

Red Tides and Domoic Acid Toxicity

In 1998, The Marine Mammal Center diagnosed the first case of domoic acid toxicosis in marine mammals.

This condition is caused by harmful algal blooms, sometimes referred to as “red tides.”

What Is Domoic Acid?

Domoic acid is produced during certain harmful algal bloom events by a type of algae called *Pseudo-nitzschia australis*. This neurotoxin accumulates in small fish, like sardines and anchovies, which are then eaten by marine mammals like sea lions in large quantities.

Domoic acid attacks the brain and the heart causing seizures and heart failure. If left untreated, it usually causes permanent brain damage. The toxin will naturally flush from an animal’s system over time, but sea lions repeatedly exposed to the toxin will suffer longer-lasting and more serious effects.

If these animals come into our care before significant damage occurs, we are often able to help flush the toxin from their systems by giving them fluids. We also provide them with a fish source that is free of domoic acid. To control any seizures, our veterinarians give these patients anti-seizure medications that are also used in humans.

The Center’s veterinary team is investigating new therapies to reduce the amount of inflammation and damage the brain experiences while the animal is recovering.

You Can Help

To ensure your safety and the safety of the animals, keep these guidelines in mind as you observe and report stranded marine mammals.

Keep Your Distance

Do not touch, pick up or feed the animal. Do not return the animal to the water. Keep a distance of at least 50 yards (150 feet). If an animal reacts to your presence, move farther away.

50 yds
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Locate

Determine the animal's exact location for accurate reporting.



Observe

Symptoms of domoic acid poisoning include seizures, bobbing head, erratic behavior and lethargy. Note physical characteristics such as size, presence of external ears and fur color.



Call

Call The Marine Mammal Center at 415-289-SEAL with details about the animal and your location.



Although most of the patients we treat for domoic acid toxicity are California sea lions, other marine mammals are susceptible to its effects as well. Domoic acid has been reported in a number of other seal and sea lion species, as well as cetaceans such as blue and humpback whales. In 2014, researchers at the Center were the first to detect domoic acid in Guadalupe fur seals, a threatened species.

Domoic acid can also affect humans who eat contaminated crab, shellfish and fish, causing a life-threatening condition known as amnesiac shellfish poisoning. Because sea lions are often the first to be affected by a toxic algal bloom, the Center provides data to the public health department when domoic acid poisonings are detected. This helps public health officials determine whether seafood warnings should be issued and allows scientists to better understand local ecosystem health.

Through testing and closing dangerous fisheries, we've gotten better at preventing humans from getting sick from domoic acid, but these efforts don't work for marine mammals. And there's still a lot we don't know about what causes massive algal blooms like the ones we've seen in recent years—or even why the *Pseudo-nitzschia* algae produces the toxin.

One thing we do know is that the algae thrives in unusually warm waters off the West Coast—ocean conditions that have become more frequent in recent years as we see the impacts of [climate change](#) increase. Center scientists collaborate with other oceanographers and climate scientists to investigate the links with climate change and other environmental factors.

Source: <https://www.marinemammalcenter.org/science-conservation/research-library/domoic-acid-toxicosis>

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