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PFOS and PFOSA in Bottlenose Dolphins: An investigation into two unusually high mortality epizootics.

Haebler, Romona [1,] Douglas Kuehl[2], Charles Potter[3], Garet Lahvis[4], Michael Donahue[5] and Ronald Regal[5]

[1] Atlantic Ecology Division, National Health and Environmental Effects Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Narragansett, RI, 02882
[2]Mid-Continent Ecology Division, National Health and Environmental Effects Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Duluth, MN, 55804
[3] Museum of Natural History, Smithsonian Institution, Washington, D.C., 20562
[4] Department of Behavioral Neuroscience, Oregon Health and Science University, Portland, OR, 97239
[5] Department of Mathematics and Statistics, University of Minnesota-Duluth, Duluth, MN, 55812

haebler.romona@epa.gov

Along the Atlantic coast of the United States during 1987 and 1988, bottlenose dolphins (*Tursiops truncatus*) suffered one of this country's largest marine mammal mass mortality events. An estimated 50% of all near-shore bottlenose died during this short period. Two years later a second, although less dramatic, event occurred along the United States coastline of Gulf of Mexico. The cause of these mortalities is not known for certain; however, morbilliviral infection seemed to have spread rapidly throughout the dolphins. Suppression of the animal's immune system by high concentrations of chemical contaminants was suggested as a contributing factor. In order to investigate this hypothesis, we determined by GC/MS the concentration of many polychlorinated and polybrominated chemicals, such as PCBs, chlorinated pesticides, and brominated flame retardants, as well as mercury, determined by AA, in the affected animals. The development of electrospray ionization LC/MS has now allowed us to re-examine these same dolphin tissues (liver) for the presence of PFOS and a metabolic precursor PFOSA. Concentrations of PFOS in the affected bottlenose were found to be greater than, and statistically different from, those found in other species, and to other bottlenose dolphin populations not affected during the epizootics. PFOS concentrations were found to be as great as, or greater than, concentrations of PCBs, thirteen chlorinated pesticides, and PBDPEs. PFOS concentrations were generally less than mercury residues. PFOS was found to be readily transferred in utero from mother to fetus.

Key Words: PFOS; bottlenose dolphin; LC/MS

Contact Information:
Romona Haebler
Atlantic Ecology Division
US Environmental Protection Agency
27 Tarzwell Dr.
Narragansett, RI 02882
Haebler.romona@epa.gov
T: 401-782-3095
F: 401-782-3030

Purpose of Research:
Purpose of this research is to investigate the presence of environmental chemicals in tissues of protected marine mammals associated with a major unusual mortality event.