

***Salmonella* Typhimurium Outbreak Associated with Frozen Chicken Entrees Minnesota 2006**

Background

In 1998 and 2005, two outbreaks of salmonellosis associated with eating frozen, pre-browned, single-serving, microwaveable stuffed chicken products were identified in Minnesota. Thirty-three cases of *Salmonella* Typhimurium infection associated with consumption of Maple Leaf Farms Chicken Kiev were identified in the 1998 outbreak. Four cases of *S. Heidelberg* infection associated with consumption of Cub Foods Chicken Broccoli and Cheese were identified in the 2005 outbreak. The investigations of these two outbreaks lead to minor label changes of the two specific brands of stuffed chicken products.

Two additional outbreaks associated with the same type of product were identified and investigated in Minnesota in 2005 and 2006. Twenty-seven cases of *S. Enteritidis* infection associated with multiple brands and varieties of frozen, stuffed chicken products occurred from August, 2005 through July, 2006. During the *S. Enteritidis* investigation, an outbreak of *S. Typhimurium* infections was identified when the Minnesota Department of Health (MDH) Public Health Laboratory identified human-case isolates of *S. Typhimurium* that were indistinguishable by pulsed-field gel electrophoresis (PFGE).

Methods

All *Salmonella* cases reported to MDH are routinely interviewed about food consumption and other exposures as part of enteric disease surveillance in Minnesota.

The Minnesota Department of Agriculture (MDA), the Centers for Disease Control and Prevention, the United States Department of Agriculture (USDA) Food Safety and Inspection Service (FSIS), and other states were notified of the *S. Typhimurium* cases.

The MDA Dairy and Food Inspection Division collected products for testing that the *S. Typhimurium* cases had purchased at the same time as the products consumed in the week before their illness onset. The MDA Microbiology Laboratory cultured the products for *Salmonella*, and all isolates were sent to the MDH Public Health Laboratory for PFGE subtyping.

Results

Three cases with *S. Typhimurium* isolates of an indistinguishable PFGE subtype (designated TM2c) reported eating Cub Foods (produced by Aspen Foods, P-1358) stuffed chicken products in the week prior to onset of illness. Dates of illness onset ranged from April 16 through June 25, 2006. Two of the cases were hospitalized. The cases reported eating several varieties of the products: Kiev, Broccoli and Cheese, Mushroom and Cheddar, Mushrooms in Wine Sauce, and/or Romanov. *S. Typhimurium* that matched the cases' isolates' PFGE subtype was isolated from a product which one of the cases purchased at the same time as the products he consumed before his illness onset. The product was Chicken Mushrooms in Wine Sauce, with a production code of

5154, which represents a June 3, 2005 production date. Additionally, *S. Typhimurium* TM2c was isolated from products collected from two of the *S. Enteritidis* outbreak case-households. Both products were produced by Aspen Foods (P-1358) and had production codes 6033 and 6061, which represent production dates of February 2 and March 2, 2006.

All three cases of the *S. Typhimurium* outbreak cooked the chicken products in the microwave, and none took an internal temperature after cooking.

In March, 2006, shortly before the recognition of the *S. Typhimurium* outbreak, the USDA FSIS sent a letter to all processing plants that make these or similar products to those recalled, instructing them to re-evaluate the adequacy of the package labels to ensure that the consumer is aware that these products are “uncooked”. Also in response to the outbreaks, the National Advisory Committee for the Microbiological Criteria for Foods (NACMCF) issued new guidelines for labeling this type of product. These guidelines included: advising consumers that microwaving raw poultry from a frozen state is not advisable unless the manufacturer instructions ensure that they achieve the recommended (165°F) endpoint temperature; the principal display panel of the label should have a warning declaration explicitly stating that the product contains raw poultry; and reminding consumers to fully cook the product when the product is raw but gives the appearance of being fully cooked. The processing plants were required to submit the new labels for USDA approval within 8 months.

After the recognition of the *S. Typhimurium* outbreak, USDA FSIS issued a consumer alert on July 3, 2006. The consumer alert included instructions to consumers on needing to “take multiple temperature readings using a food thermometer at different locations throughout the product due to the non-uniformity of the heating process and the creation of ‘cold spots’” when cooking these products in the microwave. This alert was not run in local newspapers, and did not appear to have an effect on the outbreak. On July 20, MDA and MDH issued a joint press release notifying Minnesota consumers about the outbreak, and strongly advising against cooking these types of products in the microwave.

Discussion

This was the fourth outbreak of *Salmonella* infections in Minnesota associated with eating frozen, pre-browned, single-serving, microwaveable stuffed chicken products. Even though these products are raw, the products’ cooked appearance and the labels’ microwave instructions have lead to consumers undercooking the products. The three cases in this outbreak cooked the products in the microwave. Despite instructions on the label to take an internal temperature to ensure that these products were cooked thoroughly, none of the cases took the internal temperature.

Under the new label requirements, consumers will more easily identify the product as raw. The producers were required to verify that the cooking instructions (time and temperature) on the label are sufficient for the product to reach the appropriate internal temperature.