

# Consumers Should Be Informed of the Health Risks of Consuming Cadmium Contaminated Oysters

## Overview - Shellfish and Cadmium----The Risks to Human Health

Cadmium is a toxic heavy metal found naturally in the soil, air and water and in shellfish along the Pacific Northwest including Canada, Washington, Oregon, Alaska and California. "It is of particular concern to human health due to its long biological half-life and ability to accumulate in soft tissues, primarily the liver and kidneys leading to kidney dysfunction at high enough concentrations. "Cadmium is known to accumulate in the human kidney for a relatively long time, from 20-30 years."

Oysters and other shellfish produced in Washington have no routine tests done for Cadmium (Cd) or other heavy metals. The August 2008 Pacific Shellfish Institute study documents that industry and the Washington Dept of Health are aware that Washington waters have varying degrees of Cadmium which pose significant health risks as outlined below. Health Canada has issued a consumption guideline based on worldwide health studies. Current risk assessments indicate that the present consumption guidelines may need to be more stringent than those currently published.

Our federal health agencies, state health agencies and legislators should read this information carefully to be informed of the health risks for adults and children and to implement appropriate guidelines. The following facts are taken from studies with supporting information in order of discussion in the following link:

[Coalition to Protect Puget Sound Habitat](#)

## Facts and Studies:

### 1. Health Canada Oyster Consumption Guideline

Health Canada issued the following Oyster Consumption Guideline in February 2002. Washington Department of Health **has not issued any guidelines** even though they were parties to the Pacific Shellfish Institute August 2008 study information.

- Adult-- About 12 oysters per month
- Child-- About 1 1/2 oysters per month

Based on an average oyster weighing 50 grams, with an average Cd content of 2.6 ug/g, Health Canada recommends only 460 grams of oyster/month or 300 ug Cd per week...with the FAO/WHO PTWI (safe weekly intake from all sources being between 420-490).

Canada Shellfish Guidelines Link:

<http://www.inspection.gc.ca/english/fssa/concen/specif/bivalvee.shtml>

## 2. Study--Assessment of Human Health Risks of Consumption of Cadmium Contaminated Cultured Oysters

"This study indicates that based on currently available data, Health Canada's recommended BC-cultured oyster consumption rate of 12 oysters per month can be expected to cause a cadmium intake rate of approximately 0.84 to 1 ug.kg.day for non-smokers and 0.9 to 1.06 ug.kg.day for smokers. This cadmium intake rate exceeds the ATSDR chronic oral minimal risk levels (MRL) of 0.2 ug.kg.day by approximately 4-5 fold and reaches the FAO/WHO reference dose of 1 ug.kg.day for cadmium consumptions for Canadians. This suggests that although the current recommended maximum oyster consumption rates is consistent with the FAO/WHO and USEPA limits for acceptable risk, it leaves little or no room for error or uncertainty... (Page 1) The WHO reaffirmed during the 16th, 33rd and 41st meetings that "there is only a relatively small safety margin between exposure in the normal diet and exposure that produces deleterious effects (Web citation 3)." (Page 3)

"It is therefore important that human consumption guidelines appropriately and cautiously consider the hazards of cadmium exposure in high risk groups such as smokers, women with low blood iron content, children, individuals with renal impairment and people habitually eating a diet rich in cadmium, like farmed oysters or game meats...Several international bodies such as the European Union (EU), United Nations Food and Agriculture Organization World Health Organization (FAO/WHO), Codex Alimentarius Commission (CODEX) and Australia New Zealand Food Authority (ANZAF) are considering lowering the limit to 1--ug.g (Kruzynski 2002)." (Page 9)

"Cultured oysters were reported to contain higher levels of cadmium than wild oysters (Kruzynski 2000) and other shellfish (Kruzynski 2002)." (Page 2)

## 3. Study--Heavy Metals in Suspended Sediments and the Risk to Humans

"Cd-linked bone and kidney toxicities have been observed in people whose dietary Cd intakes were well within the FAO/WHO 1 mg/kg/day limits (Satarug and Moore 2004). Recent studies indicate that Cd exposure levels of 0.43-0.71 ug/kg/day demonstrate an increased risk of bone fracture, cancer, kidney dysfunction and hypertension (Satarug et al. 2000, 2003).....The recent application by the European Community of a 1-mg/kg wet weight import limit to bivalve mollusks and the current deliberation by FAO/WHO expert committee on food additives to adopt the same value pose significant threats to the wild and cultured export trade in the Pacific Northwest (BC, Washington, and Alaska)." (Page 7)

#### 4. Study-- [Cadmium in Oysters and Scallop: the BC experience](#)

An often quoted, (USFDA 1993) is sometimes misrepresented as providing an adequate level of Cd as 3.7 ug Cd/g wet weight for bivalve shellfish. These calculations were based on a 50th percentile of 0.376 ppm and 96th percentile of 0.925 ppm which although likely to be appropriate for East Coast US data, are not appropriate for the West Coast, where natural levels of 2-4 ug Cd/g are not uncommon. Furthermore, the guideline is meant to be adjusted by local health authorities to reflect local residues and consumption patterns." (Pages 163-164)

#### 5. Study--**Characterization of the Cadmium Health Risk—US West Coast Bivalve Shellfish—Pacific Shellfish Institute, Washington, August 2008**

[Summary Document](#)

[Final Project Report](#)

[Map – Cadmium Concentrations - Puget Sound](#)

[Map – Cadmium Concentrations - Washington Coast](#)

"In 2003, Codex Alimentarius, an international commission responsible for setting food standards and guidelines, proposed a 1 part-per-million (ppm or ug/g) wet weight maximum limit (ML) for cadmium in molluscan shellfish." The Commission subsequently adopted a ML of 2mg/kg for cadmium in marine bivalve mollusks excluding oysters and scallops, with member states retaining the option to set specific MLs (Codex, 2006)." (Page 1)

"A review of Cd levels in Pacific oysters around Vancouver Island in 2000 by Canada's Department of Fisheries and Oceans found more than 60% of the 81 samples taken had levels of cadmium over 2 ug/g (Schallie 2001). Similarly, following the 2003 Hood Canal shipment rejection of oysters from Hong Kong, Washington Department of Health processed 25 samples and found cadmium levels ranging from 1.2 to 4.9 ug/g with a median of 2.6 ug/g (WDOH 2003a)." (Page 1)

"Shellfish are known to accumulate significantly higher levels of cadmium due to metallothionein proteins within these organisms that strongly bind to the metal." (Page 2)

"The exact magnitude of cadmium enrichment in Pacific west coast shellfish was unknown until completion of the current study. The scattered and limited sampling of commercially farmed molluscan shellfish described above indicated that cadmium levels significantly exceeded Codex's proposed 1 ug/g international action level and in certain cases approached or exceeded the US FDA's 3.7 ug/g Level of Concern. Based on these data, it appeared that a large portion of Washington and Alaskan Pacific oysters already exceeded Codex's proposed 1 ug/g ML for cadmium in molluscan shellfish, which could result in considerable export restrictions for this commercially important product." (Page 3)

"On average, 58% of all US Pacific coast sampling stations in this study exceeded a 1--ppm (part per million or ug/g) cadmium ML (Maximum Limit) in oyster tissue. However, only 15% exceeded the 2- ppm." (Page 41)

"US. consumer. Assuming consumers are not exposed to significant Cd from other sources, consumption of Cd in oysters from areas sampled in Washington is not likely to present a health hazard. However, taking into account Cd intake via cigarettes and dietary sources other than oysters, Cd intake may approach or exceed the tolerable daily intake for some populations." (Page 43)

"Mitigating actions to producers that ship to the international market include the following:

1. Ship to international countries with less stringent or non-existent cadmium regulations.

2. A Hood Canal company planning to enter the export market should test for cadmium. Findings of high levels of cadmium in the oysters suggests that in the short run, the company should focus on business-relationships with wholesalers that ship to Taipei or Southeast Asia." (Page 44)

## **6. Lobbying Efforts by the Shellfish Industry to Delay/Eliminate Cadmium Standards that Protect Consumers**

The [East Coast Shellfish Growers Association newsletter](#) describes industry's lobbying efforts, which are represented by Bill Dewey. Mr. Dewey is on the Codex Committee on Food Additives and Contaminants, is a Director of the Pacific Shellfish Institute, the public affairs director of Taylor Shellfish and a owner of a shellfish farm.

"Bill Dewey traveled to Rotterdam last week to represent US shellfish growers at the annual meeting of the Codex Committee on Food Additives and Contaminants. He was generally satisfied at the outcome, in that bivalve molluscs remained at Step 3 in the 8 Step process used for establishing international maximum levels." (Page 4)

"The PCSGA (Pacific Coast Shellfish Growers Association) and the Gulf Oyster Industry Council (GOIC) have been making annual lobbying trips to DC for several years. The GOIC holds lavish parties, serves thousands of oysters and spends a whole week lubricating the wheels that make our government move." Page 5

Ms. Maryanne Guichard, Washington Dept of Health--Manager of Shellfish Program, is listed as a [Directors of the Pacific Shellfish Institute](#) that prepared the study in August 2008.

## **7. Pacific Shellfish Institute / Industry / NOAA Promotion of Unlimited Oysters Despite Known Cadmium Health Risks**

Industry promotion of unlimited consumption of oysters is well documented despite the known human health risks as reported in just a few of the many stories on oyster consumption:

### [Pacific Oyster Wine Winners](#)

KSKAmerica.com, June 2009

"During a week of preliminary judging in Seattle, 5 veteran preliminary judges consumed more than 1,200 Kumamoto oysters to narrow the wine contenders to 20 finalists."

The math according to Table 1 of the Kruzynski Cadmium in oysters and scallops study would be: Those judges would have consumed....2.6 ug/g Cd in an oyster X 60000 grams of oyster/month (e.g. 1200 oysters with each oyster weighing 50 grams) or 156000 grams of Cd/month or 39000 per week which would put them over the PTWI for Cadmium from all sources, by about 92 times which means, they shouldn't eat any more cadmium for at least 2.0 years.

### [Consider the Oyster](#)

Science Daily June 19, 2009

"Unlike humans, Mother Nature takes oysters seriously. They pack huge amounts of protein, along with an alphabet soup of vitamins, lots of omega-3 fatty acids and hefty doses of minerals: calcium, iodine, potassium, copper, sodium zinc, phosphorous, manganese, sulfur. All in one low calorie package. It's enough to arouse a nutritionist."

**No where is the health risk of cadmium mentioned in this article!**

### [NOAA](#) – Washington Aquaculture Opportunities for Growth

"We were especially concerned about the negative tenor displayed in comments submitted by NMFS' habitat division which seem to ignore NOAA's stated goal of supporting growth of domestic aquaculture." ([ECSGA Newsletter](#) Page 4)

Note: NMFS is the National Marine Fisheries Service, a subsidiary of NOAA & the Dept of Commerce. They are responsible for management, conservation and protection of living marine resources and have strong legislative influence.

### [Pacific Shellfish Institute Goals 2015](#)

10.3.5 (L) Promote shellfish as a healthy food for both adults and children. (Page 21)

## 8. Other Studies:

- [Marine Environmental Research – Source of Dietary Cadmium to Pacific Oyster](#)
- [Marine Pollution Bulletin – Spatial ... Variations in Cadmium](#)
- [Bone Resorption and...Cadmium in Women](#), from Environmental Health Perspectives
- [Proposed International Standard for Cadmium](#)
- [Survey of Cadmium in Pacific Oysters](#) – Ian Stupakoff, July 24, 2007
- [The Oyster is His World](#) The New York Times – June 2009
- [Cadmium, Environmental Exposure and Health Outcomes](#) - Environmental Health Perspectives, October 2009
- [Cadmium, Dietary Exposure and Cancer – Synopsis](#) – Department of Pathology, University of North Dakota School of Medicine

## Summary - OUR CONCERN FOR CONSUMERS

Our Coalition advocates systematic independent scientific sampling and testing of all Washington oysters and shellfish for cadmium and other toxins, a warning to consumers of the health risks of excess cadmium consumption from seafood and support of the 1--ppm standard essential to protect public health. Health Agencies should openly communicate health risks regardless of the lobbying by industry to protect their business interests. The Pacific Shellfish Institute August 2008 study recommendations to export oysters with high levels of cadmium levels to unsuspecting consumers certainly degrades the integrity of Washington's agricultural reputation.

**Unlimited Shellfish Consumption and Unlimited Aquaculture Expansion  
Puts Human Health At Risk**