Refining Consumer Safe Handling Educational Materials Through Focus Groups

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SUMMARY

Four focus group sessions were conducted in Northern California to gather information on consumer insight and attitudes towards two possible consumer education materials — supermarket brochure and refrigerator magnet — both focusing on safe handling and washing of fresh produce. A total of 43 people participated; all were main purchasers and preparers of fresh produce in their households. The objective of the study was to use consumer group discussions to fine-tune both of the education materials in terms of their readability, understandability, practicality, and distribution.

Consumers reacted positively to the illustrations in both the brochure and magnet. They liked the magnet’s concise and easy-to-read content, but thought the brochure was too detailed. Few consumers said they would follow all recommendations. Nevertheless, participants felt that detail was needed and suggested topics not originally included in the brochure.

Findings suggest that consumer education materials should contain an abundance of illustrations, highlight key words, and be brief and easy-to-read. Education materials should also include information on the prevalence and consequences of foodborne illnesses, provide an explanation behind each guideline, and be made available in multiple languages. Education materials and safe handling recommendations should be distributed and taught to children and young adolescents, especially in the classroom.
INTRODUCTION

Between 1988 and 1992, 6% of foodborne disease outbreaks in which a specific food was identified, and 5% of cases of foodborne illness, were associated with the consumption of fresh produce. Although fresh fruits and vegetables are not common vehicles for foodborne diseases compared to other types of foods, the number of reported foodborne outbreaks and cases of illness associated with the consumption of fresh produce in the United States had increased from 2% (1973 to 1987) to 5% and 8% (1988 to 1991), respectively. The mean number of reported fresh produce-associated foodborne outbreaks had increased from 4.3 per year between 1973 and 1987, to 9.75 per year between 1988 and 1991.

In recent years, a variety of foodborne pathogenic microorganisms have been linked to cases of foodborne illness. Less than one-third of respondents separated fresh fruits and vegetables from meat, poultry, and fish when transporting purchases home. Over 35% of respondents indicated not washing melons before preparation and over 20% reported placing meat, poultry, and fish on a refrigerator shelf above other foods. Almost half indicated not always washing their hands before handling fresh produce. While almost all respondents reported that they always wash their hands before handling meat products, 24% washed with water only. Many expressed an interest in receiving information on safe handling and washing of fresh produce, with 54% preferring a supermarket brochure and 28% preferring a refrigerator magnet. As a result of this survey, a brochure and magnet emphasizing handling practices that affect safety were developed.

This paper reports the results of a focus group study designed to discover consumers’ reactions and opinions about the content, format, and practicality of the safe produce handling guidelines. Consumers were asked to comment on readability and ease of understanding and to suggest how the guidelines could be enhanced and distributed.

MATERIALS AND METHODS

Four focus groups were held in the University of California Cooperative Extension offices in Northern California (Monterey County/Salinas, Sacramento, and two in Napa). The focus group study targeted consumers who were the principal buyers and preparers of fresh fruits and vegetables. A total of 43 consumers participated, with an average group size of eleven. Thirty-seven participants were female, and the majority were approximately 30 to 40 years old; however, the authors estimated that the participants’ ages ranged from 20 to 70. Income and educational information were not obtained. Ethnic representation included non-Hispanic Caucasians (91%), Hispanics (7%), African Americans (2%), and Asian Americans (2%). All participants were recruited through the University of California Extension offices and each focus group session lasted approximately 70 to 90 minutes.

During the focus group sessions, detailed safe handling guidelines for fresh fruits and vegetables were presented in the form of a draft of a supermarket brochure, while a more condensed, generalized set of guidelines was presented.
on a magnet. Both the brochure and magnet were printed with black ink on white, 8 1/2" × 11" letter paper. The brochure was printed on both sides and folded in thirds so that it could fit into a typical grocery store brochure slot/holder. Participants were told that the magnet would be printed in color before public distribution.

In the first half of the focus group sessions, each participant was asked to read a copy of the brochure. When all were finished, participants were asked to share their thoughts about the safe-handling guidelines, the format of the brochure, the content of the material, and the illustrations (Table 1). Next, an illustration of the magnet printed on a sheet of paper was presented to each participant and participants were asked to share their insights on the magnet’s content and presentation (Table 1). In particular, they were asked how they and other consumers might respond to the brochure and magnet. Finally, participants were asked to suggest the best means of distributing these materials. The participants answered these questions in a discussion format. Each participant was not required to respond to each question, although all contributed to the discussion.

RESULTS

Supermarket brochure

All participants commented favorably on the illustrations that accompanied the guidelines (Fig. 1a, 1b, 2a, and 2b). Participants stated that the graphics were clear, easy to understand, and appropriately sized. Many acknowledged that they would pay more attention to the illustrations than to the printed text. People mentioned that the pictures were useful for those who do not read and speak English fluently. Although participants liked the graphics, a few thought that the illustration of the grocery cart (Fig. 3), where raw meat products were placed on the bottom platform of the grocery cart and fresh produce in the basket, was unrealistic. Although the illustration was drawn to emphasize the need to separate fresh produce from meat products during shopping, a few commented that it was “strange to place meat products outside the basket.” One person argued that the bottom section of the cart was used for items such as potatoes and detergent, not meat products.

Participants agreed that the guidelines in the brochure were easy to follow and appeared easy to perform, but some complained that they were too long and wordy. A few stated that they would not read or follow all of the brochure’s guidelines because of their length. Many thought that the brochure was not practical and that other consumers would find the guidelines too demanding. However, other consumers stated that all the details should be provided so consumers would know about the safest food-handling practices.

When asked how they or other consumers could be encouraged to follow each of the guidelines, some participants wanted a much simpler and condensed version; they...
thought that general, summarized guidelines were more practical than detailed instructions. Some thought that it was not possible to encourage consumers to practice all of the guidelines presented in the brochure unless they had experienced foodborne illness that could be traced to produce.

Several participants did share ideas about how to improve the brochure without losing its specificity. Participants suggested printing crucial key words in boldface type, such as “always wash hands” and “always wash knives,” so that those terms would stand out from the rest of the text. Subsequent focus groups were presented with two versions of the brochure, one with some phrases printed in boldface type and one without. Participants were asked if the boldface words made the guidelines more effective. Many agreed that the guidelines were improved by using boldface print for key phrases. Furthermore, some suggested italicizing boldfaced terms for greater emphasis. Participants from the fourth and last focus group agreed that the terms presented in boldface and italic type greatly improved the brochure’s readability. Some also recommended boldfacing and italicizing words such as ‘one’ and ‘or’ so that consumers would not misinterpret the directions and assume that it is necessary to follow all the cleaning options.

Some participants recommended eliminating unnecessary words so that the guidelines would be briefer. For example, many thought that the guideline “It is best to wash fruits and vegetables just before cooking or eating” could be shortened simply to “Wash fruits and vegetables just before cooking or eating.”

Many participants offered advice regarding the statement on the brochure’s front cover: “Eating fruits and vegetables is healthy, but care must be taken to be sure fruits and vegetables do not become contaminated with harmful bacteria. Bacteria are everywhere, even on hands or in kitchens that look clean. This brochure provides guidelines for protecting fruits and vegetables from harmful bacteria.” Because they believed that the cover statement was not sufficiently effective to convince consumers to follow the guidelines, they recommended adding information about the severity of foodborne illness, as well as a description of various foodborne illnesses and of those at highest risk. Also, some wanted statistics showing how foodborne illness is associated with the consumption of fresh produce, and a few suggested adding names of foodborne pathogens to the brochure.

Participants from the first focus group recommended that instead of stating “This brochure provides guidelines for protecting fruits and vegetables from harmful bacteria,” the brochure should emphasize that the consumers not the produce, are the ones at risk. In response, an al-
alternative last statement stating “This brochure provides guidelines for protecting YOU from harmful bacteria” was produced on a sheet of white paper. This revision of the statement was then tested in subsequent focus groups, in which all participants agreed that the alternative statement was much more effective. When asked if the alternative message would discourage or scare consumers from purchasing or consuming fresh produce, the participants unanimously replied, that it would not.

Many wanted to know why melons were emphasized and why fruit needed to be washed before being peeled or cut. Some participants revealed that they never thought to wash melons, because the rind is not consumed. After being told about the potential spread of bacteria from rind to flesh when unwashed melons are sliced, participants suggested that an explanation was needed to encourage consumers to wash melons.

Several participants were confused as to why a discussion had been included on separating raw meat and fresh produce during shopping and transportation. A few thought that raising the topic was unnecessary, because they assumed that consumers always separate fresh produce from raw meat, poultry, and seafood products. On the other hand, others were unaware of the need to separate fresh produce from raw meat, poultry, and seafood during bagging in order to prevent cross-contamination. In addition, some stated that they have no say in how groceries are packed because supermarket bagging clerks pack their groceries.

Several thought that the advice to store raw meat, poultry, and fish on the bottom shelf of the refrigerator or below other foods was unnecessary (Fig. 4). Others recognized the potential for meat juices to drip on other foods and suggested that advising consumers to “store meat below other foods” was sufficient. People also advised that raw meat, poultry, and seafood should be stored in a container, bowl, or tray to further prevent meat juices from dripping onto other foods.

A few participants asked how often cutting boards and food preparation areas needed to be sanitized after cutting meat products and produce. They thought the brochure did not clearly indicate the need for boards and preparation areas to be sanitized after each instance of cutting meat and produce. Participants suggested printing “Al-

**Shopping**

1. In the grocery cart, separate fruits and vegetables from meat, poultry, and fish to avoid cross-contamination.
2. When bagging fresh fruits and vegetables to take home from the supermarket, put fresh produce and meat, poultry, and fish in separate bags.

**Home Storage**

In general, store fresh fruits and vegetables in the refrigerator produce drawer or on a refrigerator shelf.

When storing meat, poultry, or fish in the refrigerator, be sure to store them in the clean meat/poultry drawer or on the bottom shelf below other refrigerated foods so that they will not drip on other foods.

**Prepare the Kitchen**

1. Clean the sink with hot soapy water or cleaner before and after washing and preparing fresh fruits and vegetables.
2. If possible, use a different cutting board and preparation area for meat/poultry/fish and fresh fruits and vegetables. Always wash cutting boards and preparation areas before and after food preparation. Wash especially well between the preparation of meat/poultry/fish and the preparation of foods that will be eaten without cooking.
3. Sanitize cutting boards and food preparation areas after cutting meat, poultry, fish or any produce item with visible dirt or that grows on the ground. Choose one of the following cleaning methods:
   a. Rinse clean cutting boards with a solution of 1 teaspoon chlorine bleach in a quart (4 cups) of water.
   b. Pour boiling water over the clean board for 20 seconds.
   c. Place board in dishwasher and run, using the normal cleaning cycle.
4. Always wash knives after cutting meat, poultry, or fish with hot soapy water before cutting fresh fruits and vegetables or use different knives for cutting meat products and fresh produce.

**Wash Your Hands**

Always wash hands with hot soapy water for at least 20 seconds before and after handling fresh fruits and vegetables.

**Wash ALL Fruits and Vegetables**

1. It is best to wash fruits and vegetables just before cooking or eating.
2. Wash fresh fruits and vegetables under running water.
3. When possible, scrub fruits and vegetables with a scrub brush or with hands.
4. For melons, scrub with a brush around the rind under running water before cutting.

Sanitize the brush by putting it in the dish washer, placing it in boiling water for 20 seconds, or rinsing in bleach solution.
More on Washing

7. If you choose to soak your fresh fruits and vegetables, be sure to rinse the produce well under running warm water and dry with disposable paper towels.

8. Remove any green or the hull from fresh fruits and vegetables after washing, not before.

9. Ready-to-eat, prewashed and bagged produce can be used without further washing. If kept refrigerated and used by the "use-by" date, produce can be washed again.

Perish or prewashed produce in open bags or containers should always be washed before using.

Commercial cleaning solutions designed for fresh fruits and vegetables may help remove dirt and bacteria.

Refrigerate All Leftovers

1. Peel leftover melon and store the fruit in the refrigerator.

2. Store all cut produce in a clean container in the refrigerator.

One person mentioned that he once got dysentery from consuming produce that grew under the ground. He commented that cutting boards and food preparation areas should be sanitized after handling produce that was grown under the ground, such as potatoes and carrots, and not just those that are grown on the ground.

Some participants expressed concerns that were not originally addressed on the brochure. Many wanted to know whether bagged, prewashed fresh produce needed additional washing before consumption, and wanted the topic addressed in the brochure. Also, some asked if the guidelines addressed in the brochure pertained to home-grown and organically grown produce. Many incorrectly thought that home-grown and organically grown produce are safer to consume and thus requires less cleaning than commercially grown produce. The brochure was modified before public distribution to respond to these issues.

Some were concerned about the increased amount and variety of produce imported into the United States; many thought that increased foodborne illness in the United States was due to imported fresh produce. Since foodborne illness can be traced to both domestic and imported produce, no change was made in the brochure to reflect this perception. Consumers were advised to wash all fruits and vegetables, no matter their origin.

Refrigerator magnet

Like the brochure, the preliminary draft of the magnet contained illustrations that the participants appreciated (Fig. 5). Many liked the magnet because of its simplicity and concise format, and thus preferred the magnet over the brochure. The magnet appeared more attractive and practical to consumers because it was less detailed.

The majority stated that the magnet needed to be accompanied by the brochure when distributed. Par...
participants commented that the magnet could be used as a quick reminder whereas the brochure would be used as a reference. As with the brochure, many thought that key words printed in boldface, such as ‘refrigerate’ and ‘store’, should also be italicized for emphasis, and that unnecessary words should be removed. For example, “Remember to refrigerate leftover foods immediately after eating” should be condensed to “Always refrigerate leftovers immediately.” Participants also agreed that the magnet needed to be printed in color to enhance its attractiveness before it was distributed. A few also recommended removing the specific item on storing raw meat, poultry, and fish on the refrigerator’s bottom shelf. Some participants recommended replacing the heading ‘Keeping’ with the more practical term ‘Leftovers.’ In addition, many thought that the positioning of numbers 2 and 5 and headings ‘Cleaning’ and ‘Preparing’ in sections 3 and 4 in the preliminary draft were awkward because they read in a circular fashion.

**Sources of distribution**

Besides distribution of information in the forms of a brochure and magnet at the supermarket, participants had other ideas about how to distribute the safe handling guidelines. Several people discouraged the idea of dropping the brochure and magnet into shopping bags, claiming that most consumers would throw them away immediately without reading them. Another participant stated that distributing the brochure through supermarket brochure slots was ineffective; a more effective way would be for someone to personally hand out the brochures to shoppers.

Although participants agreed that children, especially those in elementary school, were a good source of distribution, perceived age that children should receive safe-handling material varied. Some recommended kindergartners and first graders, others recommended second and third graders, and others thought that fourth, fifth, and sixth graders should be the focus of safe food-
Handling programs. One participant thought that simple good hygiene practices, such as hand-washing, could be taught to preschoolers. Others mentioned that distributing information through health and home economics classes in high schools would be appropriate. To better reach children, some participants mentioned the need for producing a children’s version of the brochure in which simpler words, cartoon illustrations, and catchy phrases were incorporated.

Television was also identified as an effective distribution medium. One participant mentioned that a university or public health specialist could appear on a local talk show and educate viewers on safe produce handling and offer the brochure to those sending a self-addressed stamped envelope. Others recommended distributing brochures and putting up posters about safe produce handling at farmers markets and in the produce section of grocery stores. A few recommended placing a laminated sign about the necessity of separating meat and fresh produce at the supermarket meat counter and checkout counter. A few also recommended displaying a laminated sign in the meat department about the importance of double bagging all raw meat packages. One person suggested that the guidelines could be printed on supermarket paper bags, an idea that many other participants endorsed.

Several suggested distributing the brochures through various recreational classes, clubs, organizations, and special events, including food banks, foster care programs, senior programs, county fairs, county health departments, hospitals, and California State Fairs. Other suggestions included distributing the brochures along with food stamps, free supermarket coupons, free supermarket-distributed recipes, and free promotional packages for college students. One participant said that the guidelines should be incorporated into the “5 a Day for Better Health” program, which advises consumers to consume at least five servings of produce per day. Several suggested that the educational materials could be distributed through the “Special Supplemental Nutrition Program” for Women, Infants, and Children (WIC). In addition, many recommended that the brochures and magnets should be printed in multiple languages, and especially Spanish.

**DISCUSSION**

Successful research using focus groups requires a well-trained moderator (21). Challenges of this research method include greater difficulty in data analysis, group variations, and less interview control. Other limitations were present in the focus groups used in this study. Although mixed ethnic representation and different age groups were sought, a majority of the participants were Caucasian non-Hispanic females over 30 to 40 years old. People in this age group have been targeted, however, because they are more likely to practice unsafe food handling practices, according to a national survey (23). Although varied educational backgrounds and income levels were sought, exact
Demographic characteristics are unknown. Thus, it should be acknowledged that consumer attitudes revealed in the focus group do not necessarily represent all consumers.

Although focus group participants were confident that the public would not discontinue consuming fresh produce because of the brochure’s material, there is still concern among health professionals that some consumers may reduce or stop their consumption of fresh produce as a result of reading a brochure of this type. For example, one survey found that over one-fifth (22%) of consumers responded that they have stopped purchasing specific fresh produce because of food safety concerns (27). Likewise, some consumers reported reducing their fruit and vegetable intake because of concerns about pesticides (9). During the focus group study, the statement on the brochure’s cover was altered to motivate consumers to pay closer attention to the guidelines. Participants of the later focus groups thought that the revised message was much more effective, since it emphasized potential food safety hazards and was more likely to motivate consumers to practice safe handling.

Not all consumer recommendations were incorporated into the brochure and magnet. The authors incorporated the suggestions they considered most effective and appropriate. For example, because the suggestion to use a tray for raw meat storage in the refrigerator is practical and addresses an important safety issue, it was incorporated into the brochure and magnet. However, although some participants thought that the guideline to store raw meat on the bottom refrigerator shelf was unnecessary, the authors believe that this advice clarifies and reinforces the importance of storing raw meat, poultry, and seafood below all other foods. Therefore, this guideline was maintained.

Not all of the issues considered important by the participants were addressed in the brochure. Information on pesticide residues, waxes on produce, types of harmful bacteria, and storage conditions for meat products and fresh produce were not added because of space limitations. Furthermore, although many participants recommended a more condensed or abbreviated version of the brochure to encourage consumers to read the guidelines, the brochure’s content could not be shortened without removing information that is essential to safe handling. The purpose of the brochure is to provide specific information on how to reduce the risk of foodborne illness associated with the consumption of fresh produce. If shortened, the intention of the brochure would be lost.

Many incorrectly assumed that homegrown and organic produce do not need to be handled as carefully or washed as thoroughly as commercial produce. However, organically grown, just like commercially grown, produce can be contaminated by foodborne pathogens or unsafe handling practices (27). As a result, a statement about washing all fresh produce, including produce that is organically grown, homegrown, and purchased at farmers markets, was added to the brochure.
A few participants indicated that the illustration of the grocery cart, which shows meat products on the bottom platform and produce in the cart, was unrealistic and impractical. Despite consumer opinion, the illustration was not altered in either the brochure or the magnet; its purpose was to emphasize the need for consumers to separate fresh produce from raw meat products in the grocery cart. It was not designed to suggest that consumers must store raw meat specifically on the bottom platform of the cart. However, we recognize that some consumers may not appreciate the illustration because of the unfamiliarity of the idea.

Many participants were concerned about the greater availability and increased consumption of imported fresh produce; many assumed that imported produce plays a significant role in foodborne illness. Survey results indicate that as many as 70% of consumers believe that fresh produce grown in the United States is safer than imported produce (31). Nonetheless, there is no evidence that there is a difference in health risks associated with the consumption of domestically grown or imported fresh produce (43). Thus, consumers need to be informed that both domestically grown and imported fruits and vegetables are possible vehicles for foodborne illness.

In the focus group sessions, many participants indicated a concern about whether prewashed, bagged, and ready-to-eat fresh produce needed to be washed again. Many consumers purchase ready-to-eat, packaged, and precut fresh produce. According to one survey, 94% of consumers have purchased some kind of packaged, prewashed, or precut fresh produce item in the past six months (28). Many participants also stated that they liked the convenience of prewashed, packaged produce. Consumers reported that they would purchase fresh fruits (52%) and vegetables (61%) more frequently if they were more convenient to prepare or eat (26). Because of the popularity of these convenience produce items, a statement emphasizing the participants’ concerns needed a response. Thus, the following statement was incorporated into the brochure: “Ready-to-eat, prewashed and bagged produce can be used without further washing if kept refrigerated and used by the “used-by” date. If desired, produce can be washed again.” Therefore, in general, consumers can prepare and eat prewashed, bagged produce without additional washing. In contrast, precut or prewashed produce purchased from open bags or containers must be thoroughly washed again at home before preparation or consumption, because produce in open containers can easily be contaminated by consumers and supermarket employees who are ill or have poor personal hygiene.

Several participants were very interested in knowing if commercial cleaning solutions designed for fresh produce are more effective than water in cleaning and reducing harmful bacteria on fruits and vegetables. According to The Packer’s “Fresh Trends 2001” survey, 16% of respondents indicated that they wash their fresh produce with cleaners or commercial cleaning solutions. In general, commercial washes designed for cleaning fresh produce may help remove bacteria, dirt, and chemicals (32). The effectiveness of the commercial produce cleaning solution Fit is currently being evaluated. Studies indicate that Fit can reduce harmful bacteria (6, 17, 18) and its makers claim that it is more effective in removing dirt and chemicals than water (32). The effectiveness of other solutions on the market has not been reported in the peer-reviewed literature. However, some consumers with lower household income levels may not be able to afford these commercial cleaning solutions. For instance, a survey revealed that 21% of consumers with income levels of $75,000 and higher use commercial cleaning solutions, compared with 12% of consumers with income levels of less than $17,500 (32). In addition, many consumers may prefer using water because it is convenient and inexpensive. According to our mail survey conducted in spring 2000 (23) and The Packer “Fresh Trends 2001” survey, most consumers wash their fresh produce with water (32). To encourage all consumers to clean fresh produce, the brochure provides guidelines based on use of readily available supplies. The intent of the brochure is not to advocate the purchase of any specific type of product, including commercial cleaning solutions.

Some participants wanted to know if there was a difference between plastic and wooden cutting boards in terms of sanitation and risks of cross-contamination. Because of the controversy over the advantages and disadvantages of using plastic or wooden cutting boards (1, 2, 24, 25), the brochure does not recommend one type of material over another. Wooden and plastic cutting boards are both popular among consumers and as a result, the brochure addresses guidelines on how to clean and sanitize cutting board surfaces regardless of composition (25).

One participant suggested that sanitizing cutting boards after cutting produce that grows in the ground, as well as produce that grows on the ground, should be emphasized in the brochure. This makes sense because foodborne pathogens from the soil can be present on the surface or in the interior of produce grown underground (4). The brochure was modified accordingly before public distribution.

Besides revealing consumer attitudes about educational materials, the focus groups also provided important insights on consumers’ food safety knowledge. Many participants were unaware that whole melons needed to be washed before slicing or peeling, since the rinds are not consumed. The inside of a melon can be contaminated during slicing by bacteria present on its unwashed rind (11). Over the years, there have been several outbreaks associated with melons, with the
most recent outbreak (April 2001) associated with the consumption of Salmonella-infected cantaloupes (10). To reduce the risk of outbreaks of foodborne illness associated with melons, it is recommended that the outer surface of whole melons be washed thoroughly with running tap water before being cut with a sanitized knife to remove dirt and bacteria (38). Scrubbing with a brush increases bacteria removal (33). In addition, leftover cut melons, like all other leftover cut produce, should be refrigerated immediately after consumption.

Some participants were also unaware of the importance of keeping raw meat, poultry, and seafood separate from fresh produce in the grocery cart and in shopping bags. Many did not know that juices from packages of raw meat products may leak and cross-contaminate fresh produce and other ready-to-eat foods. Some also assumed that consumers routinely double bag their packages of raw meat to prevent juices from leaking out from the original wrapping; however, since the concept of double bagging was novel to others, it is apparent that all consumers double bag their raw meat packages.

In addition, many participants did not realize that bagging produce with raw meat may constitute a food safety hazard. Some mentioned that the packing of groceries is the supermarket bagging clerk’s job. However, consumers must become aware of how the supermarket clerks bag their groceries and, if bagging is inappropriate, consumers should advise the clerks about safe packing practices.

Motivating consumers to change their handling behaviors is a challenge. According to one survey, fewer than 40% of consumers who had food safety concerns, indicated making some change in their behavior as a result of those concerns. Among those who had indicated changing their behavior, only 57% indicated washing their produce carefully, and only 6% indicated changing the way they store, prepare, or cook produce (27). Because fresh produce are not commonly associated with foodborne illness, many consumers may not be willing to change their unsafe produce handling practices. Bruhn and Schutz (8) found that over 90% of California consumers were either very confident or somewhat confident in the safety of fruits and vegetables. Only 27% of Southern California consumers reported being very or somewhat concerned about bacterial contamination of fresh produce (22). Consumers appear less concerned about the safety of produce than the safety of meat, seafood, and dairy products (29). Likewise, only 10% or fewer of consumers were concerned about the safety of produce in terms of disease or getting sick (10%), bacteria (9%), and contamination (5%) (30). In addition, the mail survey conducted in spring 2000 by this paper’s authors indicated that over 30% of consumers were not interested in receiving information on safe handling of fresh produce (23).

Despite the relatively low level of consumer sensitivity to potential risks from microbiological contamination, concern for the safety of fresh produce is increasing. One 1998 survey found that 58% of consumers are more concerned about bacterial contamination of produce than they were a year ago (30).

Many participants thought that the safe handling instructions in the form of a supermarket brochure was impractical or too time-consuming. Although the brochure was perceived as being easy to read and follow, some consumers may believe that the task of proper cleaning and sanitation is too time-consuming or bothersome. In a related area, Harnack et al. (16) found that people who believed that consuming a more healthy diet is difficult are less likely to make dietary changes. Therefore, the perception that proper cleaning is burdensome is a serious impediment to safe handling.

However, the focus groups did provide some useful insights on how safe handling guidelines of fresh produce could be effectively distributed to consumers. One effective distribution method is to print the guidelines in languages other than English. One survey suggested that Hispanics report greater awareness than Asians of safe food-handling labels on packages of raw meat and poultry because the labels were printed in Spanish but not in any Asian language (42). The focus groups also provided many examples of how produce safety materials might be delivered, suggesting that the safe-handling messages need to be distributed through many different convenient sources and various food safety and health education programs (8, 34, 42).

The media may also play an important role in the distribution of food and fresh produce safety issues and guidelines. Recent outbreaks associated with consumption of fresh produce may heighten consumers’ concerns (30). Results from one survey suggest that television programs and newspaper articles may effectively communicate food safety information (34). Another way to enhance consumer awareness and motivation to change food handling practices is to include statements from reliable sources, such as Consumer Reports, in any materials distributed to the public (8). Consumers are more likely to trust the food handling guidelines in brochures if the web addresses of reliable food safety experts and organizations are included.

Education on fresh produce safety, as well as general food safety and good hygiene practices, should be targeted toward children and young adolescents (7). The focus group sessions suggest that adult consumers are greatly influenced by young children or by what the adults themselves had been taught at a young age. Thus, messages on safe food and produce handling should be incorporated into school curriculums. Focus groups can be used to increase the understanding of consumer safe handling principles, to identify information needs, and to verify and enhance effective consumer tools.
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