## Letter to the Editor

### *Perfringens illness associated with beef prime rib served in a restaurant*

DEAR SIR:

The City of Milwaukee Health Department was alerted to an alleged outbreak of foodborne illness on March 24, 1975. Thirty four public school teachers had participated in a dinner party at a Milwaukee restaurant on March 21, 1975. Six had been served a whitefish entree, none of these reported having become ill. Each of the remaining 28, who had been served prime ribs of beef, reported having experienced various degrees of illness.

The meal had been served at approximately 7:30 P.M. Onset of illness occurred the next day. Reported times of onset ranged from 2:00 A.M. to 12:00 noon; the median time was 6:30 A.M. (11 h).

Two of 28 persons reported an onset time for illness but did not describe their symptoms. Fourteen reported having experienced diarrhea and cramps; seven indicated diarrhea only; three diarrhea, nausea, and cramps; one diarrhea and nausea; and one diarrhea, vomiting, and cramps. Duration of illnesses ranged from 1 to 30 h with a median time of 12 h.

Prime ribs of beef, from the suspect meal, were not available from the restaurant. However, a portion was obtained from a home refrigerator of one of the teachers who had taken home a "doggy bag."

Stool specimens (collected on March 24, 1975) were received from three of the complainants on March 25, 1975.

Direct microscopic examination of a $10^{-1}$ dilution of beef revealed an average of 1-2 gram-positive bacilli per oil immersion field (10 fields examined). The aerobic plate count of the beef was $9.8 \times 10^5$ per gram. The *Clostridium perfringens* population was calculated to be $2.8 \times 10^6$ per gram. Characteristic sulfite-reducing colonies were not present among 32 which developed in a plate of commercial Sulfite-Polymyxin-Sulfadiazine (S.P.S.) medium seeded with 1.0 ml of a $10^{-5}$ dilution of beef. Subcultures were prepared from each of these colonies. Twenty eight isolates were found to require anaerobic conditions for growth. Each was comprised of gram-positive bacilli. The isolates were found to be non-motile, to liquefy gelatin, produce stormy fermentation in iron-milk, and to be indol-negative. The isolates were variable in their ability to reduce nitrate in commercial Indole-Nitrite medium. Each did reduce nitrate when tested by the method of Hauschild and Hilsheimer (Appl. Microbiol. 27:78-82, 1974).

A $10^{-4}$ dilution of beef gave rise to 351 colonies in S.P.S. medium. Only six of these produced a very weak indication of sulfite reduction; the balance showed no evidence of blackening. These six isolates were confirmed as *C. perfringens* by biochemical and carbohydrate fermentation characteristics.

A recheck of the 34 isolates (beef) in commercial S.P.S. medium and Tryptone-Sulfite-Cycloserine medium (commercial S.F.P. base) revealed evidence of sulfite-reduction only in the latter.

Thirteen *C. perfringens* isolates were obtained from stool specimens received from three teachers. Each of these was confirmed by biochemical and carbohydrate utilization characteristics.

Subcultures of the six isolates, from the $10^{-5}$ dilution plate of S.P.S. medium, and the 13 stool specimen isolates were forwarded to the Food Research Institute (F.R.I.), Madison, Wisconsin. Each was determined to be toxigenic type A *C. perfringens* by guinea pig skin assay. Each isolate was found to produce less than 1-5% sporulation in Duncan-Strong medium. Consequently, it is not surprising that only one isolate (from prime rib of beef) produced enterotoxin in vitro; detectable by counter current immunoelectrophoresis. The fact that the enterotoxin producing isolate was recovered from beef supports the conclusion that *C. perfringens* enterotoxin was involved in the outbreak.

The 19 isolates were also examined at the Entero-bacteriology Branch, Bureau of Laboratories, Center for Disease Control, Atlanta, Georgia. Only one (stool specimen isolate) produced a serotyping reaction when tested against pools prepared from 91 antisera presently available. Six were autoagglutinable and 12 were non-agglutinable.

The restaurant chef stated that beef ribs are supplied in sealed cryovac wrapping. When properly sealed these packages of meat are said to store well, up to 3 weeks, when kept under refrigeration. Without an intact cryovac wrapping the refrigerated ribs remain organoleptically acceptable for only one week.

The chef also stated it is his practice to process the ribs in a commercial rib oven for over 3 h. The oven heat source is then cycled to hold the ribs 6 to 10 h at 150 to 160 F. He reported that one rib oven had been malfunctioning on the day of the outbreak and that he had to reprocess the ribs in a conventional oven.

Complainants had requested ribs to be prepared medium-rare, but considered them to be rare when served. Orders were returned to the kitchen for reprocessing. One complainant judged the entree to be cold when served. She further stated the rib appeared charred on the outside when returned from the kitchen, but that it remained rare inside.

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## *Errata*

# Microbiological Criteria for Food in Military and Federal Specifications

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Vol. 39, No. 1, p. 55, last sentence of abstract and introduction and last sentence on pg. 57 should read: "Specifications for food may be obtained by writing to the Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120." Do not send requests for Technical Reports or LP/P Des documents to this address. Technical Reports may be obtained by writing to the author of the report and LP/P Des documents listed in Table 4 are not available for public distribution.