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Return to Current Issue

Food Safety for 4-H Youth: A Survey of Interests and Educational Methods

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Abstract: Improper food safety practices cause numerous illnesses and cost Americans billions of dollars each year. The study reported here addressed food safety issues by analyzing data from surveys with 4-H youth about their food safety attitudes, behaviors, and preferred methods of educational delivery. Analyses of gender differences indicate that males and females have distinct attitudes, behaviors, and preferences, necessitating more tailored educational approaches. Youth are most interested in food safety information that is fun, interactive, and built around cooking demonstrations. 4-H staff and others in Extension can optimize youth learning and practice change by approaching food safety from this experiential perspective.

Introduction

Food Safety for Youth

The Centers for Disease Control and Prevention estimates that there are 76 million cases of illness, 325,000 hospitalizations, and 5,000 deaths due to foodborne disease each year in the United States (Mead et al., 1999). A recent study in Ohio concluded that the annual cost of foodborne illness was approximately $4.1 billion, or $355 for each resident of the state (Scharff, McDowell, & Medeiros, 2009). Extrapolating these numbers to the full U.S. population, the estimated annual cost of foodborne illness would be over $100 billion.

Young adults are not very knowledgeable about food safety issues and are prone to mishandling food (Byrd-Bredbenner, Maurer, Wheatley, Cottone, & Clancy, 2007b) A recent study concluded that "overall, young adults have less than optimal levels of food safety knowledge and safe food handling best practices" (Byrd-Bredbenner et al., 2007c, p. 1923). Young adults also tend to have food safety problems in their own kitchens, including: unclean kitchen appliances, high refrigerator and freezer temperatures, and the lack of food thermometers (Byrd-Bredbenner et al., 2007b). Further, even when consumers are knowledgeable about proper food safety practices, they frequently fail to practice correct behaviors (Clayton, Griffith, & Price, 2003).

Beyond its importance for the individual, food safety practices are important to the well-being of others. Many young adults work in the food service industry, making their knowledge of food safety practices critical (Endres, Welch, & Perseli, 2001). Likewise, today's youth are current and future caregivers for others, making their food handling practices especially important for the health of family members (Byrd-Bredbenner et al., 2007b).

Food Safety in 4-H

Young people have fewer opportunities to learn about food safety practices in their homes and schools because of the trend toward more working parents, increased use of prepared foods, and limited home economics course offerings (Byrd-Bredbenner et al., 2007c). 4-H, with its emphasis on life skills development and content related to food and nutrition, is an ideal setting for education on food safety. Non-formal delivery methods and experiential learning opportunities allow for the delivery of food safety lessons that are fun, interactive, and appealing to youth.

Kolb (1984) developed the four-stage model of experiential learning consisting of a concrete experience followed by reflection, observation, abstract conceptualization, generalization, and active experimentation of these new concepts and new situations. 4-H provides the opportunity for youth to learn about and practice positive food safety behaviors. Food safety is also an important issue for 4-H and other Extension programs because groups frequently prepare, serve, and sometimes sell food, all of which create food safety issues and potential risk for the organization (Angell, 2008).

Purpose and Research Questions

The purpose of the study reported here was to assess the food safety attitudes and behaviors of 4-H youth and determine the most promising educational approaches for this population.

The research questions for this study were:

1. What are the current *attitudes and behaviors* of 4-H youth in areas relevant to food safety?

2. What educational *methods* do youth prefer for the delivery of food safety information?

3. Are there *gender differences* on attitudes and behaviors or preferred educational methods?

Methodology and Data Analysis

Survey Administration

To answer the questions for the study, a survey on food safety issues was administered to youth attending the annual 4-H Congress at the University of Florida. The survey was administered during check-in, and participation was voluntary. One hundred and three youth completed the questionnaire and are included in these analyses. Of these, 34% were male, and 66% were female. The sample was predominantly Caucasian/White (83.5%), with smaller numbers of African Americans/Blacks (9.7%) and Others (6.8%). The youth were between 12 and 18 years of age, with the majority (59.2%) having at least 7 years of experience with 4-H.

The survey addressed the following food safety issues:

- Youth Attitudes and Behaviors
    - ♦ Youth attitudes about cleanliness and sanitation (Byrd-Bredbenner, Wheatley, Schaffner, Bruhn, Blalock, & Maurer, 2007a)
    - ♦ Youth attitudes about food poisoning as a threat (Byrd-Bredbenner et al., 2007a)
    - ♦ Youth reports of hand washing
    - ♦ Youth reports of sharing food and drinks
- Youth Feedback on Educational Delivery Methods
    - ♦ Youth reports of current sources of food safety information
    - ♦ Youth reports of interest in food safety topics
    - ♦ Youth preferences for educational approaches

Measures and Scales

The scales for youth attitudes about cleanliness and food poisoning as a threat were adapted from previous measures designed to be valid and reliable measures of attitudes about food safety (Byrd-Bredbenner et al., 2007a). The items were presented on a four-point Likert scale, ranging from strongly disagree to strongly agree.

For attitudes about *cleanliness*, the following four items were selected (scale reliability = .71):

- It is important to me that the foods I eat are prepared in a sanitary way.
- It is important that the restaurants I eat in *look* clean.

- It is important that the restaurants I eat in *are* clean.

- It does not matter to me if the food store (food market) seems dirty.

For *food poisoning as a threat*, the following three items were selected (scale reliability = .76):

- Food poisoning is not currently a big threat to my health.

- I do not worry about getting food poisoning from the food I eat.

- I am concerned about getting food poisoning.

Quantitative Analyses

Quantitative data were analyzed using SPSS, with descriptive statistics and simple inferential statistics being conducted. When appropriate, ANOVAs and Chi Squares were used to test differences between males and females on the various outcomes.

Qualitative Analyses

Open-ended responses were analyzed for two questions:

1. Possible Barriers to Participation: Youth were asked why they might not participate in programs about food safety topics.

2. Suggestions to Make Food Safety Information Fun or Interesting: Youth were asked, "How can we make food safety information more fun or interesting to you?"

The narrative responses to these questions were recorded and analyzed using pattern, theme, and content analysis (Patton, 2002). The primary author initially identified themes based on word frequency counts; once the qualitative themes were proposed, the research team reviewed the work and arrived at consensus about the qualitative coding and language used.

Results and Discussion

Food Safety Attitudes and Behaviors

Attitudes about Cleanliness and Sanitation

On the scale measuring youth attitudes toward cleanliness and sanitation, the average score was 3.64, which represents a point between "agree" and "strongly agree." Overall, this represents a high degree of agreement that cleanliness and sanitation are important.

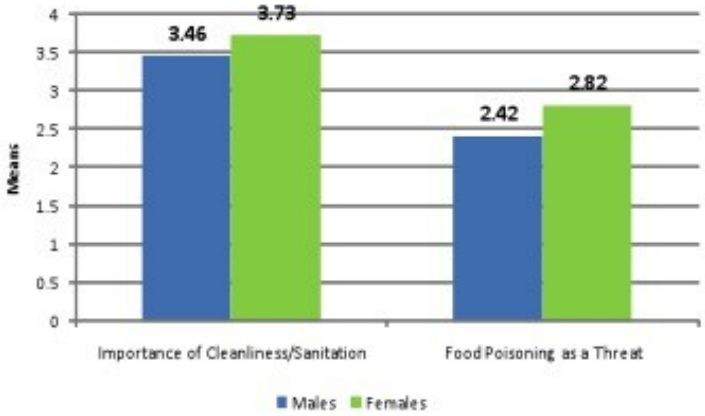
For this scale, there was a significant gender difference, with males (M = 3.46) reporting lower levels of agreement than females (M = 3.73) (F (1, 99) = 8.771, p = .004). The males in the study placed relatively less emphasis on cleanliness than did their female counterparts (Figure 1).

Attitudes About Food Poisoning

For the scale measuring food poisoning as a threat, the average score was 2.69. This represents a point between disagree and agree. Compared to the cleanliness scale described above, there is much less agreement about the extent to which food poisoning is a threat in the lives of 4-H youth.

For this scale, there was also a gender difference, again with males (M = 2.42) being less concerned about the threat of food poisoning than females (M = 2.82) (F (1, 99) = 6.168, p = .015 (Figure 1).

Figure 1.
Gender Differences on Attitude Scales (Means)



Youth Self-Reports of Hand Washing

The Centers for Disease Control and Prevention (2000) has identified hand washing as a strategy to reduce the transmission of disease. Proper hand washing is a simple way to reduce the transmission of foodborne illness as well as colds, infections, and other illnesses transmitted by hand. Despite the importance of hand washing, some research has found that people do not wash frequently enough, long enough, or with soap (Anderson, Shuster, Hansen, Levy, & Volk, 2004).

On average, the youth in this survey reported washing their hands over seven times per day (M = 7.35). Only about 7% of the youth reported washing their hands fewer than three times per day. There were no gender differences.

While there is no clear standard for how much hand washing is appropriate, these self-reports indicate that the great majority of youth are washing their hands several times per day. It is also critical to know whether youth are washing their hands when they should (after going to the bathroom, before preparing food, after handling raw meat).

Youth Self-Reports of Sharing Food and Drinks

Sharing food and drinks is one way that illness can be spread from person to person, a behavior that is discouraged by the CDC (2008). To better understand this issue, youth in this survey were asked, "How often do you eat or drink after someone else (for example, drink from the same container or eat off the same plate)?" Fifty-five percent of youth reported that they did so "sometimes" or "often," while 45% said they did so "never" or "rarely." There were no significant gender differences. It appears that a substantial number of youth are sharing food, which may contribute to the spread of infectious diseases.

Youth Feedback on Programming and Educational Methods

Current Sources of Food Safety Information

When identifying the current sources of food safety information in their lives, youth were most likely to identify: parents (65%), 4-H (50%), television (40%), and school (36%). Ten percent reported that they did not get any food safety information at all. There were no significant gender differences.

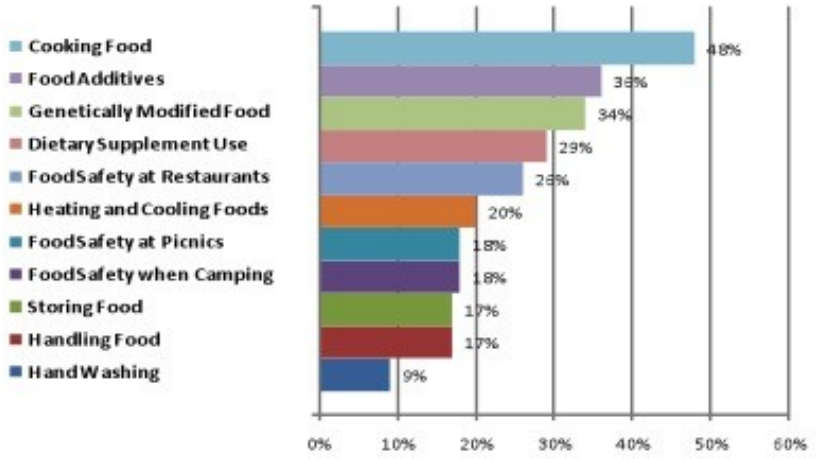
It is especially noteworthy that youth identify television as one of the primary sources of their food safety information, because some research has discovered that television cooking shows actually include many examples of poor food safety practices (Mathiasen, Chapman, Lacroix, & Powell, 2004). Also noteworthy is the fact that 4-H is identified as one of the top two sources of food safety information within this sample.

Food Safety Topics

When asked to identify which food safety topics they would like to learn more about, the most frequent answers were: cooking food (48%); food additives (36%); genetically modified food (34%); and dietary supplement use (29%). Youth were less interested in: hand washing (9%); handling food (17%); and storing food (17%).

There are some differences between these findings and a previous study that found that youth were most interested in food safety away from home, food handling, and genetically modified foods (Guion, Simonne, & Easton, 2004). While genetically modified food continues to be a topic of interest, youth in the study reported here expressed relatively low interest in "handling food" (Figure 2).

Figure 2.
Percent of Youth Reporting Interest in Food Safety Topics



Females were more likely to be interested in the following topics than were males.

- *Dietary supplement use:* 36% of females expressed interest compared to 17% of males (Ï ^{2} (1) = 3.863, p = .049). This finding is consistent with the idea that young females are concerned about body image issues.

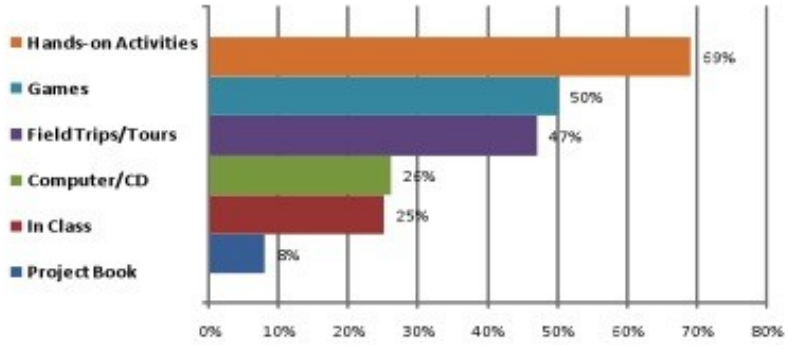
- *Food safety at restaurants:* 36% of females expressed interest compared to 9% of males (Ï ^{2} (1) = 8.771, p = .003).

Youth Preferences for Educational Approaches

Overall, 57% of youth reported that they would definitely participate in a 4-H program on food safety topics, while 36% said "maybe," and 7% said they would not participate. Overall, youth seem to be indicating a willingness to learn about food safety issues.

When asked *how* they preferred to be taught, youth were most likely to prefer: hands-on activities (69%); games (50%); and field trips/tours (47%). Youth were less likely to want education provided through project books (8%). It is notable that the preferred methods are experiential and require active participation by the youth, which is consistent with the 4-H approach. There were no significant gender differences on these items (Figure 3).

Figure 3.
Percent of Youth Preferring Educational Approaches



Youth Preferences for Educational Settings

When asked *where* they would like to receive food safety information, youth were most likely to report: 4-H Club Program (62%); 4-H Summer Camp (44%); and special interest project (30%). They were less likely to be interested in receiving information during after-school programs (11%) and programs during school (17%). Boys (74%) were more likely to say they preferred to receive information from the 4-H Club Program than were girls (54%) (Ï ^{2} (1) = 3.842, p = .050).

Possible Barriers to Participation

Possible barriers to participation were collected from open-ended responses and coded qualitatively. When asked to explain why they might *not* participate in food safety programs or activities, the top three barriers were:

1. Lack of interest in the topic;

2. Time issues (such as lack of time or scheduling difficulties); and

3. Programming considerations, including whether the programming is interactive.

Suggestions to Make Food Safety Information Fun or Interesting

When asked, "How can we make food safety information more fun or interesting to you?" the top suggestions were:

1. Make the programming hands-on and interactive.

2. Incorporate games into food safety lessons.

3. Provide food at sessions.

4. Use cooking and food demonstrations to teach key lessons on food safety.

Conclusion and Implications for Extension Educators

The National Institute of Food and Agriculture (NIFA) recently announced that food safety was one of the strategic national priorities meriting increased research and education. Extension, and 4-H in particular, are prime settings for advancing and disseminating food safety knowledge. While the study reported here does not include findings from a random sample of 4-H youth, the data from the study generate several suggestions for 4-H educators interested in teaching food safety.

- 4-H is a promising setting for food safety education. In this study, youth identified 4-H as a leading source of food safety information, second only to their parents. If youth internalize positive food safety practices when they are young, we believe they are likely to apply these practices throughout their lives.

- Youth are interested in hands-on activities that engage them in the learning process. While youth are most interested in cooking activities, they also expressed interest in games, field trips, and the application of food safety information to real-world situations. Educators need to re-think their approaches to more actively engage youth through experiential learning opportunities in fun and dynamic ways.

- Cooking and food demonstrations are an excellent vehicle for delivering food safety information to youth. "Cooking food" was the most favored food safety topic and the youth repeatedly emphasized the need for food safety education to be hands-on, fun, and interesting. The 'Kid's Chef School' (Clark & Foote, 2004) is an example of an Extension cooking program that incorporates food safety into broader cooking lessons. Educators can attract youth participation by offering cooking classes, then deliver food safety lessons as an extra bonus.

- When delivering food safety education, it is important to consider the gender of the audience members. This study and others have found differences between males and females in terms of food safety interests, behaviors, and attitudes. When creating food safety learning opportunities, educators should consider the gender makeup of their audience to optimize the chances of success.

- Food safety is an important risk management strategy for Cooperative Extension. Because food is commonly served at Extension events, there is considerable risk if the food is not properly prepared (Angell, 2008). This makes it even more important to ensure that youth and adults alike are preparing food in the safest manner possible.

- Existing resources can be used to inform education programs. The USDA and several states have created food safety education resources for children and youth that are designed to be interesting and fun. Key resources include the following:

- Fight Bac! Curriculum for Food Safety <http://www.fightbac.org>

- Food Detectives: Interactive Web site with music, facts, and games about food safety <http://www.fooddetectives.com>

- FoodSafety.gov for Kids, Teens & Educators: Federal gateway for food safety information for youth and educators <http://www.foodsafety.gov/~fsg/fsgkids.html>

- Kids World â Food Safety, Department of Agriculture, North Carolina: Food safety site for kids <http://www.agr.state.nc.us/cyber/kidswrld/foodsafe/index.htm>

- NSF Scrub Club: Interactive Web site with games, songs, and other educational tools about hand washing <http://www.scrubclub.org/home.aspx>

- USDA Food Safety Education for Kids & Teens: USDA food safety site for youth <http://www.fsis.usda.gov/Food_Safety_Education/For_Kids_&_Teens>

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