

OYSTER RELATED FOOD POISONING

New South Wales has the largest oyster industry in Australia, producing an annual crop worth more than \$32 million. The Sydney rock oyster (*Saccostrea commercialis*) is considered a gourmet food, highly valued for its quality and flavour. The oyster is grown in estuaries, where it feeds by filtering large quantities of water, so any water-borne contaminants such as pathogenic micro-organisms contained in the water are likely to be concentrated in the oyster's digestive system. Heavy rainfall in the urbanised catchment area of the Georges River in Sydney produces large quantities of nutrients for the oysters grown in that estuary, particularly when the sewerage system is overloaded by storm water and discharges directly into the river.

Sydney rock oysters have been implicated in numerous food poisoning incidents. In June and July of 1978, an outbreak of food poisoning involving over 2000 people from as far afield as Great Britain was traced to the consumption of oysters from the Georges River. A further outbreak of food poisoning in Darwin affecting 60 people in December 1978 was traced to oysters which were harvested from the Georges River in August 1978. They had been frozen, packaged and subsequently shipped to Darwin in December.

Norwalk virus (which is thought to be a parvovirus and has been implicated in numerous outbreaks of gastroenteritis) was implicated in both outbreaks, and was also implicated in the food poisoning of a party of 30 Health Surveyors who consumed oysters at a regional dinner at Tamworth in July of 1984. Between April and June 1989, 23 incidents of food poisoning involving 412 people were traced to oysters from the Georges River. Norwalk virus was once again implicated.

Following the 1978 outbreaks compulsory 'purification' of oysters in tanks was progressively introduced. This involves placing the oysters in tanks of water sterilised by ultraviolet light or ozone. The oyster filters the clean water and over a period of time its digestive system is emptied of pathogens. This is a very fragile system dependent for success on numerous critical parameters such as water salinity, dissolved oxygen content, water temperature, water cleanliness, flow rates, tank design, prevention of oyster faeces contaminating the cycle, number of oysters in the tank, the time oysters are in the tank, ensuring oysters are not subjected to physical shock, the effectiveness of the ultraviolet light tubes (which deteriorate with use), the cleanliness of the quartz tubes surrounding the ultraviolet light tubes and the effectiveness of electrical components.

To ensure the effectiveness of the purification system the Department of Health Food Inspection Branch commenced an oyster program in 1989 when this Department assumed responsibility for the purification plants from the Department of Agriculture. Under the program a technical advisor to the oyster industry was appointed to manage a specialist team of Food Inspectors who liaised closely with oyster farmers, providing technical knowledge, and evaluating and upgrading plants to ensure the success of the purification system.

On April 23 of this year the Food Inspection Branch of the Department of Health received a complaint alleging that 30 people had been ill after eating at a club on April 20. Investigation of this complaint revealed that oysters were the suspect food. Further complaints followed rapidly and to date complaints have been received alleging 752 cases of food poisoning from 43 different premises. All complaints involved the consumption of oysters and relate to a 15-day period between April 20 and May 4.

This period was preceded by heavy rainfall in the Georges River catchment area. Average rainfall for the month of April in the catchment area was approximately 300mm with the heaviest falls occurring around April 4-6, 9-11 and 19-21.

Considerable effort was made by Food Inspectors to trace and interview all possible victims in the period following initial notification. From analysis of the epidemiological data obtained, it is apparent that all major outbreaks reported are closely related, with a similar incubation period and with similar symptoms.

Onset of symptoms has occurred between five and 70 hours after first exposure, with the majority occurring between 30 and 45 hours. The median time has been 36 hours. The predominant symptoms have been nausea, abdominal cramps, diarrhoea, fever and vomiting. These symptoms and the incubation period are consistent with a viral gastroenteritis. Many victims have given stool and blood specimens from which conclusive results will not be available for some time (around one month). However to date Norwalk virus has been confirmed in three stool specimens. Around 23% of victims reported to a doctor. In all the outbreaks the food with a significantly higher attack rate has been oysters. Attack rates for oysters have varied from 85% to 100% with an average of 92%.

Although the source of contaminated oysters is still being pursued it has been possible to trace many batches through receipts kept on food premises and through labels on containers used for packaging of the oysters. Two large and separate outbreaks were found to have been caused by one batch of oysters from a purification plant on the Georges River. At three of the premises involved, residues of the oysters consumed by victims were obtained. Initial results of bacteriological examination of one of these samples shows evidence of recent faecal contamination. The samples have also been submitted for examination for viral contamination. Results are not yet available.

Oysters which have been recently subjected to fresh water, particularly in cooler weather, are shocked and are slower to empty their digestive system in the purification tanks. When this is combined with sewerage contamination of the water in which the oysters are grown, the consumption of raw or partially cooked oysters from implicated areas must be considered as the potential source of further food poisoning until such time as the oysters have been exposed to optimal conditions to reduce the infective risk to an acceptable level.

The subsidence of the outbreak around May 4 can be linked to the closure of a number of estuaries and the rapid decline in the consumption of oysters by the public as a result of the wide publicity surrounding this outbreak, which has had a significant impact on the viability of the NSW oyster industry. Oyster farmers from as far afield as Tasmania have reported a massive drop in sales. The proclamation of the Food Act of 1989 on May 11, 1990 has given the Director-General of the Department of Health the power, by order, to prohibit the harvesting of foods from areas specified by the order. This power can be expected to have a significant impact on the likelihood and duration of any further outbreaks.

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