

Developing Consumer Messages for Proper Handling of Poultry and Eggs: The Research

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Research Methods

- Ultimate goal is to produce research-based educational programming that is effective in changing knowledge, attitudes, and practices
- Multiple approaches to answering research questions
- May validate what we already hypothesized
- Types of research methods
 - Qualitative
 - Quantitative

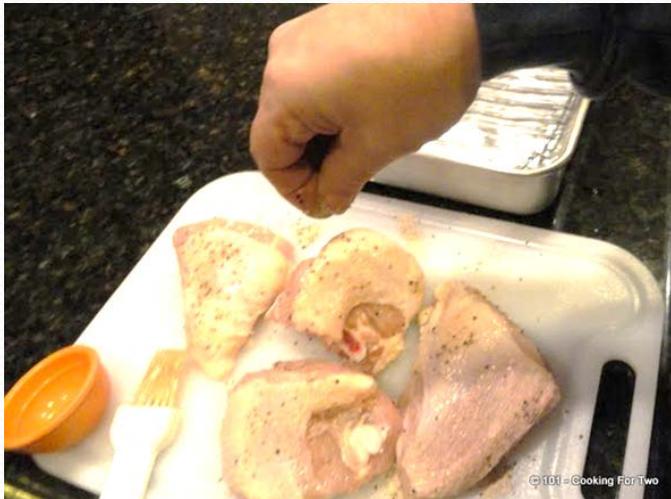
Qualitative Methods used in this Research

- Focus groups
- Cognitive interviews (mental modeling)
- Observations (unstructured)
- Discussion groups



Quantitative Methods

- Surveys
- Lab experiments
- Structured observations



Key Findings from Focus Groups and Survey on Consumer Food Safety Practices

Sample Focus Group Question and Responses

- Question: What foods do you consider most likely to contain bacteria that could make you sick?
- Answer: **Chicken, turkey, pork, hamburger**, eggs, shrimp, dairy, cantaloupe, vegetables (e.g., lettuce, spinach, sprouts, and tomatoes).



Sample Focus Group Question and Responses

- Question: Have you heard of any bacteria associated with poultry and eggs that may cause foodborne illness? If yes, what are they?
- Answer: Most participants had heard of *Salmonella* and associate the bacteria with **poultry and/or eggs**.
- No participants had heard of *Campylobacter*.



More Focus Group Findings

- Question: How likely do you think it is that you could become sick if you ate a fried egg with a runny yolk?
- Answer: Many participants thought it was **very unlikely** that they would become sick from eating a fried egg with a **runny yolk**.



More Focus Group Findings

- Question: How likely do you think it is that you could become sick if you ate roasted chicken that was still pink in the middle?
- Answer: Most older participants thought it was somewhat to very likely they would become sick. **Younger participants were less concerned** and thought it would depend on how pink it was.



Sample Survey Findings

- Research Question: What percentage of consumers wash their hands after handling raw poultry?
 - 88% for whole poultry/parts
 - 90% for ground poultry
- Research Question: What percentage of consumers own a food thermometer?
 - Result: 62%
- Research Question: Of consumers who own a food thermometer, what percentage use it for whole turkeys? Patties?
 - 73% for whole turkeys
 - 12% for patties



More Survey Findings



- Research Question: What percentage of consumers place raw poultry in sealed containers or plastic bags on bottom shelf of refrigerator?
 - Result: 18%
- Research Question: What percentage of consumers fry eggs until both the yolk and white are firm?
 - Result: 45%
- Research Question: What percentage of consumers wash their hands after handling raw eggs?
 - Result: 48%

Using Research Findings to Determine Next Steps in Consumer Research

Example 1 of study results leading to further research

- Question asked during focus groups:
 - Have you heard of the recommendation that “During shopping, **put raw poultry in disposable plastic bags** (if available) to contain any leakage, which could cross-contaminate other foods”?
 - Finding: Many participants had heard of this, but few followed it.
 - Most younger participants said they have never seen bags in the meat section, but would use them if they were available.
 - Some participants suggested displaying a sign with the bags so people would be more likely to notice and use them.

Survey Finding:

40% of consumers do not put poultry in a separate plastic bag at the grocery store, which can lead to cross contamination.

Questions Raised

1. How do consumers handle raw poultry products in the grocery store?
2. Does posting a sign reminding consumers to bag their raw poultry products have any effect on their bag usage?
3. Where does cross contamination occur in the grocery store?

Grocery Store Study #1

- 150 consumers were screened by researchers to determine if they would be purchasing poultry on their next shopping trip
- Researchers accompanied the shoppers
 - In the grocery store
 - Putting items away at home



Grocery Store Study #1

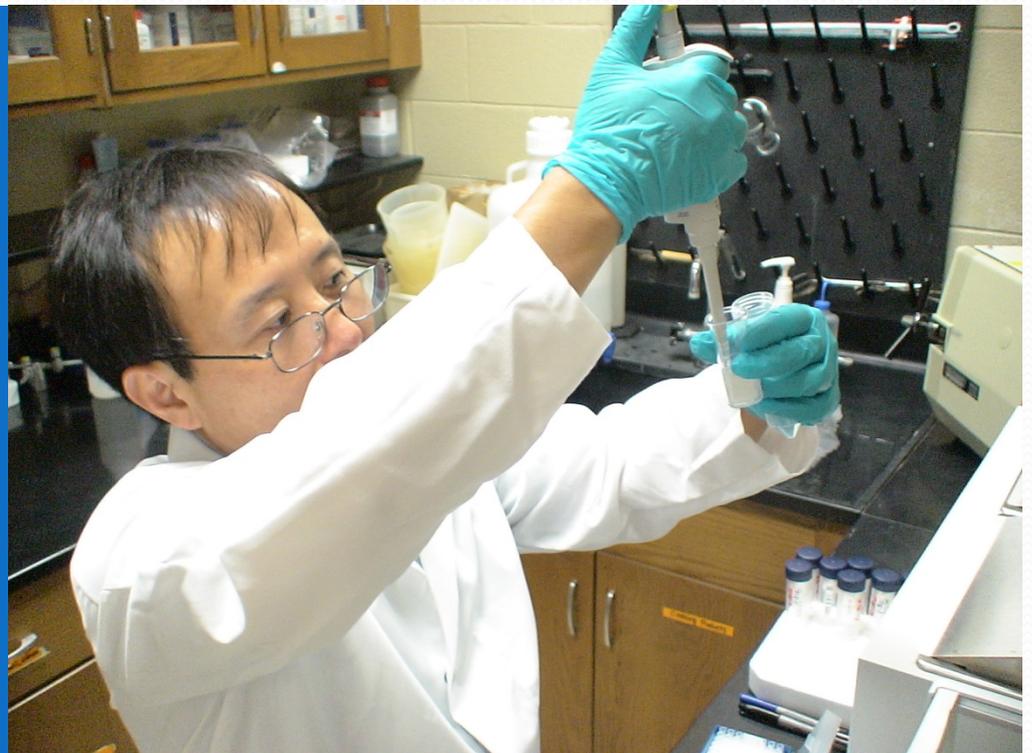
- Swabs were taken throughout the observation
 1. Consumers hand when leaving poultry section
 2. Outside of all poultry packages
 3. One item that the poultry touched in the cart
 4. One surface that the poultry touched at the consumers home
 5. The inside of the grocery bag (if it was not thrown away)



Grocery Store Study #1

- Swabs were analyzed for the presence of raw poultry juice.

The presence of
meat juice was an
indicator of
possible cross
contamination



Grocery Store Study #1

- Findings:
 - Bags are readily available in most stores
 - Only 25% of consumers actually used a bag
 - Poultry juice found on all items touched (cart handle, child, next 2-3 items handled) if not bagged before putting in grocery cart
 - No cross contamination occurred if poultry was bagged
 - Stores placed poultry in separate bags at checkout, but cross-contamination had already occurred
 - Shoppers took poultry out of bag at home, which led to more cross-contamination

Microbiology experiments

- Determining survival time for bacteria on surfaces and packages
 - Salmonella survives for up to 7 days on refrigerator surfaces and milk cartons when in poultry juice
 - Salmonella survives for months in grocery bags
 - Campylobacter survival is not favorably supported long term



Grocery Store Study #2



- 100 shoppers were observed by researchers purchasing raw poultry in 2 different grocery stores.
- Bags were available in both stores.
- After observation 1 a sign was placed to remind people to use bags.
- Shoppers were observed and interviewed.
- Only a few shoppers used a bag either before or after the sign was posted.



Example 2 of study results leading to further research

Research Finding:

Few consumers (5%) reported using a food thermometer to check for doneness of egg dishes

Questions Raised:

1. How do consumers determine doneness of egg dishes?
2. How are consumers instructed to determine when egg dishes have finished cooking?
3. Do those instructions ensure that the egg dish has been cooked to a safe temperature?

Survey question for those who did not use a thermometer:
The last time you cooked an egg dish how did you determine whether it was done and ready to eat?

57% relied on cooking time

45% inserted a knife, toothpick, or other utensil, and it came out clean

22% shook it, and it was firm (did not wiggle)

13% touched it with finger, and it was firm

7% tasted it

4% looked at it

3% other



Content Analysis of Egg Dish Recipes

Question – What do recipes tell consumers to use to determine doneness?

- 226 egg dish recipes were analyzed
- Recipes were obtained from:
 - 65 websites. 50 cookbooks. 9 magazines
- Researchers recorded the indicators for doneness

Step 3

Bake 40 to 50 minutes or until knife inserted in center comes out clean. Let stand 5 minutes; cut into wedges.

Laboratory Egg Dish Study

- 3 different egg dish recipes were evaluated
 - Chess Pie, Quiche, Breakfast Casserole
- 3 replications of each recipe were prepared
- Researchers observed:
 - Time at which the item reached 160 °F
 - Temperature of dish upon completion of recommended cooking time
 - Subjective measurements
 - Consistency at 160 °F
 - Jiggle of completed dish
 - Color of completed dish
 - Clean toothpick test
 - Clean knife test



Egg Dish Recipe Results

- Egg dishes reach 160 °F before the products are set and ready to eat.
 - Recipe time is not always accurate, but when the time is too short the recipe obviously is not done – liquid, not set, pale uncooked color.
 - When recipes were set, jiggled, and/or an inserted implement came out clean, the temperature was well above 160 °F
 - This suggests that egg dishes are not a concern from a doneness standpoint and likely do not need to have temperature measured.

Example 3 of study results leading to further research

Research Finding: Few consumers use a food thermometer when cooking raw poultry pieces (26%) and ground poultry (12%)

Questions Raised

1. How are consumers told to determine doneness?
2. How do they determine when their raw poultry pieces and ground poultry have finished cooking?
3. Would consumers use a food thermometer if instructions were provided in the recipe?

Consumer Cooking Study #1

- 90 consumers were observed by researchers in a research test kitchen
- Participants were asked to prepare the following:
 - Chicken breast in the oven
 - Ground turkey breast on the stovetop
 - Fried egg on the stovetop
 - Scrambled eggs on the stovetop
- Consumers were asked to prepare the items as they would at home

Cooking Study #1 cont.

- Researchers recorded how participants determined when poultry and egg items were cooked
- Internal temperatures of the cooked items were also recorded
- $\frac{1}{4}$ used a thermometer to test chicken for doneness
- No-one used a thermometer for eggs
- $\frac{1}{2}$ of temperatures were lower than recommended



Consumer Cooking Study #2

- **120** consumers were observed by researchers in a research test kitchen
- Participants were provided with the following recipes:
 - Baked Parmesan Chicken Breast
 - Mushroom Turkey Burger
- 2 different versions of the recipes were created
 1. With food safety instructions
 2. Without food safety instructions

Sample Recipe- Mushroom Turkey Burger

- **Wash your hands with soap and warm water before you begin this recipe.**
- **Run cold water over the mushroom while rubbing gently with your fingertips. Use a paper towel to dry.**
- Remove the stem from the mushroom and chop using a cutting board.
- Spray a medium sauté pan with cooking spray. Preheat pan over medium high heat.
- Remove the wrapper from the ground turkey. Place the ground turkey into a medium bowl.
- **Wash your hands with warm soap and water after handling the ground turkey.**
- Add the chopped mushroom, soy sauce, onion powder, salt and pepper to the ground turkey. Mix with hands or a wooden spoon. Once mixed thoroughly form into a burger patty and place into the preheated pan.



- Wash your hands with soap and warm water after placing the patty into the pan.
- Cook the patty for 5 minutes on each side.
- Using a spatula, tilt the patty up and insert the cooking thermometer into the side of the burger, with the tip extending into the center. If the temperature is less than 165°F, return the patty to the pan and continue cooking until the internal temperature reaches 165°F.
- If you touched the turkey when checking the temperature, wash your hands with warm soap and water.
- Place the turkey patty on a clean plate when finished cooking.



Results of Cooking Study # 2

- Dramatic increases in the percentage of people who washed hands before and during food preparation
- Dramatic increases in the percentage of people who used a thermometer to test for doneness – and used it correctly.



Chef study

Question: What food safety behaviors are modeled by chefs on popular television programs?

- Watched 100 episodes of television cooking shows featuring well-known chefs cooking poultry/meat.
- Tracked food safety behaviors.
- Chefs generally model poor food safety behaviors for viewers including not washing hands, touching other foods after touching raw meat, reusing utensils (including cutting boards) without washing.



Lighting study

Question: Do new lighting sources make it easier or harder to determine visual doneness of poultry?

- Consumers viewed pictures of turkey patties, cooked to various temperatures, under incandescent, daylight, fluorescent, halogen, and LED lighting.
- Consumers believed that ground turkey cooked to 160°F (below the 165°F recommended) was done and OK to eat under new LED and compact fluorescent bulbs, but not other bulbs.
- Will this convince consumers that what they have done in the past no longer works?

Developing Educational Programming

Program Branding



Developing Educational Programming

- Conducted synthesis of results to identify risky practices most commonly exhibited by consumers
- Identified key messages to focus on in the intervention
- Contracted with Partnership for Food Safety Education
- Chose target audiences for the PFSE intervention program
- Conducted program icon research
- Developed Educational modules (lesson plans) for 4-H

Some of the Key Messages Identified for Educational Programming

- Wash your hands after handling eggs
- Put raw poultry in a separate plastic bag before placing in grocery cart, and leave it in that bag until time to prepare
- Use a food thermometer to check doneness of large and small cuts of poultry
- Do not reuse disposable plastic grocery bags for carrying food

Handout for
educational
programs
www.fightc-les.org

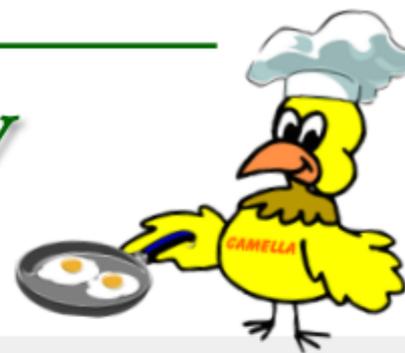
Chef Camella's



*Guide To Storing,
Handling, And Preparing
Your Egg And Poultry
Products Safely*

*Sandria L. Godwin
Richard W. Stone*

Grocery Store Safety



Lesson Overview

Time: 10-20 Minutes

Learning Objectives:

In this Lesson, participants will:

- Identify poultry and egg safety practices shoppers can do while in the grocery store.

Tennessee Department of Education Academic Standards:

- Health Education Standards 3-5: 1.1; 1.4; 2.1, 2.3
- Science Education Standards 5: 0507.Inq.1, 0507. Inq.3

Contents:

- **Video:** Short, educational video outlining key points from this lesson
- **Handout & Activity Page:** Overview of key points and puzzle activity
- **Video Guide:** Fill-in-the-blank and short answer worksheet to supplement educational video
- **Check For Understanding Review:** Review of key points (Use if not using video & Video Guide)

Materials:

- Printed Handout & Activity Page for each participant
- Access to “Grocery Store Safety” video
- Printed Video Guide for each participant (if using video)
- Printed Check For understanding Review for each participant (If not using video)
- PowerPoint or other visual
- Activity 2 materials: Paper, construction paper or poster board, markers,

Collaborators



- Kansas State University
 - Delores Chambers
 - Curtis Maughan
 - Kadri Koppel
- Tennessee State University
 - Fur-chi Chen
 - John Ricketts
 - Agnes Kilonzo-Nthenge
 - Sam Nahashon
- RTI
 - Kathy Kosa
 - Sheryl Cates



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Questions?

