Ciguatera fish poisoning is a potential health hazard to all consumers of tropical fish products. This phenomenon, also known as tropical fish poisoning, results when affected fish are consumed in a raw or cooked form. The symptoms of ciguatera poisoning are extremely unpleasant indicating the need for increased public education and awareness.

The accumulation of ciguatera poison (ciguatoxins) in fishes occurs only in warm tropical or semi-tropical waters and has been directly linked to the discus toxicus (Anon 1984). This bottom dwelling algae is consumed by herbivorous reef fish such as members of the Surgeonfish family (Pono, palagi, une). Most of the fish that become ciguatoxic are the larger carnivorous reef fishes which concentrate the poison in their bodies through the long term ingestion of the smaller herbivorous species (Randall 1980). The poison concentrates in the skeletal muscle and internal organs, although the organs may be 50 to 100 times more toxic than the meat (Bagnis 1874). Snappers (mu), groupers (gatala), barracudas (spatu), sharks (maliu), and moray eels (pusi) are most often involved in cases of ciguatera poisoning.

Population explosions or "blooms" of the algae C. toxicus have been linked to natural and man inflicted disruptions in the nearshore environment. These disturbances can be a typhoon, tsunami, or the construction of a new boat harbor or dredged channel. Some investigators have directly linked the death of corals in an area to ciguatera (Bagnis 1881). The dead coral provides space for algae to grow which presumably attracts C. toxicus. Subsequent outbreaks of ciguatera poisoning in these areas have been noted 1/2 to two years after the disturbance (Anon 1984). This lag time represents the time required for the reef fish to accumulate toxic levels of the poison.

Fatalities from tropical fish poisoning are rare but have been recorded (Lewis 1879). The symptoms include nausea, vomiting, diarrhea and weakness. Most victims report an aching in the joints and a tingling in the mouth, nose and extremities (Bagnis 72). The most classic symptom is a temperature sensation reversal phenomenon characterized by a burning sensation when in contact with cold water (Anon 1984).

Ciguatera fish poisoning should not be confused with other seafood related maladies. A different form of fish poisoning can result from eating sardines or herring (polo pelo) called clupeotoxicity and the deadly tetradotoxicosis results from eating certain pufferfish (sue). Histamine poisoning comes from spoiled tuna and billfish (kua, asi asi, sa'ula) and a particular hallucinatory poisoning results from eating certain goatfishes (vele, u'a'o). Adverse allergic reactions have also been noted from the consumption of octopus (fe'e) and palolo worms.

The best treatment for confirmed ciguatera poisoning is the rapid elimination of infected food from the system. The victim should be taken to the hospital immediately and comforted as much as possible. The responsible fish should be identified or brought to the hospital. Unfortunately, ciguatoxic fish can not be externally distinguished from edible members of the same species. This is responsible for the discarding and subsequent waste of thousands of harmless fish by fishermen and fish buyers (Aecoc 1983).
The amount of ciguatoxin present in a particular fish can be determined by bioassay (mongoose test, mouse bioassay), radioimmunoassay and enzyme immunoassay. Unfortunately, these methods are expensive and time consuming and are not practical for fishermen or small fish buyers. Dr. Yoshitugu Nakama of the University of Hawaii has recently developed a rapid and technically simple test for ciguatoxin. The Nakama "stick test" shows great promise in providing a solution to the ciguatera problem (Murakami-Walker 1989, Wilson and Jokiel 1986). Of course, the best solution is one of prevention. Fortunately, the Samoans are blessed with an historically low incidence of ciguatera poisoning. Relatively few fish species are toxic and the level of toxicity is low as compared to other islands of the Pacific. The most commonly ciguatoxic fishes in Samoa are the snappers lutjanus bohar (mu), lutjanus nicosia (taiva), lutjanus argenteosagittatus, (mu-taiva) the barracuda, sphyraena barracuda (sapatu, kusi); moray cells gymnotherax sp. (pupu) and the liver of sharks (malie).

The poison accumulates in the fish with time, therefore larger fish are more likely to be ciguatoxic. Also, fish caught near Pago Harbor and Leone Bay seem to have a higher incidence of ciguatera (Baguali 1976). The snappers, lutjanus gibbus (mala'i), lutjanus hippotus (mu - safaalafatu); the longnose emperor lethrinus digrammus (fili-o va); triggerfish (sama) and various groupers (gataia) are potentially dangerous but most Samoans eat them without hesitation. lutjanus nagginga (taiva) are usually eaten but exceptionally large fish are sometimes avoided. lutjanus bohar (num) is undoubtedly the most commonly ciguatoxic fish in Samoa but is often consumed with no ill effects. The mu from the waters around Tutuila and Manu'a are usually discarded but mu caught a brains Island, Rose Atoll and on the offshore banks are considered completely safe (pers. comm. Peddr 1986). This may be due to the relatively undisturbed environments at these locations. Commonly ciguatoxic fishes in other areas of the Pacific, such as jacks, amber-jacks, wrasses, surgeonfish and puffer fish have never been known to cause ciguatera poisoning in American Samoa (pers. comm. Kuresa 1985). Nevertheless, almost any fish is potentially ciguatoxic but your chances of being poisoned are greatly reduced if the following rules are followed.

1. Avoid eating mu (lutjanus bohar) taiva (L.monomotus) and any reef fish you suspect of being ciguatoxic Avoid unusually large specimens.

2. Do not eat the brain or visceral organs of reef fish especially the liver of large sharks.

3. Do not eat reef fish from areas where ciguatoxic fish were recently caught.

4. Do not eat a large portion of potentially ciguatoxic reef fish at one sitting.

5. If you become poisoned go to the hospital immediately, identify the responsible fish and warn others who may have been fishing in the same area. If the fish was purchased from a retail outlet, contact the store and public health officials.

6. If you have been poisoned by ciguatera, do not eat potentially ciguatoxic fish for three months.
REFERENCES


