Appendix A:
Detailed Study Description for Year 5 Study on Breakfast and Food Safety Labeling

The purpose of the observational study is to evaluate adherence to the key behaviors of clean, separate, cook, and chill following exposure to food safety messaging and to assess the extent of cross contamination in the kitchen due to failure to follow recommended practices. The purpose of the Year 5 observational study/meal preparation experiment is to evaluate participants' adherence to recommended food safety practices when the mandated Safe Handling Instructions (SHI) label is removed from meat packaging and the SHI label instructions are integrated into voluntary manufacturer's cooking instructions (MCIs).

For the Year 5 study, we will recruit individuals who self-report preparing breakfast using eggs and breakfast meat and have cooked breakfast sausage within the past 6 months. Participants will be randomly assigned to either a control group or an intervention (treatment) group. The treatment group will receive a meat product with safe handling instructions incorporated into the MCI label and the control group will receive a meat product with a separate SHI label and MCI label that mirrors in-market MCI labels.

We will recruit participants for the study using the same approach used for year 4 and prior years (convenience sampling). The estimated burden per participant and incentive payment are the same as year 4 and prior years.

For year 5, we will provide participants with the ingredients needed to prepare a breakfast meal of breakfast sausage, shell eggs, and a fruit salad made with cantaloupe as an ingredient. Initially, we will tell participants that they are testing a new breakfast sausage product. Following the session, we will inform them of the real purpose of the study and why it was important from a scientific perspective to inform them after the study was complete, an approach used in prior studies (DeDonder et al., 2009). We will begin video recording handling and meal preparation as soon as the participant enters the test kitchen and will end video recording after the participant leaves the test kitchen.

Participants will be instructed to prepare and cook the eggs, sausage, and fruit salad as they would at home and to plate the meal for two people, including pouring a glass of juice (to test for presence of the surrogate on the glass). Participants in both the treatment and control groups will be told that the sausage is a new formulation and that we plan to ask them some questions about the product after meal preparation, including their feedback on the label. This approach will help to ensure that participants view the label. Participants will be told to access the fruit salad recipe on a tablet (to test for presence of the surrogate on the device). After cooking, participants will be asked to clean the kitchen as they would at home. Participants will leave the kitchen and go to another room for the post-observation interview.

We will collect microbiological samples to assess the extent of cross-contamination in the kitchen due to failure to follow recommended cleaning and sanitation practices. Before the observation and food preparation, we will inoculate the sausage roll with a traceable, nonpathogenic surrogate. NCSU is conducting laboratory studies to see if it is possible to use the *E. coli* strain (DH5a) tagged with green fluorescent protein (Niebuhr, Laury, Acuff, & Dickson, 2008) that was approved by The FSIS Office of Public Health Science and used as a surrogate for *Salmonella* for the Year 2 study on chicken thighs and as a surrogate for *E. Coli* for the Year 4 study on ground beef.

Following the observation portion of the study and after participants have cleaned up as they would at home, trained sample collectors will take six swab samples (including a validation sample) to gather data on participants' cleaning/sanitizing efficacy. The swabs will be plated at an NCSU laboratory to determine the presence and concentration of the surrogate. The presence of the surrogate will indicate that cross-contamination occurred during food preparation. The level of cross-contamination will be compared across the sampling sites to determine the highest risk areas. Kitchen surfaces, appliances, and other potentially contaminated sites will be cleaned and sanitized after each participant to ensure that any positive samples collected were a result of the individual participant's behaviors.

We will use notational analysis to assess thermometer use and other behaviors such as handwashing and their frequencies. Notational analysis is a generic tool used to collect observed events and place them in an ordered sequence (Hughes & Franks, 1997); it has been used to track food safety behaviors, because it enables the recording of specific details about events in the order in which they occur by associating a time-stamp with actions (Clayton & Griffith, 2004). This method is especially useful when looking at sanitation steps limiting cross-contamination or the use of common food contact surfaces and equipment. Notational analysis has been used in both nonparticipant and participant consumer food safety behavior observation studies, as well as participant food service observation (Clayton & Griffith, 2004; Green et al., 2006; Redmond et al., 2004).

Supplementing the observations, we will conduct a post-observation interview to provide insight into participants' opinions of and experiences when preparing the breakfast meal and their response to the intervention. Content analysis provides a means of adapting qualitative (in this case, interview) data into quantitative data to allow for comparison across groups through a consistent and validated coding scheme. Collecting qualitative data will allow the project team to connect the knowledge, attitude, and perceived behavior with actual observed practices, allowing for a more targeted intervention development. The results of these interviews, coupled with observation, will serve as the foundation for message development and delivery.

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