CHEMSTAR

MONTHLY FOOD SAFETY NEWSLETTER **July 2010 Focus: Seafood**

IS YOUR SEAFOOD AFFECTED BY THE GULF OIL SPILL?

Atlanta, Georgia, July 22, 2010 – When oil is spilled into the ocean, it initially spreads primarily on the surface of the water, depending on its relative density and composition. The oil slick formed may remain cohesive, or may break up in the case of rough seas. Waves, water currents, and wind force the oil slick to drift over large areas, impacting the open ocean, coastal areas, and marine and terrestrial habitats that are in the path of the drift.

Oil that contains volatile organic compounds partially evaporates, losing between 20 and 40 percent of its mass and becomes denser and more viscous. A small percentage of oil may dissolve in the water. The oil residue can also disperse almost invisibly in the water or form a thick mousse with the water. Part of the oil waste may sink with suspended particulate matter, and the remainder eventually congeals into sticky tar balls. Over time, oil waste deteriorates and disintegrates by means of photolysis and biodegradation. The rate of biodegradation depends on the availability of nutrients, oxygen, and microorganisms, as well as temperature.

Oil spills present the potential for enormous harm to deep ocean and coastal fishing and fisheries. The immediate effects of the oil may be mass mortality, but long-term ecological effects may be worse. In the early stages of an oil spill, oil coats and smothers fin fish, shrimp, and bi-valves by coating their gills and inhibiting their ability to recover oxygen from the water. These fish will never make it to market. In the event that some tainted fish did make it to market the fish would smell like oil and taste like oil so the consumer would most likely not consume it.

There is some concern with the dispersing chemicals used as well. The composition of these chemical dispersants is unknown, but according to two data sheets published online by Transocean Ltd., the company that owns the Deepwater Horizon rig that was being leased by BP, the primary ingredients are 2-butoxyethanol and propylene glycol. Both chemicals can be toxic in high doses, but neither chemical accumulates in fish and seafood.

In response to the oil spill, NOAA has closed an area to fishing that now represents 78,597 sq miles, or about 33% of the Gulf of Mexico. The majority of federal waters in the Gulf of Mexico are open to commercial and recreational fishing. The fishery closures can be found at: NOAAs fisheries web site: http://sero.nmfs.noaa.gov/ and are updated daily.

The closed area is primarily in deep water used by long line fisheries that target highly migratory (pelagic) species, such as tuna and swordfish. Pelagic and benthic (sea-bottom) finfish spend most of their time in relatively deep waters and have a low exposure risk to spilled oil because they are highly mobile and often are able to avoid oiled areas. The federally closed area does not apply to any state waters. The closing of fishing in this area is a precautionary measure to ensure that seafood from the Gulf will remain safe for consumers.

NOAA continues to work closely with the U.S. Food and Drug Administration and the states to ensure seafood safety, by closing fishing areas where tainted seafood could potentially be caught, and assessing whether seafood is tainted or contaminated to levels that pose a risk to human health. NOAA and the FDA are working to implement a broad-scaled seafood-sampling plan. The plan includes sampling seafood from inside and outside the closure area, as well as dockside and market-based sampling.

Due to the unprecedented and ongoing discharge of oil, NOAA's closure of these federal waters is an appropriate public health measure to prevent potentially unsafe seafood from being harvested and reaching consumers.

Although crude oil has the potential to taint seafood with off flavors and odors caused by exposure to hydrocarbon chemicals, consumers should not be concerned about the safety of seafood in stores at this time. With the safeguards put in place by the FDA and NOAA the risk of contaminated product making its way to the market is minimal. As part of managing the safety of your seafood, you should verify your sources and stay informed on the harvesting restrictions.

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REDUCED OXYGEN PACKED (ROP) FISH RISKS

Atlanta, Georgia, July 22, 2010 – There is a potential food safety risk with the preparation and storage of fish processed and packaged under a reduced oxygen environment. Research has shown that seafood products are subject to outgrowths of *C. botulinum* type E when temperature abused under an anaerobic environment. *C. botulinum* type E is naturally occurring in marine organisms, and can grow at refrigeration temperatures as low as 37.2°F (2.9°C.). Fish that may contain this microorganism include, but are not limited to salmon, trout, herring, whitefish, cod, plaice, eel, pollack, flounder and flatfish. The localization of contaminating spores of C. *botulinum* type E differs among fish species. Some fish species are contaminated in the intestines and viscera, some in the gills and the peritoneum, while others are contaminated on the outer surfaces (skin and fins). In some cases, strains have been isolated from internal organs and surface area of the same fish.

The presence of spores in the internal organs and skin of fish is a reflection of the general contamination of the environment, feed and water of the harvest area. The germination of spores, growth of vegetative cells, and production of toxins in fishery products is due to a number of factors which include the exposure of fish to temperature danger zones between time of harvest and delivery to food service or processing establishments; further exposure to temperatures in the danger zone during preparation or processing in the establishments; subjection to mild heat treatments or insufficient cooking temperatures; untrained or careless food workers' introduction of spores into the tissues and carcasses of the fish during preparation; packaging in an anaerobic environment; and subsequent subjection of the finished (fishery) products to refrigerated storage temperatures warmer than 38°F (3.3°C).

Reduced oxygen packaging fish (ROP) creates a couple issues of concern to consider. One is creating an environment that promotes the growth of *C. botulinum* and other is the anaerobic environment is killing off competing spoilage micro flora (aerobic) that normally out competes the *C. botulinum*. The spoilage micro flora is what causes the foul smell that indicates the fish has gone bad.

Factors that may control *C. botulinum* type E growth and toxin production include efficient heat treatment (194° F for 10 minutes), pH below 4.6, holding temperatures at or below 38° F (3°C) and the use of a oxygen permeable packaging material that meets the oxygen permeation rate of 10,000cc/m2/24hrs. With smoked fish, pickled fish, and fish that are stored, distributed and sold frozen, the risk is not as great as it is with fresh fish (sold chilled). With ROP fresh fish the only controls available would be maintaining a temperature of less than 38° F (3°C) at all stages, from harvesting to display for the customer, and/or the use of an oxygen permeable membrane. To guarantee that the temperature of the ROP fresh fish was maintained throughout distribution at <38° F (3°C) would be difficult to impossible.

Mitigation of the C. *botulinum* risk for ROP fish that has not been smoked or pickled comes down to what you are selling, fresh or frozen. Requiring that ROP fish be frozen during all stages of processing and then sold frozen, not slacked, will mitigate the risk for sure. If you absolutely must sell ROP fresh fish (sold chilled), you should require that your supplier use a packaging material that meets the oxygen permeation rate requirement of 10,000cc/m2/24hrs.

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