



## Recipe Websites: A Novel Medium for Disseminating Food Safety and Origin Information

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### ABSTRACT

This paper outlines a novel approach to increasing public awareness of food safety and supply concerns through the medium of popular cooking websites. When a recipe containing the words chicken, beef, pork, turkey, eggs, or milk is accessed, the corresponding food safety and origin information will appear in a box under the cooking directions. By directly targeting the people at greatest risk of contracting or disseminating pathogens through improper food preparation, this initiative will help to reduce the number of cases (76 million) of foodborne illness diagnosed in the United States each year. The initiative will also serve a central database of websites that provide consumers with reliable information about specific pathogens, food labeling terminology, and current issues in animal production.

### INTRODUCTION

At a time when dollars and ballots have never been more powerful in shaping the future of agricultural production systems, consumers have never been more detached from the origins of their food. With an estimated 80% of the population living in urban environments, the answer to the question “Where does chicken come from?” may sadly soon become “the frozen food aisle” (7). Fortunately for the consumer, the United States Department of Agriculture (USDA) and Food and Drug Administration (FDA) have enacted countless programs to keep people safe from threats they may not even know exist. Slaughterhouses are required to maintain strict cleaning and disinfection protocols to prevent the contamination of meat products with enteric bacteria. Food must be processed, packaged, and stored within strict guidelines to minimize microbial growth. Labeling regulations ensure that the consumer knows what they have purchased and how they should safely prepare it. Yet despite these precautions, an estimated 76 million foodborne illnesses occur every year in the United States (14).

The journey from grocery store to plate is clearly important in determining the risk of foodborne illness. A recent survey of 153 restaurants that prepare egg dishes found that 26% stored eggs at room temperature, 54% pooled raw eggs intended for future use, and at least 42% sanitized cooking utensils at intervals of more than four hours (13). These practices were identified as risk factors for foodborne disease in the government sponsored Egg Safety Action Plan. If trained professionals are unaware of basic food safety principles, it is unlikely that the average household cook does any better. Improper food preparation in the

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home has been linked to a significant number of foodborne disease outbreaks all across Europe, North America, and Australia (16). Almost every household in an Australian study reported handling food in a manner that could lead to contamination (15). The most common mistakes occurred with storage and cooking temperatures and leaving foods unrefrigerated for more than 4 hours (2, 3, 10). It seems that, when asked, most people can recite good food safety tips, such as hand washing or using separate preparation utensils for raw meat and vegetables, but because of an underestimation of risk, the practices are not being translated into everyday use (14).

Cultivating awareness of emerging food supply concerns is challenging when people are so far removed from production systems and their primary exposure to agriculture is through activist campaigns or food distributors. Consumer trends are shifting toward organic, welfare-friendly, and raw milk products, but few people have a clear idea of exactly what these products entail (24). Ambiguous product label terms such as “cage-free,” “natural,” and “no residues,” are in part responsible for perpetuating myths about the quality of conventionally raised products. Ironically, the primary reason people cite for drinking raw milk is health benefits, despite the fact that any unpasteurized dairy products can pose a significant risk to human health (12). The other key problem is the abundance of unreliable and biased information circulating on the Internet. When the term “raw milk” was entered into a popular search engine, the FDA fact website was the 10th listing. Misinformation can have serious consequences when it comes to making policy decisions. For example, Proposition 2 in California, a ballot initiative dealing with space requirements for production animals, received overwhelming support from voters despite legitimate concerns that it was not properly worded to ensure animal welfare and could jeopardize the ability of production systems to meet consumer demands (1).

While there are many reputable resources on the Internet, consumers may not know how to access them or even that they should be accessing these websites. Food safety is an important component of everyday living, so it is logical that food safety information be located on websites that people use regularly, especially those that are dedicated to the preparation of food. We propose a new initiative designed to integrate simple food safety tips into online recipes involving beef, pork, poultry, fish, and dairy products to reinforce the importance of appropriate food storage, handling, and preparation. Providing links to the Centers for Disease Control and Prevention (CDC) web-

pages that outline the disease risks associated with specific food products and to other reputable websites with valuable farm-to-fork educational resources will help consumers develop the knowledge base to make informed decisions about the food they eat and the policies that bring it to the table.

## FRAMEWORK

The first step in this initiative will be enlisting the support of top online recipe and cooking websites. As the resources required to implement the project are minimal relative to the potential impact on foodborne illness, it is likely that at least some of the major websites would agree to participate. Based on current CDC and USDA recommendations, a list of 4 or 5 important food safety and origin facts should be developed for beef, pork, poultry, fish, and dairy products, keeping in mind the importance of selecting tips that will be practical for people to implement. In a study ranking people’s ability to follow 55 food safety precautions, using separate cutting boards, keeping pets out of the kitchen, and washing meat prior to preparation were listed among the most difficult (8). Cleaning kitchen counters frequently, heating food as long as recommended on the package, and hand washing were ranked among the easiest.

As shown in Figure 1, when people access a recipe containing the words chicken, beef, pork, turkey, eggs, or milk, the corresponding food safety and origin information should appear in a box under the cooking directions. There should also be a link directing people to a central webpage that provides a complete list of safety tips for each product and serves as a database of other reputable websites with in-depth discussions of foodborne illnesses, food safety guidelines, product labeling information, and current issues in food production systems. The central website can be programmed to record the number of visitors and whether or not the additional links were followed.

The simplest means of evaluating the success of this initiative is to track overall website usage and the percentage of visitors that follow links to the central webpage and/or external educational resources. If the brief food safety information provided with each recipe is of sufficient interest and relevance, then at least some visitors should be motivated to browse through more detailed websites. To identify the most effective method of disseminating information, different presentation formats can be tried and compared by monitoring usage statistics. As an adjunct evaluation method, an optional online survey can be offered through the recipe websites to gauge general knowledge about food safety and to encourage suggestions

## Roast Chicken with Herbs

### Ingredients

- 2 whole chickens, rinsed and patted dry
- Salt and pepper
- 1 Bunch fresh thyme
- 1 Bunch fresh rosemary
- 2 Tablespoons butter at room temperature

### *Food Safety Fact Sheet*

Did you know...

- Raw chicken should be kept refrigerated at 40°F and used within 1 or 2 days of purchase
- The color of cooked chicken is not a sign of safety. Always use a meat thermometer to make sure the chicken has reached a minimum internal temperature of 165°F
- Wash your hands! Most foodborne illness outbreaks from *Salmonella*, *Campylobacter*, and *Listeria* are the result of contamination by food handlers.
- It is illegal to use hormones in the raising of chickens in the United States. All chicken products are inspected by the USDA to ensure quality

For more information, visit [www.foodsafetyandorigin.org](http://www.foodsafetyandorigin.org)

Directions

- Preheat oven to 475°F. Season chicken cavities with salt and pepper

for making the food safety tips more helpful or to include other information that consumers would find useful. Sampling biases aside, the results would provide valuable insight into prior consumer knowledge and how that knowledge changes over time, particularly when reports of foodborne disease outbreaks appear in the media.

### **SIGNIFICANCE**

Consumers are well known to engage in behaviors that place them at risk for *Salmonella*, *Escherichia coli*, and *Campylobacter*, among other enteric pathogens. Over a 12-month period, approximately 50% of people consume undercooked eggs, 20% eat pink hamburgers, 1.4% drink raw milk, and approximately 20% don't wash their hands or the cutting boards after preparing raw meat (22). The CDC estimates that *Campylobacter* affects 2.4 million adults each year, causing approximately 124 deaths, and *Salmonella* is responsible for at least 40,000 reported cases of foodborne illness each year (5, 6). The annual cost of gastrointestinal illness was estimated at around \$100 per capita (19). Many of these cases could be prevented with appropriate food safety measures. The people at greatest risk, based on prevalence studies, appear

to be children and women in the 25–44 age group, which may represent exposure of parents to children or exposure to risky products in the kitchen during meal preparation (18). Integrating food safety facts directly into the recipes being used to prepare meals will serve as a good reminder of the simple precautions that can be taken in the home.

Although food-handling instructions are already placed on product labels, they appear to have little influence on consumer practices. A survey conducted by the CDC indicated that only 40% of respondents read through the label instructions, and of those, only 37% changed their meat preparation habits (21). Furthermore, young adults, who are at increased risk of foodborne illness, are significantly less likely than people over 30 to notice the existence of a label (22). Personal experience shows that the font is often too small and the instructions too ambiguous to be of great practical value. For some meat products, the food safety instructions are actually located underneath the label, so that reading them is likely to increase the risk of cross-contamination. Using the Internet to disseminate food safety instructions is likely to appeal to a much younger audience and offers more opportunity to present food safety tips in a user-friendly format.

Generating awareness of agricultural production systems is just as important as disseminating food safety information when consumers are making decisions every day about the types of foods they eat and, with increasing frequency, decisions at the polls about how that food gets produced and distributed. Studies have demonstrated a strong disconnect between meat consumers and their perceptions of live animals. For example, consumers in a Danish study tended to think of animal welfare in terms of their own health and living environment but were reluctant to consider the specific details of designing welfare-friendly animal production systems (9). Schroder et al. also made the important distinction that consumer views on societal standards for meat production do not necessarily coincide with behavior at the time of purchase (17). The cost of meat raised in welfare-friendly systems may outweigh the ethical advantages for many consumers. This suggests overall that while consumers may have good intentions about their food choices, they lack a complete understanding of the factors involved in bringing it to the table. Programs that can generate some interest in production system issues may be of great future importance.

The Internet is already widely used to disseminate health information and can be very effective in stimulating behavioral change (4). However, the current challenge for public health officials lies in attracting consumers to reputable websites among the many thousands still perpetuating food safety myths. In 2006, the Canadian Health Network (CHN) launched a “viral” campaign to build Internet traffic on government health promotion websites (11). The initiative was presented as an online game that revolved around individuals disseminating word of the campaign to friends and relatives nationwide via electronic invitations. From an initial 215 individuals, the campaign was able to generate 110,200 active web participants in under 15 days with no media advertisement and a budget of only \$40,000. New subscriptions to CHN e-newsletter doubled in number from the previous 6 years combined. Because of the amount of traffic through online recipe websites, this initiative places food safety information where the average uniformed consumer is most likely to stumble across it. The target audience is also people handling raw meat, poultry, and fish products and therefore the ones most likely to be at risk of contracting or spreading gastrointestinal illnesses through improper food preparation. If the project appears to be successful, applying a “viral” platform, as in the Canadian study, could allow for much greater dissemination of food safety tips.

Consumers also cite the need for better explanations of terms like “organic” or “free-range” in relation to food production and safety (23). Because of extensive media attention, this information would be likely to be of greater interest than just basic food handling tips. Gauci et al. (10) found that consumers were more likely to remember food safety information if an immediate acquaintance had been affected or if they had heard a great deal of information about the topic in the media. This initiative is unique in pairing the two subjects, food safety and food origin, together in an effort to increase general knowledge of where food comes from. Even if people just skim over the food safety facts, it is hoped that they will become aware that it exists as a resource should future questions arise.

This initiative also addresses many of the key Healthy People 2010 focus areas proposed by the U.S. Department of Health and Human Services to promote good quality of life (20). Under Objective 10, Food Safety, including pertinent information on websites can help reduce infections caused by key foodborne pathogens and increase the proportion of consumers who follow key food safety practices. For Objective 11, Health Communication, this initiative includes an online survey to gauge prior consumer knowledge and to provide feedback about the utility of the website. It also increases the traffic to governmental public health websites that provide reliable information on food safety and many other important public health issues.

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