

## ***SALMONELLA HEIDELBERG ASSOCIATED WITH A BAKERY***

### **BACKGROUND**

Within a 24-hour period in August 1998, the Acute Communicable Disease Control Unit (ACD) received two foodborne illness reports involving persons who became ill after attending unrelated parties. Within a few days, a total of six foodborne illness reports had been received. All those involved had become ill after attending unrelated parties held on the first weekend in August; most of the parties had been held on August 1. The only food item common to all the parties was Tres Leches cake purchased from a specific Mexican bakery.

### **METHODS**

ACD accompanied the Food and Milk Unit during an inspection of the bakery. The bakery was asked to supply names and telephone numbers of persons who had purchased Tres Leches cakes on August 1. Lists of persons attending each party were requested from hosts. Interviews were conducted using a standardized questionnaire. Additional case finding methods included notification of the district health centers about the outbreak, and routine surveillance through review of Salmonellosis Case History Forms and Foodborne Illness (FBI) reports. Stool specimens were submitted to the Public Health Laboratory (PHL) as follows: (1) specimens from all bakery employees; (2) specimens from a sampling of ill victims from six parties where illness was reported; (3) twelve environmental samples taken at the bakery during the site visit; (4) samples of pooled egg yolks and egg shells from a flat taken from the bakery (eggs were not from the batch used for the implicated Tres Leches cakes; none were left); (5) leftover cake from four different parties and the whipped cream frosting from one of the cakes. Invoices were requested for the ingredients used to prepare the cakes.

### **RESULTS**

Environmental. During the site visit to the bakery on August 5, eggs were found in flats on the preparation table at a room temperature of >90° F. At delivery, eggs were cracked and encrusted with dirt, straw, and feces. The bakery owner reported that eggs were hand-cracked for pooling. No other high-risk foods, including meats, were found. Milk products were pasteurized, although one carton of milk was found at room temperature. The bakery was closed until the owner corrected the violations and attended a class for foodhandlers.

Epidemiology. Approximately 242 persons attended eight of the ten parties identified as purchasing Tres Leches cakes on August 1; persons from eight of ten parties were contacted. One party denied illness among attendees, and one party reported illness but

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refused to submit specimens. The remaining six parties were included in the case-control study. The case-control interviews revealed that the parties had no food in common except the Tres Leches cakes. One hundred seventy persons were interviewed either personally or by proxy; 114 persons (67%) reported illness after eating cake. Four persons were hospitalized; there were no deaths.

Laboratory. The results of cultures conducted by the PHL were as follows: (1) 17 party attendees were stool culture positive for *Salmonella heidelberg* (these persons represented six of the eight parties); (2) three of four leftover cake pieces, as well as one whipped cream frosting used on the cakes were positive for *Salmonella heidelberg*; (3) all employees were stool culture negative; (4) all environmental cultures were negative; (5) cultures of the pooled egg yolks were negative for enteric pathogens; one egg shell pool was positive for *Salmonella cerro* and *infantis*.

On August 9, a site visit by the State Department of Food and Agriculture and ACD was made to the egg distribution plant listed on the bakery invoice. No conclusions could be reached regarding the farm where the eggs originated. Even eggs prior to washing at the distribution plant did not appear as grossly contaminated with dirt, straw, and feces as the eggs found at the bakery on August 5.

## CONCLUSIONS

The epidemiological data, stool culture results from ill persons, and culture results from the Tres Leches cakes implicated the cakes as the vehicle for this large outbreak. The combined odds ratio for the Tres Leches cakes for seven parties with illness was OR 62.71 (17.06, 255.12); p value: <0.0000000. The most likely source of *Salmonella* contamination was the eggs which, as seen at the time of inspection, were below standard for sale in California according to the State of California Department of Food and Agriculture. Cross-contamination via hands, from raw eggs (especially if the shells are feces-encrusted) to uncooked whipped cream frosting, equipment, or food preparation surfaces, was the most likely method of transmission. The originating source of the eggs could not be determined. It was likely that these eggs were not acquired through the distributor named on the invoices obtained from the bakery.