GULF OF MEXICO OIL SPILL – OIL TOXICITY IN SEAFOOD

Since April, 20th 2010 when an accident happened on an oil rig in the Gulf of Mexico, oil has been continuously spilling into the gulf waters. The Gulf of Mexico is a major source of the commercial seafood industry mainly shrimp, some fin fish such as red snapper and mollusks such as oysters and clams. As per the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce, “in 2008, commercial fisherman in the Gulf of Mexico harvested 1.27 billion pounds of finfish and shellfish”. NOAA in conjunction with the Gulf States (Alabama, Florida, Louisiana, Mississippi and Texas) has closed over 80, 228 square miles or about 33% of the Gulf of Mexico to harvesting of seafood.

The main area of concern regarding toxic effects of oil on seafood stems from the environmental chemical contaminants known as polycyclic aromatic hydrocarbons (PAHs). PAHs may accumulate in seafood products at high levels resulting in illness in seafood consuming population. Additionally there are concerns that petroleum based contaminants may cause cancer and neurological damage.

NOAA has been studying the affects of oil on seafood since March, 24th 1989 when the Exxon Valdez accident spilled oil into the Alaskan coastal waters. The conclusions from that and other oil spills, was developed into a paper “Managing Seafood Safety after an Oil Spill” published by NOAA November 2002. This is the primary basis to the actions being taken by the U.S. government.

Oil exposure of seafood varies depending on the species of seafood and the exposure which can occur in different ways. Mollusks such as oysters and clams are filter feeders so the mollusks can absorb the oil when exposure to it. Additionally as oil dispersants or oil naturally breaks down these filter feeders will absorb the oil droplets they are exposed to. Mollusks because of their limited

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¹ Fishing Industry in the Gulf of Mexico
² Size and Percent Coverage of Fishing Area Closures
³ Centers for Disease Control “Toxicological Profile for Petroleum Hydrocarbons”
⁴ Managing Seafood Safety after an Oil Spill
metabolic capacity, being filter feeders and their habitat are a high risk to absorb oil contaminants such as PAHs. Shrimp and other crustaceans can be exposed directly to oil or can absorb oil contaminants through contaminated plants and animal material that they may consume. Crustaceans that are found in shallow areas are more at risk than those found in deeper waters. Finfish are predatory in nature and are migratory in nature. Finfish can be exposed to oil and PAHs while passing through oil by absorbing through the gills or the gut. Additional fin fish can absorb oil contaminants through the consumption of other species that have been exposed to and absorbed oil contaminants.

NOAA has vessels that are collecting seafood products and are testing them in their laboratories. NOAA employs fish sniffers that are performing sensory evaluations on the fish to determine if the fish have been tainted by oil and they are performing LC/MS testing on the seafood meat for analytical analysis of PAHs contaminants. Under the sanitation program for shellfish (mollusks) that was established in 1969 the state regulatory personnel in conjunction with the U.S. federal government are monitoring the water areas where mollusks are harvested to make sure no mollusks are harvested from contaminated and therefore closed areas. Additionally the US FDA has notified the seafood industry that regulation 21 CFR 123 (seafood HACCP) requires that environmental chemical contaminants such as PAHs are to be incorporated into their HACCP plans in order for the industry to prevent the sale and consumption of potentially contaminated fish and fishery products. The US FDA has also notified the shellfish (mollusk) suppliers that they are prohibited from harvested shellfish from closed areas under 21 CFR 128.28 and all shellfish (mollusk) are to properly tagged to identify license harvester, date and location of harvesting.

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5 Gulf of Mexico Oil Spill Update
6 FDA Letter to the Fish and Fishery Product Industry Regarding the Gulf of Mexico Spill

Water and seafood products can both be tested for oil and oil contaminants such as PAHs. Typical instrumentation used for testing is a Gas Chromatograph coupled with a Mass Spectrometer (GC/MS) or a Liquid Chromatograph coupled with a Mass Spectrometer (LC/MS). SGS has capabilities of performing both water and seafood product analysis.

SGS will inform interested parties as developments on issues that affect the commercial industry. Throughout our global network of laboratories, we are able to provide a range of services, including analytical testing, auditing, inspections and consultancy of food articles for the US and worldwide markets. Please do not hesitate to contact us for further information.