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Lindsay O'Connell

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**FOOD HANDLING PERCEPTIONS, PRACTICES,
KNOWLEDGE AND BARRIERS IN NATIVE AMERICAN
PRIMARY FOOD HANDLERS OF YOUNG CHILDREN IN
NEW MEXICO**

by

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**BACHELOR OF ARTS
VISUAL COMMUNICATION DESIGN
2005**

THESIS

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B.A., Visual Communication Design, Kent State University, 2005

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ABSTRACT

Food borne illness among Native American populations exceeds that of majority populations. Due to the unique cultural diversity in New Mexico, these inequities are even greater. Attitudes and behaviors towards food are influenced by social and cultural contexts, yet, there has been limited research relating to the knowledge and perceptions of minority populations.

A qualitative research design using focus group methodology was used in this study. The Health Belief Model was used as the theoretical framework. The purpose of this study was to gain a deeper understanding of the food safety practices and beliefs of primary food handlers within Native American families. Thirty-one participants were recruited to participate in focus group discussions and to complete a food safety knowledge survey. Data was organized and analyzed for central themes. Results suggest a need for cultural competent public health education designed to increase awareness about food safety practices within the home.

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Chapter One: Introduction

“Food and language are the cultural habits humans learn first and the ones they change with the greatest reluctance”

~Donna Gabaccia, *We Are What We Eat: Ethnic Food and the Making of Americans*

The purpose of this chapter is to provide a general overview of the area of study to be investigated, describe how this topic is important to the field of community health education, and introduce the research questions of interest. A list of pertinent definitions of terms and delimitations are also provided.

Statement of the Problem

Foodborne illness (FBI) refers to infectious or toxic diseases resulting from the ingestion of contaminated food and include a broad group of illnesses caused by bacteria, viruses, parasites, chemical agents and toxins, which contaminate food at different points along the “farm to table” continuum (WHO, 2011). It has been estimated that the annual burden of foodborne infections in the United States alone is 48 million cases, 128,000 hospital admissions and 3,000 deaths. An estimated 9.4 million illnesses come from known pathogens, mainly Salmonella (nontyphoidal), Campylobacter spp., Clostridium perfringens, Norovirus, and Staphylococcus aureus. Unknown pathogens account for the remaining 38.4 million illnesses (CDC, 2011a). Every person is at risk for foodborne illness, however children under 10 years old have a higher risk of infection as compared to all other age groups. Children are at higher risk due to lower body weight, developing immune systems, reduced stomach acid production and limited control over diet and related food safety risks (Buzby, 2001).

The United States spends nearly \$152 billion dollars annually on medical costs, lost productivity, and premature deaths due to foodborne illness (Scharff, 2011). Illness in children contributes almost 33% of this cost (Buzby, 2001). Children under 15 years of age cost the United States nearly \$2.3 billion annually in medical costs, lost productivity, and premature deaths and amount to roughly 50% of all cases (CDC, 2007; Buzby 2001). Children under 4 years of age are disproportionately affected by *Campylobacter*, *E. coli* 0157, *Listeria*, *Salmonella* and *Shigella* (CDC 2011b). Infants under 1 year of age have the highest incidence of *Listeria*, *Campylobacter* and *Salmonella*, and children under 10 years of age are second highest risk group for *Salmonella* (CDC, 2011b).

Attitudes and behaviors towards food are influenced by the social and cultural context in which an individual is raised. Despite this fact, there has been limited research relating to the knowledge and perceptions of minority and other special demographic groups whose actions may predispose them to foodborne illness (Adu-Nyako, 1999). Literature pertaining to Native Americans in relation to foodborne illness is particularly exiguous. However, limited reports have revealed foodborne illnesses among Native American populations have consistently exceeded that of majority populations (CDC 2004; Racz 2009, Shiferaw, 2004). For instance, when compared to other ethnicities, Shiferaw (2004) showed increased rates of *Shigella* infections and the highest rates of hospitalizations due to *Shigella* in Native populations.

Additionally, in a 2009 national annual report, Indian/Native Alaskan populations had the highest incidence rate of *Campylobacter* (13.19/100,000) when compared to other populations (CDC, 2011b). Though these previous studies have shown noticeable differences in incidence rates and behaviors across demographic categories, there is

currently insufficient data to fully understand the food safety knowledge and practices of Native Americans that may contribute to these disparities (Patil, 2005; Racz, 2009; Khanlian, 2011).

Foodborne illness is a persistent yet preventable health issue. Educational efforts that seek to increase awareness of food safety that result in behavior change are an important strategy in this prevention. In 1997, The Partnership for Food Safety Education (PFSE), USDA and Food and Drug Administration (FDA) along with other collaborators started the FightBAC program to educate consumers on safe food handling practices at home. It focuses on four simple concepts to reduce incidence of foodborne illness:

- Clean: Washing hands and surfaces often
- Separate: Avoiding cross-contamination
- Cook: Using proper cooking temperatures
- Chill: Refrigerating promptly

Consumer knowledge of these four crucial steps can greatly reduce the incidence of foodborne illness (USDA, 2010).

In 1998, Susan Conley, Director of Food Safety Education and Communications Staff, Food Safety and Inspection Service, USDA, emphasized the importance of effective messaging by providing consumers with actions they can take to reduce their personal risks in regards to foodborne illness. Additionally, when necessary, messages should target specific audiences (Conley, 1998). Further research of risk factors contributing to the high rates of incidence of foodborne illness in young children and minority populations can improve current prevention strategies.

With greater understanding of perceptions related to food handling practices of

Native Americans, who are the primary food handlers of children, educational messages may be more appropriately targeted. As such, this population may be more likely to take action that may result in the decline of foodborne illness.

Significance of Study

National Agenda.

National health agencies including the United States Department of Agriculture (USDA), the Center for Disease Control (CDC) and The United States Department of Health and Human Services (HHS) have recognized food safety as an important public health issue. HHS launched the initiative Healthy People 2020 with the goal of improving health across the country by focusing on specific public health objectives. It recognizes food safety as a priority topic, seeks to improve safety and reduce foodborne illness. Specific objectives that relate to this study are reducing infections caused by key pathogens commonly transmitted through food and increasing the proportion of consumers who follow recognized key food safety practices at home: clean, separate, cook and chill (Healthy People, 2011).

In 1996, as part of the Emerging Infections Program, the CDC launched FoodNet, a population-based active surveillance program for foodborne disease. It is a collaborative program between the CDC, the United States Department of Agriculture's Food Safety and Inspection Service (USDA-FSIS), the Food and Drug Administration (FDA) and 10 state health departments, including New Mexico, which was added in 2004. FoodNet produces information which is used to assess the impact of food safety initiatives, determine the burden of foodborne illness in the United States, monitor trends of specific foodborne illnesses over time, attribute foodborne illness to specific foods and

settings and disseminate information that can lead to improvements in public health practice and intervention development (CDC, 2011b). There was no precise estimate of the burden of foodborne illness prior to the inception FoodNet.

The FDA Food Safety Modernization Act (FSMA) was signed into law on January 4, 2011. A key goal of this act, the first major change to United States food safety laws since 1938, is to reduce the adverse health and economic burden of foodborne illnesses. This requires the CDC to strengthen the capacity of state health departments to respond to foodborne outbreaks and to improve the coordination and integration of surveillance systems (CDC, 2011b).

New Mexico.

New Mexico is the only majority-minority state contributing to FoodNet surveillance system. Due to this unique cultural diversity, inequities in New Mexico are greater than national averages. New Mexico rates of Campylobacteriosis and Salmonellosis exceeded Healthy People 2010 objectives for all populations (8.5/100,000 and 11.4/100,000 between 2004 and 2010). For instance, according to a 2011 report by the New Mexico Emerging Infections Program (NMEIP), national rates of Campylobacteriosis averaged at 12.8/100,000, while the New Mexico average was 17.6/100,000. When compared to national averages, New Mexico also had higher incidence rates of Salmonellosis (15.0 vs. 16.1/100,000) and Shigellosis (5.4 vs. 6.8/100,000).

In a 2011 report (Khanlian, 2010) on foodborne disease trends in New Mexico, when compared to Hispanic and Caucasian populations, Native Americans were disproportionately affected by outbreak cases (10.6% vs. 4.3% & 3.4%) and had the

highest incidence of laboratory confirmed enteric illnesses, specifically Campylobacter, Salmonella and Shigella. This is especially noteworthy, when taking into consideration Native Americans makes up 11% of the New Mexico's population as compared to 43% and 41% for Caucasian and Hispanic populations.

In New Mexico, children less than 5 years of age have the highest cumulative incidence rates of Campylobacter, Salmonella and Shigella (160/100,000) (Khanlian, 2011). When compared to Hispanic (54.4/100,000) and Caucasian populations (40.3/100,000), Native American children also carry an extra burden for foodborne disease (61.3/100,000). Despite these disparities, there has not been further analysis on contributing factors to these inequities.

Results from this study will help to:

- Examine knowledge levels about foodborne illness among Native Americans who are primary food handlers of young children.
- Understand current food handling practices, perceptions and barriers that may be contributing factors to the increased incidence of foodborne illness in Native American populations.
- Determine salient and tailored culturally appropriate educational messages and materials that can contribute to the prevention of foodborne illness

Purpose

While numerous studies have been conducted to determine the food safety attitudes, knowledge and practices of consumers, there has been little segmentation of demographics. The purpose of this study is to gain a more accurate perspective of the current practices, perceptions, barriers and knowledge levels related to food safety and

foodborne illness in Native Americans who are primary food handlers of young children.

Research Questions

1. What are the current practices, perceptions and barriers related to foodborne illness and food safety in Native Americans who are primary food handlers of young children?
2. What is the current knowledge level of foodborne illness and food safety among Native Americans who are primary food handlers of young children?

Definition of terms

Native American. Individuals who have self-identified themselves as a member of any of the indigenous peoples of the Americas.

Foodborne illness. Infectious or toxic diseases resulting from the ingestion of contaminated food and include a broad group of illnesses caused by bacteria, viruses, parasites, chemical agents and toxins, which contaminate food at different points along the “farm to table” continuum (WHO, 2011).

Primary food-handler. Those individuals that make most of the meals for a child under the age of 10, whether it is their own children or those whom they are the primary caregivers.

Delimitations

Participation in this study is delimited to adult participants self-identified as Native American decent, a primary food handler of a child under 10 years old, English speaking and who voluntary consented to participate in the study.

Chapter Two: Review of the Literature

This chapter describes the findings from a review of the scientific literature on those variables and concepts that are key to this study. The burden and surveillance of foodborne illness in the U.S. are reviewed followed by a more specific focus on the populations most at risk. In addition, the rates and impact of foodborne illness in New Mexico are discussed, followed by consumer perceptions of foodborne illness. The theoretical framework used in this study is also described.

Burden and Surveillance

One in six Americans gets sick, hospitalized or dies of foodborne illness every year (CDC, 2011a). Thirty-one known major pathogens and countless unknown pathogens in food cause an estimated 48 million illnesses, 128,000 hospitalizations and 3,000 deaths per year (Scharff, 2011; CDC, 2011c). However, illness caused by food often goes under reported and these figures could be much larger (Scallan, 2011, Mead 1999; Anderson, 2004; Bender 2004; Redmond 2003).

Cases do not get reported due to a multitude of reasons. The most predominant is due to the fact that active surveillance systems capture only laboratory confirmed infections (Hardnett, 2004). For laboratories to confirm a case, several surveillance steps are necessary: the person must visit a physician, a stool specimen must be taken, and the lab must test and report the incident to a public health agency (Figure 1). If a break occurs in this chain, cases will not be confirmed and reported. Often the ill person does not seek medical care so many milder cases of foodborne illness are not detected through routine surveillance. Additionally, many pathogens are transmitted through sources other than food, such as human contact or water, which obscures transmission. Illnesses as a

result of nonfood routes differ for each pathogen and cannot usually be determined for illnesses unrelated to outbreaks (Mead, 1999).

Current surveillance systems, like FoodNet, do not regularly track pathogens such as Norovirus, Clostridium Perfringens, and Toxoplasma because tests to detect them are generally not available in clinical laboratories (CDC, 2010). Likewise, Listeria is rarely diagnosed as the cause of gastroenteritis because it cannot be detected by routine stool culture. Miscarriage associated with Listeriosis may also be under diagnosed (Scallan 2011). Mead (1999) reports hospitalizations and deaths also often go underreported as not all illnesses are diagnosed and surveillance systems rarely collect data on illness outcome.

It is also important to note that some illness caused by pathogens have not yet been identified and therefore cannot be diagnosed. Twenty years ago, Campylobacter, E. coli, and Listeria were not even recognized causes of foodborne illness (Mead, 1999).

Further, Mead (1999) reports that sporadic illnesses are not reportable through active or passive systems and only get reported if they are related to outbreaks. As such, Redmond (2003) reports that over 95% of cases are believed to be sporadic and those cases, in addition to those that originate in the home, are not likely to be identified by public health surveillance systems. If all of these instances got reported, it is estimated the total number would result in 10 times the number of cases (Mead, 1999).

Jones (2004) found outbreaks investigated by local health departments, as opposed to federal agencies, were less likely to have etiology identified. While understanding of the epidemiology of foodborne illness is furthered by outbreak investigations, it is necessary to take into consideration the distinctive epidemiologic

features that are related to illnesses unrelated to outbreaks. If foodborne illness gets reduced by 10% annually, this would keep 5 million Americans from getting sick (CDC, 2010). To measure the burden of foodborne illness and measure improvements in food safety, surveillance is a challenging but critical priority (Scallan, 2007).

For the development and prioritization of food safety interventions, it is imperative to attribute foodborne illness to specific foods and contexts (Scallan, 2007). To determine consumer food safety attitudes, knowledge and practices, numerous surveys have been conducted, however there has been limited population segmentation (Albrecht, 1995; Angelillo, 2000; Brewer, 2002; Bruhn, 1999; Kennedy, 2005; Raab, 1997; Redmond, 2004). Specific populations that have been looked at are college students (Unklesbay, 1998), elderly people (Boone, 2005; Johnson, 1998), pregnant women (Cates, 2004) and low-income adults (Wenrich, 2003).

Children

When segmented by age, foodborne illness unequally affects young children (Buzby, 2001; CDC, 2004; Hafejee, 1995; Pew Health Group, 2009). For example, children under the age of five have a significantly higher incidence than any other age group of *Campylobacter* (24.4/100,000), *Shigella* (16.4/100,000) and *Salmonella* (69.5/100,000) (CDC, 2010). Children under the age of four are three times as likely (28.54/100,000) to contract *Campylobacteriosis* that any other age group under 50 (CDC, 2011b). Similar statistics are found for *E. Coli* (4.24/100,000), *Listeriosis* (.76/100,000), *Salmonellosis* (74.65/100,000) and *Shigellosis* (27.86/100,000) (CDC, 2009; Pew Health Group, 2009). Scallan (2011) shows that by the time children turn 5 years old, three-fourths of them have experienced an episode of clinical Rotovirus. Despite these

statistics, there has been limited research targeting families with young children (Lin, 2004, Food Safety and Inspection Service, 2002; Riggins, 2008; Cody, 2003).

Byrd-Bedrenner (2010), recently studied the knowledge, beliefs and practices of parents or guardians with children older than 10 years old. There have also been studies on the knowledge and awareness of food handlers with children under five years old and on food handling practices of parents with children under 18 (Lin, 2004; Cody, 2003). Though these studies *included* parents of young children, it was not the main focus of the research.

Minority Populations

It has been found that health disparities also exist in rates of foodborne illness within Hispanic and Native American populations when compared to majority populations (CDC, 2004; Lay, 2002; Palmeri, 1998; Patil, 2005; Racz, 2009; Taylor, 2000; Voetsh, 2007). Hispanic populations are at higher risk for contracting Salmonellosis (Voetsh, 2007) and 12 times more likely to contract Listeriosis (Lay, 2002) when compared to Caucasian populations. While studies have been limited regarding the Native American population, Shiferaw (2004) found high rates of Shigellosis and Racz (2009) found that Native American populations are almost three times more likely to contract Campylobacteriosis when compared to other populations

New Mexico

The majority foodborne illness in New Mexico is from Campylobacteriosis, Salmonellosis, and Shigellosis. While New Mexico averages for these illnesses already exceed national averages, it is even more note worthy when looking at rates within the state. The average incidence of Campylobacteriosis in New Mexico is 17.6/100,000.

Native American rates (33.2/100,000) are almost triple that of rates in Hispanic (12.8/100,000) and Caucasian populations (12.2/100,000). Similarly, rates were higher in children under five (61.3/100,000) when compared to the same populations (43.9/100,000 and 25.9/100,000). Native Americans also had substantially higher rates of Salmonellosis in adults (22.4/100,000) and in children (49.9/100,000). Shigellosis rates, already 25% higher than national averages (5.4/100,000) put rates in Native Americans at twice that (11.7/100,000) (Khanlian, 2011).

Consumer perceptions

In a 2002 Benchmark Survey, 70% of respondents from the Home Food Safety survey did not think it was common for people to become ill from food prepared in their homes (Cody 2003). Several other studies (Bruhn, 1999; Kennedy, 2005; Lin, 2004; Raab, 1997; Redmond, 2004) have also found consumer perceptions of food safety are generalized toward specific foods and commercial practices as opposed to behaviors related to food preparation at home.

Consumers consider their kitchens the least likely place to contract a foodborne illness, yet over half of all foodborne infections are contracted in the home (Kennedy, 2005). Individuals are less motivated to change if they misperceive the cause and severity of foodborne illness. They must first believe they are susceptible to foodborne illness to change behaviors related to safe food handling.

Health Belief Model

The theoretical Health Belief Model (HBM) is often used to assess cultural specific behaviors and readiness to change (Rosenstock, 1988; Janz and Becker, 1984).

The HBM aids in planning strategies to provoke behavior change by examining an

individual's perception of susceptibility and severity of a health problem, the benefits and barriers of the threat, their self-efficacy and factors which influence their decision to act (National Cancer Institute, 2005). Two prior studies have shown that the HBM can help predict adult's attitudes and behaviors related to food safety and suggest determining factors related to actions regarding food safety (Shafer, 1993; Hanson, 2002). As such, Hanson (2002) calls for further research looking at casual relationships between HBM variables and behaviors related to safe food handling.

Education

Currently, there are three major national educational initiatives being implemented regarding food safety. These include the Thermy, developed by the USDA and FDA, the USDA Be Food Safe campaign and most notably the USDA FightBAC campaign. The FightBAC campaign was developed based on the four basic food safety concepts of clean, cook, chill and separate. Kennedy (2005) found a positive correlation between food safety knowledge and safe food handling practices. However, a majority these campaigns have been developed for general education and offer very little audience segmentation to educate specific minority population such as Native Americans.

Conclusion

Patil (2005) and Racz (2009) have suggested behaviors relating to cultural food practices may be a predisposing factor that increases the likelihood of contracting foodborne illness. Despite these findings, there is limited research on the correlation between foodborne illness and cultural food practices. Food safety knowledge and practices of Native American families must be better understood so that community interventions and educational campaigns can be better targeted toward this population.

Greater cultural sensitivity and application may improve food safety knowledge and incidence of foodborne illness may decline in Native Americans populations.

Chapter Three: Methods

The purpose of this chapter is to provide a description of the methods used in this study. The sampling procedures, data collection methods and data analysis will be discussed. Approval for this study was received by The University of New Mexico's Institutional Review Board on July 1, 2011 (IRB # 11-219).

Study Design

The integration of qualitative and quantitative data was used in this study. Qualitative research, a systematic and rigorous form of inquiry, uses mainly inductive methods to examine context and meaning of lived experiences and the range of their effects (Pasick, 2009). Quantitative research is a mode of inquiry (mainly deductive) that is used when the goal is to test theories or hypotheses, gather descriptive information, or examine relationships among variables (Creswell, 2008).

This study used both qualitative and quantitative research methods to maximize the strengths and minimize the weaknesses of both research designs. The methods of data collection included key informant interviews, focus group discussions and a food safety knowledge survey. The remaining discussion is organized around the key informant interviews and focus group discussions.

Sample and Recruitment

Key Informants.

A key informant interview is typically a semi-structured conversation with people who have specialized knowledge about the topic under investigation and/or insight into the population, culture or research setting (Creswell, 2008). Key informants were sought out in the preliminary phase of this study to enhance the cultural competency of the

researcher and to gain insight from those individuals who conduct research with the population of interest. A pool of potential key informants were identified by merit of their professional or research affiliation with the target group, Native Americans. Several key informants were recruited using a snowball technique, recommended by other informants to the study. The following individuals served as key informants. Summaries of these interviews are discussed in the results section.

1. Sarah Lathrop – Primary Investigator with New Mexico Emerging Infections Program and head of the New Mexico portion of FoodNet.
2. Dr. Tassy Parker – Seneca; Director of the UNM HSC Center for Native American Health
3. Dr. Johnny Lewis - Director, Community Environmental Health Program doing research on Health Impacts of Uranium Mining in the Navajo Nation
4. Lucinda Cowboy – Navajo; Native American Community Outreach Specialist with the New Mexico Health Disparities Center
5. Miranda Cajero – Jemez; Research Specialist with Community Environmental Health Program
6. Dr. Emily Haozous – Comanche; Assistant Professor, UNM College of Nursing; doing research on culture and cancer in Native Communities
7. Michelle Suina – Cochiti; Program Specialist: CRTC Cancer Prevention and Control
8. Carla Sakiestwea – Hopi; Program Manager: CRTC Research Program Support and former Co-Chair at United Native Council

9. Shannon Fleg – Navajo; Health Education graduate and Coordinator for the Native Health initiative

Procedures. Key informants were contacted by either telephone or e-mail to schedule interviews. Interviews were face-to-face and took place at a location most convenient for them, which in most cases was their place of employment. Interviews lasted approximately 45 minutes. Key informants were asked about cultural appropriateness related to the study and gave suggestions and comments on best practices related to working with Native American populations in New Mexico. They were shown study materials and asked to comment on anything that might appear offensive or confusing.

Focus Groups

The criteria for eligibility to participate in the focus group discussions included 1) being of Native American decent; 2) being a primary food handler for any child(ren) under 10 years old 4) being English speaking and 5) agreement to be audio-taped.

Participants were recruited using recruiting flyers (Appendix A) posted around Albuquerque and surrounding areas including Indian Health Services, The Indian Center, First Nations Community Health Source, The Indian Pueblo Cultural Center, The Native American Studies Department at The University of New Mexico and The National Indian Youth Council. Flyers were also hung at local businesses in Albuquerque, Santa Fe and Gallup. An advertisement asking for potential participants was also posted on the Internet at www.craigslist.com.

Interested individuals were asked to call the phone number on the flyer or e-mail the researchers to be interviewed and determine eligibility. A preliminary screening was conducted by phone or e-mail to determine if the person was eligible for participation. If

they did not qualify, they were told immediately in the telephone interview or by e-mail. After determining eligibility, participants were assigned to a focus group and then notified by e-mail of the date, time and location.

Procedures

Focus group sessions. Six focus groups, including the pilot were conducted, resulting in 31 participants. The estimated time for each focus group ranged from 60 to 90 minutes. Focus groups were conducted in a private room in Johnson Center at the University of New Mexico. A Native American facilitator was used in 4 of the 6 focus groups.

Confidentiality procedures and the option and freedom to leave the discussion at any time, for any reason, were clearly communicated to all participants. Before the focus group discussion began all participants were given adequate time to review and sign two copies of an informed consent (Appendix B), and had the opportunity to have all their questions answered prior to participation. Participants were given the option to keep one copy of the form and turned the other signed copy in to the facilitator. At no point were the participants or their consent forms linked to the data.

Following the informed consent and after all study questions from participants were answered, participants were asked to complete a food safety knowledge survey (Appendix C) that included demographic items (Appendix D). So as to not impact the thoughts and opinions of the other participants, everyone was asked to hold their questions related to food safety until the end of the discussion. Participants were asked not to share the discussion or names with anyone outside the group. Focus group discussions were audio-recorded into an Apple MacBook Pro laptop using a Yeti

Microphone and the recording program GarageBand. Following the focus group participants were given a \$25 Wal-Mart gift card for their willingness to participate.

Measures

Demographic form. Participants completed a demographic form before focus groups began. Results of the demographic form were used to describe the make-up of focus group participants. Items on the demographic form included 12 questions encompassing gender, ethnicity, city of birth, level of education, food industry experience, employment status, number and ages of children of whom they provided meals for and preference for educational methods. Choice of demographic questions resulted in a limitation: by asking ‘city of birth’ instead of ‘city of residence’, it is not possible to describe where participants were specifically, coming from regionally.

Food safety knowledge survey. To ascertain the current food safety knowledge levels of participants, a knowledge survey was distributed to each participant before the focus group discussion began. The knowledge survey was validated for reliability and cultural appropriateness in a previous study (UNM IRB # 11-386). Items on the 32-question knowledge survey were derived from various validated surveys published in the literature and are based on the food safety messages in the FightBac™ and Be Food Safe™ (USDA) campaigns. Questions are organized into 4 concepts (chill, separate, clean and cook) from the FightBac™ campaign and 2 additional categories of food safety; groups at greatest risk of foodborne illness and foods that increase risk of foodborne illness. (FDA 2009; Haapala, 2004; Medeiros 2004; Unklesbay 1998; Weinrich, 2003; Meysenburg, 2009).

Data from the Food Safety Knowledge Survey and the demographic form was

first entered to Microsoft Excel and then merged into the program Statistical Package for Social Sciences V14 (SPSS) to obtain descriptive statistics.

Focus Group Script. The focus group script (Appendix E) was developed using the main constructs of the Health Belief Model (Rosenstock, 1988; Janz and Becker, 1984) to generate questions. Focus group interview questions were created to gain a deeper understanding of perceived barriers and benefits to food safety, perceived severity of risk and susceptibility to contracting a foodborne illness, cues to action that would prompt behavior initiation or personal action and perceived efficacy. The published literature was used to structure focus group discussion questions related to knowledge and current food handling practices. Lastly, participants were asked about their preferred method of receiving food safety information and their opinions about credible educational resources.

Prior to the study, the focus group script was evaluated for face validity by members of the UNM research team and food safety experts at the University of Lincoln-Nebraska (UNL). Local key informants, of whom were Native American, were interviewed to discuss their reactions and perceptions about the cultural sensitivity related to the script. They were asked questions about wording, language and content. Additionally, informants were invited to make comments or suggestions regarding the focus group script or the study as a whole.

Data Analysis

Key informant interviews. Hand-written notes were taken during earlier interviews and while subsequent interviews were audio-taped and transcribed into Microsoft Word. Data was analyzed using the first two steps of the Krueger (2009)

method as described in the next section.

Focus groups. The focus group discussions were transcribed into Microsoft Word and data was analyzed using the Krueger Method (2009). These steps include:

1. Transcribe the focus groups verbatim from audio tapes
2. Read and code – The data was coded into meaningful categories using two phases: initial coding, which generated several category codes and focused coding, which eliminated, combined, redefined or subdivided coding categories.
3. Data presentation and interpretation – The data was thematically analyzed for pattern recognition, recurring irregularities and convergence. To ‘ground’ the interpretive analysis in actual data collected, data was descriptively presented by charting themes and supportive data segments. Data interpretation requires an analysis of what the data is saying and what the data means relative to the research questions.
4. Consensual validation – To establish validity of the results, both the researcher and Dr. Christina Perry independently reviewed the focus group transcripts to identify codes and themes.

The following questions were considered when coding and analyzing the data

(Berkowitz, 1997):

- What common themes emerged in responses about specific topics?
- How did these patterns (or lack thereof) help to illuminate the broader central question(s) or hypotheses?
- Were there deviations from these patterns? If so, were there any factors that might explain these deviations?

- How are participants' environments or past experiences related to their behavior and attitudes?
- What interesting stories emerged from the responses? How did they help illuminate the central question(s) or hypotheses?
- Did any of these patterns suggest that additional data may be needed? Did any of the central questions or hypotheses need to be revised?
- Were the patterns that emerged similar to the findings of other studies on the same topic? If not, what might explain these discrepancies?

Separately, codes were created, compared and verified by two researchers for consensual validation. The coding scheme (Appendix F) is based on the HBM constructs and other topics that emerged in the focus groups. Axial coding created major themes.

After creating codes, data was transferred into NVIVO 9 qualitative data software system (www.qsrinternational.com) for organization. The program Statistical Package for Social Sciences V14 (SPSS) was used for analysis of quantitative data derived from the demographic form and Food Safety Knowledge survey. These instruments were analyzed using descriptive statistics.

Risks, Privacy and Confidentiality

The risks in this study were not considered to be any greater than those experienced in everyday life. The data and privacy of participants was protected by using no identifiable data and pseudonyms were used in the analysis and reporting of data.

Groups were identified by focus group number, date and interview site (i.e.

FG1_1.15.12_Johnson Center) This method prevents tracking an individual's comments

to their identities. Additionally, participants were free to withdraw from the study for any reason, at any time, and without consequence.

Note. Participants in the pilot were not asked to fill out knowledge surveys because they had previously filled them out in the survey pilot. These three individuals, while included in data analysis of the focus groups, were not included in the analysis of knowledge scores and demographics, except for gender. One individual in the pilot was a Caucasian female, however, she was married to a Native American male who also took part in the pilot study.

Chapter 4: Findings

“I think food plays a big role in how we keep ourselves safe, but also how we expose ourselves.”

-Focus group participant

The purpose of this chapter is to report the findings from the key informant interviews and focus group discussions that were conducted to investigate the research questions of interest.

Note: Quotes from participants are presented in italics. When there are a series of quotes, participants are differentiated by the following coding structure: P1, P2, P3.

Key Informant Interviews

Nine key informants agreed to participate in a face-to-face interview to discuss cultural sensitivity issues and data collection methods of the study. Seven of the informants were Native American adults, all were female, and all were involved in research of Native American populations.

Informants shared about the meaning of “cyclical migration” factors in Native communities and that many individuals frequently move back and forth between the city and the reservation. Because of this, many off-reservation Native Americans have different food beliefs and practices when compared to those living on reservation. As one key informant explained, *“I think if you are targeting those that live in the city, they may not be as traditional or they may not be as entwined in their culture. Whereas if they live in the reservation, this person might be different.”*

Access to water sources is another issue that was mentioned by a key informant.

This particular issue is more salient to on-reservation populations but still must be

considered as a risk factor to foodborne illnesses. Over 30% of the Navajo Nation lacks access to regulated water and 73% hauls water even if they do have regulated water in their homes. This creates risk for a number of reasons:

1. Hands, dishes and utensils are getting washed in the same bin of water that increases the risk of cross contamination.
2. Uranium leeches into nearby water sources and is known to suppress the immune system.

When discussing the focus group script, the following concepts emerged:

Cultural Concepts.

Foods in Native culture. It is imperative to understand the meaning of food in Native cultures. When asked about giving any insight that might be important as focus groups were being conducted one informant stated that *“Food is pretty immense in Native Communities because food is considered....it’s almost spiritual. And then it’s a lot of respect for the people who prepare it. That is why you don’t refuse anything...that cycle of that nutrition, and that ceremony and all those prayers go through you as a human being and that is very significant. The food is very significant to you as a people and it is part of giving. Giving food is considered more respectful than anything.”*

Sick. Informants cautioned against using the word “sick,” which can hold several meanings depending on the context. Making sure participants are aware of what you mean when using this word, is of particular importance as explained by one key informant: *“Sick might mean a cold, or sick might mean something greater than what they actually have...and actually, sick can mean alcoholism.”* Another cultural belief mentioned was the importance to talk about illness in certain ways as explained by the

following: *“They don’t want to talk about illness. Just saying it might make you sick. You are allowing it to enter you.”*

Food causing harm. We were forewarned by a few of the key informants that associating sickness with food is disrespectful. Using the term “food-safety” might resonate more than “foodborne illness”, as the later associates sickness with food and *“There are some people who many have a problem associating any sickness directly with the food.”*

Several informants cautioned against asking a question about steps to take from getting sick from food in the home. Informants shared the following:

P1: *“It implies that you don’t want them to want your food...Well, if I were to read this, then I wouldn’t eat the food, and that causes another repercussion...It’s going to be kinda funny to associate sickness with the food because it is disrespectful to associate that with anybody else’s food. You know, because it is disrespectful to not eat at somebody’s table”*

P2: *“It is not our intention to make others sick, it might mean that and whoever you are asking questions to, it might offend them.”*

It was also mentioned that using statements such as “Tell me about ...” may be more effective than “What steps can you take from getting sick?” Informants explained that this particular question could imply that you are not already taking those steps to keep your family safe and this could appear rude.

Language.

Traditional. The first question on the focus group script asks about traditional foods. It was suggested by several informants that a differentiation may need to be

made. Those that are more engrained into their culture, as well as those that identify as living on or off reservation have different food practices and beliefs surrounding food as explained by two informants:

P1: "Some individuals may not view traditional meals that way because they have to go back for these types of meals."

P2: "Traditional can mean a family tradition, no matter what culture you are from. But if you ask the Native community, to me traditional means its more ceremonial, more sacred. It's more meaning."

Off-Reservation vs. "Urban." An informant mentioned that the word 'urban' can sometimes be viewed as derogatory by Native peoples, meaning an individual is detached from their culture and is ignoring impacts which forced people into urban areas. Mostly, it depends on whom you are talking to and what their personal beliefs are. Use of the word 'off-reservation' is more neutral and more widely accepted. As one informant explains, *"Well if you are just doing research here in New Mexico, you can say 'off-reservation.' I don't think many people will find it offensive if you said 'urban' but I really think it depends on the person, where they have grown up and affiliated."*

Approaches.

Story Telling. Some individuals may prefer to tell their story as opposed to answering direct questions. This method also helps with shy individuals as *"people are more open, especially natives, if you make yourself more accessible. When we introduce each other and are going to have a kind of more in depth conversation about something. I'll say, my name is... I work for so and so – and you may not be tribal or native but tell them your background."*

The same informant continues, *“I think what you need to find out is, that you need to have them tell their story rather than direct questions. Because one thing about a lot of native people is that they will love to tell you their story.”*

These comments are supported by a second informant stating, *“You can include yourself, it may make it more meaningful – the facilitator might share a story about a traditional meal in their family.”*

Overall, informants thought favorably toward the study and did not think food safety would be an offensive subject. Only minor comments were made concerning the use of language and things to be aware of while conducting focus groups and reporting results. They were thankful for researchers to be seeking cultural insight on the study

Focus Group Discussions

Sample.

Thirty-one Native American adults who met the eligibility criteria for the study agreed to participate in one of six focus group discussions. Participants were mostly female (n=19) with a mean age of 32 (SD=9.35) ranging from 20 to 62 years of age (see Table 1). Most participants (n=22) were native to New Mexico and all but one participant, who did not complete the demographic question, self-identified as Native American. Twelve participants self-identified as Navajo/Dine. Others represented local and statewide pueblos including Sioux, Osage-Irish, Deona, Laguna-Acoma, Crow, San Felipe, and Zuni.

Participants prepared food for an average of 2 children, ranging from 1 to 5 children. The mean age of children was 8.5 years old, ranging from <1 to 22 years of age.

Three participants, while still main food handlers for children, did not list any children under 10 years old, though they were previously screened as such.

About half of participants (N=15) had some college education, four were college grads and 7 had graduated from high school or obtained a GED. A majority (N=20) of participants said they had experience in a food or nutrition related job and 16 said they had education or training in food safety.

Most participants (N=15) were unemployed, 3 were employed full-time and 9 were employed part-time. Focus group characteristics are outlined in Table 1.

Table 1.
Focus group participant demographics and characteristics

Characteristics	N	%
Gender		
Male	8	28.6
Female	19	67.9
Education		
Some High School	1	3.6
Diploma/GED	7	25.0
Some College	15	53.6
College Graduate	4	14.3
Employment		
Unemployed	15	53.6
Part-Time	9	32.1
Full-Time	3	10.7
Food/Nutrition Experience		
Had a Food/Nutrition job	20	71.4
Had education in food safety	16	57.1

Food Safety Knowledge Survey

The Food Safety Knowledge survey was organized into four main food safety concepts: cook, chill, clean and separate (CDC, 2011d); and two additional categories: foods that increase risk of foodborne disease and groups most at risk for foodborne disease. The overall mean was $.6779 \pm .113$ with a range of .46-.91. The scores for each of the survey constructs are shown in Table 2.

Table 2.

Summary of scores from knowledge Survey (n=28)

Construct	Mean	Range
Chill	$.632 \pm .175$.27-.89
Separate	$.6915 \pm .267$.14-1.00
Clean	$.679 \pm .113$.36-.90
Cook	$.611 \pm .221$.28-.96
Vulnerable Populations	$.6644 \pm .142$.33-.94
Food that increase risk	$.796 \pm .141$.43-.97
Total Score	$.6779 \pm .113$.46-.91

Focus Group Themes

The participant responses were grouped into categories based on content. The themes that emerged are discussed. The vernacular and syntax of focus group participants are used throughout each theme.

Theme: General Awareness of Foodborne Illness.

Meaning of getting sick from food. It was common across all focus groups to refer to getting sick from food as “food poisoning.” Other words that came up were Salmonella, E.coli and mad cow disease. Participants believe getting sick from food is

contingent on a number of factors like poor hygiene, preparation and storage practices. One participant describes what comes to mind when she thinks of food poisoning:

“What flashes in my mind is all these pictures. And I see like, all the flies flying around on all the food. Even indoors, in a restaurant or something they show very graphic stuff. And then I think of turkeys being left out too long. Or someone had chicken on the counter or they didn’t clean the counter well. That’s the image I project when I think of food poisoning. And then I think about the individual...they are coming in, they’re sick, they’ve got diarrhea, they are running a temp. You know, they are just pale, lethargic, all those things together.”

When asked about symptoms related to food poisoning participants mentioned upset stomach, diarrhea, vomiting, being nauseous, getting dehydrated, “flu-like” symptoms and a feverish feeling. Participants identify food as a cause of sickness when it happens right after eating, or when they did not eat anything else all day as explained by this participant: *“But I remember quickly and instantly after eating the food, like within a 24 hour period, having to throw up and just having like a feverish feeling. And I was like, OK, this is food poisoning.”*

However some believe, at times, there is a confusion surrounding symptoms, as explained here: *“But I think some people don’t even realize, as you said, the differentiation between getting a cold and something that they have eaten, or they think even that its something that they drank. Or they don’t even make the connection sometimes that they have had something bad running through their system.”*

Theme: Perceived causes to food poisoning

Food Types. When asked about foods that can cause ‘food poisoning’ participants

mentioned chicken, eggs, raw eggs, Salads, cheese, milk, lunch and deli meat, hotdogs, unpasteurized juices, pork or beef and canned foods. They also mention foods that receive attention through media reporting major outbreaks, such as cantaloupe, spinach and peanut butter as illustrated in this comment from a participant: *“I cook for my kids too, so I make sure it is well done or cooked good. But of course there is some food that comes from the market that’s got some E.Coli or Salmonella that you never know about it. Like recently I think it was the tomatoes or something like that where... I guess from something that we don’t know about you get sick from.”*

However, while participants do recognize food types as causes to food poisoning they focused more on preparation and what happens to food before it gets to the table as this participant clearly points out: *“It’s just a combination of everything from growing that or culturing that on a farm or dairy to literally coming to the table. There is just so many aspects food goes through before it actually touches your mouth.”*

Another participant continues, *“I think maybe getting sick from food is like that. It would have been a number of factors like the hygiene of the person preparing it and stuff. A foodborne illness is probably something that was already in the food before it was prepared or something. Like Mad Cow disease or something and like its already there and regardless of how it is prepared and handled afterwards.”*

Theme: Perceived Susceptibility

Susceptible Populations. Participants identified several different populations they see as susceptible to food poisoning including: the elderly, pregnant woman, diabetics, cancer patients, children and those with compromised immune systems. Transient and homeless populations were also mentioned due to hygiene and hoarding food.

Some participants do see young children as more susceptible as shown by this young mother's comment: *"I think it would have been a lot worse for my son because he wasn't even two yet. Probably would have been a lot worse than it was for me, because he is younger"*

This is supported by another mom who works as a cook in a daycare facility as she comments on being more aware of her actions when cooking for children. *"Yeah definitely, like he was saying that the immunity in the child from one year old to five, you know, that's something scary to work with."*

However, some participants believe that children are less susceptible than adults, as described here: *"I think genetics plays a role in that too. And the younger you are and the stronger your immune system is, the easier it is to fight things off...I think kids have a lot of resilience to things, cause I mean, look how many times they pick things off the floor and put it in their mouth. So I think they have a built in resilient immunity to a point."*

Immunity and allergies. Many participants believe individuals have different defenses to getting sick. Over and over, they mention "immunity" and "genetics" not only as factors of increased susceptibility but also as protective factors as illustrated by the following:

P1: *"I think he is right though, some people do have less tolerance for eating goods that are older or whatever. Cause me and my dad can eat older foods and some people get really sick."*

P2: *"I don't think its leftovers you have to worry about. I think it depends on the person's body I guess. I don't know... I think tolerance is a big part."*

Participants also mention allergies when talking about causes of getting sick from food as this dad states: *“I think it varies with anybody. A person’s immune system, their allergies. I wouldn’t pinpoint it to just one thing because, you know, people are allergic to nuts or wheat or flout, or whatever it is in that, eggs. I wouldn’t pinpoint it to just one thing. It would probably have to be something within those foods, that makes their body react.”*

Theme: Eating outside the home

Eating outside the home, in restaurants or at public events, regularly creates a sense of susceptibility, as stated by this mom: *“I think every meal that you eat, that you don’t prepare yourself is a risk of getting food borne illness.*

”This lack of control is the most resonant concern of participants, simply stated by this dad: *“Right. It is more controlled. You know, you would know what you were doing at home, whereas, in a restaurant, it is out of control. Out of your control.”*

This concept is supported by other participants who all similarly said the following types of comments:

P1: *“People who eat out, they are not really seeing out it is prepared. The person who is handling it, did they wash their hands at all or check the temperature or have produced it and washed it appropriately.... (they have less control) they are just waiting for their food. There is a disconnect between the person and their meal.”*

P2: *“I always order mine (steak) well done. If I cook it myself I will do it medium rare but if it is at a restaurant I always tell them to cook it all the way through, that is just the way I like mine...I don’t really trust the restaurant when they cook it. Yeah, (I prefer to have) more control.”*

Theme: Food safety practices and self-efficacy

Cook. Overall participants seem aware of safe food handling practices, however, most participants indicated that they do not use a thermometer to determine ‘doneness.’ Most used subjective ideas of ‘doneness’ as illustrated by the following quote:

“The cooking part of it I mean I didn’t know how long and we don’t have thermometers around and I mean it’s probably something that needs to be done around the kitchen. I know it won’t be in my kitchen. You know to take the temperature, but we just cooked the meat until we think it’s done.”

‘Doneness’ is checked by cooking until there is “no red.” This was consistent throughout all focus groups. *“I see if the redness comes out then I know it’s not cooked.”* Later confirmed from another participant, *“Yeah, see the color inside. Make sure there is no red whatsoever.”*

The most notable practice that could increase risk of foodborne illness is the handling of soups and stews. Some refrigerate and cool down everything “right away.” Though, some participants also mentioned leaving soup on the stove to eat or store later. *“The one thing that I need to do is start putting my food away right cause a lot of times I’ll just like, you know, if I make a pot of soup or a pot of noodles or whatever, I’ll just let them cool down and then throw them in the fridge. I don’t put them away and then when it’s time to eat later, I’ll just heat them back up.”*

These two practices within the cook concept, thermometer use and storing food, are items on the Food Safety Knowledge survey. The cook concept scores overall were the lowest when compared to all other concepts tested.

Clean. Participants seem to have awareness about proper cleaning practices such

as hand washing, cleaning surfaces and utensils. The concept of clean focused around hand washing and “*being sanitary*” throughout process of cooking. ‘Continuously cleaning after each step’ and keeping the kitchen clean were commonly mentioned practices. “*Like if I cut meat on the cutting board you know, just making sure I wash it, taking it to the sink and wash it, wash the area around you know.*”

In addition to cleaning cooking tools and kitchen counters, participants also mentioned the need to rinse all food and vegetables before consuming them. To clean counters and tables, one participant mentioned using bleach, while others are just using wet rags. Although, they frequently said everything needed to be “*sanitized.*”

Separate. The concept of separate was the highest scoring of the four food safety constructs. Self reported practices of participants reflect the same concepts tested on the knowledge survey.

A majority of participants are aware of the necessity of separation of raw meats from other foods, mentioning not only putting them on the bottom shelf of the refrigerator. They also say they place meat from the store in a plastic bag to avoid cross-contamination with other groceries. When it comes to food preparation, participants mention washing knives and cutting boards in between uses and after handling meat products.

Chill. Chill was the most talked about concept regarding food safety practices and there seems to be a bit of confusion around how many days food can be stored in the refrigerator or freezer. Participants indicated that they do not date their own foods because “*it’s just inconvenient*”, but mentioned that it would be a useful practice. “*I don’t write any dates and times on, dates when it should be thrown out but just kind of*

going through the refrigerator, what to be thrown out right away. After two or three days, just throw it out.'

One participant shared that a relative makes it a common practice to date food since he is susceptible to illness and this created awareness in the participant:

"My older brother, he goes off and he writes the date that he bought it and he is really picky about his food. But I think that he is on dialysis that is why. But he pays really close attention to that all the time. He is always telling us to be careful when you store food, store it right away when you get back from the grocery store from shopping, store it right away."

One to four days were mentioned as time periods for how long food can sit in the refrigerator before having to throw it away, as well as the use of printed expiration dates. However, participants mentioned that the most common practices they use to determine if a food was okay to eat was by 'smell,' 'look' and 'taste.'

It is a common among participants to freeze meats instead of putting them in the refrigerator because it increases shelf life. However, most mentioned transitioning into buying less food and only cooking enough for the day or meal as illustrated by the following quotes:

P1: *"I shop 2-3 times a week even though I don't like to. I just like to know what I am going to use and to have things fresh and I read somewhere that you spend less money rather than shopping in bulk."*

P2: *"And so I think that helps us not have any leftovers and keep ourselves out of the refrigerator all the time. We got bad where we used to have stuff in there and it had mold on it."*

When discussing defrosting methods, a few participants mentioned putting meat in a bowl of water in the sink as discussed by this dad: *“I put the them (chicken) in a bowl in the plastic bag and let them defrost in the sink, and I don’t know if that’s the safest thing to do with it but that’s how I defrosted it...I didn’t get sick. (laughs).”*

Theme: Barriers

Dating food. Participants stated that they did not have a habit of dating their food when placing it into the refrigerator. As time goes by, things get pushed around and one day a dish comes to the front and it’s questionable as to the timeframe it has been sitting in there. In multiple person households this becomes more of an issue, people are unaware of who is putting what into the refrigerator and when, as explained by two focus group participants:

P1: *“I would rate myself like a seven (in storing food) because I am not the only one who goes through the fridge and touches the food through the whole day. There is a lot of people living with us, so.”*

P2: *“I feel that way too. Because we used to have like ten people living at my house and now there is only five of us. But still, I don’t know who touches the food, who eats the food. And there is more people besides me, and I am not the only one who touches the food so I am not really 100% confident, you know?”*

Children. Parents in several focus groups discuss how babies, toddlers and young children become their own barriers in several ways.

First, children do not have the capability to communicate that it is food that is making them sick, nor do they do not have the capacity to voice or to understand this connection. This concern is expressed by a young mom: *“I think of how they don’t know*

what to say but at the same time there is no way for them to express that it's the food...the knowledge is not there to say 'oh its food poisoning.' Or this has caused me to get sick.' They just say 'oh I am not feeling good' This comment is supported by another mom, "When they are little and they can't really explain to you what they are feeling."

Secondly, as children grow up, they being to be able to access counter tops and open the refrigerator. While parents are self-efficacious in storing their food, this issue creates a barrier to keeping kids safe from food as these parents comment:

P1. *"....my toddler just realized how to open the fridge. And now he takes stuff out....and I come home and there is Tupperware containers and there is stuff laying out."*

P2: *"I am confident when we store it but then when he gets to it, sometimes he ruins it. I am not confident it will stay there and be safe."*

Caregivers are aware of these barriers and become motivated to take on several behaviors to try and keep their children safe. One of these is modifying their own practices, as stated by this dad: *"Before, I was being a single man, I used to have people at the house. Hey, how old is that pizza? That's a day old. Ok I'm going to eat it...but with my kids, hey can we eat the food? No, don't touch anything, just stay by the door we are going to be leaving soon."*

The other behavior parents mention is modeling, which they do so *"you can feel confident that you can teach your children that they are prepared to you know. That you can prepare them to cook for themselves without getting themselves sick."*

This is supported by another mom, stating, *"I don't know about if there is a difference (in susceptibility) in the kids...it's just kids are prone to be sick no matter what, but adults you know, it's just not fair to compare ourselves. But if we take care of*

the kids and teach them...if you wash their hands, they wash their hands too because they mimic everything you do, so it's just a matter of how we take care of ourselves that the kids will take care of their selves."

When asked about their own self-confidence concerning food preparation, storage and buying food, participants were very sure of their skills in these areas. Reasons for this confidence and why individuals feel safe eating in their own home is explained by two participants, whose ideas reflect those of other participants:

P1: *"Well I have never gotten sick from my own cooking and my family hasn't."*

P2: *"Being the preparer.. Knowing where it comes from I guess from start to finish. I am the one who took it from the grocery store, I am the one who bagged it and just having just the accessibility to it and being the one who takes care of every step"*

Theme: Preferred educational methods and topics

Preferred methods. When participants were asked how they would want to receive educational information about food and nutrition the most preferred method mentioned was educational classes with supplemental materials such as brochures (see Table 3). Some had previously taken workshops at the WIC office, child development classes or attended health fairs. This is supported by several comments:

P1: *"They had like health fairs with my tribe back home and they would tell us like wash your vegetables off, put a thermometer in your meat and when you buy meat at the store put it in a sack instead of just putting it in your groceries and don't put your raw food above your other food, on the bottom, right? That where I learned that from because other than that, I didn't know that."*

P2: *“And it was really cool to see her kind of like doing thins in front of us and she would hand out pamphlets while doing hands on education. It was really cool. It was really interesting with a combination of both because seeing it and then getting the information on paper and getting to review it later was really helpful. I really liked that class. I still have the packet and that was last year I went to it. I still like to go over it sometimes.”*

P3: *“I prefer to talk to someone about what they are telling me because I don’t like having all this information and just...I like to be able to ask “why” or whatever.”*

A dad in the group shared, *“I notice like on the reservation where they’re doing a lot more workshops types or, you know, trying to get the community involved. I think that helps too, you know, community involvement. Where you know, you just don’t feel like you’re just one person going to some workshop.”*

Other methods mentioned, were simple notes such as magnets on the refrigerator, *“Something that is going to be in your kitchen that you see.”* Many of the younger participants mentioned the use of technology, such as e-mail newsletters, podcasts, short videos and phone apps.

Secondary methods would be pamphlets and posters in doctor’s offices, *‘just stuff while you are sitting there waiting.’* This is supported by a dad, who said, *“Yeah. If you’re sitting in the doctor’s office, I notice I read the posters a lot more. Especially if you are waiting, that is the only time I ever like, read them, what’s on the wall.”*

A summary of participant’s preferred methods to receive health information is outlined in Table 3.

Table 3.

Participants' preferred methods to receive health information

Preferred way to get information	N
Print (mail, brochures, posters)	18
Media (TV, radio)	8
Electronic (e-mail, internet, texts, blogs)	14
People (family/community member, doctor)	18
Education (classes, workshops)	18

Preferred topics. While participants mentioned most food safety issues as possible educational topics, what they specifically are looking for, as explained by one participant is information that *“pertain to you family at the time. The certain person you raise or you watch or you live with or whatever it might be. I think it would have to be specific to your needs as well.”*

Participants agreed across the board that if they saw something that would affect their kids versus themselves they would be more likely to read it, but prefer *“simple bulleted points and facts, not a lot of information.”*

Most also mentioned *“Anything that is self seeking, not something that is thrown at you but you have the opportunity to look at. It's not something that is shoved in your face.”*

And while participants do prefer workshops, they are cautious of the educator and anything that comes via word of mouth as voiced by this participant, *“Yeah, word of mouth. From people who are not in the know, or who are assuming that things can be done a certain way. And I'm, you know, 'lets go find out how it's supposed to be done.’*

You have to be careful about who is giving you the information, who the educator is so to speak.”

Overall, while focus group participants mentioned preferences on educational topics and methods, they were interested in learning about food safety topics in all capacities.

Chapter Five: Discussion

The purpose of this chapter is to discuss the findings, how they relate to the literature and the new insights they provide. A discussion on how the results answer the proposed research questions is also presented.

Introduction

Epidemiologic studies and surveillance systems show the disparities that exist when comparing rates of food borne illness in Native American populations to majority populations. This becomes particularly evident when looking at incidence rates from within New Mexico. However, to date, there have been no extensive qualitative studies looking to why these disparities may exist. Findings from this study do not suggest any glaring cultural differences in perceptions surrounding food safety, but this is perhaps because it has examined an off-reservation population. Some participant comments have suggested a social factor related to culture that might be a barrier to awareness.

The aim of this study was not only to explore at perceptions, barriers, and knowledge surrounding foodborne illness and food safety but also to understand how these beliefs might contribute to the development of effective educational strategies. The health belief model, used in this study, suggests a relationship between perception and healthful behaviors. This study finds that the concept of perception is formed by the interaction of internal and external factors that change depending on context in which they are experienced. This interaction may have implications for communication strategies.

Hillers (2004) found educational efforts that are aimed at high-risk populations, should emphasize on specific behaviors for target audiences. There is a need to know which behaviors and perceptions are most likely to result in illness. This study begins to get at the root of perceptions surrounding food safety in focus group participants.

Awareness

Public outbreaks of foodborne illness, which receive media attention, seem to be a key factors in creating awareness surrounding foodborne illness. This concept is supported by Redmond (2003), who finds improved public awareness about consequences of unsafe food is associated with safety issues revealed through the media. When asked ‘What does it mean to be sick from food?’ participants in this study frequently mentioned illness related to outbreaks such as E.coli and Salmonella. When prompted about what food cause illness, participants mention those that have received recent media attention as mentioned by these participants:

P1: *“...But of course there is some food that comes from the market that’s got some E.coli or salmonella that you never know about, Like recently, I think it was that tomatoes or something like that where...I guess something that we don’t know about you get sick from.”*

P2: *“Oh yeah I remember that. Tomatoes were infected with, wasn’t it E.coli or something like that? Well you hear it on the media, you can know how people who have gotten sick from it.”*

P3: *You know I would say too also like the things from the media like you hear you know. Like the cantaloupe thing and the peanut butter thing and there was, yeah like you hear these things and get like worried from stuff that’s going on. People do they have these*

outbreaks, so it's scary so you're like more aware of what you are doing and you know how you're handling your eating and stuff."

P4: *Yeah people are dying from that stiff and it's like crazy so, it's like wow.*

Practices

Participants seem to possess general knowledge of safe food handling practices and most said they were confident in their abilities of preparing, storing and purchasing food. However, responses indicate they may nonetheless be using certain practices that may put them at higher risk of foodborne illness. For instance, participants mentioned that they do not use meat thermometers to check for 'doneness.' Instead they use subjective ways to determine if something is done cooking, as indicated by this conversation between participants:

P1: *"I kinda cut the middle and check the colors."*

P2: *"What I see people do is boil it first then brown the outside, this way you know it's cooked."*

P3: *"Yeah, because I don't really know, for me when I am cooking meat or something, I just check to make sure it is still pink and that's when I know it is ready or not. Like I don't really know what the temperature is to be. Like when you know it is cooked thoroughly because we don't have a thermometer."*

Another mentioned practice that may increase risk of getting sick from food is the improper cooling and storage of soups and stews. This issue is occurring both in participant's homes and at public events as indicated by these participants:

P1: *"...like I said the grandparents, mom and sisters, they all know how to cook beans and stuff so they know how to keep it at room temperature and stuff throughout the day*

like when we are having a ceremony. That ceremony lasts all day long so we got pots of beans and pots of chili ad stuff and you know you have to keep it at room temperature and you can only reheat it so many times before it spoils so I am amazed at how a lot of stuff doesn't spoil, I think we ate it too fast (laughs)''

P2: "The one thing I need to do is start putting my food away right cause a lot of times I'll just like, you know if I make a pot of soup or a pot of noodles or whatever...I don't put them away and then when it is time to eat later on I'll just heat them back up."

Improper cooking and cooling of foods presents substantial risk to foodborne illness. This is supported by Redmond (2004), who finds that while consumers know they must adequately cook meat, knowledge of internal temperatures is lacking. Additionally, most consumers fail to acknowledge with need for cooling hot food rapidly before storage. These behaviors, in combination with lack of associated risk in the home can result in contamination of food and increase risk of foodborne illness.

Social factors

Points made about politeness around food during discussions with key informants became resonate in the focus group discussions and this social factor may represent a barrier to awareness.

When discussing feast days many participants mention never hearing of anyone getting sick by eating traditional foods or at a feast day. Despite this belief, participants continually identify food practices that can increase the risk for foodborne illness, mainly food being left out all day and not getting refrigerated. Sometimes, they even politely pass it by if they feel as though it is unsafe. However, as revealed by participants and supported by key informant comments, it is disrespectful to associate sickness with

someone else's food. This becomes evident by the following two quotes from participants:

P1: *"I think, I mean, without saying it is like connected – some people always blame something else. Like, allergies come up, or especially like the season, wintertime, you are getting a cold. And then some say I have a toothache and then they relate it to something else. But I think it's also.... the kindness of not wanting to blame someone for their food. I just think of a lot of events and activities like hmm, I wonder if anyone is going to get sick from my food. But I sincerely think that sometimes people are just very generous that they don't want to say and tell people that oh, your food made me sick. So they blame something else."*

P2: *"Depends on how well you know the person. I might be like 'Oh, I don't know if these hotdogs are good anymore.'" If it is a complete stranger, I'm No, I'm going to pass. Again, in social events it depends on how comfortable you are with the people you are around on whether you can say something or not. Because if you are a newcomer to a situation you don't want to be...I don't know what's my word? Overprotective, I dunno. You know you don't want to make waves, but at the same time you want to be safe. So it's a fine line you walk."*

Food practices that have been mentioned by participants that take place at feast days are known to increase the risk of foodborne illness. It is possible that people are getting sick at these events, but due to the social factor of politeness and not wanting to associate sickness with food, it does not get brought up. This creates a lack of awareness around these issues and can ultimately increase susceptibility, without motivation to change behaviors.

Holistic View of Food Safety

Participants seem to have a holistic view of ‘food safety’ which they related to nutritional risks, microbial risks, and overarching health problems related to food, such as diabetes prevention and food allergies. A survey distributed by Bruhn (1999) shows that when taking action to minimize risk for hazards in food most people indicate responses associated with nutritional risks, followed by pesticide residues and bacterial contamination.

Additionally, participants tell stories of having gotten “food poisoning” yet do not think they are at risk for a foodborne illness. The issue here seems to be that participants appear to lack familiarity of food safety terms and concepts. This is consistent with findings by Byrd-Brenner (2010) who saw participants confusing food ‘poisoning’ with food qualities, poorly (but not unsafely) prepared food or allergens. Focus group participants may benefit from a clear definition of foodborne illness and food risk. Use of terminology can have implications for social marketing efforts and impact attempts to educate participants.

Preferred educational methods

People, workshops and classes were considered the most preferred methods of getting of food and nutrition information, though word of mouth raised some flags of credibility. According to participants, to elicit a response, food safety education must appear salient to themselves and their families, particularly their children. This view of educational methods was suggested by Redmond (2004) who suggests that to create interest, consumers must perceive educational interventions to be personally relevant. Additionally, an option to partake in education is preferred rather than something that is

mandatory or “thrown at you.” This was brought up both by my participants and key informants.

Perceptions about risk, barriers and sense of control

Participants’ perceptions of food appear to interact and intersect with one another depending on the context in which they are experienced. Internal and external factors interact with one another causing an individual to feel more or less vulnerable in a situation. These factors, often viewed as independent variables, must be looked at as variables that interact to create different outcomes (Fig.1). Continual reinterpretation of perceptions is necessary to understand the changing set of meanings surrounding the complexity of culture and food beliefs.

Participants perceive food, illness and food safety in two capacities: internally and externally. These factors interact with one another on various levels creating perception on a continuum of security to vulnerability. Internal factors can include: self-efficacy and confidence in food preparation, immunity or anything that is not environmental. External factors include concepts like eating outside the home, social factors and multi-person households.

Control.

The concept of control is by far the most recurring theme in perceptions surrounding food. It appears to influence confidence, susceptibility, barriers, and benefits.

Perceived Susceptibility. As brought up in focus groups, and well supported by the literature (Bruhn 1999; Redmond, 2003; Cates 2004; Cody, 2003) participants do not feel susceptible to illness when they prepare food in their own homes. In fact up to 75% believe their home is the least likely place for illness to occur (Redmond, 2004). This

internal confidence, which creates a sense of control and the most security and confidence behind feeling self-efficacious in the preparation, storage and purchasing of food. These judgments of optimistic bias, lower perceived susceptibility and will make it more difficult to convince individuals to change their behavior.

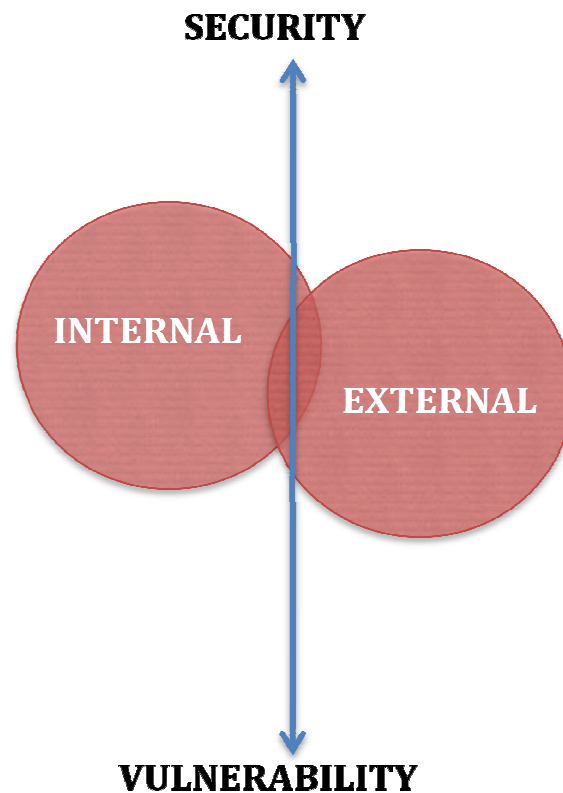


Fig. 1. Proposed diagram of how perceptions are formed

While participants seem to have a sense of security when they prepare their own food, other internal factors such as immunity, genetics and allergies affect this to either increase or decrease vulnerability. Additionally, when participants are eating outside of the home, when food preparation is not in their control, they feel more susceptible to getting sick from food. While internal control creates a sense of security and lack of

external control creates a sense of vulnerability, sometimes these factors interact. For instance, most participants express their confidence in being able to properly and safely store their food. However, when the external factor of multi-person households comes into play, security goes down. It is crucial to understand these interactions when looking at how perceptions are formed surrounding food safety and foodborne illness.

Children. In children, this interaction seems to work oppositely. As stated by parents and caregivers, internal factors, such as the inability to effectively communicate food is making them sick, creates susceptibility. External factors, such as caregivers taking careful steps to make children food, create security. Again, it is important keep in mind how individuals view the concept of control and how context can change the meaning and feeling of susceptibility.

Key Informants

Interviews with key informants presented themselves more as discussions than anything else. While concepts emerged for improvement, on the whole, informants saw value in the project and were very supportive. A number of informants gave suggestions on not only on how to improve the cultural competency but how to best recruit participants and suggestions on where to hold focus groups.

Summary

Participants have general knowledge surrounding food safety issues and practices. However, there seems to be perception of lack of severity and susceptibility, especially in the home environment. History and culture circumscribe perceptions and influence how and if behavior changes are made. Behavior changes do not necessarily happen through the acquisition of knowledge alone (Redmond, 2003). Understanding on how perceptions

are formed and how they influence thoughts surrounding food safety are crucial aspects when approaching educational efforts.

Reflexive statement

Experts in qualitative research recommend that researchers write memos or notes to ones self throughout the entire research study (Creswell, 2012, Gilgun, 2006, Maxwell, 2005). They claim that this process of reflective writing is the beginning of analysis and can provide insight into the process of knowledge construction of the researcher.

The purpose of my reflexive statement is to acknowledge the multiple influences that I may have brought to the research process and how the research process affected me. My reflexive statement is structured around three realms. The first is my own personal meaning and professional experiences with the topic of foodborne illness and food safety. The second is the perceptions of those persons in this study, key informants and focus group participants and my interpretation and interactions to these discussions. The third are the salient audiences to whom the research findings will be directed.

I took copious notes before and during the design process, throughout the implementation of the study, while analyzing and during the writing of this thesis. What is written here reflects my biases, hunches, insights and experiences. Prior to the study Dr. Perry and I would meet together with some of the key informants and afterwards share our own points of view. This would always lead to a useful dialogue about how this shared knowledge would or should influence the study design.

Realm one, my personal and professional understandings. I make no claim to fully understanding Native American culture. However, I am a former cook, who has had formal training in food safety. I am also a former art director and am familiar with

marketing concepts. I am currently a health education student who has taken classes in behavior theory and qualitative research. While these experiences have shaped how I interpret and understand these research findings, it makes it more difficult to look at the issues from the point of view of the participants.

Realm two, Interactions with participants. My Type A personality in combination with my minimal experience with social norms in Native culture creates a barrier in communication. One particular focus group, which seemed to have more traditional views in general, and the oldest of all participants, was the most difficult one for me to get people to open up. The eldest participant was especially quiet. I invited her to share in the discussion by she declined. My initial reaction was not to press her further since she appeared disinterested. Afterwards her daughter came up to me and mentioned that we should slow down when conducting focus groups so that the quieter individuals (her mother) would get a chance to speak. I apologized and afterwards, spoke to the facilitator Kyle, a Native American. He revealed that sometimes when he is around other Native people, there is a sense of calmness and it takes people a while to start talking. He shared how important it is to remain quiet and wait patiently for people to decide to start talking. What was once an interpretation of disinterest or a shy person grew to a greater understanding that influenced future focus group discussions. Specifically, this experience led me to two conclusions:

1. The presence of a Native American focus group facilitator allows for greater sensitivity to the cultural social cues that may influence engagement.
2. When working with older generations or more traditional populations, in-depth interviews may be more effective than focus groups. Due to the quiet nature of

these individuals, dominant participants in focus groups can overshadow their presence and interviews would allow them to full engage with the facilitator.

At first, it did not seem as though questions around barriers were eliciting the responses that could answer questions surrounding these constructs. Questions about barriers fed off the first question ‘What gets in the way of you taking steps to prevent your family from getting sick?’ Participants would first have to believe that something got in the way to answer the remaining questions. We were getting no response, or were asked to repeat the question.

As it turns out it was the phrasing of the question that created confusion. Taking cues from key informants, ‘What get in the way...’ suggests that you are not already taking steps to keep your family safe. Rephrasing the question to ‘Is there anything that gets in the way..’ started to get participants talking about barriers and provided insight and support for an on reservation study. Many times it was brought up that their families do not have electricity for refrigeration or had to drive long distances to get to the store, which in some cases led to keeping food past expiration dates. The focus group script was changed to adapt to these perceptions surrounding perceived barriers.

Salient audiences. Being intimately involved with a project, as I have for the past year and a half, can sometimes create barriers to effective communication with participants. Having gone over the script a number of times before focus groups began, I was convinced that the proposed script would prompt answers to the research questions, after all it was based on behavior theory. But here’s the glitch - theory works well to predict behavior. However, it fails to take into account cultural perspectives that influence perceptions surrounding a particular issue. It is crucial, as a researcher, to

educate yourself as much as you can on how certain cultures perceive what is it you are seeking answers to, although you still may miss something since in the end you are not viewing it through a personal cultural lens. The use of facilitators that understand and are part of the culture that you are speaking to is crucial. The biggest limitation in this study is the fact that while Native people were contacted to comment on the study, and facilitated focus groups, there were none that were involved in the interpretation of the data. This was mostly due to time constraints but it may be beneficial to take results back to key informants and get their opinions on interpretation.

Chapter Six: Conclusions, Limitations, Recommendations and Implications

Conclusions

While numerous studies have been conducted to determine the food safety attitudes, knowledge and practices of consumers, there has been little segmentation of demographics. A majority of studies have not collected data on, nor segmented studies out by ethnicity. The purpose of this study was to gain a more accurate perspective of the current practices, perceptions, barriers and knowledge levels related to food safety and foodborne illness in Native Americans who are primary food handlers of young children.

This qualitative study used focus groups in a way to support and compliment preceding literature. This study shows food safety practices and knowledge in this sample of Native Americans do not significantly differ from other cultural groups. However, there are cultural aspects that may influence how perceptions are formed around foodborne illness.

As supported by the literature, the focus group participants in this study appeared to underestimate the incidence of foodborne illness in the home. They may also be unaware of the severity of consequences related to poor food handling practices. As suggested by the Health Belief Model, when individuals do not have a feeling of susceptibility in a situation it impedes motivation to change behaviors and increases risk of foodborne illness.

Limitations

- Focus groups are limited in that they provide qualitative data that are not generalizable to the larger population.
- While this project views the Native population as a homogenous population, there

are different iterations of beliefs and practices surrounding food in each distinct pueblo/tribe and among tribal members who reside in rural and urban areas.

- Purposeful sampling results in limited participation because of recruitment restrictions.
- There is the possibility of social desirability bias with the use of focus groups.
- Self-reported practices of participants may not reflect actual behaviors (Redmond 2003).

Recommendations for future research

Based on the findings of this research and the experiences of the researcher in conducting this study the following recommendations are advanced.

- The validated survey used in this study should be used in future research to reliably measure food safety knowledge.
- This study should be replicated and findings should be confirmed across a broader and more diverse sample of off-reservation Native Americans in New Mexico
- Findings suggest that Native Americans who live on reservations may have different beliefs and practices surrounding food than those represented in this study. It is recommended not only to replicate this study with more traditional populations, but also to examine the differences and similarities.
- A more in-depth investigation should be conducted as to how perceptions of security and vulnerability are formed surrounding food safety and foodborne illness.
- Researchers should consider using in-depth interviews when working with older and traditional Native peoples.

Implications

This is the first study, to our knowledge, that explores Native American perceptions of foodborne illness and food handling practices in the home. It suggests that there are no cultural differences when it comes to knowledge surrounding foodborne illness and food safety. However, it provides insight on origins of perceptions formed around foodborne illness and food safety that may be culturally influenced.

One of the implications of this study is that educational interventions should emphasize awareness surrounding risk of foodborne illness in the home environment as well as definitions of basic terminology and explication of relationships between defined terms. Interventions focusing on safe food practices should emphasize proper cooling and storage of soups and stews.

Comments from participants and suggestions from key informants suggested that educational efforts around safe food handling should be framed around health and the benefits of engaging in these practices rather than associating sickness and risk with food. Additionally, this work suggests that future educational efforts should address issues that are salient to the population, particularly emphasizing family and child wellness.

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Appendices

VOLUNTEERS WELCOMED

You are invited to complete a survey & participate in a 1½ hour discussion on food safety - FREE FOOD WILL BE PROVIDED AND A \$25 GIFT CARD!!

Do you qualify?

Answer YES to all three:

- Are you Native American
- Do you have a child under 10 years old?
- Do you make most of the meals for your child?

This study is being done by Dr. Christina Perry and her associates from the University of New Mexico, Department of Health Education.

If you are interested in participating, please contact

Lindsay O'Connell at Loconne1@unm.edu or leave a message at 505.277.1983

Volunteers Needed

- Lindsay O'Connell
Research Assistant
505.277.1983 or lloconne1@unm.edu

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Appendix B: Consent Form

The University of New Mexico
Consent to Participate in Research: Focus Group Discussion
Food Safety for Diverse Families with Young Children

Introduction

You are being asked to participate in a research study that is being done by Dr. Christina Perry and Lindsay O'Connell, a Graduate student from the Department of Health, Exercise & Sports Sciences, University of New Mexico.

The purpose of this project is to understand your thoughts about food safety. You are being asked to participate in a discussion group with other adults because you have said you prepare the meals in your family and have at least one child in your house under 10 years of age or younger.

This study is funded by the United States Department of Agriculture (USDA). This form will explain the research study, and will also explain the possible risks and benefits to you. If you have any questions, please ask one of the study investigators.

What will happen if I decide to participate?

If you agree to participate the following things will happen:

- You will be asked to read and sign a consent form agreeing to participate in a group discussion with 5-8 other adults about food safety.
- The discussion will be held in a quiet room in a public community building and will last about 2 hours.
- The discussion will be audio recorded so we can remember what was said. No names will be used or linked to any information given during the session. If you decide you do not want to be audio recorded you will not be able to participate.
- There will be a discussion leader who will be asking questions to all group members, you may answer or refuse to answer any question.
- You will be asked to complete a survey about food safety topics.
- You will be given a gift card for your participation.
- The information collected will be compiled and used to develop educational materials about food safety.

What are the risks or side effects of being in this study?

The risks in this study are not considered to be any greater than those experienced in everyday life. Every effort will be made to protect the information you share with us. If at any time you feel uncomfortable to share in the discussion you may refuse to answer or withdraw from the study for any reason and without any effect on you.

HRPO #: 11-219
APPROVED: 07/01/11

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Version: 06/20/11
EXPIRES: 06/30/12



UNM | Human Research Protections Office

The University of New Mexico Institutional Review Board (HRRC/MCIRB)

CONSENT

Signing this consent form means you have read all of the given information and agree to participate in this study.

A copy of this consent form will be provided to you.

I have had an opportunity to ask questions and all questions have been answered to my satisfaction.

Name of Adult Subject (print)
or for Child enrollment.

Signature of Adult Subject
or for Child enrollment.

Date

INVESTIGATOR SIGNATURE

I have explained the research to the subject and answered all of his/her questions. I believe that he/she understands the information described in this consent form and freely consents to participate.

Name of Investigator (Research Team Member) (type or print)

(Signature of Investigator (Research Team Member)

Date

06/28/2011 - HRPO# 11-219

HRPO #: 11-219
APPROVED: 07/01/11

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Version: 06/20/11
EXPIRES: 06/30/12



The University of New Mexico Institutional Review Board (HRRC/MCIRB)

Appendix C: Knowledge Survey

Food Safety for Diverse Families with Young Children

Directions:

- Choose 1 answer for each question. Unless the question states otherwise.
- If you do not understand the question, please put a question mark (?)
If possible, make comments on why it is confusing.
- If you find the question offensive, please cross it out and comment on why it offends you.
- Please feel free to write any other comments or opinions about this survey in the margins.

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?
 - a. Throw them away
 - b. Cook them right away
 - c. See how they smell or look before deciding what to do
 - d. 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?
 - a. Store it in the refrigerator and reheat it when the child is ready to eat it
 - b. Place it on the kitchen counter until the child is ready to eat it
 - c. Store it in a cool oven until the child is ready to eat it
 - d. 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?
 - a. Apples
 - b. Dried corn
 - c. Open box of raisins
 - d. Corn bread
 - e. An open can of beans
4. What is the safest way to cool a large pot of hot soup?
 - a. Put the soup in a clean shallow pan and refrigerate right away
 - b. Keep the soup in the cooking pot and refrigerate right away
 - c. Put the soup in a clean, deep pot before and refrigerate right away
 - d. 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?
 - a. 1-2 days
 - b. 3-4 days
 - c. 5-7 days
 - d. More than a week

6. How long can you store raw hamburger and chicken in the refrigerator to eat later?
 - a. 1-2 days
 - b. 3-4 days
 - c. 5-7 days
 - d. More than a week

7. If you have a cut or sore on your hand, what should you do before you prepare food for your family?
 - a. Nothing, if it is not infected
 - b. Put a bandage on the cut or sore
 - c. Wash hands
 - d. Put a bandage on the sore and wear a glove

8. Where is the best place to store raw meat in the refrigerator
 - a. On the top shelf
 - b. Where there is space
 - c. 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:
 - a. Increases the chance of food poisoning
 - b. Decreases the chance of food poisoning
 - c. Makes no difference

10. How should you wash fresh fruits and vegetables to keep you from getting food poisoning?
 - a. Wash with regular soap
 - b. Wash with hot water
 - c. Wash with anti-bacterial soap
 - d. Hold under cool running water

11. After you have used a cutting board to slice raw meat or chicken, or fish and need to cut other foods, which of these is the best way to prevent food poisoning?
- Wipe the cutting board off with a paper towel
 - Rinse the cutting board under very hot water
 - Turn the cutting board over and use the other side
 - Wash the cutting board with hot soapy water and rinse
12. 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
13. 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.
14. Washing hands after changing a diaper:
- Increases the chance of food poisoning
 - Decreases the chance of food poisoning
 - Makes no difference
15. 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
16. 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

17. To prevent food poisoning, how long should leftover soup be heated?
- a. Until it is boiling hot
 - b. Just until it is hot, but not too hot to eat right away
 - c. When it is at least room temperature
 - d. Reheating isn't necessary

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

18. Check the safe way(s) to thaw frozen meat? **(Check all that apply)**
- a. In the refrigerator
 - b. In the microwave
 - c. On the countertop
 - d. Under running water
 - e. Put in a sink filled with water
19. To prevent food poisoning, which of these individuals should not prepare food for other people? **(Check all that apply)**
- a. A person with diarrhea
 - b. A person with sores or pimples on face
 - c. A person with a fever
 - d. A person with a rash
 - e. A person who smokes
 - f. A person with a sore throat
 - g. A person with allergies
 - h. A person who has just vomited
 - i. A person with a runny nose
20. When preparing food, you should wash your hands after touching which of these? **(Check all that apply)**
- a. Dirty pots and pans
 - b. Fresh fruit
 - c. Dishes that came out of the dishwasher
 - d. Clean countertop
 - e. Cell phone or home telephone
21. How should dishes be washed to prevent food poisoning? **(Check all that apply)**
- a. Hand wash and rinse them right after the meal and then let them air-dry
 - b. Hand wash and rinse them right after the meal and then dry them with a dish towel
 - c. Wash and dry them in a dishwasher

22. Which is an acceptable way to clean a cutting board or counter after it is used for raw meat? **(Check all that apply)**
- a. Wash with hot soapy water only
 - b. Wash with hot soapy water, rinse with water, then rinse with bleach
 - c. Clean with a disinfectant (example: Lysol, Clorox, bleach)
 - d. Wash cutting board in a dishwasher
23. A food is properly cooked in a microwave oven when **(Check all that apply)**
- a. You follow directions on the package
 - b. You stir the food about half way through cooking
 - c. You use a turntable in the microwave
 - d. The food feels hot
 - e. You test the food with a thermometer
24. Which foods will likely cause food poisoning for pregnant women, infants, and children? **(Check all that apply)**
- a. Soft cheeses
 - b. Cold smoked fish
 - c. Cold deli salads
 - d. Hot dogs that have not been heated
 - e. Undercooked eggs
 - f. Canned fruit juice
25. Which of these people will likely get sick from harmful germs in food? **(Check all that apply)**
- a. Preschool children
 - b. Teenagers
 - c. Pregnant women
 - d. Older people (age 60 and over)
 - e. People with type 2 diabetes
 - f. Cancer patients
 - g. People who frequently eat at restaurants or get take-out food often
 - h. None of these individuals

26. Eating which of these foods will increase a person's risk of food poisoning?

(Check **all** that apply)

- a. Baked potato that was left on the counter overnight
- b. Leftover turkey eaten cold
- c. Cake that was left on the counter overnight
- d. Refried beans cooled on the counter
- e. Fried eggs with a runny or soft yoke
- f. Purchased cookie dough
- g. Raw homemade cookie dough or cake batter
- h. Sushi
- i. Raw shellfish
- j. Ceviche
- k. Unpasteurized fruit juice
- l. Sliced melon
- m. Raw sprouts (alfalfa, bean, clover, radish)
- n. Fresh homemade salsa
- o. Leftover soup reheated until warm but not boiling
- p. Raw milk (not pasteurized) or fresh cheese made with raw milk
- q. Infant milk or formula with honey added
- r. Meat cooked medium-well
- s. Milk with raw egg added
- t. Hamburger cooked rare

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

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

- a. True
- b. False

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

- a. True
- b. False

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

- a. True
- b. False

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

- a. True
- b. False

31. Chilling or freezing eliminates harmful germs in food.
a. True
b. False
32. Your TV dinner will be cooked properly in your microwave when you follow the package directions.
a. True
b. False
33. Deli foods or luncheon meat kept beyond the expiration date are safe.
a. True
b. False
34. If a leftover food looks and smells good, it is still safe to eat.
a. True
b. False

Appendix D: Demographic Form

Demographic Survey

1. Gender: Male Female

2. Race/Ethnicity:
 - Caucasian or White
 - Native American (Tribe/Pueblo name _____)
 - African American or Black
 - Hispanic, Latino or Spanish origin
 - Asian
 - Other, please list _____

3. How old are you? _____

4. City, State, of birth _____

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

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 E: 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 _____ and I am a researcher/student researcher from the University of _____ (state). This is my assistant _____ (name), also from the University of _____. We are 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 and something you like to make to eat with/for your kids

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?

Prompts: Pursue feast days – are you concerned with the safety of foods there? What can be done to change this? Are others aware? Has preparation changed at all based on awareness?

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?

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.)

What do you do if your kids get sick

- (prompts: take them to the doctor?) versus what do you do if adults get sick?

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 adults sick?

-How do you think these foods make you sick?

What foods do you think make kids or babies sick? Do you think kids are more at risk than adults?

Do you think that you are at risk for a food borne illness Prompts: If no, is difference between getting sick from food and a foodborne illness?

Self-Efficacy

Do you feel confident in your ability to safely prepare food in your home so that your family won't get sick?

What makes you confident?

What specific steps do you take/How do you to keep your food safe?

How did you know that would keep your food safe?

How are from who did you learn this?

Do you feel confident in your ability to safely store food in your home?

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) you and your family consumes is safe?

-prompts – grocery shopping – ask what they do with their meat when they buy it – do they put it in plastic or directly into cart – are their kids in the cart?

What are some reasons why people might keep food beyond the expiration date or longer than they should?

Perceived Barriers

Do you do takes these steps regularly?

Is there anything that gets in the way or makes it difficult to do this consistently?

Prompt: others in household, time, money, inconvenience

Why or why not?

Can you overcome this? How?

Is there anything you would change to keep food safer in your home?

Perceived Benefits

Do you think there benefits to practicing food safety in your home?
Why or why not?

Cues to Action

How do you like to receive food and nutrition information? (brochures/classes/internet)

Prompt: Think about that last question on the demographic survey asking how you would like to get food and nutrition information (print, internet, classes)

Probe for specific materials – brochures, posters, doctors office, grocery stores, e-newsletters, apps, classes, Google, websites...

What makes you think it is credible? Why do you use that source?

Is there any health information that you don't trust – where does that come from?

What kind of food safety information would you like to learn more about?

- Clean (proper methods)
- Cook (cook temperatures)
- Chill (storage)
- Separate (cross-contamination)

- Refrigerator safety
- Safe grocery shopping
- Leftovers – how to store
- Summer cookouts/feasts
- Packing safe school lunches
- Safe microwave cooking
- Safe ways to buy/handle produce
- Egg safety

Knowledge survey

Do you think cultural foods should be on the survey?
Are there any kinds of foods that are part of your culture or that you regularly eat that should be included on the survey?

Which ones?

Appendix F: Coding Scheme

1. Traditional foods

- 1A. types of foods - Current
- 1B. types of foods - Growing up
 - 1B2. reasons for change

2. General awareness of FBI

- 2A1. Media (news) as a source
- 2A2. other sources
- 2B1. What do you call getting sick from food/meaning
- 2B2. Symptoms of getting sick
- 2C1. Personal Experience with FBI - Self
- 2C2. Personal Experience with FBI - others

3. "Perceptions" of Causes to FBI

- 3A. Food type
- 3B. Food preparation
- 3C. Food production process/before it gets to you (?)
- 3D: storage (to cover those that say food is in fridge too long)

4. Susceptibility factors

- 4A. Individuality/immunity
- 4B. Vulnerable populations (kids/elderly/suppressed immune systems)
- 4C. allergies
- 4D. Restaurants/Eating away from home
- 4E. Kids actions as susceptibility
- 4F. Self Risk

5. Severity

- 5A. Severe Symptoms for vulnerable populations
- 5B: being more aware with kids/as parent/caregiver
- 5C: Lack of severity

6. Barriers

- 6A. Multi-person households
- 6B. Time
- 6C social component -
- 6D knowledge/awareness/education/terminology
- 6E. Kids lack of communication

7. Self Efficacy

- 7A. To prepare food
 - 7A1. Steps taken to assure food safety/Prevention
- 7B. To store
 - 7B1. 7A1. Steps taken to assure food safety/Prevention

7C. To purchase

7C1. 7A1. Steps taken to assure food safety/Prevention

8. Health Information

8A. Effective

8B. Not effective

8C - preferred topics of interest

9. Quotes/stories to use