

Case study A - Conclusions

Investigation findings

Bacillus cereus was isolated from the faecal specimens of those people who had been ill and also from the remains of the risotto. The risotto was therefore the vehicle and the rice the original source of the bacteria.

The rice had been cooked at 12.00 noon Friday 10th November. After cooking it had been left to cool at room temperature overnight. It was then transported unrefrigerated. It was reheated by microwave oven just prior to service.

Explanation

The rice contained spores of *Bacillus cereus*. Normal cooking is incapable of destroying spores, in fact the heat activates the spores so that on long slow cooling they germinate and produce large numbers of vegetative bacteria. The bacteria multiply and produce toxins (this is the main hazard). These toxins are heat resistant and would not have been destroyed by normal cooking methods including the use of the microwave.

Controls

The main control is to serve the rice immediately after cooking or keep the rice above 63°C prior to serving or to cool the rice rapidly, for example with cold running water. The rice should then be refrigerated at below 5°C.

The rice should then be reheated thoroughly and only allowed to be at room temperature for a short period of time (maximum 30 minutes), during further preparation or waiting to be served.

Case study B - Conclusions

Investigation findings

Staphylococcus aureus was isolated from the nasal swab of a food handler who prepared the mayonnaise. After preparation the low-acid mayonnaise had been left in the kitchen at 26°C for around 8 hours. The same strain of *Staphylococcus aureus* was isolated from the mayonnaise and toxin isolated from vomit specimens of ill persons.

Explanation

The source of the pathogen was the nose of the food handler and the vehicle the mayonnaise. The cause of the outbreak was contamination of the mayonnaise by the food handler and the storage of the mayonnaise for 8 hours at 26°C, which allowed the production of exotoxin. (Contamination and toxin production are the hazards).

Controls

The controls involve the training, instruction and close supervision of staff to ensure they always wash their hands after sneezing or touching their nose. The other important control would be to purchase the mayonnaise or if home-made to prepare it immediately prior to consumption or to store under refrigeration as soon as it has been made.

Case study C - Conclusions

Investigation findings

A retained sample of the chicken and gravy contained high levels of *Clostridium perfringens*, which was also isolated from the majority of ill children.

The source and vehicle was the chicken.

Explanation

The cause of the outbreak was the long, slow cooling of the chicken after boiling. The spores of *Clostridium perfringens* would have been activated by the cooking and germinated to produce vegetative bacteria. The long, slow cooling would have resulted in rapid multiplication, especially around 45°C when it would take only 10 minutes to double the numbers present.

After consumption, sporulation within the stomach and intestine would have released enterotoxin in sufficient amount to cause food poisoning.

Controls

The chickens should have been removed from the boiler, separated and cooled as quickly as possible after the temperature had reached 63°C. The critical temperature range for *Clostridium perfringens* is between 30°C and 50°C.

After cooling for around 1.5 hours, the chickens should have been placed in a suitable refrigerator, i.e. one with adequate capacity and not used for raw food.