

STAPHYLOCOCCUS FOOD POISONING

Recommendations for its prevention and control

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The recent Report on the occurrence of Food Poisoning in England and Wales during 1965, showed that there were 74 incidents of Staphylococcal food poisoning, viz: 11 general outbreaks, 14 family outbreaks and 49 sporadic cases. The total number of persons affected were 899, this being more than twice the number recorded in 1964. Three large outbreaks occurred in schools and accounted for 462 cases.

Most of the contaminated foods associated with the outbreaks were pro-

cessed or made-up meats.

It is well known that *Staphylococcus aureus* is commonly found in nature and the organisms are widespread among healthy persons, being present on the skin, in the throat and in the nasal passages. In fact, in recent surveys, it has been shown that 50 per cent. of normal persons harbour Staphylococci in the nasal passages and in 10 to 20 per cent the organisms are present on the hands and back of the wrists (Gillespie *et al.* (1939), confirmed by Miles *et al.* (1944). Nasal drip which is expelled while coughing or sneezing is quite liable to contaminate food.

Strains of Staphylococcus are present in boils, pimples, carbuncles, infected cuts

and sores, as well as in localised abscesses, periostitis, septicæmia, pyæmia, urinary sepsis and wound suppuration. They are also present on eating and drinking vessels.

Vella E. E. (1963), carried out investigations into the survival of *Staphylococcus aureus* on the water taps in a hospital. He found that the organism can survive for an appreciable period of time on metal taps, given favourable conditions.

A large number of outbreaks of food poisoning due to *Staphylococcus aureus*, have been traced eventually to human carriers of the organism.

Morrison, Fair and Kennedy (1961) made a survey of domestic animals, (canine, feline, bovine, and equine), regarding another possible source of transmission of potentially pathogenic antibiotic-resistant, coagulase positive *Staphylococcus aureus*. They found that 89 per cent of all animals sampled, yielded cultures of the organism from the nose, 56 per cent of the total nasal isolates being coagulase-positive.

Contrary to the accepted theory, it is obvious that outbreaks can, and do occur, where the food is handled in a cleanly manner by persons apparently free from infection.

The widespread presence of the pathogenic types of *Staphylococcus aureus* amongst healthy persons, can cause contamination of food, regardless of care in handling under normal sanitary conditions.

It is recognised that the "enterotoxin", which under favourable conditions is produced by certain pathogenic strains of *Staphylococcus aureus*, is heat stable. Dack (1943), found that these organisms can withstand one hour's boiling or 20 minutes at 121°C. in an autoclave. The enterotoxin also retains its toxicity when stored at low temperatures. Jordan *et al.* (1931) found not only that the enterotoxin resists heat, but also that a sterile *Staphylococcus* filtrate was toxic after storage in a refrigerator for 67 days.

In the majority of the outbreaks occurring in England and Wales due to the enterotoxin, the incriminated vehicle has been a protein foodstuff (meat), which has been cooked the day previous to its being

eaten, and left to cool overnight at room temperature, and then re-heated the next day, prior to consumption. Instances have been recorded where the protein foodstuff has been cooked, cooled and afterwards placed in an overcrowded refrigerator where the temperature (which has not been checked) was too high.

In the Report on food poisoning of all types occurring in England and Wales during 1965 (Report 1966) meat products were associated with 74 of the 84 outbreaks in which a particular food was incriminated. In 59 outbreaks, pre-cooked or made-up dishes were involved, the foods concerned were re-heated meat in 23 outbreaks, cold meat in 22 outbreaks, meat pies in 8 outbreaks and made-up dishes in 6 outbreaks.

The Report states: "It is evident that the risk of food poisoning is likely to be considerably increased if food is partially prepared on the day before consumption and subjected to direct handling."

Apart from the precautionary measures usually adopted against infection and intoxication of food by *Staphylococcus aureus* there appears to be only one effective way of controlling this type of food poisoning and that is to prevent pathogenic staphylococci from producing the enterotoxin in cooked protein foods.

It is, therefore, recommended that the following temperature standard be adopted:

- (a) 4.5°C. to be the maximum temperature at which to keep cold "cooked" protein foods.
- (b) That 61°C. be the maximum temperature for keeping hot cooked protein foods, and that 3 hours be the maximum length of time cooked protein food be kept between 4.5°C. and 61°C. including time of chilling. The length of each exposure to temperature of 4.5°C. to 61°C. must be added to that of all previous exposures when "left-over" food is involved.

The following additional precautionary measures are recommended: Do not depend on appearance, taste or smell of

cooked protein food to determine whether it is safe for consumption, since enterotoxin is odourless, colourless and tasteless (Dack 1956). The above can be determined only by the total length of time the cooked protein food has been exposed to temperatures between 4.5°C. and 61°C. Do "not" cook food well in advance of intended consumption.

Refrigeration

Before use, the cooling system must always be checked to see that the temperature remains constant at the maximum required. Frequent opening of door may give rise to fluctuations in temperature. There must be no overloading of foods in apparatus, as this is liable to cause a rise in temperature. If possible, the food should be placed in flat stainless steel pans. Do not put hot food in the refrigerator. Do not mix hot with cold protein food without thoroughly heating the mixture afterwards.

Personal Hygiene — Food Handlers

All food should be handled as little as possible — especially protein food. Any

cuts, abrasions, burns on hands or arms should be protected with clean waterproof dressings.

No person suffering from any affection of the nose, throat, ear, from severe colds or gastro-intestinal trouble, should be employed in the handling or preparation of food.

Hands should be thoroughly washed and scrubbed with a nail brush after use of the toilet.

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