Recent Changes in Behavior

The model incorporating risk and taste attitudes showed risk motivation to be a smaller factor than taste in influencing consumer choices. But several surveys show consumers have changed their cooking and ordering choices, probably because their awareness of foodborne illness has increased. As we discuss below, consumers have been exposed to food safety messages from a wide range of sources in the past several years, providing both food safety advice and stories about outbreaks.

The HPQ asked a sample of consumers how they cooked and ordered their hamburgers at the time of the survey, 1996, as well as how they cooked and ordered 5 years previously. For purposes of comparison, we treat the responses about previous behavior as though it took place in 1991, although respondents' memory may not have been that clear. Twenty percent of respondents reported that in 1996 they usually prepared lightly cooked hamburgers at home, down from 24 percent in 1991 (table 11). The survey also showed a decline, from 21 percent in 1991 to 15 percent in 1996, in the share of respondents who ordered lightly cooked hamburgers at restaurants.

About 9 percent of the total sample switched from cooking hamburgers rare or medium-rare in 1991 to cooking them medium-well or well-done in 1996 (table 12). This represents 38 percent of those who reported cooking less well-done in 1991. However, about 5 percent of respondents reported switching from cooking hamburgers medium-well or well-done in 1991 to cooking hamburgers rare or medium-rare in 1996. The results were similar for hamburgers ordered in a restaurant: close to half of those who previously ordered rare or medium-rare switched to more well-done, but this shift was undermined partially by respondents who switched from more well-done to less well-done.

The findings of the HPQ are consistent with the FDA/FSIS Food Safety Survey (FSS), which showed the percent of respondents serving hamburgers rare, medium-rare, or medium-pink at home declined from 25 percent in 1988 to 17 percent in 1998 (table 11).

Reasons for Change

Most of the 1996 HPQ respondents who switched from less well-done to more well-done explained they had made the change because of the possibility of becoming ill (70 percent for cooking at home and 72 percent for eating out). Some reported making the change because of their peers (18 percent for eating at home and 36 percent for eating out), and some because of taste (47 percent for eating at home and 38 percent for eating out). One-fourth of the respondents who changed their ordering behavior reported making the change because restaurants were no longer serving lightly cooked hamburgers.

Taste was the most often-cited reason reported for cooking hamburgers less well-done than previously. Many in this group also cited nutrition as a reason for cooking less well-done. This could reflect a concern about loss of nutrients during cooking, but another

Table 11—Percentage of survey respondents reporting they cook or order hamburgers rare or medium-rare, 1988-98

Year and survey	Percent of respondents who usually cook hamburgers rare or medium-rare
1988 FDA/FSIS Food Safety Survey	25 (at home)
1991, from 1996 Hamburger Preparation Quiz, (survey in 1996 asked about behavior in that year and 5 years previously)	24 (at home) 21 (in restaurants)
1993 FDA/FSIS Food Safety Survey	24 (at home)
1996 Hamburger Preparation Quiz	20 (at home) 15 (in restaurants)
1998 FDA/FSIS Food Safety Survey	17 (at home)

Note: Medium hamburgers were counted as medium-rare if the respondent counted medium as still pink in the center, and as medium-well if the respondent counted medium as light brown or dark brown in the center.

Sources: 1988, 1993, and 1998 FDA/FSIS Food Safety Surveys, Fein and Riggins, 1998; 1996 Hamburger Preparation Quiz, ERS estimates.

Table 12—Reported changes in hamburger cooking and ordering, 1991-1996

Risk-reducing changes	Percent of all respondents	Percent of respondents who previously cooked or ordered rare, medium-rare, medium-red, or medium-pink
Switched from cooking rare, medium-rare, medium-red, or medium-pink to cooking medium-brown, medium-well, or well-done	9.1	37.7
Switched from ordering rare, medium-rare, medium-red, or medium-pink to ordering medium-brown, medium-well, or well-done	9.1	43.7
Risk-increasing changes	**Percent of all respondents**	**Percent of respondents who previously cooked or ordered medium-brown, medium-well, or well-done**
Switched from cooking medium-brown, medium-well or well-done to cooking rare, medium-rare, medium-red, or medium-pink	5.0	6.6
Switched from ordering medium-brown, medium-well or well-done to ordering rare, medium-rare, medium-red, or medium-pink	3.1	3.9

Source: 1996 Hamburger Preparation Quiz. Observations weighted by gender, ethnicity, and education of household head. N=820.

reason comes from focus groups conducted by FDA and FSIS in 1995. Some participants expressed a concern about overcooking lean hamburger because it may lose juiciness and flavor when cooked well-done (USDHHS, FDA, 1995). Therefore, some nutrition-conscious consumers may be using lower-fat ground beef and cooking it less well-done than they did in the past to preserve the juiciness and flavor.

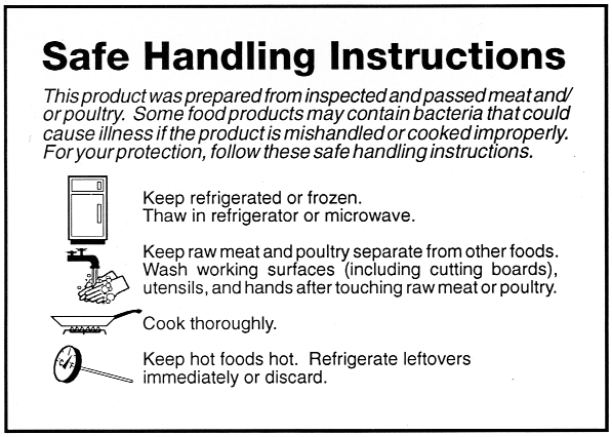
Some consumers also cited fear of illness as a reason for cooking less well-done than 5 years ago. This concern about illness may be related to fears of carcinogens from the charred surface on a well-done hamburger—a concern also discussed by participants in the FDA/FSIS focus groups. Thus, the message encouraging thorough cooking to destroy bacteria may compete not only with consumers' tastes, but also with consumers' nutritional concerns and fear of other perceived food-related risks.

Food Safety Awareness

In 1995, FSIS began requiring safe handling labels on meat and poultry (see figure 1). The label reminds consumers to cook thoroughly, thaw properly, refrigerate unused portions quickly, and wash food preparation equipment and surfaces to avoid cross-contamination. FSIS worked with supermarket chains and local health authorities to jointly produce supermarket brochures and materials for school children to draw attention to the safe handling label and reinforce its messages. In 1998, the Partnership for Food Safety Education, a coalition of industry, government, and consumer groups, began a national public advertising campaign with messages similar to those on the safe handling labels. Media coverage of foodborne illness outbreaks and recalls of contaminated food also increase consumer awareness of foodborne illness risks.

The importance of having many channels for food safety education is reflected in the diversity of sources cited by respondents to the HPQ (table 5) as providing food safety information. Newspapers and TV/radio

Figure 1
FSIS safe handling label



were cited most frequently (72 percent of the sample for each). Word of mouth, magazines, and labels were also important, cited by 60 percent, 57 percent, and 54 percent of the sample, respectively. These results were similar to findings of Buzby and Ready (1996), in which 70 and 71 percent of respondents cited newspapers and television, respectively. The 1998 FSS found similar results for labels, but lower percentages of respondents citing television or newspapers. In that survey, food labels were the most frequently cited source of "a lot of information about food safety," with 43 percent of respondents, followed by broadcast media (37 percent), print media (29 percent), and cookbooks (26 percent).

Respondents to the 1996 Trends survey by the Food Marketing Institute (FMI) and the 1998 FSS said that safe handling labels contributed to their shift in hamburger cooking behavior. The 1996 Trends survey found that 59 percent had seen the new safe handling label for meat and poultry (FMI, 1996). Of those who had seen the labels, 43 percent said the safe handling labels had caused them to change their behavior, and of those, 19 percent (8 percent of those who had seen the labels) said they had begun to follow proper cooking directions.

In the 1997 FMI Trends survey, all respondents were asked what they were doing differently as a result of the safe handling labels. Thirteen percent reported they were "cooking properly," "using correct temperatures," or "following proper cooking directions" (FMI, 1997). The large increase over the previous year could be due to the new format of the question, since it was asked of all respondents, and not just those who specifically said they saw the label.

In 1998, the FSS asked a similar question in a survey and found that 67 percent of respondents had seen safe handling labels on meat and poultry. While only 11 percent of those who had seen the label said they found some of the information new, 29 percent of those who had seen the label said they had changed their behavior as a result of the label. Of those who said they had changed their behavior, 22 percent, or 4 percent of the original sample, said they were now cooking meat properly. Note that other respondents who did not remember seeing the label may also have begun cooking meat properly. Here, the format of the question is more like the FMI survey in 1996, and the result is similar. This suggests that the large increase reported by FMI in 1997 was more likely due to the change in the format of the question.

Several well-publicized incidents of foodborne illness or recalls have also contributed to the shift in consumer behavior. Sixty-eight percent of respondents to the 1998 FSS had heard of the 1993 outbreak of foodborne illness associated with the Jack-in-the-Box fast food chain. Of those, 70 percent recalled that it was related to hamburger, 38 percent recalled that it was caused by a strain of *E. coli*. Twenty-eight percent of those who recalled the Jack-in-the-Box outbreak said the incident affected their behavior even though only 5 percent identified *undercooked* hamburger as the culprit. Further analysis of the FSS data will be required to determine how respondents changed their behavior in response to the incident. Forty percent of respondents had heard about a 1997 incident involving Hudson Foods (the 1997 recall of frozen hamburger patties), and of those, 40 percent recalled it was associated with hamburger, and 42 percent could name the bacteria involved (*E. coli* O157:H7). Twenty-five percent of those who remembered the Hudson Food recall in some form said they had changed their behavior as a result of the news, although again, researchers have not yet determined what respondents are doing differently.

It is difficult to separate the effects of labels and brochures from the effects of publicity surrounding foodborne illness outbreaks and recalls. In fact, the two are intended to work together because food safety officials work with the media to incorporate food safety education into news, magazine, and television stories, and to increase awareness of safe food handling recommendations. Thus, food safety messages often reach consumers indirectly through newspapers, magazines, and cookbooks rather than directly from consumer education materials such as labels and brochures.