysis is done. Then the data are converged sometime later (either in data analysis or data interpretation
or both). This design is used most often in health behavior sciences as a quantitative instrument such as a survey, test or questionnaire coupled with qualitative interviews or focus groups. Other types of studies in health behavior sciences might include observations, which can be done quantitatively as check lists or qualitatively as descriptive notes or video. This study uses a validated quantitative knowledge survey instrument and qualitative semi-structured focus group discussions. Another important quality to note about the convergent parallel design of this particular study is that priority is being placed on the qualitative component over the quantitative component. This is due to the unknown nature of this topic with this cultural target audience.

**Characteristics.** There are a few noted challenges to using a convergent mixed methods design (Creswell & Plano Clark, 2011). One major challenge to using this design is that much expertise is required for each of its parts. This challenge is being addressed by utilizing a team of researchers with expertise in each of the areas of the study. The research team for this project included a food safety expert, two extension specialists, a health education expert, and four nutrition and health sciences graduate students.

Another challenge lies in having different samples and different sample sizes for each component and how these will be merged properly must be considered. In this study, a larger quantitative sample was used compared to the qualitative portion. This strengthens the qualitative portion by having fewer participants, as it strengthens the quantitative portion by having more participants. All of the qualitative focus group participants are also a part of the quantitative sample. The quantitative sample includes extra participants of the same demographic. Another challenge to this type of mixed
methods study is the ability to properly merge the data sets. To offset this challenge, specific concepts are used for both the qualitative and quantitative components with the purpose of easing the merging process. A final challenge to this design is deciding what to do with contradictions in results from the quantitative and qualitative data sets. The research team for this study is open to diverging results due to the ability for this to bring new ideas to light.

**Methods**

**Qualitative Script Development**

A qualitative semi-structured, open-ended focus group script (Appendix A) was developed by the research team based on the constructs of the Health Belief Model (Figure 2). The Health Belief Model is based on the constructs of perceived threat, perceived severity, perceived barriers/motivators, and cues to action. It is believed that these items are related to behavior choices that affect an individual’s quality of life. When these constructs are measured, a plan for changing the behaviors can be developed in the form of a social marketing campaign or educational outreach project. The focus group semi-structured script questions come directly from the Health Belief Model constructs. The script, including the introduction and “ice-breaker” question was edited and agreed upon by the entire research team for this USDA grant project.

**IRB Approval**

This project has been approved by the University of Nebraska-Lincoln IRB. There are no known risks associated with participating in this study. The consent form (English: Appendix B1, Spanish: Appendix B2) attached to the quantitative survey (English: Appendix C1, Spanish: Appendix C2) explains the study to the participant and
asks for name and social security number for the compensation of gift cards. Name and social security numbers are required by funding rules for compensation of any kind. This personal information was obtained on a slip of paper within the survey that was detached from the survey information immediately following the focus groups. Obtaining social security numbers is a sensitive issue with any group of people, but more so with the Hispanic population due to the possibility of having illegal immigrants as participants. This problem was diverted by gaining trust from the participants, letting participants know that information is kept safe and destroyed after 2 months, and compensating them with the $25 Wal-mart gift card. Also, social security numbers were not verified, so it is possible that fake numbers were used without the researchers knowledge.

**Participant Recruitment**

Participants qualified for the study if they considered themselves the primary food handler in a Hispanic family that prepared food for children 10 years old and younger. The participant did not necessarily have to be the child’s parents, but could be an aunt, uncle, grandparent, cousin, older sister or someone else in the household who does the food preparation. Participants were recruited through several different Hispanic community centers, churches, and by community members in Lincoln, South Sioux City, Columbus, Grand Island, and Lexington, Nebraska. Recruitment was typically done by word of mouth through the use of a bilingual Hispanic contact or extension educator. Convenience sampling and the snowball technique was used to obtain participants. Participant qualification criteria were verified with questions in the demographics that section of the knowledge survey. Hispanic race/ethnicity was verified in the
demographic questions (English: Appendix D1, Spanish: Appendix D2) as well as children 10 years old and younger being present in the household.

Qualitative Data Collection

The Krueger (1994) methodology for conducting focus group discussions was followed using a semi-structured, open-ended format. This approach was used so that the researchers were able to guide the sessions, but still have unique sessions based on the feelings of the participants. Question items for the focus groups used the constructs of the Health Belief Model to elicit information about current food handling practices, typical sources of food safety information, food safety beliefs including cultural beliefs related to food, barriers to current food safety recommendations and how and what methods should be used to reach Hispanic families with young children with food safety information. Initial questions focused on what foods are prepared at home, how they prepare them, what foods they consume away from home, and what foods they eat at home but are prepared by others, such as take-out or delivered foods. The ice-breaker question: “What is your favorite meal to prepare at home for your family?” was asked with the intention of making the participants more comfortable with sharing their thoughts on the food they make for their family. This question not only fulfilled this purpose but provided rich information on the what, how and why participants make certain foods.

Qualitative Data Analysis

Audio tapes from the focus groups (6 groups, 52 participants total) were transcribed into written notes. A bilingual person translated the Spanish audio tapes into English notes. Transcripts were coded for common themes. Transcripts were coded
independently by the 3 researchers to strengthen the validity of themes discovered. The coding process involved highlighting the text by Health Belief Model constructs (perceived severity, perceived susceptibility, barriers, motivators, and cues to action) or by the quantitative FightBac!™ concepts (Clean, Separate, Cook, Chill, foods that increase risk, and groups at increased risk) or both and then tallying the frequencies throughout the transcripts. Qualitative validity was maintained by reporting disconfirming evidence, and by having three independent coders (Creswell & Plano Clark, 2011). An initial coding tree created before analysis began used the Health Belief Model constructs and the 6 quantitative concepts as code categories and more codes were added as needed. Using the quantitative concepts to code the qualitative transcripts allows for the data to be merged (“mixed”) in a meaningful way.

**Quantitative Instrument Development**

A quantitative knowledge survey adapted for easier understanding, shorter length, cultural appropriateness and less repetitiveness from a validated published article (Byrd-Bredbenner et al., 2007) was used to evaluate food safety knowledge for the four FightBac!™ concepts: Clean, Separate, Cook, Chill; and two additional concepts: foods that increase risk, and groups at increased risk. The original survey from Byrd-Bredbenner (2007) was validated for college students, not for the Hispanic target population for this study.

First, this survey was initially evaluated by food safety experts in the current research team. The shortened version was reviewed by the Buros Institute of Mental Measurements at the University of Nebraska-Lincoln. The Buros Institute is known for their expertise in survey development. Changes made from their suggestions include: the
removal of “I don’t know” response in multiple choice, re-arrangement of questions to group questions of the same type together (i.e. multiple choice with single response vs. multiple response, true/false), removal of questions that are too difficult, re-wording some questions and items for simplification, and changing some response items for similar length.

Quantitative Pilot Study

This revised version (41 questions and 12 demographic questions) was pilot tested with 38 qualified participants (primary food handler in a Hispanic family with children 10 years old and younger). This process has its own IRB approval and consent form (English: Appendix E1, Spanish: Appendix E2). Participants were recruited through word of mouth at the local Hispanic community center in Lincoln, Nebraska and through the Minority Health Coordinator in Columbus, Nebraska. Participants were compensated with a $5 Wal-Mart gift certificate for completion of the survey in this pilot study. Kuder-Richardson 20 (KR20) was used to analyze the surveys in SPSS (http://www-01.ibm.com/software/analytics/spss). Content validity was conducted with food safety experts to rate clarity, repetitiveness, construct relevance, and content domain (McGartland Rubio et al., 2003). This resulted in a final condensed 29-question survey (Appendix C) based on statistical analysis, the repetitiveness of content, and expert opinions. A few response items were deleted based on being rated “too easy” or “too hard”. The KR20 score for the survey used for the rest of the study was $r=0.553 \ (n=38)$. It was concluded that this knowledge survey can provide a valid and reliable instrument for measuring food safety knowledge among the main food preparer in Hispanic families with young children. For this pilot study, more emphasis was placed in expert opinions.
and simplicity of the survey than statistics due to small sample size (n=38) of a homogenous population (primary food handlers in Hispanic families with young children).

**Quantitative Data Collection**

The 29-question modified knowledge survey were administered at the beginning of each focus group session. IRB approval for the quantitative component is the same as for the qualitative component, and the one consent form (Appendix B) covered both components. Participant recruitment for the surveys completed at the focus groups is described in the qualitative recruitment section. The reason the survey was done prior to the discussion was to ascertain knowledge before the focus group discussion. Although, this does mean that participants were exposed to the quantitative questions before the focus group discussion began. The participants choose either an English or Spanish version of the survey based on their preference. Completion of the survey generally took 20-30 minutes. A total of 90 completed surveys were collected from the pilot study (n=38) and focus groups (n=52).

**Quantitative Data Analysis**

Data from the 29 questions from the pilot survey (n=38) was merged with the same 29 questions used with the focus group participants (n=52). The data from the knowledge surveys (n=90) were entered into Excel™ and imported into SPSS (http://www-01.ibm.com/software/analytics/spss) for statistical analysis. A consultant from the Nebraska Evaluation and Research Center (NEAR) at the University of Nebraska-Lincoln was used for insurance of accurate analysis. Descriptive statistics including means, frequencies and overall test scores were analyzed. KR20 was
determined for the knowledge survey. Knowledge scores were also analyzed (using independent t-tests) based on whether the participant has worked in the food industry (thus receiving some sort of food safety training), and how long they have been living in the US (acculturation level).

**Mixed Methods Data Analysis**

The qualitative and quantitative data were merged in the analysis and interpretation phases of the study. The initial qualitative coding tree codes came from the Health Belief Model constructs and FightBac™ concepts plus the two additional food safety concepts. Themes that emerged were compared with the results from the knowledge survey to uncover supporting, diverging and other interesting findings. Qualitative themes that were not present in the quantitative instrument appeared allowing for the possibility of future edits to the quantitative component. These themes were largely centered on cultural traditions and beliefs that can make for a more culturally sensitive food safety knowledge survey for Hispanic populations in the future.

**Results**

**Participant Demographics**

Majority of participants preferred Spanish to English for focus group discussions (47 of 52). Almost all participants were female (51 of 52), middle aged, from Mexico and with lower education levels (Table 1). The z ratio for the significance for two independent proportions indicates that the difference in education between the pilot group and the focus group participants is not significant (z=-1.66, p=.0969).
### Qualitative Results

Six focus groups were held following the focus group script (Appendix A). Two were held in Lincoln, Nebraska and one in each of the following locations: South Sioux City, Columbus, Grand Island, and Lexington, Nebraska. Focus groups were conducted by an English speaking graduate student, and with the help of a bilingual (English and Spanish) person. Focus group discussions generally lasted between 35 and 45 minutes. Individual focus group summaries and notes can be found in Appendix F.

Table 1. Demographic Characteristics of Focus Group and Pilot Survey Participants

<table>
<thead>
<tr>
<th>Gender</th>
<th>Pilot Survey n=38</th>
<th>Focus Group n=52</th>
<th>Total n=90</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male n=3 (7.9%)</td>
<td>Male n=1 (1.8%)</td>
<td>Male n=4 (4.4%)</td>
</tr>
<tr>
<td></td>
<td>Female n=35 (92.1%)</td>
<td>Female n=51 (98.1%)</td>
<td>Female n=86 (95.6%)</td>
</tr>
<tr>
<td><em>missing data</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age*</th>
<th>Pilot Survey</th>
<th>Focus Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean = 36 yrs</td>
<td>Mean = 39 yrs</td>
<td>Mean = 36 yrs</td>
</tr>
<tr>
<td></td>
<td>+ or – 7.2 yrs</td>
<td>+ or – 7.7 yrs</td>
<td>+ or – 7.5 yrs</td>
</tr>
<tr>
<td><em>missing data</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education*</th>
<th>Pilot Survey</th>
<th>Focus Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than high school</td>
<td>23%</td>
<td>Less than high school</td>
<td>40%</td>
</tr>
<tr>
<td>Some high school</td>
<td>14%</td>
<td>Some high school</td>
<td>11%</td>
</tr>
<tr>
<td>High school/GED</td>
<td>23%</td>
<td>High school/GED</td>
<td>19%</td>
</tr>
<tr>
<td>Some college</td>
<td>0%</td>
<td>Some college</td>
<td>0%</td>
</tr>
<tr>
<td>College grad</td>
<td>29%</td>
<td>College grad</td>
<td>11%</td>
</tr>
<tr>
<td>Post-college grad</td>
<td>3%</td>
<td>Post-college grad</td>
<td>9%</td>
</tr>
<tr>
<td><em>missing data</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment*</th>
<th>Pilot Survey</th>
<th>Focus Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time</td>
<td>31%</td>
<td>Full-time</td>
<td>29%</td>
</tr>
<tr>
<td>Part-time</td>
<td>17%</td>
<td>Part-time</td>
<td>15%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>46%</td>
<td>Unemployed</td>
<td>50%</td>
</tr>
<tr>
<td><em>missing data</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country of Origin*</th>
<th>Pilot Survey</th>
<th>Focus Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>n=24 (63%)</td>
<td>n=35 (67%)</td>
<td>n=62 (69%)</td>
</tr>
<tr>
<td>US</td>
<td>n=7 (18%)</td>
<td>n=2 (4%)</td>
<td>n=9 (10%)</td>
</tr>
<tr>
<td>Guatemala</td>
<td>n=2 (5%)</td>
<td>n=4 (8%)</td>
<td>n=6 (7%)</td>
</tr>
<tr>
<td>El Salvador</td>
<td>n=2 (5%)</td>
<td>n=3 (6%)</td>
<td>n=5 (6%)</td>
</tr>
<tr>
<td>Honduras</td>
<td>n=0</td>
<td>n=2 (4%)</td>
<td>n=2 (2%)</td>
</tr>
<tr>
<td>Peru</td>
<td>n=0</td>
<td>n=1 (2%)</td>
<td>n=1 (1%)</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>n=0</td>
<td>n=1 (2%)</td>
<td>n=1 (1%)</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>n=0</td>
<td>n=1 (2%)</td>
<td>n=1 (1%)</td>
</tr>
<tr>
<td>Columbia</td>
<td>n=0</td>
<td>n=1 (2%)</td>
<td>n=1 (1%)</td>
</tr>
<tr>
<td><em>missing data</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*missing data
Qualitative Focus Group Themes

Focus group transcripts yielded rich insights into the Hispanic culture surrounding food behavior. Several themes with supporting quotes were gleaned from this data (Table 2).

The following sections are specific qualitative themes identified and agreed upon by three independent researchers.

**Acculturation.** Many traditional Hispanic foods were talked about and also many American foods (see Table 3). American foods were mentioned by this largely immigrant population suggesting that an influence of acculturation into America has occurred.

**Relating Foods to Illness.** Perceived severity (Health Belief Model construct) only seemed to be present to participants if there had been an experience (cue to action) with foodborne illness. Many participants had no experiences with foodborne illness, but those who did expressed the misery of the symptoms and the fear of certain foods afterwards. Confusion between how and why foods can make people sick, and how the body reacts to the illness was largely present. Participants talked of the body’s defenses in confusing ways such as “the illness came out her eyes”. A confusion between allergies and foodborne illness also existed. Many times the idea of “mixing foods” as a source of foodborne illness was mentioned, but this was surrounded by misunderstanding and traditional folk beliefs (hot and cold theory). Fear (traditionally called “susto” in Hispanic culture) and confusion were largely present in this theme.

**Buying Safe Food.** When participants were asked about how to shop for safe food, almost everyone mentioned checking expiration dates on foods. Also reported was
looking at the color of the food, smelling the food, and once a woman mentioned keeping raw meats separate in the shopping cart.

**Comparison between US and Home Country.** This concept of how to shop for safe food leads into how stores in America differ from open markets in Hispanic home countries. It was spoken of in every focus group how the markets in their home countries have fresher foods than American grocery stores.

Other items mentioned when comparing the US to Spanish speaking home countries included the use of hormones, preservatives and chemicals in the US. There was concern among the participants about ingesting too many chemicals in American food. Packaging and labeling of American products was also mentioned, but in a positive way that it makes the food cleaner. It was also noted that fresh foods in America are expensive and the frozen or canned alternatives are cheaper in the US.

**Lacking Time, Equipment and Resources.** When participants were asked about what makes it difficult to keep food safe in the home, the common answer was “needing to make time” and being in a hurry. It was mentioned three times that it is difficult to keep food safe when you do not own a refrigerator, but all participants currently did own refrigerators. Participants may know people who do not have refrigerators and it is possible they did not want to admit they did not have one. Participants spoke of certain fresh and healthy foods being too expensive to buy for their families, indicating that money is an obvious resource that is lacking.

**Cleanliness.** When participants were asked about how to keep food safe in their own homes, the answer identified most had to do with hygiene and keeping foods, hands and counters clean. Cleanliness was a broad overarching theme that extended frequently
throughout every focus group. Hygiene seemed to be of top priority to these individuals. Participants were very aware of the “Clean” FightBae!™ concept as an important way to prevent foodborne illness. An interesting “Clean” topic that emerged four times at three different focus groups without any prompting was the use of chlorine to wash fruits, vegetables and countertops.

Table 2. Qualitative Theme Summary and Evidence for Focus Groups

<table>
<thead>
<tr>
<th>Qualitative Theme</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acculturation</td>
<td>Mention of lasagna, spaghetti and meatballs, hamburgers and casserole several times as favorite foods to prepare for the family.</td>
</tr>
<tr>
<td></td>
<td>“I make it because it is what my kids like best.”</td>
</tr>
<tr>
<td>Relating Food to Illness</td>
<td>“My son got intoxicated with ice cream and he ended up at the hospital.”</td>
</tr>
<tr>
<td></td>
<td>“I think that the most delicate things are the meats. Vegetables and fruits wash them and it will not be bad.”</td>
</tr>
<tr>
<td></td>
<td>“I think it is more of an allergy than food poisoning”</td>
</tr>
<tr>
<td></td>
<td>“Sometimes they [children] do not want to eat that food again. They develop a fear for that specific food.”</td>
</tr>
<tr>
<td></td>
<td>“Mixing something that has been cooked with something that has not been cooked. And this causes the bacteria”</td>
</tr>
<tr>
<td></td>
<td>“Well, that [food poisoning] happens because sometimes food is mixed and they are not supposed to be mixed and there is when it begins.”</td>
</tr>
<tr>
<td></td>
<td>“The infection did not know how to exit her body and it came out through her eyes”</td>
</tr>
<tr>
<td></td>
<td>“There are a lot of parents that overprotect their children. For example they do not let them be in the sun, they do not let them go outside, and this affects children because children need to get use to the climate so this is why they are low on body defenses and think these are the ones that get sick the most.”</td>
</tr>
<tr>
<td></td>
<td>“I think that by eating the food cold” [is why I got sick from food]</td>
</tr>
<tr>
<td>Comparison of US to Home country</td>
<td>“In my city…they are selling meat, the cow was butchered the day before. Everything is fresh. Eggs were laid by the hen that same day or pretty close. If we eat chicken, the chicken is killed at that same time.”</td>
</tr>
<tr>
<td></td>
<td>“They [Americans] add a lot of preservative so that the meat can last longer.”</td>
</tr>
<tr>
<td></td>
<td>“More things are added to the meat [in America] so that it can last longer. It is fresher in my home country.”</td>
</tr>
<tr>
<td></td>
<td>“In Mexico, everything is fresh.”</td>
</tr>
<tr>
<td></td>
<td>“Over there [Hispanic home country] you kill the chicken and it is cooked immediately.”</td>
</tr>
<tr>
<td></td>
<td>“The tomatoes, the peppers everything is home grown” [in home country]</td>
</tr>
<tr>
<td></td>
<td>“The hormones, because over there [home country] hormones are not injected into them because over there the food is natural.”</td>
</tr>
<tr>
<td></td>
<td>“To the chicken… no hormones are injected into them” [in home country]</td>
</tr>
<tr>
<td></td>
<td>“And here… too many hormones, too many chemicals”</td>
</tr>
<tr>
<td></td>
<td>“Another thing is that everything [in US] is too expensive, fresh fruits and vegetables are extremely expensive.”</td>
</tr>
<tr>
<td></td>
<td>“It is very difficult to keep in line or under a healthy standard at home because”</td>
</tr>
</tbody>
</table>
it is cheaper to buy canned goods and even the processed meats like nuggets and patties than buying it ourselves. But I had a big problem with that because we recently arrived and the kids don’t like it at times. It becomes expensive for a family.”

Lacking Time, Equipment and Resources
“Because we do not take the necessary precautions because sometimes we are in a hurry”
“When you go to the store and you do not put the meats or vegetables in the refrigerator as soon as you get home because you are in a hurry and you do not have time. Especially with you have a lot of kids and you are in a hurry.”

Buying Safe Food
“First of all, check the expiration date.”
“When you go to the store, separate the chicken from the meats, fruits and vegetables.”
“I look at the color of the meat and check the expiration date.”
“I always look at the date. Also to see if it has a darker color or if it smells bad.”
“It depends if it has an expiration date. And the color of the food.”

Cleanliness
“Keep everything clean.”
“For example drinking out of the same cup and not washing their hands appropriately.”
“Wash your hands, wash fruits, clean tables, babies high chairs need to be cleaned very well”
“It is more about hygiene.”
“Add a drop of chlorine in a kitchen vessel full of water.”
“Put it in a bowl of water and two drops of chlorine. I leave it there for ten minutes and then I prepare them.”

Table 3. Hispanic and American foods mentioned in Focus Groups by frequency

<table>
<thead>
<tr>
<th>Hispanic Foods</th>
<th>Frequency</th>
<th>American Foods</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice and Beans</td>
<td>15</td>
<td>Spaghetti and Meatballs</td>
<td>2</td>
</tr>
<tr>
<td>Enchiladas</td>
<td>8</td>
<td>Casserole</td>
<td>2</td>
</tr>
<tr>
<td>Birria</td>
<td>4</td>
<td>Lasagna</td>
<td>2</td>
</tr>
<tr>
<td>Ceviche</td>
<td>4</td>
<td>Hamburger</td>
<td>1</td>
</tr>
<tr>
<td>Tacos</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pozole</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mole</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carne asada</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fried plantains</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taquitos</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mizoite</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tamale</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fajitas</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chilaquiles</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Quantitative Demographics

The quantitative participants include the 38 from the quantitative instrument pilot study and the 52 participants that completed knowledge surveys prior to the focus group discussions (Table 1).

Quantitative Results

The KR20 score of the 90 completed surveys for this study was $r=0.659$. Overall, the knowledge survey indicated poor food safety knowledge in this sample. The overall average score was $72\% \pm 11\%$.

The 10 lowest scoring questions (in order, starting with the lowest) were:

1. What is the safest way to cool a large pot of soup? (Chill)
2. How long can you store cooked hamburger and chicken in the refrigerator to eat later? (Chill)
3. How should kitchen counters be cleaned to prevent food poisoning? (Clean)
4. What is the best way to tell when chicken has cooked long enough? (Cook)
5. Your electricity went off in your freezer and the meat, chicken, and fish thawed and felt warm. What should you do to prevent food poisoning? (Chill)
6. How should you wash fresh fruits and vegetables to keep you from getting food poisoning? (Clean)
7. What is the best way to tell if hamburgers are cooked enough to prevent food poisoning? (Cook)
8. Your child is going to be eating 2 hours after you cook a meal. How should you keep the meal safe before your child eats it? (Chill)
9. Refrigeration eliminates harmful germs in food. True/False (Chill)
10. If a leftover food looks and smells good, it is still safe to eat. True/False (Chill)

The results of the survey are listed in Table 4.

<table>
<thead>
<tr>
<th>Table 4. Quantitative Knowledge Survey Frequencies ordered by Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>CLEAN</td>
</tr>
<tr>
<td>1. How should you wash fresh fruits and vegetables to keep you from getting food poisoning?</td>
</tr>
<tr>
<td>Wash with regular soap</td>
</tr>
<tr>
<td>Wash with hot water</td>
</tr>
<tr>
<td>Wash with anti-bacterial soap</td>
</tr>
<tr>
<td>+ Hold under cool running water</td>
</tr>
<tr>
<td>2. How should dishes be washed to prevent food poisoning? (Check all that apply)</td>
</tr>
<tr>
<td>+ Hand wash them and rinse right after the meal and then let them air-dry</td>
</tr>
<tr>
<td>Hand wash and rinse them right after the meal and then dry them with a dish towel</td>
</tr>
<tr>
<td>+ Wash and dry them in a dishwasher</td>
</tr>
<tr>
<td>3. Which is an acceptable way to clean a cutting board or counter after it is used for raw meat? (Check all that apply)</td>
</tr>
<tr>
<td>Wash with hot soapy water only</td>
</tr>
<tr>
<td>+ Wash with hot soapy water, rinse with water, then rinse with bleach</td>
</tr>
<tr>
<td>Clean with a disinfectant (example: Lysol, Clorox, bleach)</td>
</tr>
<tr>
<td>+ Wash cutting board in a dishwasher</td>
</tr>
<tr>
<td>4. How should kitchen counters be cleaned to prevent food poisoning?</td>
</tr>
<tr>
<td>Spray with a strong bleach solution, rinse and wipe dry</td>
</tr>
<tr>
<td>+ Wash with hot soapy water, rinse and wipe with a bleach solution</td>
</tr>
<tr>
<td>Wash with hot soapy water and let air dry</td>
</tr>
<tr>
<td>Brush off any dirt or food, wipe with a bleach solution and let air dry</td>
</tr>
<tr>
<td>5. What is the best way to wash your hands?</td>
</tr>
<tr>
<td>Apply sanitizer, run water, rub hands together for 20 seconds, rinse hands, dry hands, rub on an antiseptic hand lotion</td>
</tr>
<tr>
<td>Apply soap, rub hands together for 20 seconds, rinse hands under water, dry hands, apply sanitizer</td>
</tr>
<tr>
<td>+ Run water, moisten hands, apply soap, rub hands together for 20 seconds, rinse hands, dry hands</td>
</tr>
<tr>
<td>Run water, moisten hands, apply sanitizer, rub hands together for 20 seconds, rise hands, dry hands, rub on antiseptic hand lotion.</td>
</tr>
</tbody>
</table>
6. Washing hands after changing a diaper:

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increases the chance of food poisoning</td>
<td>20 22.2</td>
</tr>
<tr>
<td>+ Decreases the chance of food poisoning</td>
<td>65 72.2</td>
</tr>
<tr>
<td>Makes no difference</td>
<td>3 3.3</td>
</tr>
</tbody>
</table>

7. If you have a cut or sore on your hand, what should you do before you prepare food for your family?

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nothing, if it is not infected</td>
<td>0 0.0</td>
</tr>
<tr>
<td>Put a bandage on the cut or sore</td>
<td>19 21.1</td>
</tr>
<tr>
<td>Wash hands</td>
<td>11 12.2</td>
</tr>
<tr>
<td>+ Put a bandage on the sore and wear a glove</td>
<td>58 64.4</td>
</tr>
</tbody>
</table>

8. Where is the best place to store raw meat in the refrigerator?

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ On the top shelf</td>
<td>56 62.2</td>
</tr>
<tr>
<td>Where there is space</td>
<td>6 6.7</td>
</tr>
<tr>
<td>Below foods that are ready to eat</td>
<td>25 27.8</td>
</tr>
</tbody>
</table>

9. Putting raw meat in a separate bag (away from other food items) before placing it in the grocery cart:

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increases the chance of food poisoning</td>
<td>16 17.8</td>
</tr>
<tr>
<td>+ Decreases the chance of food poisoning</td>
<td>46 51.1</td>
</tr>
<tr>
<td>Makes no difference</td>
<td>1 1.1</td>
</tr>
</tbody>
</table>

10. When preparing food, you should wash your hands after touching which of these? (Check all that apply)

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Dirty pots and pans</td>
<td>73 81.1</td>
</tr>
<tr>
<td>+ Fresh fruit</td>
<td>20 22.2</td>
</tr>
<tr>
<td>Dishes that came out of the dishwasher</td>
<td>10 11.1</td>
</tr>
<tr>
<td>Clean countertop</td>
<td>14 15.6</td>
</tr>
<tr>
<td>+ Cell phone or home telephone</td>
<td>74 82.2</td>
</tr>
</tbody>
</table>

11. What is the best way to tell if hamburgers are cooked enough to prevent food poisoning?

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut one to check the color of the meat inside</td>
<td>20 22.2</td>
</tr>
<tr>
<td>Check the color of the juice to be sure that it is not pink</td>
<td>13 14.4</td>
</tr>
<tr>
<td>+ Measure the temperature with a food thermometer</td>
<td>38 42.2</td>
</tr>
<tr>
<td>Check the texture or firmness of the meat</td>
<td>15 16.7</td>
</tr>
</tbody>
</table>

12. What is the best way to tell when chicken has cooked long enough?

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>The juices run clear</td>
<td>1 1.1</td>
</tr>
<tr>
<td>The meat is not pink in the center</td>
<td>24 26.7</td>
</tr>
<tr>
<td>The meat falls off the bone</td>
<td>25 27.8</td>
</tr>
<tr>
<td>+ Test with a meat thermometer</td>
<td>35 38.9</td>
</tr>
</tbody>
</table>

13. To prevent food poisoning, how long should leftover soup be heated?

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Until it is boiling hot</td>
<td>76 84.4</td>
</tr>
<tr>
<td>Just until it is hot, but not too hot to eat right away</td>
<td>9 10.0</td>
</tr>
<tr>
<td>When it is at least room temperature</td>
<td>2 2.2</td>
</tr>
</tbody>
</table>
14. A food is properly cooked in a microwave oven when (Check all that apply)

<table>
<thead>
<tr>
<th>Option</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ You follow directions on the package</td>
<td>71</td>
<td>78.9</td>
</tr>
<tr>
<td>You stir the food about half way through cooking</td>
<td>22</td>
<td>24.4</td>
</tr>
<tr>
<td>You use a turntable in the microwave</td>
<td>7</td>
<td>7.8</td>
</tr>
<tr>
<td>The food feels hot</td>
<td>17</td>
<td>18.9</td>
</tr>
<tr>
<td>+ You test the food with a thermometer</td>
<td>27</td>
<td>30.0</td>
</tr>
</tbody>
</table>

15. Your electricity went off in your freezer and the meat, chicken, and fish thawed and felt warm. What should you do to prevent food poisoning?

<table>
<thead>
<tr>
<th>Option</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Throw them away</td>
<td>37</td>
<td>41.1</td>
</tr>
<tr>
<td>Cook them right away</td>
<td>17</td>
<td>18.9</td>
</tr>
<tr>
<td>See how they smell or look before deciding what to do</td>
<td>32</td>
<td>35.6</td>
</tr>
<tr>
<td>Immediately re-freeze until solidly frozen, then cook it</td>
<td>1</td>
<td>1.1</td>
</tr>
</tbody>
</table>

16. Your child is going to be eating 2 hours after you cook a meal. How should you keep the meal safe before your child eats it?

<table>
<thead>
<tr>
<th>Option</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Store it in the refrigerator and reheat it when the child is ready to eat it</td>
<td>47</td>
<td>52.2</td>
</tr>
<tr>
<td>Place it on the kitchen counter until the child is ready to eat it</td>
<td>16</td>
<td>17.8</td>
</tr>
<tr>
<td>Store it in a cool oven until the child is ready to eat it</td>
<td>4</td>
<td>4.4</td>
</tr>
<tr>
<td>Store it in a warm oven until the child is ready to eat it</td>
<td>21</td>
<td>23.3</td>
</tr>
</tbody>
</table>

17. Which food needs to be refrigerated to prevent food poisoning?

<table>
<thead>
<tr>
<th>Food</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Dried corn</td>
<td>3</td>
<td>3.3</td>
</tr>
<tr>
<td>Open box of raisins</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Corn bread</td>
<td>6</td>
<td>6.7</td>
</tr>
<tr>
<td>+ An open can of beans</td>
<td>79</td>
<td>87.8</td>
</tr>
</tbody>
</table>

18. What is the safest way to cool a large pot of hot soup?

<table>
<thead>
<tr>
<th>Option</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Put the soup in a clean shallow pan and refrigerate right away</td>
<td>10</td>
<td>11.1</td>
</tr>
<tr>
<td>Keep the soup in the cooking pot and refrigerate right away</td>
<td>4</td>
<td>4.4</td>
</tr>
<tr>
<td>Put the soup in a clean, deep pot before and refrigerate right away</td>
<td>7</td>
<td>7.8</td>
</tr>
<tr>
<td>Put the soup in a clean, deep pot before and refrigerate right away</td>
<td>64</td>
<td>71.1</td>
</tr>
<tr>
<td>Cool the soup to room temperature on the counter, then refrigerate it</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

19. How long can you store cooked hamburger and chicken in the refrigerator to eat later?

<table>
<thead>
<tr>
<th>Duration</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 days</td>
<td>62</td>
<td>68.9</td>
</tr>
<tr>
<td>+ 3-4 days</td>
<td>25</td>
<td>27.8</td>
</tr>
<tr>
<td>5-7 days</td>
<td>1</td>
<td>1.1</td>
</tr>
</tbody>
</table>
20. How long can you store raw hamburger and chicken in the refrigerator to eat later?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>0.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ 1-2 days</td>
<td>51</td>
<td>56.7</td>
</tr>
<tr>
<td>3-4 days</td>
<td>15</td>
<td>16.7</td>
</tr>
<tr>
<td>5-7 days</td>
<td>16</td>
<td>17.8</td>
</tr>
<tr>
<td>More than a week</td>
<td>5</td>
<td>5.6</td>
</tr>
</tbody>
</table>

21. It is safe to give an infant a bottle of baby formula that has been out of the refrigerator for longer than 2 hours?

<table>
<thead>
<tr>
<th></th>
<th>27</th>
<th>30.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ False</td>
<td>58</td>
<td>64.4</td>
</tr>
</tbody>
</table>

22. Refrigeration eliminates harmful germs in food.

<table>
<thead>
<tr>
<th></th>
<th>36</th>
<th>40.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ False</td>
<td>48</td>
<td>53.3</td>
</tr>
</tbody>
</table>

23. If a leftover food looks and smells good, it is still safe to eat.

<table>
<thead>
<tr>
<th></th>
<th>34</th>
<th>37.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ False</td>
<td>52</td>
<td>57.8</td>
</tr>
</tbody>
</table>

**FOODS THAT INCREASE RISK**

24. Eating which of these foods will increase a person’s risk of food poisoning? (Check all that apply)

<table>
<thead>
<tr>
<th></th>
<th>40</th>
<th>48.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Baked potato that was left on the counter overnight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leftover turkey eaten cold</td>
<td>48</td>
<td>59.1</td>
</tr>
<tr>
<td>Cake that was left on the counter overnight</td>
<td>31</td>
<td>36.5</td>
</tr>
<tr>
<td>+ Refried beans cooled on the counter</td>
<td>29</td>
<td>33.3</td>
</tr>
<tr>
<td>+ Fried eggs with a runny or soft yolk</td>
<td>31</td>
<td>35.3</td>
</tr>
<tr>
<td>Purchased cookie dough</td>
<td>16</td>
<td>19.9</td>
</tr>
<tr>
<td>+ Raw homemade cookie dough or cake batter</td>
<td>24</td>
<td>28.2</td>
</tr>
<tr>
<td>+ Sushi</td>
<td>30</td>
<td>35.3</td>
</tr>
<tr>
<td>+ Raw shellfish</td>
<td>70</td>
<td>82.3</td>
</tr>
<tr>
<td>Ceviche</td>
<td>38</td>
<td>54.8</td>
</tr>
<tr>
<td>+ Unpasteurized fruit juice</td>
<td>26</td>
<td>29.4</td>
</tr>
<tr>
<td>+ Sliced melon</td>
<td>13</td>
<td>12.9</td>
</tr>
<tr>
<td>+ Raw sprouts (alfalfa, bean, clover, radish)</td>
<td>20</td>
<td>23.5</td>
</tr>
<tr>
<td>Fresh homemade salsa</td>
<td>9</td>
<td>11.6</td>
</tr>
<tr>
<td>+ Leftover soup reheated until warm but not boiling</td>
<td>25</td>
<td>27.1</td>
</tr>
<tr>
<td>+ Raw milk (not pasteurized) or fresh cheese made with raw milk</td>
<td>53</td>
<td>62.4</td>
</tr>
<tr>
<td>+ Infant milk or formula with honey added</td>
<td>28</td>
<td>32.9</td>
</tr>
<tr>
<td>Meat cooked medium-well</td>
<td>51</td>
<td>61.1</td>
</tr>
<tr>
<td>+ Milk with raw egg added</td>
<td>59</td>
<td>69.4</td>
</tr>
<tr>
<td>+ Hamburger cooked rare</td>
<td>69</td>
<td>82.4</td>
</tr>
</tbody>
</table>

25. *E. coli* (a harmful germ) in undercooked hamburger can cause kidney failure in children.

<table>
<thead>
<tr>
<th></th>
<th>55</th>
<th>61.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>True</td>
<td></td>
<td></td>
</tr>
<tr>
<td>False</td>
<td>22</td>
<td>24.4</td>
</tr>
</tbody>
</table>

26. Undercooked chicken and raw eggs can carry *Salmonella* (a harmful germ).
27. It is safe to use raw eggs in recipes that will not be cooked.

<table>
<thead>
<tr>
<th></th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>79</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>87.8</td>
<td>8.9</td>
</tr>
</tbody>
</table>

28. Which foods will likely cause food poisoning for pregnant women, infants, and children? (Check all that apply)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Cottage cheeses</td>
<td>25</td>
<td>27.8</td>
</tr>
<tr>
<td>Cold smoked fish</td>
<td>60</td>
<td>66.7</td>
</tr>
<tr>
<td>+ Cold deli salads</td>
<td>12</td>
<td>13.3</td>
</tr>
<tr>
<td>+ Hot dogs that have not been heated</td>
<td>46</td>
<td>51.1</td>
</tr>
<tr>
<td>+ Raw eggs</td>
<td>63</td>
<td>70.0</td>
</tr>
<tr>
<td>+ Undercooked eggs</td>
<td>60</td>
<td>66.7</td>
</tr>
<tr>
<td>Canned vegetables</td>
<td>9</td>
<td>10.0</td>
</tr>
<tr>
<td>Canned fruit juice</td>
<td>9</td>
<td>10.0</td>
</tr>
</tbody>
</table>

29. Which of these people will likely get sick from harmful germs in food? (Check all that apply)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Preschool children</td>
<td>68</td>
<td>75.6</td>
</tr>
<tr>
<td>Teenagers</td>
<td>25</td>
<td>27.8</td>
</tr>
<tr>
<td>+ Pregnant women</td>
<td>59</td>
<td>68.6</td>
</tr>
<tr>
<td>+ Older people (age 60 and over)</td>
<td>64</td>
<td>71.1</td>
</tr>
<tr>
<td>+ People with type 2 diabetes</td>
<td>29</td>
<td>32.2</td>
</tr>
<tr>
<td>Cancer patients</td>
<td>32</td>
<td>35.6</td>
</tr>
<tr>
<td>People who frequently eat at restaurants or get take-out food often</td>
<td>39</td>
<td>43.3</td>
</tr>
<tr>
<td>None of these individuals</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

+ correct answer(s)

Six of the ten lowest scoring questions come from the “Chill” concept. The average percent score for each concept in descending order are: Separate (68.2%), Cook (66.4%), groups at increased risk (57.6%), foods that increase risk (52.4%), Clean (51.0%), and Chill (43.5%).

The independent t-test relating the six concepts with whether the person had worked with food indicated significant relationships between the “Clean” concept (p=.049, t=2.003) and the “foods that increase risk” concept (p=.040, t=2.097) with food experience (Table 5). The levene’s test was not significant in these cases.
<table>
<thead>
<tr>
<th>Table 5. Independent samples t-test. Concept vs food experience</th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sum score</td>
<td>Equal variances assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chill sum</td>
<td>Equal variances assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sep. sum</td>
<td>Equal variances assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean sum</td>
<td>Equal variances assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cook sum</td>
<td>Equal variances assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>foods sum</td>
<td>Equal variances assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>group sum</td>
<td>Equal variances assumed</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Mixed Methods Results

Many qualitative themes aligned with quantitative data from the survey (Table 6). Some results were supported in the opposing data set (quantitative or qualitative) while others indicate food safety implications or diverge in the combined data sets. The following are specific mixed methods themes that emerged from the combined data sets.

**High Frequency Foods.** Several different types of soup were mentioned in focus groups. Ceviche, a traditional Hispanic seafood soup (fish and shrimp usually) was mentioned at 4 of 6 focus groups as well as pozole another Hispanic soup (made with hominy), and bean soup. In the quantitative survey, questions regarding leftover soups were scored very low (questions number 4 and 23 item “O”; 11% and 27% respectively). This combined data interpretation has implications for mishandling leftover soups, some containing high risk ingredients such as fish and shrimp.

Chicken was mentioned more frequently than any other food used in the home. Several questions from the knowledge survey show low knowledge for storing and cooking chicken (questions number 5, 9 and 15; 27%, 51% and 38% respectively). It was also reported several times that chicken bought at fresh markets in the participants home countries would be killed when bought and cooked immediately. This implies that participants are cooking large amounts of chicken, are not sure how to cook or store chicken, and possibly have had little practice buying and storing chicken from American grocery stores. Chicken poses high risk for contracting *Salmonella* if improperly handled.

**Infant Feeding Practices.** Themes surrounding infant formula and breast milk developed in both the quantitative and qualitative data. In the focus groups when
participants were asked about foods that make babies sick, “spoiled milk, honey, cereal, raw egg, water added to the formula, and anything added to the formula” were reported. One participant reported:

“I think that it is not the food but the amount of food given to the child. Sweet and sour will make the baby sick.”

**Fresh vs. Packaged.** A lack of understanding concerning fresh foods versus packaged foods was present in focus group discussions. Different themes surrounding fruits and vegetables were gleaned from both types of data as well. Fruits and vegetables were identified in focus groups as items that can make people sick, but on the knowledge survey there were low scores (41%) on the question “how should you wash fresh fruits and vegetables to keep you from getting food poisoning?” Also, “fresh fruit” and “sliced melon” were not specifically identified as foods that increase risk on knowledge survey (questions number 18 item “B” and 23 item “L”; 23% and 12% respectively). It was mentioned in focus groups that fruits and vegetables are more expensive in the United States than in participant’s Hispanic home countries. Participants reported that because of this, they have been buying more frozen and canned fruits and vegetables. These results are complex and somewhat diverging, which suggests that this needs to be explored further.

**Food Handling Control.** One strong theme that was present in all six focus groups was high self-efficacy (Health Belief Model construct) in preparing safe food at home. Many participants expressed feelings of low confidence in restaurant food in comparison to food cooked at home where they can control how the food is handled. Although this was a strong theme overall, some participants expressed that they were
unsure if they were doing things properly. Most participants had very high confidence reporting:

“It is a lot safer at home”

“I believe that if you cook more at home and eat out less, there is less risk”

“It is not because they got sick from my food.”

“The hygiene at restaurants is not good.”

“Not at my house but at a restaurant.”

“It is safer when one prepares foods at home than eating at a restaurant. At a restaurant, if meat was left over from a customer, they put it away and store it.”

Only one participant expressed they were unsure:

“Maybe I think I am doing something right, but maybe I am not.”

**Interactive Learning Style.** When asked about desirable ways to receive information, the most common answer was to attend a class where they could ask questions and have Spanish and English both available. Cooking classes were mentioned, as well as question and answer sessions. It was also expressed that information received through community members, doctor’s or other trusted people would be preferred. Other common responses included print items such as brochures, by regular mail, and through posters at places such as doctor’s offices. When asked about sending information home with their kids from school, a general response was that they did not trust their kids to bring the information home to them. In contrast, a woman mentioned:
“My son belongs to a food program and on Fridays a bag of food is sent home. Sometimes there are recipes with the food and I read them. It is from the University of Nebraska.”

This indicates that when the information is sent home with the food, rather than by itself, it is more useful.

Quantitative information regarding how participants wanted to receive nutrition information indicated preference for print materials and for educational classes or workshops. Television, radio and through electronic means were the least chosen for how they would like to receive information. This is supportive of what was said during qualitative focus group discussions, where brochures and posters were noted as good print materials to use and many times participants said they would like a class where they can ask questions. It was noted that it is very important for everything to be available in Spanish.

<table>
<thead>
<tr>
<th>THEME</th>
<th>Qualitative Findings</th>
<th>Quantitative Findings</th>
<th>Mixed Method Interpretation</th>
</tr>
</thead>
</table>
| High Frequency Foods: Soups | Pozole, ceviche, fish soup and bean soup frequently among favorite meals reported in focus groups.  
“I make a lot of soups” | Lowest scoring survey question: “What is the safest way to cool a large pot of soup?”  
Also, “leftover soup reheated until warm but not boiling” among least identified foods that increase risk | Lack of knowledge on how to keep leftover soups along with high reported preparation of soups (some of which are seafood soups) increases the risk of abusing leftover soup. |
Table 6 (continued). Side-by-side comparison of qualitative themes and quantitative results with mixed method interpretation and implications.

<table>
<thead>
<tr>
<th>THEME</th>
<th>Qualitative Findings</th>
<th>Quantitative Findings</th>
<th>Mixed Method Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Frequency</td>
<td>Most frequently mentioned ingredient used in home cooking in focus groups.</td>
<td>Low scoring survey questions involving appropriate storage times of cooked and raw chicken, how to tell when chicken is cooked long enough, and where to store raw meat in the refrigerator.</td>
<td>Low knowledge of cooking and storing chicken coupled with using chicken in the home frequently increases the chances of mishandling chicken. Increases the chances of contracting Salmonella.</td>
</tr>
<tr>
<td>Foods</td>
<td>“I don’t have a favorite food but we cook everything, enchiladas, chicken, soups.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicken</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Infant Feeding         | Items identified in focus groups that can make babies sick  

- Spoiled milk  
- Honey  
- Cereal  
- Raw egg  
- Water added to formula  
- Anything added to formula or milk  

Babies and children identified as groups at risk on knowledge survey.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Although babies and children are identified in both quantitative and qualitative data, the items identified that make kids sick beg other questions. Are raw egg and honey being added to infant formula or milk? At what rates?                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Practices              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Fresh vs. Packaged     | “Lately in vegetables and fruits” and “unwashed fruits” responses in identification of foods that increase risk. Also mentioned that fresh fruits and vegetables are more expensive in the U.S. Influencing participants to buy more canned and frozen products.                                                                                                                                                                                                                                                                                                                                                   | Low scores on “how should you wash fresh fruits and vegetables to keep you from getting food poisoning?”. Fresh fruit and sliced melon not identified as foods that increase risk on knowledge survey.                                                                                                                                                                                                                                                                         | Complex and somewhat diverging results involving fresh fruits and vegetables. Needs to be explored further.                                                                                                                                                                                                                                                                                                                                       |
| Food Handling          | High self-efficacy in home cooking. Very little doubt in ability to make safe food at home. Low confidence in restaurant food.                                                                                                                                                                                                                                                                                                                                                                                                                                           | Low knowledge scores overall. Mean 72% standard deviation 11%                                                                                                                                                                                                                                                                                                                                                                                             | Low knowledge with high self-efficacy implies that individuals may be over confident in areas they do not fully understand.                                                                                                                                                                                                                                                                                                                      |
| Control                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
Table 6 (continued). Side-by-side comparison of qualitative themes and quantitative results with mixed method interpretation and implications.

<table>
<thead>
<tr>
<th>THEME</th>
<th>Qualitative Findings</th>
<th>Quantitative Findings</th>
<th>Mixed Method Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interactive Learning Style</td>
<td>Classes or workshops in Spanish frequently mentioned. Print materials such as brochures and posters mentioned as good tools (also in Spanish). We want “a class like this one”</td>
<td>Highest positive responses for print materials, classes, and through people such as educators or doctors. Low responses for TV, radio and electronic means (email, texting)</td>
<td>Findings in both data sets show that classes in Spanish with materials in Spanish would be good ways to reach this audience with nutrition information</td>
</tr>
</tbody>
</table>

Discussion

Answers to Research Questions

What food safety cultural beliefs, barriers and motivators to implementing safe food handling practices are present in Hispanic families with young children in Nebraska?

- Cultural beliefs: Hot and cold theory, susto
- Barriers: Time, money, and equipment
- Motivators: Saving time, saving money, not missing school or work, not visiting the hospital.

What food safety practices and attitudes are present in this cultural group?

- Practices: Hand washing, cooking American and Hispanic foods, cooking chicken at high rates, using chlorine to clean foods, checking expiration dates
- Attitudes: High self-efficacy, fears of foods, misunderstanding illness
What are effective strategies to reach Hispanic families with young children with food safety information?

- Classes/workshops with a person to answer questions
- Materials to take home
- In Spanish

What is the food safety knowledge level of the primary food handler in Hispanic families with young children in Nebraska related to the FightBac!™ food safety concepts?

- 72% average ± 11%

What items within the FightBac!™ concepts are the least and most understood by this population?

- Most: “Separate” (M=68.2%), followed by “Cook” (M=66.4%)
- Least: “Chill” (M=43.5%), second least “Clean” (M=51.0%)

What are effective strategies to reach Hispanic families with young children with food safety information?

- Classes/workshops
- Person such as a doctor or other health professional

To what extent do food safety knowledge assessments compare (support/diverge) with food safety barriers, motivators, beliefs and practices in Hispanic families with young children in Nebraska?

- See Table 6
Are there any qualitative themes that present themselves that are not present in the quantitative instrument?

- Foods from Table 3, especially rice and beans
- Cultural beliefs

**Health Belief Model Constructs seen in Themes**

**Self-efficacy.** It is evident that a lack of knowledge is coupled with high self-efficacy in this group. This suggests that Hispanic primary food handlers have low perceived susceptibility (although an understanding of perceived severity is present) to foodborne illness. The literature review also emphasizes the poor food safety knowledge and practices as well as higher incidence of foodborne illness in the Hispanic population.

**Demographics.** Mixing different foods was often mentioned, but not in the sense of cross-contamination. A traditional Hispanic belief known as the hot and cold theory (Batty & Kurko, 2009) may have been what they were referring to. The hot/cold theory is a belief that certain foods and illnesses are either “hot” or “cold”, but this has nothing to do with temperature. A “hot illness” is treated with a “cold food” and vice versa, but the belief is that “hot” and “cold” foods should not be mixed.

Fear of certain foods was also discussed. Although chicken was frequently mentioned as a food that was cooked in the home, participants referred to chicken as “delicate” in the sense that it can make people sick easily. Moreover, “susto” (traditional Hispanic word for fear or “soul loss”) was mentioned as a feeling after becoming sick from food.

**Cue to Action.** According to the results (qualitative and quantitative) the educational campaign would be best received by the Hispanic population if print
materials were coupled with workshops or classes. It is extremely important that print materials are in Spanish and that classroom instructors are able to speak Spanish or have interpreters. The social marketing campaign or educational outreach project should target the themes gleaned from this data and should be mindful of Hispanic cultural foods and beliefs that presented themselves in this study. Foods from Table 3 should be used as examples in this campaign. Specific topics that may be addressed in the educational component are found in Tables 2 and 6.

**FightBac!™ Concepts seen in Themes**

**Clean.** Cleanliness was the most present qualitative theme, indicating that Hispanic immigrant families are aware of the need for cleanliness and hygiene to keep food safe. This may be due to public health education targeting these specific behaviors. The behavior of adding chlorine to water to wash foods and countertops does effectively eliminate pathogens if used in the proper quantity, but under improper circumstances, the use of chlorine can also be dangerous.

**Chill.** In the quantitative knowledge survey, many questions in the chill category scored very low (M=43.5%). This is consistent with a previous study with mostly white families where they identified handling leftovers (a “Chill” behavior) as an area lacking knowledge (Meysenburg, 2009). An interesting culturally defined quote from the focus groups involving the use of leftover beans was reported:

“The beans are cooked so that they last at least two days.”

This is a traditional practice and where “re-fried” beans originate. It is unclear exactly how the beans are handled and re-fried over the course of two days. There may be food safety implications regarding these leftover behaviors. This is something that
could be added in the future to make the survey more culturally relevant (ex: question #32 “refried beans” could be substituted for “can of beans”).

Many interesting beliefs surrounding the differences in food from US versus food in the participants’ home countries were revealed. The idea that US food is less fresh, is more expensive and contains more chemicals, hormones and preservatives may have merit. This may have food safety implications due to a lack of experience and knowledge of how to handle food that is not slaughtered or picked directly before consumption. Storage issues may be a concern with this population in the US.

**Summary**

Table 7 summarizes the main themes gleaned from the data alongside the quantitative concepts and qualitative constructs used to analyze the themes.

<table>
<thead>
<tr>
<th>Quantitative Concepts for survey</th>
<th>Health Belief Model Constructs for focus groups</th>
<th>Qualitative Themes from focus group results</th>
<th>Mixed Methods Themes from survey and focus groups</th>
</tr>
</thead>
</table>

**Recommendations**

**Edits to Knowledge Survey.** Statistical analysis of the quantitative knowledge survey component provides suggestions for questions and response items that could be deleted to increase the KR20 r-value (see Appendix G for item total statistics table).
Also, items that received zero responses could be deleted (find zero’s in Table 4). In this way, the knowledge survey can be shortened and improved statistically in the future. These edits will continue to make this survey more valid and reliable for this population in the future. Hopefully, this survey can continue to be improved upon until it reaches the point of carrying external validity to the entire Hispanic population of the US.

**Educational Component.** The findings from the mixed methods theme “active learning style” should be used to create an educational component for this audience. The themes gleaned from the data can guide the topics to be addressed, and the foods mentioned in Table 3 should be used as examples.

**Issues and Resources**

This research project is USDA grant-funded project number 25-6236-0079-001. This is what made funding for the gift certificates, payment of the Buros Institute, payment of graduate students and extension educators, as well as printing costs, transportation costs, translation/interpretation costs, and all other costs possible. The payment of the Buros Institute for their suggestions was a sizeable cost, although of major importance to securing a strong quantitative instrument.

A major challenge to overcome was the language barrier. Fortunately, the University of Nebraska has effective Extension across the state and utilizes the NEP program as well. Many of the sites used had pre-existing Hispanic community contacts or employees (some from NEP). These contacts were extremely useful in the process of recruiting, and likely why so many willing and qualified participants were found. This technique is similar to an abuela (Hispanic grandmother) technique in that it utilizes an already existing member of the Hispanic community that is respected (Taylor, 2000).
is believed that this increases the number of willing participants and also allows researchers to gain trust among participants easier. Thus, creating better, more honest and deep data. A large cost in both time and money was spent on the translation of English written materials, such as the quantitative knowledge survey, consent letters, and demographics, as well as the interpretation and transcription of the Spanish audio tapes into English notes. All of the language barriers considered, it is not a drawback to have a white American researcher for this type of study. Many participants expressed gratitude that a white American woman was interested in talking to them. One woman was especially thankful and had this to say:

“I thank them [Americans] for having the kindness and initiative to help us, the Hispanics, that come to this country with so many problems and so many difficulties to encounter in this country that is not ours. One thousand thanks on this day for this nice gesture that you have done with the Hispanics”.

Limitations

The use of referrals and convenience to obtain participants will not meet the standards of a random sample but using several different sites with large Hispanic populations across the state does create variety in the purposeful sample. Some of the focus groups were over capacity (10 or less participants at one group is recommended). This means there was less time to hear a response from each participant. The icebreaker question was asked of all participants around the table. This technique made sure that everyone, even in large focus groups, had a chance to share at least one story.
The data does not carry external validity to be generalized to the entire Hispanic population of the US. The sample being entirely from central and eastern Nebraska and mainly immigrants makes the results applicable only to this region at this time.
References


SPSS, http://www-01.ibm.com/software/analytics/spss


U.S. Census Bureau (2010). Retrieved from:


*Journal of Clinical Infectious Disease, 44*, 513-520.
Appendix
Appendix A.  

Focus Group Script

INTRODUCTION
Good afternoon/evening and welcome to our session today/tonight.

Thank you for taking the time to join our discussion. My name is Kristen and I am a researcher/student researcher from the University of Nebraska. I am here today to better understand your thoughts about how to keep foods safe to eat.

Because you are the main person who prepares the food in your home and have at least one child under the age of 10, we are very interested in talking with you.

As we talk about food safety, there are no right or wrong answers but rather differing points of views and opinions. Please feel free to share your point of view or opinion even if it differs from what others have said.

We will need to audio-record our discussion so we can remember what was said. If several are talking at the same time, the recorder will get garbled and we’ll miss your comments, so try to speak only one at a time. I will make sure that everyone gets a chance to be heard. We will be on a first name basis today/tonight; however in our reports we will not attach any names to any comments. Your responses will be kept private.

Our session will last about 1-1 1/2 hours and there will not be any breaks. If you need to get up to stretch or use the restroom (which is located ____), please feel free to do so quietly. We also ask that you turn the volume off on cell phones as this can be a distraction from our session.

ARE THERE ANY QUESTIONS YOU HAVE AT THIS TIME?

Well, let’s begin. We’ve given name cards to everyone but let’s go around the room/table and tell everyone your name.

ICE BREAKER QUESTION
What are some traditional meals that you prepare?
-Prompt: Tell me more. How is that prepared? When do you prepare this?

Are there any foods made for special events?
-How is that made? Can you share how? What ingredients are used?

TRANSITION
We are here today to talk to about food safety. Have you heard about anyone getting sick from food? What do you call that? Prompt: What does the word ‘food poisoning’ mean to you?
Appendix A.

INTERVIEW QUESTIONS

Perceived Severity

When a person gets sick from food, what are the symptoms?
(Get them to say diarrhea, vomiting, so others will be less shy saying these words)

Have you or anyone living with you ever been sick from food?
-If yes, ask, “Tell me about the last time you or someone in your household got sick from food?” or “Tell me more…”

What made you think the sickness was caused by food?
-How bad was it?
-(Could probe for specific symptoms)

Do you think certain food or drinks caused this sickness?
-Prompt for specific foods and beverages ...What were these foods?

If someone in your family got sick from food, how would it affect you?
Prompt: (family/schedule) Would you have to do different that day?

If your child(ren) got sick from food, what do you think could happen to them?
-Are there more serious symptoms? (if they just say tummy ache, vomiting, etc.)

Perceived Susceptibility

Some people, more than others, get sick from eating food. Why do you think this is so?
-(Add prompts related to age, where they eat, how they eat, etc.)
Prompt: do you think this makes them sick?

What foods do you think make people sick?
-How do you think these foods make you sick?

What foods do you think make babies sick?

Do you think that you are more or less at risk for a food borne illness living in the United States? Why or why not?
-Prompts: level of perceived risk in US w/food regulation; learning to make US foods, What new foods do you make that your children want that they had at school?)
Appendix A.

**Perceived Benefits**

What is one thing you would like to change to keep food safe in your home?

What would prevent you from doing these things?

Do you think you can prevent your family from getting sick from food?
If so, how? If no, why?

What steps can you take to prevent your family from getting sick from food?

What about others in your household? What steps can they take to prevent getting sick from food?

**Perceived Barriers**

What gets in the way of you taking steps to prevent your family from getting sick from food?

*Prompts: To what extent do you think it takes more time, costs more money, is inconvenient, etc.)*

What would it take to help you make changes even though barriers exist?

Of the problems you have mentioned, which is most difficult to overcome?

**Self-Efficacy**

To what extent do you feel confident in your ability to safely prepare food in your home so that your family won’t get sick?

To what extent do you feel confident in your ability to safely store food in your home?

To what extent do you feel confident in your ability to safely purchase food for your family?

*How confident are you that the supply of food (from a grocery store, restaurant, carniceria, farmer’s market) you and your family consumes is safe?*
Think about the last time you were given health information that you were able to use right away. What was unique about that information or how it was provided? What made it useful to you?

Now think about the last time you were given health information that was not useful to you. What was unique about the information or how was it provided that made it not useful?
Appendix B1.

Dear Parent or Guardian,

The University of Nebraska-Lincoln is conducting a food safety study with Hispanic families with children 10 years of age and younger, and we would like your help!

You have been offered a chance to participate in a focus group and complete the Food Safety for Hispanic Families with Young Children in Nebraska Survey because you are the primary food handler in your home with children 10 years old and younger. This focus group and survey are for research purposes only and there are no known risks involved with participation. The benefits include adding to our body of knowledge of food safety in Hispanic families.

Your participation is completely voluntary and will take place right here in your community center or church. Focus group discussion and completion of the survey will take about an hour, and to thank you for your participation you will receive a $25 Walmart or HyVee gift certificate. To receive the gift certificate you will need to fill out the attached form with your name and social security number.

If you have any questions about the project please contact Dr. Julie Albrecht at 402-472-8884 (jalbrecht@unl.edu) or Kristen Stenger at 402-472-3717 (kstenger85@gmail.com). If you have any questions about your rights or wish to report any concerns, please contact the UNL Research Compliance Services Office at 402-472-6929.

Thank you.

Julie A. Albrecht, Ph.D., R.D.
Professor/Extension Food Specialist
Department of Nutrition and Health Sciences

Kristen Stenger
Research Assistant
Department of Nutrition and Health Sciences

Please sign below to show your consent for participation in Food Safety for Hispanic Families with Young Children with Young Children in Nebraska focus group and survey.

Participant Signature__________________________________________________________

Date__________________________
Estimado Padre o Tutor,

¡La Universidad de Nebraska-Lincoln está conduciendo un estudio de seguridad alimenticia con familias Hispanas que tienen niños entre las edades de 10 años o menores, y nos gustaría su ayuda!

A Usted se le está dando la oportunidad de participar en un grupo de enfoque y completar la Encuesta de Seguridad Alimenticia para Familias Hispanas con Niños Menores en Nebraska porque Usted es el/la que prepara los alimentos a niños de 10 años o menores. Este grupo de enfoque y encuesta son para propósitos de investigaciones solamente y no hay ningún riesgo involucrado en su participación. Los beneficios incluyen aumentar a nuestro cuerpo conocimiento acerca de la seguridad alimenticia.

Su participación es totalmente voluntaria y se llevara a cabo aquí en su Centro de la Comunidad o iglesia. Las platicas del grupo de enfoque y la llenura de esta encuesta tomara como una hora, y para darle gracias por su participación Ud. recibirá un certificado de regalo de Wal-Mart o HyVee por $25. Para recibir el certificado de regalo necesita completar el formulario adjunto con su nombre y número de seguro social.

Si Ud. tiene cualquier pregunta acerca de este proyecto por favor comuníquese con la Dra. Julie Albrecht al 402-472-8884 (jbalbrecht@unl.edu) o Kristen Stenger al 402-472-3717 (kstenger85@gmail.com). Si Usted tiene cualquier pregunta acerca de sus derechos o desea reportar alguna inquietud, por favor comuníquese a UNL Research Compliance Services Office al 402-472-6929.

Muchas gracias,

Julie A. Albrecht, Dra., R.D.
Profesora/Extensión Especialista Alimentista
Departamento de Nutrición y Ciencias de Salud

Kristen Stenger
Asistente de Investigaciones
Departamento de Nutrición y Ciencias de Salud

Por favor firme abajo manifestando su consentimiento para participar en el grupo de enfoque y la Encuesta de Seguridad Alimenticia para Familias Hispanas con Niños Menores en Nebraska.

Firma del Participante_____________________________________________________
Fecha____________________________

110 Ruth Leverton Hall / P.O. Box 830806 / Lincoln, NE 68583-0806 / (402) 472-3716 / Fax (402) 472-1587
Appendix C1.

MULTIPLE CHOICE – PLEASE CHOOSE 1 ANSWER FOR EACH QUESTION

1. Your electricity went off in your freezer and the meat, chicken, and fish thawed and felt warm. What should you do to prevent food poisoning?

   __ Throw them away
   __ Cook them right away
   __ See how they smell or look before deciding what to do
   __ Immediately re-freeze until solidly frozen, then cook it

2. Your child is going to be eating 2 hours after you cook a meal. How should you keep the meal safe before your child eats it?

   __ Store it in the refrigerator and reheat it when the child is ready to eat it
   __ Place it on the kitchen counter until the child is ready to eat it
   __ Store it in a cool oven until the child is ready to eat it
   __ Store it in a warm oven until the child is ready to eat it

3. Which food needs to be refrigerated to prevent food poisoning?

   __ Apples
   __ Dried corn
   __ Open box of raisins
   __ Corn bread
   __ An open can of beans

4. What is the safest way to cool a large pot of hot soup?

   __ Put the soup in a clean shallow pan and refrigerate right away
   __ Keep the soup in the cooking pot and refrigerate right away
   __ Put the soup in a clean, deep pot before and refrigerate right away
   __ Cool the soup to room temperature on the counter, then refrigerate it

5. How long can you store cooked hamburger and chicken in the refrigerator to eat later?

   __ 1-2 days
   __ 3-4 days
   __ 5-7 days
   __ More than a week

6. How long can you store raw hamburger and chicken in the refrigerator to eat later?

   __ 1-2 days
   __ 3-4 days
   __ 5-7 days
   __ More than a week
Appendix C1.

7. If you have a cut or sore on your hand, what should you do before you prepare food for your family?
   __Nothing, if it is not infected  
   __Put a bandage on the cut or sore  
   __Wash hands  
   __Put a bandage on the sore and wear a glove

8. Where is the best place to store raw meat in the refrigerator?
   __On the top shelf  
   __Where there is space  
   __Below foods that are ready to eat

9. Putting raw meat in a separate bag (away from other food items) before placing it in the grocery cart:
   __Increases the chance of food poisoning  
   __Decreases the chance of food poisoning  
   __Makes no difference

10. How should you wash fresh fruits and vegetables to keep you from getting food poisoning?
    __Wash with regular soap  
    __Wash with hot water  
    __Wash with anti-bacterial soap  
    __Hold under cool running water

11. How should kitchen counters be cleaned to prevent food poisoning?
    __Spray with a strong bleach solution, rinse and wipe dry  
    __Wash with hot soapy water, rinse and wipe with a bleach solution  
    __Wash with hot soapy water and let air dry  
    __Brush off any dirt or food, wipe with a bleach solution and let air dry

12. What is the best way to wash your hands?
    __Apply sanitizer, run water, rub hands together for 20 seconds, rinse hands, dry hands, rub on an antiseptic hand lotion  
    __Apply soap, rub hands together for 20 seconds, rinse hands under water, dry hands, apply sanitizer  
    __Run water, moisten hands, apply soap, rub hands together for 20 seconds, rinse hands, dry hands  
    __Run water, moisten hands, apply sanitizer, rub hands together for 20 seconds, rise hands, dry hands, rub on antiseptic hand lotion.

13. Washing hands after changing a diaper:
    __Increases the chance of food poisoning  
    __Decreases the chance of food poisoning  
    __Makes no difference
Appendix C1.

14. What is the best way to tell if hamburgers are cooked enough to prevent food poisoning?
   __ Cut one to check the color of the meat inside
   __ Check the color of the juice to be sure that it is not pink
   __ Measure the temperature with a food thermometer
   __ Check the texture or firmness of the meat

15. What is the best way to tell when chicken has cooked long enough?
   __ The juices run clear
   __ The meat is not pink in the center
   __ The meat falls off the bone
   __ Test with a meat thermometer

16. To prevent food poisoning, how long should leftover soup be heated?
   __ Until it is boiling hot
   __ Just until it is hot, but not too hot to eat right away
   __ When it is at least room temperature
   __ Reheating isn’t necessary

IN THIS SECTION, EACH QUESTION MAY HAVE MORE THAN ONE CORRECT ANSWER. PLEASE SELECT ALL OF THE CORRECT ANSWERS.

17. How should dishes be washed to prevent food poisoning? (Check all that apply)
   __ Hand wash them and rinse right after the meal and then let them air-dry
   __ Hand wash and rinse them right after the meal and then dry them with a dish towel
   __ Wash and dry them in a dishwasher

18. When preparing food, you should wash your hands after touching which of these? (Check all that apply)
   __ Dirty pots and pans
   __ Fresh fruit
   __ Dishes that came out of the dishwasher
   __ Clean countertop
   __ Cell phone or home telephone

19. Which is an acceptable way to clean a cutting board or counter after it is used for raw meat? (Check all that apply)
   __ Wash with hot soapy water only
   __ Wash with hot soapy water, rinse with water, then rinse with bleach
   __ Clean with a disinfectant (example: Lysol, Clorox, bleach)
   __ Wash cutting board in a dishwasher
Appendix C1.

20. A food is properly cooked in a microwave oven when (Check all that apply)
   ___ You follow directions on the package
   ___ You stir the food about half way through cooking
   ___ You use a turntable in the microwave
   ___ The food feels hot
   ___ You test the food with a thermometer

21. Which foods will likely cause food poisoning for pregnant women, infants, and children? (Check all that apply)
   ___ Cottage cheeses
   ___ Cold smoked fish
   ___ Cold deli salads
   ___ Hot dogs that have not been heated
   ___ Raw eggs
   ___ Undercooked eggs
   ___ Canned vegetables
   ___ Canned fruit juice

22. Which of these people will likely get sick from harmful germs in food? (Check all that apply)
   ___ Preschool children
   ___ Teenagers
   ___ Pregnant women
   ___ Older people (age 60 and over)
   ___ People with type 2 diabetes
   ___ Cancer patients
   ___ People who frequently eat at restaurants or get take-out food often
   ___ None of these individuals
Appendix C1.
25. Eating which of these foods will increase a person’s risk of food poisoning?
   *(Check all that apply)*

   __Baked potato that was left on the counter overnight__
   __Leftover turkey eaten cold__
   __Cake that was left on the counter overnight__
   __Refried beans cooled on the counter__
   __Fried eggs with a runny or soft yolk__
   __Purchased cookie dough__
   __Raw homemade cookie dough or cake batter__
   __Sushi__
   __Raw shellfish__
   __Ceviche__
   __Unpasteurized fruit juice__
   __Sliced melon__
   __Raw sprouts (alfalfa, bean, clover, radish)__
   __Fresh homemade salsa__
   __Leftover soup reheated until warm but not boiling__
   __Raw milk (not pasteurized) or fresh cheese made with raw milk__
   __Infant milk or formula with honey added__
   __Meat cooked medium-well__
   __Milk with raw egg added__
   __Hamburger cooked rare__

   **TRUE/FALSE - PLEASE CHOOSE TRUE OR FALSE FOR THE FOLLOWING STATEMENTS**

24. *E. coli* (a harmful germ) in undercooked hamburger can cause kidney failure in children.

   __True__
   __False__

25. Undercooked chicken and raw eggs can carry *Salmonella* (a harmful germ).

   __True__
   __False__

26. It is safe to use raw eggs in recipes that will not be cooked.

   __True__
   __False__

27. It is safe to give an infant a bottle of baby formula that has been out of the refrigerator for longer than 2 hours?

   __True__
   __False__
Appendix C1.

28. Refrigeration eliminates harmful germs in food.
   __ True
   ___ False

29. If a leftover food looks and smells good, it is still safe to eat.
   __ True
   ___ False
Appendix C2.

**ELECCION MULTIPLE-POR FAVOR ESCOGA SOLO UNA NRESPUESTA POR CADA PREGUNTA**

1. Su electricidad se ha apagado en su congelador y la carne, el pollo, y el pescado se están descongelando y se sienten tibios. ¿Que debería hacer Usted para prevenir una intoxicación alimenticia?
   __Tirarla
   __Cocinarla al momento.
   __Mirar como huele o mirarla primero antes de actuar.
   __Congelarla de nuevo, y después cocinarla.

2. Su hijo va a comer dos horas después de que Usted prepare los alimentos. ¿Como debería mantener la comida segura antes de que su hijo se la coma?
   __Guardarlo en el refrigerador y recalentarlo cuando el niño este listo para comerlo.
   __Ponerlo sobre el mostrador de la cocina hasta que el niño este listo para comerlo.
   __Guardarlo dentro de un horno frío hasta que el niño este listo para comerlo.
   __Guardarlo dentro de un horno tibio hasta que el niño este listo para comerlo.

3. ¿Cual comida necesita ser refrigerada para evitar una intoxicación alimenticia?
   __Manzanas
   __Maíz seco
   __Una caja de pasitas
   __Pan de elote
   __Una lata abierta de frijoles

4. ¿Cual seria la manera mas segura para enfriar una olla grande de sopa?
   __Ponga la sopa en una olla no muy honda y refrigérela inmediatamente.
   __Mantenga la sopa en una olla y refrigérela inmediatamente.
   __Ponga la sopa en una olla honda antes y refrigérela.
   __Deje que se enfrie y después refrigérela.

5. ¿Cuanto tiempo puede Usted guardar carne molida y pollo ya cocinados en el refrigerador para comérselo después?
   __1-2 días
   __3-4 días
   __5-7 días
   __Más de una semana
Appendix C2.
6. ¿Cuánto tiempo puede Usted guardar carne molida y pollo crudos en el refrigerador y después comérselo?
   __1-2 días
   __3-4 días
   __5-7 días
   __mas de una semana

7. ¿Si Usted tiene una cortada o llaga en su mano, que debe Usted hacer antes de preparar la comida para su familia?
   __Nada, si no esta infectada.
   __Poner una venda sobre la cortada o llaga.
   __Lavarse las manos.
   __Poner una venda sobre la llaga y usar un guante.

8. ¿Cuál es el mejor lugar para guardar carne cruda en el refrigerador?
   __En la parrilla de arriba.
   __Donde haya espacio.
   __Bajo las comidas que estando listas para comer.

9. El poner carne cruda en una bolsa aparte (lejos de otras comidas) antes de ponerla en la canasta de comida:
   __Incrementa el riesgo de una intoxicación.
   __Reduce el riego de una intoxicación.
   __No hace ninguna diferencia.

10. ¿Cómo deben lavarse las frutas y verduras para prevenir una intoxicación alimenticia?
    __Lavarse con jabón regular.
    __Lavarse con agua caliente.
    __Lavarse con jabón anti-bacterial.
    __Mantener los comestibles bajo agua fría con la llave abierta.

11. ¿Como deben limpiarse los mostradores de cocina para prevenir una intoxicación alimenticia?
    __Rociar con una fuerte solución de cloro, enjuagar y secar.
    __Lavar con agua cliente y jabón, enjuagar y secar con una solución de cloro.
    __Lavar con agua cliente y jabón y dejarlos que se sequen solos.
    __Quitar comida o polvo, limpiar con un trapo con cloro y dejar que se sequen solos.
Appendix C

12. ¿Cuál es la mejor manera de lavarse las manos?
   ___ Aplicar gel higiénico, abrir la llave, frotarse las manos, secarse las manos y
   ___ unirse una loción antiséptica para las manos.
   ___ Aplicar jabón, frotarse las manos por 20 segundos enjuagarse las manos y
   ___ aplicar gel higiénico.
   ___ Abrir la llave, mojarse las manos, tomar jabón, frotarse las manos por 20
   ___ segundos, enjuagarse las manos, y secarse las manos.
   ___ Abrir la llave, mojarse las manos, ponerse gel higiénica, frotarse las manos por
   ___ 20 segundos, enjuagarse las manos secarse las manos, y frotarse una loción
   ___ antiséptica para las manos.

13. El lavarse las manos después de cambiar un pañal:
   ___ Incrementa el riesgo de intoxicación alimenticia.
   ___ Reduce el riesgo de intoxicación alimenticia.
   ___ No hace ninguna diferencia.

14. ¿Cuál es la mejor manera de saber si las hamburguesas están cocidas lo suficiente
para prevenir una intoxicación alimenticia?
   ___ Corte uno para revisar que color tiene por dentro.
   ___ Revise el color del jugo para asegurarse que no esta rosita.
   ___ Mida la temperatura con un termómetro de comida.
   ___ Revise la textura o firmeza de la carne.

15. ¿Cuál es la mejor manera de saber si el pollo se ha cocinado por suficiente
    tiempo?
   ___ Los jugos fluyen claros.
   ___ La carne no está rosa en el centro.
   ___ La carne se desprende del hueso.
   ___ Probarla con un termómetro de carne.

16. Para prevenir una intoxicación alimenticia, ¿Por cuánto tiempo debe calentarse la
    sopa sobrante?
   ___ Hasta que hervir.
   ___ En cuanto esté caliente, pero no tan caliente para comérsela al momento.
   ___ Cundo este a la temperatura ambiental.
   ___ No hay necesidad de recalentarla.
Appendix C2.
EN ESTA SECCION, CADA PREGUNTA PUEDE TENER MAS DE UNA RESPUESTA CORRECTA. POR FAVOR ESCOGA TODAS LAS RESPUESTAS CORRECTAS.

17. ¿Cómo deben lavarse los trastes para prevenir una intoxicación alimenticia?
   (Marque todas las que apliquen)
   ___ Lavarlos a mano al terminar de comer y dejarlos secar por sí mismo.
   ___ Lavarlos a mano y enjuagarlos al terminar de comer y secarlos con una toalla.
   ___ Lavarlos y secarlos en el lavaplatos.

18. Cuando Usted está preparando alimentos, debe lavarse las manos después de tocar ¿Cuáles de los siguientes? (Marque todos los que apliquen)
   ___ Ollas y sartenes sucios.
   ___ Fruta fresca.
   ___ Platos que acaban de salir del lavaplatos.
   ___ El mostrador limpio de la cocina.
   ___ El teléfono celular o el de casa.

19. ¿Cuál es una manera aceptable de limpiar una tabla de cortar o un mostrador después de partir carne cruda? (Marque todas las que apliquen)
   ___ Lavarla con agua caliente y enjabonada solo.
   ___ Lavarla con agua caliente y enjabonada, enjuagarlos con agua, y luego enjuagarlos con cloro.
   ___ Lavarlos con algún desinfectante (como: Lysol, Clorox, cloro)
   ___ Lavar la tabla en el lavaplatos.

20. La comida se prepara apropiadamente en un horno microondas cuando (Marque todas las que apliquen)
   ___ Usted sigue las instrucciones en el paquete.
   ___ Usted menea la comida cuando esta medio preparada.
   ___ Usted usa una tornamesa en el microondas.
   ___ La comida se siente caliente.
   ___ Usted prueba la comida con un termómetro.
21. ¿Cuál de las siguientes comidas puede causar una intoxicación alimenticia a una mujer embarazada, infantes y niños? (Marque todas las que apliquen)
   __ Quesos blanditos
   __ Pescado ahumado frío
   __ Ensaladas frías
   __ Perros calientes que no han sido calentados
   __ Huevos crudos
   __ Huevos no cocidos bien
   __ Vegetales enlatados
   __ Jugo de frutas enlatada

22. ¿Cuál de estas personas se enfermará de gérmenes en comida? (Marque todas las que apliquen)
   __ Niños de Pre-escolar
   __ Adolescentes
   __ Mujeres embarazadas
   __ Gente mayor (de 60 años o más grande)
   __ Las personas con diabetes tipo 2
   __ Los pacientes con cáncer
   __ Las personas que frecuentemente comen en restaurantes o conseguir llevar a cabo a menudo
   __ Ninguno de estos individuos

23. ¿Comer cuál de estos alimentos aumenta el riesgo de una persona de la intoxicación alimentaria? (Marque todas las que apliquen)
   __ Papa horneada dejada sobre el mostrador de cocina toda la noche
   __ Comerse sobrantes de pavos fríos
   __ Pastel dejado sobre el mostrador de cocina toda la noche
   __ Dejar frijoles refritos sobre el mostrador de cocina para enfriar
   __ Huevos fritos con una yema de huevo que moquea o suave
   __ Masa para galletas comprada
   __ Masa para galletas cruda hecha en casa o mezcla para pastel
   __ Sushi
   __ Mariscos crudos
   __ Ceviche
   __ Jugo de frutas no pasteurizado
   __ Una melón rebanado
   __ Brotes crudos de (alfalfa, frijol, trébol, rábano)
   __ Salsa fresca hecha en casa
   __ Sobras de sopa recalentada hasta que este tibia pero hirviendo
   __ Leche bronca (no pasteurizada) o queso fresco hecho con leche bronca
   __ Leche para niños o fórmula con miel agregada
   __ Carne cocida a medio termino
   __ Leche con un huevo crudo
   __ Hamburguesas cocidas rara
Appendix C2.
VERDADERO/FALSO - POR FAVOR ESCOJA VERDADERO O FALSO PARA LAS SIGUIENTES DECLARACIONES

24. *E. coli* (una germen muy dañino) en carne molida no bien cocida puede causar daños en el riñón en niños
   __Verdad
   __Falso

25. Pollo al medio crudo y huevos crudos pueden contraer *Salmonela* (un germen muy dañino).
   __Verdad
   __Falso

26. Es seguro usar huevos crudos en recetas que no van hacer cocidas.
   __Verdad
   __Falso

27. ¿Es seguro darle a un infante una biberón con alimento que has estado en el refrigerador por mas de dos horas?
   __Verdad
   __Falso

28. Refrigeración elimina los gérmenes dañinos en comida.
   __Verdad
   __Falso

29. Si las sobrantes de comida se miran y huelen bien, entonces están bien para comerase.
   __Verdad
   __Falso
Appendix D1.

Demographics

1. Gender:
   □ Male       □ Female

2. Race/Ethnicity:
   □ Caucasian or White
   □ Native American
   □ African American or Black
   □ Hispanic, Latino or Spanish origin
   □ Asian
   □ Other, please list ________________

3. How old are you? ________________

4. City, State, Country of birth __________________________________________

5. How long have you been living in the U.S.? __________________

6. Who was the first member of your family to live in the U.S.?
   □ You
   □ Parents
   □ Grandparents
   □ Other, please list ________________

7. What is the last grade or year of school that you have completed?
   □ Less than high school
   □ Some high school
   □ High school (graduate or GED)
   □ Additional training beyond high school (not college)
   □ Some college
   □ College graduate
   □ Post-College graduate
Appendix D1.

8. Have you worked in a food or nutrition related job?
   - no
   - yes

9. Have you ever had training in food safety or nutrition? (Choose all that apply)
   - I have not had any education/training in food or nutrition
   - I have had education/training in nutrition
   - I have had education/training in food preparation
   - I have had education/training in food safety

10. Please list the ages of the children you make food for:
   - First Child age: _____
   - Second Child age: _____
   - Third Child age: _____
   - Fourth Child age: _____
   - Fifth Child age: _____
   - Sixth Child age: _____

11. Are you:
   - Employed full-time
   - Employed part-time
   - Not employed

12. Please check how you would like to get food and nutrition information.
   - Print (example: mail, brochure, poster, materials from child’s school)
   - Media (example: TV, radio)
   - Electronic (example: email, internet, text message, blogs)
   - People (example: family/community member, doctor)
   - Education (example: classes, workshops)
Appendix D2.

1. Género
   □ Masculino  □ Femenino

2. Raza/Etnicidad:
   □ Caucásico o Blanco
   □ Nativo Americano
   □ Americano Africano o Negro
   □ Hispano, Latino o origen Española
   □ Asiático
   □ Otro, Por favor especifique _______________________

3. ¿Cuántos años tienes? ________________________________

4. Ciudad, Estado, País de nacimiento ________________________________

5. ¿Cuánto tiempo ha estado Usted viviendo en los Estados Unidos? ____________

6. ¿Quién fue el primer miembro de su familia a vivir en los Estados Unidos?
   □ Usted
   □ Los Padres
   □ Abuelos
   □ Otros, por favor lista________________________

7. ¿Cuál es el último grado escolar o año de escuela que Usted ha terminado?
   □ Menos de Preparatoria
   □ Alguna Preparatoria
   □ Preparatoria (graduado o GED)
   □ Entrenamiento adicional después de la preparatoria (no colegio)
   □ Algo de colegio
   □ Graduado de colegio
   □ Posgraduado
Appendix D2.

8a. ¿Ha trabajado en un empleo relacionado con la alimentación o la nutrición?

☐ No

☐ Si

9. ¿Cuál de los siguientes describe mejor cualquier enseñanza /entrenamiento que Usted haya tenido en servicios alimenticios o nutrición? (escoja todos los que apliquen)

☐ Yo nunca he tenido enseñanza/entrenamiento en alimento o nutrición.

☐ Yo he tenido enseñanza/entrenamiento en nutrición.

☐ Yo he tenido enseñanza/entrenamiento en preparación de alimentos.

☐ Yo he tenido enseñanza/entrenamiento en seguridad alimenticia.

10. Por favor escriba las edades de los niños que hacen los alimentos para:

Edad del Primer niño _________
Edad del Segundo niño _________
Edad del Tercer niño _________
Edad del Cuarto niño _________
Edad del Quinto niño _________
Edad del Sexto niño _________

11. Esta Usted:

☐ Empleado tiempo completo

☐ Empleado medio tiempo

☐ Desempleado

12. Por favor indique ¿Cómo le gustaría recibir información alimenticia y nutricional?

☐ Impreso (ejemplo: correo, folleto, poster, materiales de la escuela del niño)

☐ Medios de comunicación (ejemplo: televisión, radio)

☐ Electrónico (ejemplo: correo electrónico, internet, mensaje de texto)

☐ Gente (ejemplo: una familia / miembro de la comunidad, el médico de)

☐ Educación (ejemplo: clases, talleres)
Dear Parent or Guardian,

The University of Nebraska-Lincoln is conducting a food safety study with Hispanic families with children 10 years of age and younger, and we would like your help!

You have been selected to complete the Food Safety for Hispanic Families with Young Children in Nebraska Survey because you are the primary food handler in your home with children 10 years old and younger. This survey is for research purposes only and there are no known risks involved. The benefits include adding to our body of knowledge of food safety.

Your participation is completely voluntary and will take place right here in your community center. Completion of the survey will take about half an hour, and to thank you for your participation you will receive a $5 Walmart gift certificate. To receive the gift certificate you will need to fill out the attached form with your name and social security number.

If you have any questions about the project please contact Dr. Julie Albrecht at 402-472-8884 (jalbrecht@unl.edu) or Kristen Stenger at 402-472-3717 (kstenger85@gmail.com). If you have any questions about your rights or wish to report any concerns, please contact the UNL Research Compliance Services Office at 402-472-6929.

Thank you.

Julie A. Albrecht, Ph.D., R.D.  
Professor/Extension Food Specialist  
Department of Nutrition and Health Sciences

Kristen Stenger  
Research Assistant  
Department of Nutrition and Health Sciences
Appendix E2.

Estimado Padre o Tutor,

La Universidad de Nebraska-Lincoln está conduciendo un estudio de seguridad alimenticia con familias Hispanas que tienen niños entre las edades de 10 años o menores, y nos gustaría su ayuda!

Usted ha sido seleccionado para completar la Encuesta de Seguridad Alimenticia para Familias Hispanas con Niños Menores en Nebraska porque Usted es el/la que prepara los alimentos a niños de 10 años o menores. Esta encuesta es para propósitos de investigaciones solamente y no hay ningún riesgo involucrado. Los beneficios incluyen aumentar nuestro conocimiento acerca de la seguridad alimenticia.

Su participación es totalmente voluntaria y se llevará a cabo aquí en su Centro de la Comunidad. La llenura de esta encuesta tomará solamente media hora, y para darle gracias por su participación Ud. recibirá un certificado de regalo de Walmart por $5. Para recibir el certificado de regalo necesita rellenar el formulario adjunto con su nombre y número de seguridad social.

Si Ud. tiene preguntas acerca de este proyecto por favor comuníquese con la Dra. Julie Albrecht al 402-472-8884 (jalbrecht@unl.edu) o Kristen Stenger al 402-472-3717 (kstenger85@gmail.com). Si Ud. tiene alguna pregunta acerca de sus derechos o desea reportar alguna inquietud, por favor comuníquese a UNL Research Compliance Services Office al 402-472-6929.

Muchas gracias,

Julie A. Albrecht, Dra., R.D.
Profesora/Extensión Especialista Alimentista
Departamento de Nutrición y Ciencias de Salud

Kristen Stenger
Asistente de Investigaciones
Departamento de Nutrición y Ciencias de Salud
Appendix F.

Focus Group Summaries and Notes

Focus Group #1 (n=12)

Location: El Centro de Las Americas, Lincoln NE (Hispanic Community Center)

When: Saturday March 3, 2012, 10am-11:30am

Interpreter – Health Outreach Coordinator from El Centro de Las Americas (male)

This group was held in the common room around a large table at El Centro de Las Americas, and the center was closed otherwise. Twelve participants were female and one male. It took participants about 30 minutes to complete the survey. All participants preferred Spanish over English for the survey and discussion. No one attempted to speak English at all. One of the active female participants sincerely thanked me for my interest in the Hispanic community. Participants were recruited from El Centro de Las Americas through word of mouth and flyers.

Focus Group #2 (n=12)

Location: Hispanic Christian Church, Lincoln NE

When: Sunday March 11, 2012, 1pm-2:30pm

Interpreter – Health Outreach Coordinator from El Centro de Las Americas (male)

The group was held in a quiet side room at the church, after Sunday worship. Twelve participants completed the survey and participated in the focus group discussion. All were female. It took participants about 25 minutes to complete the survey. All but one preferred Spanish over English for the survey and discussion. The woman that preferred English was notably younger (twenty-something) and had received food training. Very
chatty discussion by the whole group. Again, I was thanked sincerely by an older
female for having interest in the Hispanic community. These participants were all
recruited through the church by word of mouth; they had requested a time right after
Sunday service.

After the focus group was done, I got to observe and partake in pork tacos that
were being prepared in the hall at the church. A chunk of seasoned pork was put on a
vertical rotisserie. Pieces were sliced off and then fried in a pan. Pineapple was added to
the pork pieces, and when it was ready, it was served on small corn tortillas with a
cilantro onion mixture on top. I denied the “chili” on top because I’m sure it was very
spicy. All of the people preparing the food wore gloves. Everything seemed clean and
fresh. The meat was not checked for temperature; I’m pretty sure it was pre-cooked, but I
do not know how it was handled before/while they brought it to the church that afternoon.

*Focus Group #3 (n=6)*

*Location: Public Library, South Sioux City, NE*

*When: Saturday March 17, 2012 11am-12:15pm*

*Interpreter – local Hispanic University of Nebraska-Extension employee (female)*

This group was held in a quiet meeting room in the public library. Participants
completed the survey in about 20 minutes. All participants were female. Two
participants preferred English (both younger and although they were verbally fluent in
Spanish, one of them mentioned not being able to read Spanish), three preferred Spanish
(written and verbal), and one spoke mostly in English but used the Spanish survey. With
a smaller group it is possible to use both languages simultaneously and effectively. The
interpreter would interpret not only the Spanish for me to understand, but also the
English from the participants into Spanish so the other participants would know what was
being said. For the previous larger groups, it may have been harder and I would prefer if
the participants would all speak Spanish so that everyone at the table would know what it
being discussed. It worked here because of the smaller size of the group and because of
the high competency of the interpreter. The bilingual UNL extension employee recruited
all of the participants by word of mouth.

Focus Group #4 (n=12)
Location: Lutheran Church in Grand Island, NE
When: Friday March 23, 2012 6pm-7:20pm
Interpreter – local Hispanic University of Nebraska-Extension employee (female)

This group was held in a quiet room in the back of a large church. The church
was not specifically Hispanic, many Caucasians and others were seen at the church. All
participants preferred Spanish as the language for speech and for the written survey. This
group was particularly chatty. The bilingual UNL extension employee recruited all of the
participants by word of mouth. The participants were not necessarily affiliated with the
church, most were there because their children participated in a soccer league that
practiced at that time at the church.

Focus Group #5 (n=2)
Location: County Health Department in Columbus, NE
When: Saturday, March 31st 1pm-2:15pm
Interpreter – Hispanic Minority Health Dept coordinator (female)

This group was held in a quiet room at the health department office in Columbus. The office was closed otherwise. There were two female participants in this group. They both preferred Spanish for speech and written materials. This was a fast session due to the small number of participants. Because of the small number of participants this gives variety to the focus group sizes and settings. Recruitment was done by word of mouth by the minority health coordinator in Platte County.

Focus Group #6 (n=8)

Location: UNL Extension office in Lexington, NE

When: Monday, April 2nd 6pm-7:30pm

Interpreter – Hispanic Community Member (female)

This group was held in a quiet room at the UNL extension office in Dawson County. The UNL extension educator did the recruitment through Hispanic contacts in the community by word of mouth. One participant spoke fluent English and Spanish, some others spoke a bit of English, but preferred Spanish. Several others spoke only Spanish. This was the longest discussion of all of them with non-stop conversation for 45 minutes.
### Appendix G

<table>
<thead>
<tr>
<th>Item</th>
<th>Scale Mean if Item Deleted</th>
<th>Scale Variance if Item Deleted</th>
<th>Corrected Item Total Correlation</th>
<th>Cronbach's Alpha if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>question1</td>
<td>45.6140</td>
<td>44.634</td>
<td>.023</td>
<td>.661</td>
</tr>
<tr>
<td>question2</td>
<td>45.5263</td>
<td>43.468</td>
<td>.201</td>
<td>.652</td>
</tr>
<tr>
<td>question4</td>
<td>45.9649</td>
<td>43.213</td>
<td>.396</td>
<td>.646</td>
</tr>
<tr>
<td>question5</td>
<td>45.8596</td>
<td>45.159</td>
<td>-.051</td>
<td>.664</td>
</tr>
<tr>
<td>question6</td>
<td>45.4912</td>
<td>43.576</td>
<td>.187</td>
<td>.652</td>
</tr>
<tr>
<td>question7</td>
<td>45.4035</td>
<td>46.209</td>
<td>-.217</td>
<td>.672</td>
</tr>
<tr>
<td>question8</td>
<td>45.4737</td>
<td>46.682</td>
<td>-.280</td>
<td>.676</td>
</tr>
<tr>
<td>question9</td>
<td>45.5263</td>
<td>43.861</td>
<td>.141</td>
<td>.655</td>
</tr>
<tr>
<td>question10</td>
<td>45.6491</td>
<td>44.303</td>
<td>.074</td>
<td>.658</td>
</tr>
<tr>
<td>question11</td>
<td>45.6842</td>
<td>44.434</td>
<td>.056</td>
<td>.659</td>
</tr>
<tr>
<td>question12</td>
<td>45.4211</td>
<td>42.891</td>
<td>.310</td>
<td>.646</td>
</tr>
<tr>
<td>question13</td>
<td>45.3860</td>
<td>43.241</td>
<td>.262</td>
<td>.649</td>
</tr>
<tr>
<td>question14</td>
<td>45.6316</td>
<td>41.701</td>
<td>.476</td>
<td>.636</td>
</tr>
<tr>
<td>question15</td>
<td>45.6491</td>
<td>41.732</td>
<td>.474</td>
<td>.637</td>
</tr>
<tr>
<td>question16</td>
<td>45.2105</td>
<td>43.812</td>
<td>.256</td>
<td>.651</td>
</tr>
<tr>
<td>question24</td>
<td>45.3509</td>
<td>43.589</td>
<td>.215</td>
<td>.651</td>
</tr>
<tr>
<td>question25</td>
<td>45.1579</td>
<td>44.385</td>
<td>.173</td>
<td>.655</td>
</tr>
<tr>
<td>question26</td>
<td>45.4035</td>
<td>43.566</td>
<td>.203</td>
<td>.652</td>
</tr>
<tr>
<td>question27</td>
<td>45.3860</td>
<td>44.634</td>
<td>.032</td>
<td>.660</td>
</tr>
<tr>
<td>question28</td>
<td>45.5439</td>
<td>44.253</td>
<td>.081</td>
<td>.658</td>
</tr>
<tr>
<td>question29</td>
<td>45.4035</td>
<td>44.174</td>
<td>.105</td>
<td>.657</td>
</tr>
<tr>
<td>question3</td>
<td>45.1754</td>
<td>45.290</td>
<td>-.085</td>
<td>.662</td>
</tr>
<tr>
<td>q23a</td>
<td>45.5614</td>
<td>42.893</td>
<td>.288</td>
<td>.647</td>
</tr>
<tr>
<td>q23b</td>
<td>45.6842</td>
<td>45.970</td>
<td>-.174</td>
<td>.671</td>
</tr>
<tr>
<td>q23c</td>
<td>45.4386</td>
<td>45.751</td>
<td>-.144</td>
<td>.669</td>
</tr>
<tr>
<td>q23d</td>
<td>45.7544</td>
<td>43.689</td>
<td>.180</td>
<td>.653</td>
</tr>
<tr>
<td>q23e</td>
<td>45.7193</td>
<td>44.991</td>
<td>-.028</td>
<td>.664</td>
</tr>
<tr>
<td>q23f</td>
<td>45.3158</td>
<td>45.363</td>
<td>-.087</td>
<td>.665</td>
</tr>
<tr>
<td>q23g</td>
<td>45.8596</td>
<td>43.623</td>
<td>.222</td>
<td>.651</td>
</tr>
<tr>
<td>q23h</td>
<td>45.7193</td>
<td>41.956</td>
<td>.453</td>
<td>.638</td>
</tr>
<tr>
<td>q23i</td>
<td>45.2632</td>
<td>43.233</td>
<td>.330</td>
<td>.647</td>
</tr>
<tr>
<td>q23j</td>
<td>45.5614</td>
<td>45.322</td>
<td>-.078</td>
<td>.667</td>
</tr>
<tr>
<td>q23k</td>
<td>45.7719</td>
<td>42.679</td>
<td>.350</td>
<td>.644</td>
</tr>
<tr>
<td>q23l</td>
<td>45.9474</td>
<td>44.051</td>
<td>.187</td>
<td>.653</td>
</tr>
<tr>
<td>q23m</td>
<td>45.8596</td>
<td>43.230</td>
<td>.294</td>
<td>.648</td>
</tr>
<tr>
<td>q23n</td>
<td>45.1930</td>
<td>45.944</td>
<td>-.237</td>
<td>.668</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----</td>
<td>------</td>
<td>------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>q23o</td>
<td>45.7895</td>
<td>45.062</td>
<td>-.037</td>
<td>.664</td>
</tr>
<tr>
<td>q23p</td>
<td>45.4561</td>
<td>41.574</td>
<td>.515</td>
<td>.635</td>
</tr>
<tr>
<td>q23q</td>
<td>45.7193</td>
<td>42.277</td>
<td>.400</td>
<td>.641</td>
</tr>
<tr>
<td>q23r</td>
<td>45.7193</td>
<td>45.777</td>
<td>-.147</td>
<td>.670</td>
</tr>
<tr>
<td>q23s</td>
<td>45.3684</td>
<td>41.773</td>
<td>.523</td>
<td>.636</td>
</tr>
<tr>
<td>q23t</td>
<td>45.2632</td>
<td>42.840</td>
<td>.410</td>
<td>.644</td>
</tr>
<tr>
<td>24.</td>
<td>45.3509</td>
<td>43.589</td>
<td>.215</td>
<td>.651</td>
</tr>
<tr>
<td>25.</td>
<td>45.1579</td>
<td>44.385</td>
<td>.173</td>
<td>.655</td>
</tr>
<tr>
<td>26.</td>
<td>45.7719</td>
<td>46.965</td>
<td>-.333</td>
<td>.678</td>
</tr>
<tr>
<td>27.</td>
<td>45.7895</td>
<td>45.883</td>
<td>-.168</td>
<td>.670</td>
</tr>
<tr>
<td>28.</td>
<td>45.6316</td>
<td>46.344</td>
<td>-.227</td>
<td>.674</td>
</tr>
<tr>
<td>29.</td>
<td>45.7719</td>
<td>46.358</td>
<td>-.240</td>
<td>.673</td>
</tr>
<tr>
<td>17a</td>
<td>45.5439</td>
<td>44.467</td>
<td>.049</td>
<td>.660</td>
</tr>
<tr>
<td>17b</td>
<td>45.7018</td>
<td>43.927</td>
<td>.135</td>
<td>.655</td>
</tr>
<tr>
<td>17c</td>
<td>45.6667</td>
<td>43.762</td>
<td>.157</td>
<td>.654</td>
</tr>
<tr>
<td>18a</td>
<td>45.1930</td>
<td>44.087</td>
<td>.210</td>
<td>.653</td>
</tr>
<tr>
<td>18b</td>
<td>45.8947</td>
<td>43.382</td>
<td>.287</td>
<td>.649</td>
</tr>
<tr>
<td>18c</td>
<td>45.1754</td>
<td>44.719</td>
<td>.064</td>
<td>.658</td>
</tr>
<tr>
<td>18d</td>
<td>45.2456</td>
<td>44.403</td>
<td>.104</td>
<td>.657</td>
</tr>
<tr>
<td>18e</td>
<td>45.2456</td>
<td>42.939</td>
<td>.409</td>
<td>.644</td>
</tr>
<tr>
<td>19a</td>
<td>45.4737</td>
<td>45.182</td>
<td>-.057</td>
<td>.665</td>
</tr>
<tr>
<td>19b</td>
<td>45.3158</td>
<td>44.506</td>
<td>.064</td>
<td>.658</td>
</tr>
<tr>
<td>19c</td>
<td>45.6842</td>
<td>44.720</td>
<td>.012</td>
<td>.662</td>
</tr>
<tr>
<td>19d</td>
<td>45.8421</td>
<td>45.028</td>
<td>-.033</td>
<td>.664</td>
</tr>
<tr>
<td>20a</td>
<td>45.2105</td>
<td>44.883</td>
<td>.012</td>
<td>.660</td>
</tr>
<tr>
<td>20b</td>
<td>45.3333</td>
<td>44.619</td>
<td>.041</td>
<td>.660</td>
</tr>
<tr>
<td>20c</td>
<td>45.1930</td>
<td>45.301</td>
<td>-.084</td>
<td>.663</td>
</tr>
<tr>
<td>20d</td>
<td>45.3333</td>
<td>43.726</td>
<td>.197</td>
<td>.652</td>
</tr>
<tr>
<td>20e</td>
<td>45.7544</td>
<td>42.010</td>
<td>.456</td>
<td>.639</td>
</tr>
<tr>
<td>21a</td>
<td>45.7719</td>
<td>43.572</td>
<td>.203</td>
<td>.652</td>
</tr>
<tr>
<td>21b</td>
<td>45.8947</td>
<td>45.310</td>
<td>-.079</td>
<td>.664</td>
</tr>
<tr>
<td>21c</td>
<td>45.9298</td>
<td>43.816</td>
<td>.225</td>
<td>.652</td>
</tr>
<tr>
<td>21d</td>
<td>45.5439</td>
<td>42.395</td>
<td>.366</td>
<td>.643</td>
</tr>
<tr>
<td>21e</td>
<td>45.3684</td>
<td>43.273</td>
<td>.263</td>
<td>.649</td>
</tr>
<tr>
<td>21f</td>
<td>45.3684</td>
<td>43.308</td>
<td>.257</td>
<td>.649</td>
</tr>
<tr>
<td>21g</td>
<td>45.1930</td>
<td>44.480</td>
<td>.114</td>
<td>.656</td>
</tr>
<tr>
<td>21h</td>
<td>45.1930</td>
<td>44.873</td>
<td>.019</td>
<td>.659</td>
</tr>
<tr>
<td>22a</td>
<td>45.3333</td>
<td>42.833</td>
<td>.356</td>
<td>.645</td>
</tr>
<tr>
<td>22b</td>
<td>45.3509</td>
<td>47.946</td>
<td>-.504</td>
<td>.684</td>
</tr>
<tr>
<td>22c</td>
<td>45.3684</td>
<td>42.308</td>
<td>.429</td>
<td>.641</td>
</tr>
<tr>
<td>22d</td>
<td>45.4035</td>
<td>41.995</td>
<td>.466</td>
<td>.638</td>
</tr>
<tr>
<td>22e</td>
<td>45.7544</td>
<td>43.689</td>
<td>.180</td>
<td>.653</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>22f</td>
<td>45.7193</td>
<td>43.741</td>
<td>.166</td>
<td>.654</td>
</tr>
<tr>
<td>22g</td>
<td>45.5789</td>
<td>43.784</td>
<td>.151</td>
<td>.654</td>
</tr>
<tr>
<td>22h</td>
<td>45.0877</td>
<td>45.046</td>
<td>0.000</td>
<td>.659</td>
</tr>
</tbody>
</table>