Assessing and Managing Risk to Those Who Consume Fish or Shellfish from Texas Waters

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DSHS Fish and Shellfish Sampling Procedures

- Sample design
- Sample collection
- Sample data requirements

Sample Design

- Water body selection
- Sample site selection
- Sample type selection
  - Whole fish
  - Edible tissue
  - Composite samples

Sample Collection

- Collection methods
  - Electrofishing
  - Gill nets
  - Hook and Line
  - Trotlines
  - Crab traps
  - Trap nets
  - Oyster dredge

Sample Collection

- Collection Guidelines
  - Collect harvestable-size fish and shellfish per regulations published by TPWD
  - Collect an even mix of predator and bottom feeder target species at each sample site

Sample Data Requirements

- Identify and record unique alphanumeric code for each sample
- Record total length (in, cm) and weight (lb, g)
- Record deformities, wounds, or infections
- Label each sample with analyses required

Laboratory Analysis

- Metals (As, Cd, Cu, Pb, Se, Zn, Hg)
- Polychlorinated Biphenyls (PCBs)
- Pesticides
- Semi-volatile Organic Compounds
- Volatile Organic Compounds
- “Dioxins/furans”

Risk Characterization

- Statistical Analysis of Laboratory, field data
- Comparison of tissue contaminant concentrations to established guidelines
  - Determine Contaminants of Concern
- Draw Conclusions about risk from consumption of contaminated fish
- Provide recommendations for controlling risk from consumption of environmental contaminants in fish

Basis for Risk Characterization Guidelines

- Reference Dose-RfD (mg/kg -day)
- Minimal Risk Level-MRL (mg/kg -day)
- Carcinogen Potency Factor-CPF or SF (unit risk per (mg/kg) -day)

Assumptions for Establishing Guidelines

- Adult Body weight (BW): 70 kg
- Consumption rate (CR) 0.03 kg/day (8 oz/wk)

–and, for Cancer

- Acceptable Risk Level (ARL): 1 extra cancer/10,000 exposed persons
- Exposure period: 30 years

Calculating Guidelines

- Systemic Effects:

$$HAC_{nonca} = (RfD \times BW) \div CR$$

- Carcinogenic Effects:

$$HAC_{ca} = ((ARL/Slope\ Factor) \times BW) \div CR$$

Risk Characterization Report

- Background and statement of issues
- Contaminants/concentrations of concern
- Brief description of toxicology of contaminants of concern (optional)
- Conclusions, implications for human health
- Recommendations

Managing Risk from Consuming Contaminated Fish or Shellfish

- Ban possession of fish or shellfish from the water body
- Issue consumption advice
- Rescind existing advisories or bans
- Modify existing advisories or bans

Communicating Risk from Consumption of Contaminated Fish or Shellfish

- Press releases
- Publications:
  - Seafood Safety Web Site
    http://www.tdh.state.tx.us/bfds/ssd/
  - ***Fish Consumption Advisories and Bans***
  - ***Outdoor Annual Hunting and Fishing Regulations*** (Texas Parks and Wildlife Department-lists bans only)