**INTRODUCTION**

Use of food thermometers for checking the end-point temperature of small pieces of meat, such as hamburger patties, is recommended by the US Department of Agriculture but is uncommon among consumers. Most consumers rely on visual cues to judge the doneness of meat. We developed a set of educational materials to educate and motivate consumers to routinely use a thermometer for small cuts of meat, with the long-term goal of reducing the incidence of foodborne illnesses, particularly *Escherichia coli* O157:H7 infections.

We used the Transtheoretical Model (TTM), or Stages of Change (SOC) theory, to assess consumer readiness regarding use of food thermometers. TTM assumes that 5 stages, precontemplation, contemplation, preparation, action, and maintenance, are associated with behavior changes. Stage-matched interventions have been shown to be more effective than standardized treatments in moving people toward behavior change.

**OBJECTIVES**

Our specific goal for the development of *Now You’re Cooking* educational materials was to reach general consumers efficiently by targeting consumers at different SOC. We anticipated that the majority of consumers would be in the precontemplation SOC regarding thermometer use, or, in other words, most would not have thought about using a thermometer for small cuts of meat. The *Now You’re Cooking* educational materials were designed to deliver interesting and motivating information about thermometer use in terms of improving the safety and quality of meat.

**MATERIAL DEVELOPMENT**

The educational materials included a brochure, a video, and a set of 5 recipe cards. Prior to development of the materials, we conducted focus groups to assess motivators and barriers to thermometer use. "If a thermometer assured the safety of meat" and "if thermometers were shown to be easy to use" were examples of motivators, and "Using a thermometer is inconvenient and a hassle" and "it is difficult to use a thermometer on small cuts of meat" were examples of barriers. Focus group results were used to develop the materials. All materials featured pictures of a variety of types of thermometers being inserted into small cuts of meat.

**Brochure**

The full-color brochure (Figures 1 and 2), aimed at those in precontemplation and contemplation, describes the scientific reasons as to why color is not a good indicator of doneness and why and how to use a food thermometer when cooking small cuts of meat. Information about
steps for using an instant-read thermometer and the most effective cooking method for reducing *E. coli* O157:H7 in hamburger patties is also included.

**Video**
The 15-minute video, targeting those in preparation, action, and maintenance, includes information about how to use a thermometer to assess end-point temperature in small cuts of meat, why thermometer use can reduce foodborne infections, and how to choose an appropriate food thermometer for small cuts of meat.

**Recipe Cards**
The recipes featured in the 5 recipe cards are All American Burger, Apricot Ginger Glazed Chicken Breast, Spice Rubbed Pork Chops, In a Hurry Turkey Curry Burgers, and Sausage Waffle Stack with Honey Apple Syrup. All recipe cards include reasons for using a food thermometer with small cuts of meat, targeting people in all SOC. The recipe instructions also included the end-point internal temperature of the meat featured in the recipes (Figure 3).

**EVALUATION**
Packages of the materials and a Thermy Magnet with cooking temperatures were mailed to 793 consumers in Washington and Idaho who had previously returned a stage classification survey regarding food thermometer use. Six weeks later, a questionnaire, which assessed respondents' use of the materials, the usefulness of the materials, and effectiveness in motivating respondents to use a food thermometer, was sent. Thirty-five percent of respondents (n = 275) returned a completed questionnaire; 63% were female, and 86% were primary food preparers. Most respondents had used the materials; 88% had read the brochure, 76% had read the recipe cards, and 56% had watched the video. Consumers reported that they were motivated to use a thermometer for small cuts of meat by the brochure (63%), recipe cards (45%), and the video (38%). Most participants said that the materials were easy to understand and useful to know how and why to use a food thermometer. Only 1.3% reported that the written materials were difficult to understand, indicating that the materials were appropriate for different reading levels.

Respondents were classified into 5 stages prior to and after the intervention based on a stage classification question regarding ownership of a food thermometer and use of the thermometer for small cuts of meat. Most people in precontemplation (pre 80%, post 46%) and contemplation (pre 8%, post 12%) found the brochure motivating, saying that they preferred the brochure as their first source of information about thermometer use. In contrast, most people in action (pre 1%, post 18%) and maintenance (pre 8%, post 16%) found the video motivating and most useful. No demographic information correlated with the findings. The greatest limitation of the project was the fact that, as was anticipated, the majority of consumers prior to the intervention were in precontemplation, causing a relatively low response rate (35%). The results indicate that the set of materials can be used to efficiently target audiences at various SOC regarding thermometer use for small cuts of meat.

**NOTE**
The materials developed for *Now You're Cooking Using a Food Thermometer* can be ordered from the Washington State University Bulletin Office at (800) 723-1763 or at http://pubs.wsu.edu/. For more information about the materials, visit http://bhn.wsu.edu/thermy/.

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**REFERENCES**