This research may be used to determine the safety of seafood products from the Gulf region to assess the risk of illness/disease due to the consumption of seafood.

Bioaccumulation, Distribution, and Toxicity of N-Nitrosamines in Red Swamp Crayfish

Who cares and why?

The expositive and continual growth of the fishery industry is of major concern as products may be potentially contaminated. This is critical because nitrosamines are chemical compounds, most of which are carcinogenic, and are produced when the food preservative nitrite combines with amino acids in the stomach. Furthermore, high temperatures, such as frying also enhance formation of nitrosamines. The Environmental Protection Agency (EPA) and the Food and Drug Administration (FDA) have been forced to evaluate the safety of imported fish products into the U.S., to determine levels of heavy metals and carcinogens within the food. This study has major implications since crayfish are consumed seasonally and in large amounts there may be a potential risk of exposure to N-nitrosamines.

What has the project done so far?

Recent studies on N-nitrosamines in seafood focus on compounds being formed during various processing methods without consideration of the N-nitrosamines already present in the fresh meats and seafood. The purpose of this study was to determine the concentration of N-nitrosamines in various compartments of commercially-available red swamp crayfish. Crayfish samples were purchased from a wholesale dealer, washed in tap water and boiled for 7-10 min at 100°C. Crayfish were dissected into shell, head (hepatopancreas and green gland) and tail meat. So far, scientists have gathered data from the following steps:

- Isolated, identified, and quantified the accumulation of N-nitrosamines in specific compartments of red swamp crayfish obtained from Louisiana;
- Determined the toxicokinetics for bioaccumulation of N-nitrosamines in compartments of red swamp crayfish, which is the description of what rate a chemical - *N-nitrosamines* will enter the body and what happens to it once it is in the body;
- Determined the mechanism of toxicity of nitrosamines specific to red swamp crayfish using a cell culture model; the technique of maintaining live cell lines that are grown under controlled conditions, generally outside of their natural environment; and they have
- Compared consumption patterns and possible risk using an epidemiological study in Alabama and Louisiana**,** which studied the patterns, causes, and effects of health and disease conditions in the defined populations.

What research is needed?

Due to the consumption of seafood and seafood products, there needs to be continual aassessment of the risk of disease.

Impact Statement

Research may be used to determine the safety of seafood products from the Gulf region to assess the risk of illness/disease due to the consumption of seafood.

Want to know more?
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Strategic Priority: Food Safety, Nutrition, and Health

Additional links: http://www.umes.edu/ard/Default.aspx?id=46285

University and year: Alabama A&M University, 4900 Meridian St. Normal, AL 35762, Submitted 2011

This project was supported by: Title III HBGI (Historically Black Graduate Institutions) grant