# Development and Testing of Food Safety Knowledge and Attitude Questionnaires for Use With Consumer Audiences

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# Food Safety Education: What Should We Be Teaching?

- Step one: Identification of major themes (control factors) for food safety education
- We suggest emphasis on behaviors associated with the most prevalent foodborne illnesses (as identified by the CDC).

*Medeiros, Hillers, Kendall, Mason*
*J. of Nutrition Education 33:108-113, 2001*

## Five Major Control Factors for Pathogens

- Practice personal hygiene
- Cook foods adequately
- Avoid cross-contamination
- Keep foods at safe temperatures
- Avoid foods from unsafe sources

## What Food Safety Behaviors Are Most Important in Preventing Foodborne Illness?

- Step 2: Developed consensus among food safety experts (n=24) about the most important behaviors to reduce risks of foodborne illnesses from home food preparation.

*Medeiros, Hillers, Kendall*
*J of American Dietetics Assoc 2001; 101:1326.*

## Summary of Expert Panel Recommendations

- Twenty-nine behaviors that are associated with pathogens and foodborne illness were ranked according to their importance in preventing foodborne illnesses.
- The behaviors are grouped according to the five major control factors for pathogens.

## Food Safety Education: How Do We Evaluate Its Success?

- Step 3: The research team received funding from USDA to develop evaluation tools for food safety educators.

*Medeiros, Hillers, Kendall, 1999-2001*
*USDA grant #99-35201-8126*

## Goal: Develop Valid and Reliable Questionnaires

- Knowledge of recommended food safety behaviors
- Attitudes regarding recommended food safety behaviors
- Food safety behaviors

## Development of Questions

- A sub-group (n=8) from the Expert Panel attended a meeting to write at least one knowledge and one attitude question related to each of the 29 messages that originated from the Expert Panel.

## Review of Items

- Items were reviewed by tri-state team, cooperative extension faculty, questionnaire experts and end-users.
- Reviewers looked for ambiguous wording, unclear format and appropriateness of questions for a low-literacy audience.
- Ambiguous items were discarded or re-worded for more acceptable phrasing.

## Assessment of Validity

- Content validity: used guidelines from the panel of food safety experts.
  - Review of questions by persons with expertise in food safety, nutrition, questionnaire development.
- Face validity: reviewed by wide variety of people who represented target audiences.

## Pilot-testing the Questionnaires

- Knowledge questionnaire: 43 items
  - Cooperative Extension groups
    - Pretest, intervention, post-test (n=58)
    - Test, no intervention, re-test (n=19)
  - College students
    - Prestest, intervention, post-test (n=79)

## Pilot-testing the Questionnaires

- Attitude questionnaire: 49 items
  - Cooperative Extension n=30
  - College students
    - Non-majors (n-138)
    - Majors (n=57)

## Development of Final Questionnaires

- Questionnaires from the pilot-tests were statistically analyzed.
- Findings were used to develop shortened versions of the questionnaires.
  - Knowledge: 18 items
  - Attitude: 10 items
- The short forms were re-tested.

## Knowledge Questionnaire: Item Analysis

- Difficulty Scores (% answering correctly)
  - Should be between 20 and 80%
  - Four questions of final 18 were too easy.
    - 1 on personal hygiene
    - 3 on cross-contamination
  - These questions were retained in the final questionnaire because the concepts were rated as very important by the expert panel.

## Knowledge Questionnaire: Instrument Sensitivity

- Changes in mean scores following an educational program.
  - For each of the 18 questions, there was a sig. difference ($p<.05$) in mean values between pre and post test.
- Control (with no intervening instruction)
  - No significant difference between test and re-test scores.

## Knowledge Questionnaire: Reliability

- Test-retest: Coefficient of stability for 18-item questionnaire was 0.81
  - Should be at least 0.7*.
- Internal Consistency: Cronbach's alpha >0.75 for extension participants and college students.
  - Should be at least 0.7*.

**Parmenter and Wardle, JNE 32:269; 2000.*

## Attitude Scale: Item Analysis

- Ten items met statistical criteria for inclusion in the final food safety attitude scale.
  - One item was accepted that was judged too easy
  - Two were accepted that did not meet construct validity standard
  - These 3 items were otherwise statistically acceptable.
- No items related to personal hygiene were judged acceptable.

## Attitude Scale: Reliability, Construct Validity

- Test/retest: Correlation of test and retest responses was highly significant (P>01) for each of the 10 items.
- Extreme Group Comparison: group with greater knowledge of food safety had higher mean scores indicating a more positive attitude toward food safety.

## Attitude Scale: Internal Consistency (Cronbach $\alpha$)

| Group | Initial Testing | Final Testing |
|---|---|---|
| EFNEP | .71 | .63 |
| Non-majors | .77 | .46 |
| Majors | .79 | .45 |
| Food Safety Class | Not tested | .75 |

## Summary

- These food safety knowledge and attitude questionnaires are among the first to be tested for validity and reliability.
- They are relatively short and should pose little respondent burden.
- They were designed to be used with a wide variety of audiences.

# Potential Uses of Questionnaires

- Assess subject matter knowledge before and after a food safety educational program.
- Assess attitudes to help explain food safety behavior or the likelihood that someone will change behavior after an educational intervention.
- Determine food safety knowledge and attitudes of a population for research purposes.