Oral Ingestion of Infectious Antigens Through Beverage Cans Surface Contamination.

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Abstract

The United States experiences approximately 76 million food borne illnesses each year, with 325,000 hospitalizations and 5,000 deaths. Only 14 million are identified, while 62 million pathogens go unidentified (*Gamarra, 2012*). One area with limited research has been the study of oral ingestion of surface contaminants from food and beverage containers. Projected growth trends in globalization over the next coming years suggest that large scale food production and distribution will be greatly impacted. The canning industry globally is expected to meet this demand, potentially adding to an already existing 76 million cases of food borne illnesses annually. This increased demand can increase improper processing, handling and storage conditions that may contribute to the 62 million unidentified cases of food borne illnesses.

Based on research literature reviewed, three common findings were derived from the reference sources that indicated that food and beverage containers have the potential to be exposed to a variety of infectious and environmental agents ranging from E. Coli (*Escherichia coli*), Salmonella and Hantavirus to environmental airborne contaminants, such as lead and Arsenic (*Altekruse et al, 1997*). One of the most compelling study findings was the study which focused on can openers, food and beverages can top surfaces. These items indicated high levels of bacterial and fungal contamination. The findings suggest that diagnosis methods for food borne illnesses are not identifying pathogens and their sources in the 62 million pathogens that go unidentified each year (*Gamarra, 2012*). Studies have shown that infectious agents ranging from E. Coli (*Escherichia coli*), Salmonella and Hantavirus, *Klebsiella pneumonia* and S*taphylococcus* and spore forming *Bacillus* species to environmental airborne contaminants, such as lead and Arsenic exist in the general environment and available in and around food preparation, handling storage and eating locations. Washing the surface of the cans were somewhat effective, however, because of the tab area beverage cans are more than likely have a greater propensity to hold bacteria under the tab and varying uneven surfaces. The resultant outcome may be an increase in the likelihood of food borne illness due to surface contamination by pathogens during consumption even after washing or rinsing.

In closing, the study has presented evidence that it is very likely that amounts of various bacteria and other surface contaminants are consumed each time when a beverage is consumed from a can, even with rinsing and wiping. Findings suggest that storage and handling of these containers play an important part in this process. Concerns over plastic containers, specifically Bisphenol A (BPA) as a health risk continue to grow, making the can industry the primary alternative for food and beverage containers (Zeratsky, 2012). The challenge moving forward is to maintain the cleanliness of the containers once they leave the manufacturing facility through improved container designs that prevent contamination and better storage practices. The relationship of these surface contaminants to the actual causal relationship of food borne illness needs further research and study to determine the exact causal relationship and it impact on the 62 million unidentified food borne illness a year.