

## Emerging Issues

This paper on emerging issues in food safety and the challenges these issues pose to the education of consumers on safe food handling, was developed by Ellen Steinberg under contract to the non-profit Partnership for Food Safety Education. [March 2011] [www.fightbac.org](http://www.fightbac.org)

It is well accepted that globalization of the food supply, centralized large scale production and distribution of food, microbial diversification and emerging pathogens are just some of the factors that influence the safety of the food we eat. Food can become contaminated at any stage of the food production process, and many of these threats cannot be controlled by consumers. For instance, in 2009, the *Salmonella* outbreak caused by contaminated peanut butter was a public health threat that could not have been eliminated by an individual's food handling behaviors. Conversely, in 2010, the impact of the *Salmonella* outbreak associated with shell eggs could have been reduced, although not eliminated, by consumers' compliance with the food safety recommendation to cook eggs thoroughly. However, while there is an inherent risk associated with consumption of any food, the majority of food related illnesses are preventable if food safety principles are understood and practiced from production to consumption (Jacob, Mathiasen and Powell, 2010).

To begin, it is important to acknowledge that, each year, an estimated 31 major pathogens acquired in the United States cause approximately 9.4 million episodes of foodborne illness (Scallan, 2011). In addition, these illnesses are an underestimation of the total burden, because additional food related illnesses are probably caused by a heterogeneous group of unspecified agents (Scallan, 2011). Looking ahead, there is strong and consistent research indicating that environmental changes will produce unknown safety consequences for the food supply (American Dietetic Association, 2009; Carlin, 2010; Marques, 2010; Martinez-Urtaz, 2010; Paterson and Lima, 2010). For example, climate anomalies have already expanded the risk area and season for vibrio illnesses (Martinez-Urtaza, 2010), and an increased number of outbreaks from chemical and microbial contamination of seafood are likely to occur in the future (Marques, 2010). In addition to environmental changes, there is consistent evidence indicating that novel food processing techniques and microbial genetic variability may alter the survivability characteristics of certain pathogens; thus, some of the current food safety recommendations that address cook and chill may not be adequate to destroy or control these harmful microbes (Nyachuba, 2011; Rodriguez-Marval, 2009; Rodriguez-Palacios, 2010; Sergelidis and Abraham, 2009). Additionally, it is important to note that viruses cause more foodborne illnesses than do bacteria (Scallan, 2011). Hence, hand hygiene recommendations may also need to be reviewed to account for the fact that alcohol-based hand sanitizers have proven to be relatively ineffective in reducing the level of human enteric viruses from contaminated hands (Liu, 2010).

While the dynamics of the food supply chain are constantly changing, so are the demographics and lifestyles of consumers. For example, in 2009, there were approximately 39.6 million Americans over the age of 65 and this number is predicted to reach 72.1 million by 2030 (DHHS/AOA, 2009). Also, due to innovative medical interventions, people with chronic illnesses, such as HIV/AIDS, diabetes, and cancer, are living longer. In addition to changing demographics, lifestyle changes have increased the demand for ready-to-eat and refrigerated or frozen foods as well as increased the number of consumers who eat outside of the home (Nyachuba, 2011).

Cumulatively, these shifts increase the number of consumers who are at a relatively high risk of acquiring a food related illness. Hence, to optimize the effect of safe food handling messages, research suggests that risk communication should target specific audiences as opposed to the general population (Jacob, 2010; Patil, 2005).

In addition to the current Fight BAC!<sup>®</sup> messages, the 2005 Dietary Guidelines for Americans includes the following message: “Avoid raw (unpasteurized) milk or any products made from unpasteurized milk, raw or partially cooked eggs or foods containing raw eggs, raw or undercooked meat and poultry, unpasteurized juices, and raw sprouts.” Yet, strong and consistent evidence shows that consumption of raw or undercooked animal products is relatively common in the United States (Abbot, 2009; Byrd-Bredbenner, 2008; Cates, 2009; Hoffman, 2005; Samuel, 2007; Trepka, 2006). Limited, but consistent, research indicates that undercooked meat and runny eggs are among the most commonly eaten risky foods (Samuel, 2007; Trapeka, 2006) and that consumption of unpasteurized milk and cheese is a growing public health threat (LeJeune 2009; MacDonald, 2005; US Fed News Service, 2009). Hence, “avoiding risky foods” is a relevant food safety message that should be addressed.

Many traditional methods (pH, temperature, water activity) for controlling bacterial levels in food have proven to be ineffective against viral pathogens (Grove, 2006). Even new irradiation dosages recommended for controlling *Escherichia coli* O157:H7 on lettuce may not be effective against viruses (Niemira, 2008). However, experts agree that alternative technology has much potential in the food industry for controlling pathogenic organisms. Paradoxically, while consumers express willingness to pay more for food “guaranteed” to be free of harmful pathogens, they also indicate reluctance to purchase products that have been processed with new technology (Brewer and Rojas, 2008). Thus, it appears that consumer education, regarding the overall safety of innovative technology, is warranted.

As summarized by the 2010 Dietary Guidelines Advisory Committee (DGAC), consumers need to have a better understanding of their role in ensuring the safety of the food they eat. In terms of consumer behavior, strong evidence shows that food safety education that focuses on hand sanitation, use of food/appliance thermometers, prevention of cross-contamination, and consumption of risky foods could prove beneficial (DGAC, 2010).

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