



Ciguatera Fish Poisoning Fact Sheet

What is Ciguatera?

Ciguatera is a foodborne intoxication caused by consumption of ciguatoxins: a group of stable, fat-soluble chemical toxins that are found in particular fish species which spend some or most of their life-cycle on coral reefs. Precursor toxins to ciguatoxin are produced by dinoflagellate microalgae, and then modified as they move up marine food chains, for example as herbivorous fish are eaten by small carnivorous fish, which are in turn eaten by larger carnivorous fish. The transformed toxins that cause illness are mainly found in large carnivorous fish.

What outbreaks have occurred?

Ciguatera is the most common food poisoning event related to finfish consumption in Australia. Numerous cases and outbreaks, including some fatal intoxications, have occurred in Australia over many decades. These cases relate to both commercial and recreational catch and domestic and export products. Fish captured from coastal and oceanic waters in Queensland and the Northern Territory account for most cases and outbreaks of ciguatera from Australia.

Several ciguatera source regions are known around the world, including the South Pacific, Hawaii, the Caribbean and Gulf of Mexico, and the western Indian Ocean.

How much ciguatoxin is a harmful dose?

Ciguatoxins are highly potent, and are capable of initiating ciguatera poisoning in very low quantities.

Fish containing as little as one ten-thousandth of a gram of the most potent ciguatoxin per gram of fish flesh may cause illness.

What are the symptoms?

Mild intoxication may involve only gastrointestinal upset (nausea, vomiting, diarrhoea, gut pains) which resolves in a day or two. More severe poisoning may cause one or more of the following neurological signs and symptoms:

- Itching, which may be intense and unrelenting for days or weeks
- Alterations in sensory perception, where contact with cold surfaces or taking cold drinks may provoke burning or electric-shock-like sensations
- Tingling or painful sensations in hands, feet or genitals
- Dizziness, low blood pressure, cardiac abnormalities
- Joint and/or muscle pain, lassitude

Symptoms can last for days, weeks, months or (rarely) years following a single ciguatera poisoning incident.

What can be done to inactivate or eliminate ciguatoxins?

- It's recommended to be aware of ciguatera high risk areas and species size limits. The Sydney Fish Market's schedule lists fish to avoid: high risk species (Chinaman or Chinaman Snapper, Tripletail Maori Wrasse, Red Bass, Paddle-tail or Humped-back Red Snapper and Moray Eel), and specified fish from high risk areas (listed), or above specified size limits.

- Ciguatoxins are heat-stable, so are not destroyed by cooking or freezing.
- Ciguatoxins are tasteless and odourless, so fresh and visually-appealing fish may be toxic.
- If neurological symptoms occur within 24 hours of a fish meal, seek medical attention; request attending doctors inform public health authorities if ciguatera poisoning is diagnosed.

How can we monitor ciguatera?

There is currently no technology that is reliable and cost-effective for testing fish prior to sale or consumption for ciguatoxins.

Ciguatoxins in fish can be measured by some specialist laboratories, but the analysis is expensive and therefore currently only suitable for post-intoxication testing or research. Individual fish suspected of causing ciguatera cases or outbreaks should be retained or retrieved, and forwarded to local public health authorities.

Where can I access more information?

Queensland Health food safety fact sheet: naturally occurring seafood toxins <http://www.health.qld.gov.au/foodsafety/documents/fs-37-sea-toxin.pdf>

Stewart, I., et al., *Emerging tropical diseases in Australia. Part 2. Ciguatera fish poisoning*. *Annals of Tropical Medicine and Parasitology*, 2010. **104**(7):557-71.

Sydney Fish Market: schedule of ciguatera high-risk areas and species size limits http://www.sydneyfishmarket.com.au/Portals/0/Ciguatera_Schedule.pdf

US Food and Drug Administration: Fish and fishery products hazards and controls guidance – 4th edition 2011 <http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Seafood/ucm2018426.htm>

Regulatory standards

Current Australian seafood industry risk management protocols involve restrictions on sale based on maximum size limits, high-risk species and capture location. See the Sydney Fish Market Schedule for details.

There are currently no regulatory limits in Australia for ciguatoxin in seafood.

The US Food and Drug Administration have recently set action limits of 10ng Pacific ciguatoxin and 100ng Caribbean ciguatoxin per kg fish tissue. EU regulations state that fish products containing ciguatoxins should not be marketed.

International regulatory limits can be found in the Trade & Market Access Database, available at (<https://micor.agriculture.gov.au/Pages/default.aspx>).

Contact us:

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Eating seafood confers many benefits: it provides top-quality protein, and is an excellent source of important nutrients like iodine, selenium, vitamins A and D, and long-chain polyunsaturated omega-3 fatty acids. However like all foods, some seafood products may contain substances that are harmful to health. Illness from seafood is rare, so the benefits of seafood consumption must be weighed against the risks. For most people, following the recommended national dietary guidelines is the best means of balancing risks and benefits. For some groups such as pregnant women and children, specific advisories on healthy and safe seafood choices should apply. For more information, see http://www.nap.edu/catalog.php?record_id=11762

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