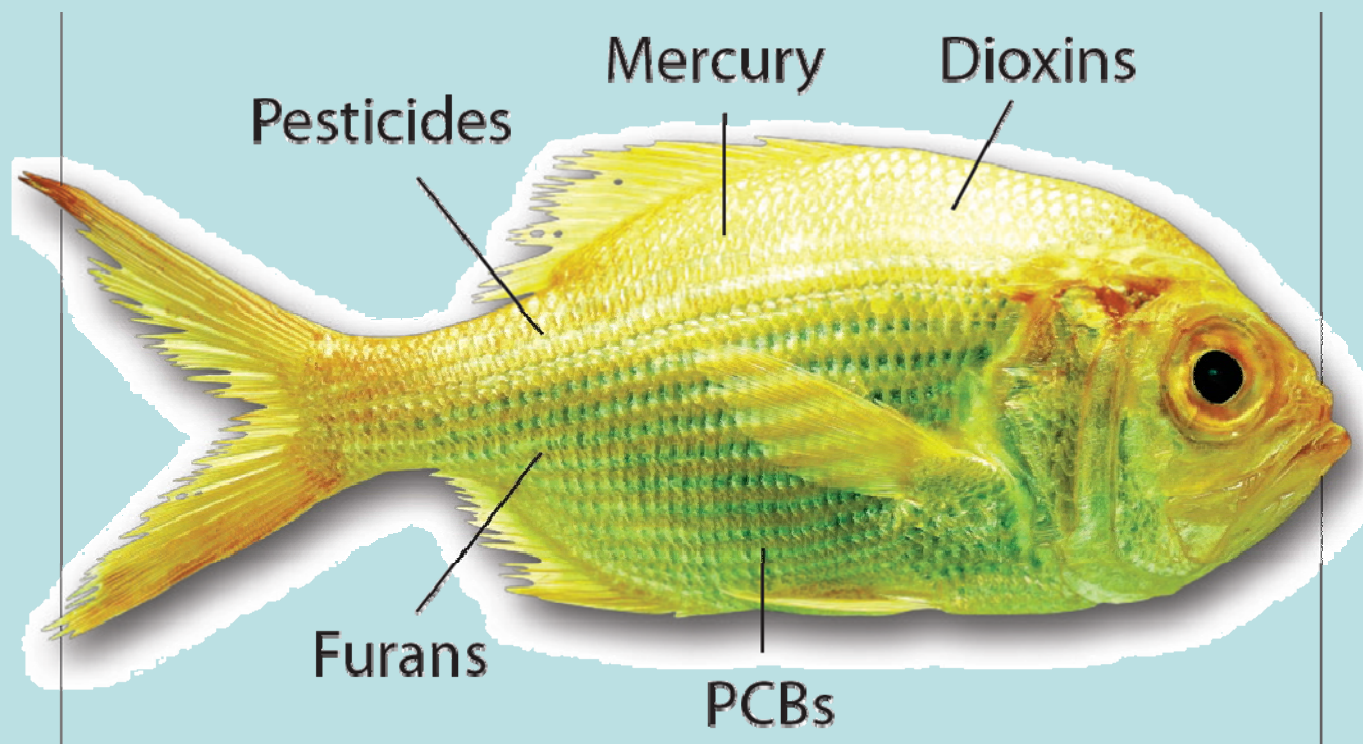
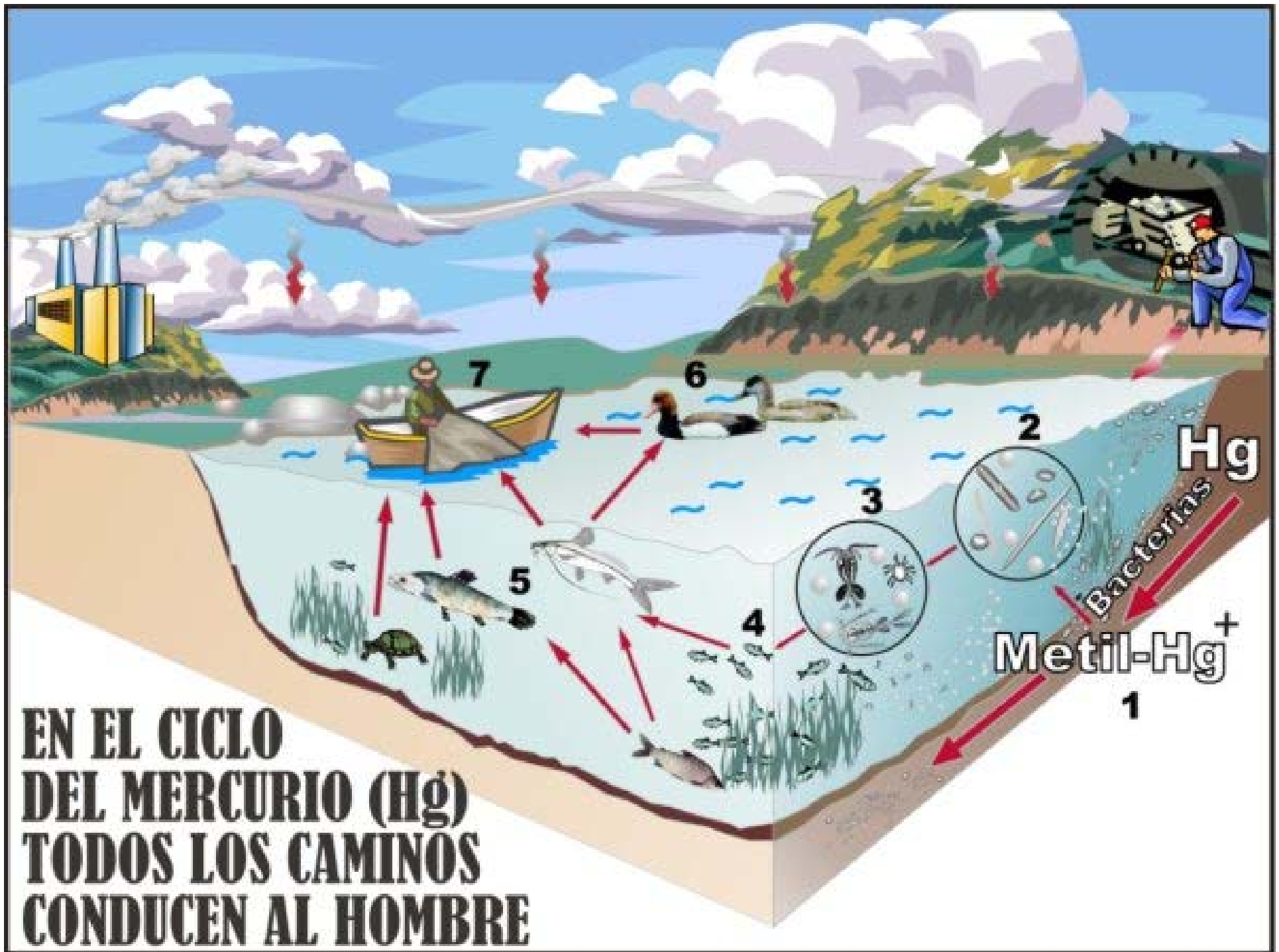


# Consulta de Expertos sobre los Riesgos y Beneficios del Consumo de Pescado



Jogeir Toppe – FAO – Septiembre 2010

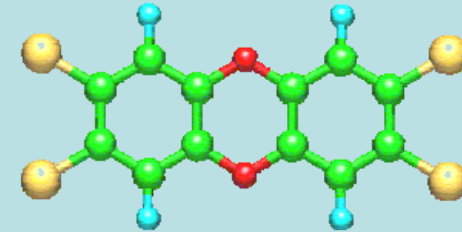


# Tendencias Mercurio

- La presencia del mercurio en el mar es principalmente por fenómenos naturales, y los niveles son relativamente estables
- Mejor control de emisiones ha reducido los niveles de mercurio en algunos lagos principales
- Los niveles de mercurio en productos pesqueros parecen ser estables
- Es sugerido que el calentamiento global podría acelerar la conversión de mercurio (Hg) al mercurio orgánico (MeHg)

# Tendencias Dioxinas y PCB

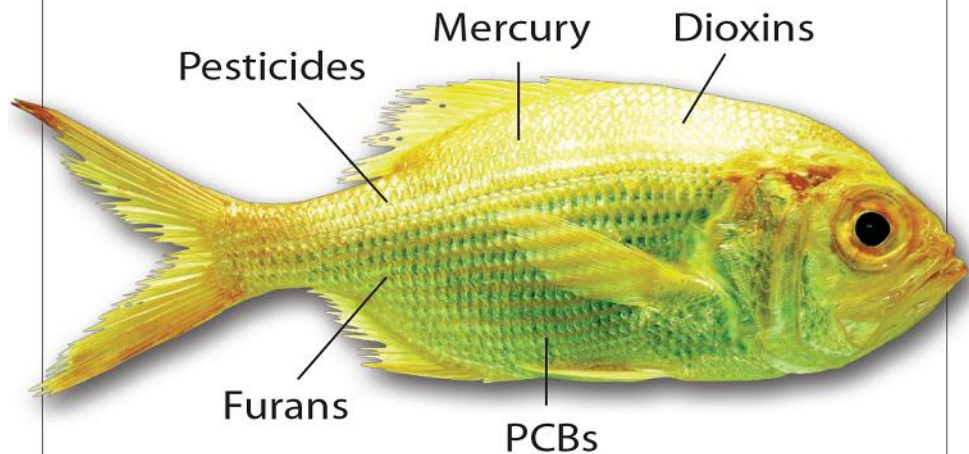
- Niveles disminuyendo desde principios de los 70
- Emisiones en los países industrializados han bajado 80-90%
- Misma tendencia en cuerpos de agua
- Niveles en alimentos muestran la misma tendencia
- Tendencias de aumento en algunas zonas geográficas con alto crecimiento económico



Los ácidos grasos Omega-3 se encuentran en la grasa de pescados como el salmón y en los aceites de linaza y canola



# Brane Fude?



## Mercury is such a potent neurotoxin

that even small doses can cause irreversible brain and heart damage. Our single biggest source of mercury exposure is fish consumption.

So why is the federal Dietary Guidelines Advisory Committee—the panel of experts charged with determining what we should eat—getting set to recommend Americans eat 8 to 9 ounces of fish a week, an amount that will put our health at risk?

While it would be easy to chalk this up to politics as usual, too much is at stake.

Mercury pollution is placing children and pregnant women at risk as never before. One in six women of childbearing age in the United States has blood mercury levels exceeding the “safe” levels recommended by the EPA.

More than 600,000 babies are born every year at risk of mercury-related birth defects, including mental retardation, learning disabilities, permanent neurological damage, and physical malformations.

In adults, mercury exposure can bring on high blood pressure, cause tremors, and lead to infertility and liver and brain damage.

Mercury is everywhere. In the canned tuna from your local grocery store. In the salmon, shrimp, and shellfish you order at the restaurant. Forty-four states have posted warnings about mercury contamination in their lakes, streams, and rivers.

**Take action.** Go to [www.pcrm.org](http://www.pcrm.org) to send an email to the federal Dietary Guidelines Advisory Committee. Tell them that our health and the health of our children come first. Or write a letter to:

Dr. Janet King  
Chair, Dietary Guidelines Advisory Committee  
Department of Health and Human Services  
200 Independence Avenue, SW, Room 738G  
Washington, DC 20201 Fax: 202-205-0463

**PCRM** P H Y S I C I A N S  
C O M M I T T E E  
F O R  
R E S P O N S I B L E  
M E D I C I N E  
WASHINGTON OFFICE PHONE: 202-686-2210

**Don't let the government tell you a fish story.**

# Brain Washed?



## Did you see this fishy ad last week?

Animal rights activists are attempting to scare Americans away from some of the healthiest foods on the menu. The American Heart Association says omega-3 fatty acids make fish a must-eat food at least twice a week. But last week the ad pictured at the right implied that all fish are dangerous to eat.

Why would an organization calling itself the “Physicians Committee for Responsible Medicine” (PCRM) run scary anti-fish ads in national newspapers? For starters, PCRM has undeniable connections to People for the Ethical Treatment of Animals (PETA), which has already steered over \$1.3 million to the organization.

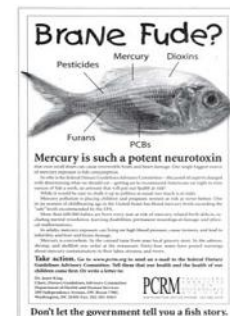
Yes, *that* PETA. The animal rights nuts who don't want us to eat beef, chicken, pork, eggs, dairy foods or fish. No matter what.

PCRM has been publicly rebuked by the American Medical Association for misrepresenting medical science. PCRM's president is a non-practicing psychiatrist, and also president of the PETA Foundation. And 95 percent of PCRM's members aren't doctors at all.

Some PCRM spokespersons endorse violence against people who don't see the world their way. At a 2003 animal-rights convention, one of them advocated murdering doctors who use animals in their research for cancer and AIDS cures.

Animal rights extremism is felt everywhere. And some of it masquerades as health advice.

Visit [www.ConsumerFreedom.com](http://www.ConsumerFreedom.com) to learn how animal rights activists use junk science, promote violence, and even set up pseudo-medical charities in order to further their crusade. Help this cause by donating online to the nonprofit **Center for Consumer Freedom**.



**Don't let animal rights activists brainwash you with fish stories.**



# **TOXIC LEGACY** Fishing with caution October 29, 2007

As many as 600,000 babies may be born in the USA each year with irreversible brain damage because pregnant mothers ate mercury-contaminated fish, the Environmental Protection Agency says. Medical researchers are just beginning to explore such mercury exposure in adults, which can leave some people struggling through life in a disorienting "fish fog." Nationwide, more than 8,000 lakes, rivers and bays are compromised by mercury's toxic effects.

"600,000 niños nacen cada año en los EEUU con daños cerebrales irreversibles debido al consumo de pescado de sus madres durante la gestación"

# Consulta de Expertos sobre los Riesgos y Beneficios del Consumo de Pescado



Solicitud del Codex Alimentarius  
Roma 25-29 de enero 2010



# Consulta de Expertos FAO/WHO

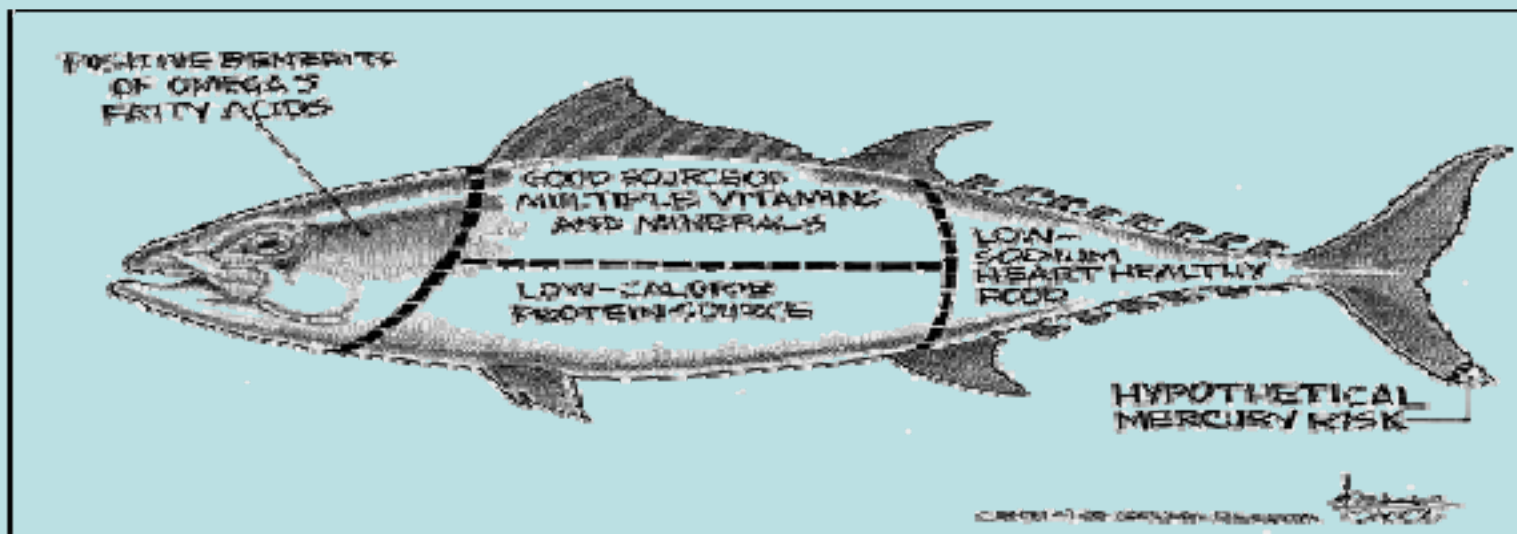
## Términos de Referencia:

- Evaluación de los riesgos por la salud asociado con el consumo de productos pesqueros
- Evaluación de los beneficios por la salud asociados al consumo productos pesqueros
- Comparación de los riesgos y beneficios asociados con el consumo de productos pesqueros
- Desarrollar modelo cuantitativa para la evaluación de los riesgos y beneficios asociados con el consumo de productos pesqueros

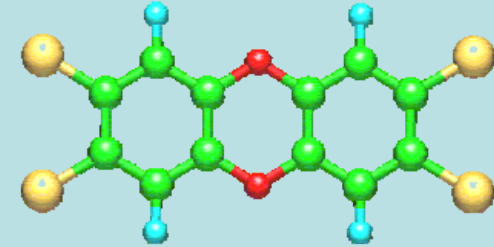
# Evidencias convincentes:

- LCn-3PUFA (DHA) es importante para un desarrollo óptimo del cerebro durante la gestación y la infancia
- El consumo maternal de pescado durante la gestación y la lactancia disminuye el riesgo de un desarrollo cerebral subóptimo en sus hijos
- Ingestión de MeHg durante la a gestación aumenta el riesgo de un desarrollo cerebral subóptimo en sus hijos

- Basado en un análisis cuantitativo sobre los riesgos y beneficios de DHA y MeHg en el desarrollo cerebral, el riesgo de no comer pescado es mayor al riesgo de comer pescado en todas las circunstancias evaluadas por los expertos



# Dioxinas y compuestos similares (DLC)



- El consumo de pescado y EPA+DHA reduce el riesgo de mortalidad cardiovascular
- Exposición de DLC a un alto nivel aumenta el riesgo de cáncer
- Por todas frecuencias y categorías de consumo de pescado evaluadas, los beneficios de mortalidad cardiovascular excede los riesgos de cáncer causados por DLC

# Diferencias Regionales

- Los niveles de nutrientes, como los LCn-3PUFA, y contaminantes en pescado, incluso MeHg y particularmente dioxinas y compuestos similares, pueden tener grandes variaciones regionales
- Es crítico que las autoridades nacionales y regionales tienen información específica sobre los niveles de nutrientes y contaminantes en productos pesqueros de sus regiones



# **Impacto Coeficiente Intelectual (IQ)**

**MeHg  $\leftrightarrow$  DHA**

# MeHg Risks

- Tres estudios meta-análisis
  - Islas Feroe
  - Nueva Zelanda
  - Islas Seychelles
- Supuestos:
  - Porción de pescado; 100g
  - Peso corporal; 60 kg
  - Proporción Hg en pelo y ingestión diaria de MeHg ( $\mu\text{g}/\text{kg persona}/\text{día}$ ) = 9.33

# Beneficios PUFA

- Cuatro análisis considerados
  - Cohen et al. 2005
  - FDA 2010
  - Oken et al. 2008
  - Oken et al. 2008
- Supuestos:
  - 28 g de pescado equivale 100 mg DHA (promedio)
  - Proporción DHA por LC n-3 PUFA = 0.67



# Ganancia/disminución del IQ

- Ganan 4 puntos IQ por cada 100 mg/día DHA, máximo 5.8 puntos IQ
- Disminuye 0.18 puntos IQ por cada  $\mu\text{g/g}$  MeHg en el pelo de la madre

Una porción por semana

## Impacto IQ

|      |                          | EPA+DHA  |            |             |           |
|------|--------------------------|----------|------------|-------------|-----------|
|      |                          | < 3 mg/g | 3 < 8 mg/g | 8 < 15 mg/g | > 15 mg/g |
| MeHg | $\leq 0.1 \mu\text{g/g}$ |          |            |             |           |
|      | $0.1 \leq 0.5$           |          |            |             |           |
|      | $0.5 \leq 1.0$           |          |            |             |           |
|      | $> 1.0$                  |          |            |             |           |

\* Proporción DHA: 0.67

Una porción por semana

|      |            | EPA+DHA      |              |              |              |
|------|------------|--------------|--------------|--------------|--------------|
|      |            | < 3 mg/g     | 3 < 8 mg/g   | 8 < 15 mg/g  | > 15 mg/g    |
| MeHg | ≤ 0.1 µg/g | -0.02, - 0.1 | -0.02, - 0.1 | -0.02, - 0.1 | -0.02, - 0.1 |
|      | 0.1 ≤ 0.5  | -0.12, - 0.5 | -0.12, - 0.5 | -0.12, - 0.5 | -0.12, - 0.5 |
|      | 0.5 ≤ 1.0  | -0.3, - 1.2  | -0.3, - 1.2  | -0.3, - 1.2  | -0.3, - 1.2  |
|      | > 1.0      | -0.6, - 2.3  | -0.6, - 2.3  | -0.6, - 2.3  | -0.6, - 2.3  |

\* Proporción DHA: 0.67

Una porción por semana

|      |            | EPA+DHA              |                      |                     |                     |
|------|------------|----------------------|----------------------|---------------------|---------------------|
|      |            | < 3 mg/g             | 3 < 8 mg/g           | 8 < 15 mg/g         | > 15 mg/g           |
| MeHg | ≤ 0.1 µg/g | -0.02, - 0.1<br>0.77 | -0.02, - 0.1<br>2.11 | -0.02, - 0.1<br>4.4 | -0.02, - 0.1<br>5.8 |
|      | 0.1 ≤ 0.5  | -0.12, - 0.5<br>0.77 | -0.12, - 0.5<br>2.11 | -0.12, - 0.5<br>4.4 | -0.12, - 0.5<br>5.8 |
|      | 0.5 ≤ 1.0  | -0.3, - 1.2<br>0.77  | -0.3, - 1.2<br>2.11  | -0.3, - 1.2<br>4.4  | -0.3, - 1.2<br>5.8  |
|      | > 1.0      | -0.6, - 2.3<br>0.77  | -0.6, - 2.3<br>2.11  | -0.6, - 2.3<br>4.4  | -0.6, - 2.3<br>5.8  |

\* Proporción DHA: 0.67

Una porción por semana

|      |            | EPA+DHA              |                      |                     |                     |
|------|------------|----------------------|----------------------|---------------------|---------------------|
|      |            | < 3 mg/g             | 3 < 8 mg/g           | 8 < 15 mg/g         | > 15 mg/g           |
| MeHg | ≤ 0.1 µg/g | -0.02, - 0.1<br>0.77 | -0.02, - 0.1<br>2.11 | -0.02, - 0.1<br>4.4 | -0.02, - 0.1<br>5.8 |
|      | 0.1 ≤ 0.5  | -0.12, - 0.5<br>0.77 | -0.12, - 0.5<br>2.11 | -0.12, - 0.5<br>4.4 | -0.12, - 0.5<br>5.8 |
|      | 0.5 ≤ 1.0  | -0.3, - 1.2<br>0.77  | -0.3, - 1.2<br>2.11  | -0.3, - 1.2<br>4.4  | -0.3, - 1.2<br>5.8  |
|      | > 1.0      | -0.6, - 2.3<br>0.77  | -0.6, - 2.3<br>2.11  | -0.6, - 2.3<br>4.4  | -0.6, - 2.3<br>5.8  |

\* Proporción DHA: 0.67

Dos porciones por semana

|      |            | EPA+DHA             |                     |                     |                     |
|------|------------|---------------------|---------------------|---------------------|---------------------|
|      |            | < 3 mg/g            | 3 < 8 mg/g          | 8 < 15 mg/g         | > 15 mg/g           |
| MeHg | ≤ 0.1 µg/g | -0.04, - 0.2<br>1.5 | -0.04, - 0.2<br>4.2 | -0.04, - 0.2<br>5.8 | -0.04, - 0.2<br>5.8 |
|      | 0.1 ≤ 0.5  | -0.2, - 0.9<br>1.5  | -0.2, - 0.9<br>4.2  | -0.2, - 0.9<br>5.8  | -0.2, - 0.9<br>5.8  |
|      | 0.5 ≤ 1.0  | -0.6, - 2.3<br>1.5  | -0.6, - 2.3<br>4.2  | -0.6, - 2.3<br>5.8  | -0.6, - 2.3<br>5.8  |
|      | > 1.0      | -1.2, - 4.7<br>1.5  | -1.2, - 4.7<br>4.2  | -1.2, - 4.7<br>5.8  | -1.2, - 4.7<br>5.8  |

\* Proporción DHA: 0.67

Siete porciones por semana

|      |            | EPA+DHA             |                     |                     |                     |
|------|------------|---------------------|---------------------|---------------------|---------------------|
|      |            | < 3 mg/g            | 3 < 8 mg/g          | 8 < 15 mg/g         | > 15 mg/g           |
| MeHg | ≤ 0.1 µg/g | -0.14, - 0.5<br>5.4 | -0.14, - 0.5<br>5.8 | -0.14, - 0.5<br>5.8 | -0.14, - 0.5<br>5.8 |
|      | 0.1 ≤ 0.5  | -0.84, - 3.3<br>5.4 | -0.84, - 3.3<br>5.8 | -0.84, - 3.3<br>5.8 | -0.84, - 3.3<br>5.8 |
|      | 0.5 ≤ 1.0  | -2.1, - 8.2<br>5.4  | -2.1, - 8.2<br>5.8  | -2.1, - 8.2<br>5.8  | -2.1, - 8.2<br>5.8  |
|      | > 1.0      | -4.2, - 16.3<br>5.4 | -4.2, - 16.3<br>5.8 | -4.2, - 16.3<br>5.8 | -4.2, - 16.3<br>5.8 |

\* Proporción DHA: 0.67

|           |                              | <b>EPA+DHA</b>  |   |  |   |
|-----------|------------------------------|---|---|--|---|
|           |                              | <b>≤ 3 mg/g</b>   | <b>3 &lt; x ≤ 8 mg/g</b>  | <b>8 &lt; x ≤ 15 mg/g</b>  | <b>&gt; 15 mg/g</b>   |
| <b>Hg</b> | <b>≤ 0.1 µg/g</b>            | <b>FISH:</b> Butterfish; Catfish; Cod, Atlantic; Cod, Pacific ; Crawfish ; Croaker, Atlantic; Haddock; Pike; Plaice, European; Pollock; Saithe; Sole; Tilapia<br><b>SHELLFISH:</b> Clams; Cockle; Cuttlefish; Oysters; Periwinkle; Scallops; Scampi; Sea urchin; St James shells; Whelk | <b>FISH:</b> Flatfish; John Dory; Flatfish; Perch, Ocean and Mullet; Sweetfish; Wolf fish<br><b>SHELLFISH:</b> Mussels; Prawn; Squid  | <b>FISH:</b> Redfish; Smelt; Salmon, Pacific (farmed & wild); Salmon, Atlantic (wild)<br><b>SHELLFISH:</b> Crab, spider; Swimcrab  | <b>FISH:</b> Anchovy; Herring; Mackerel; Mackerel, Chub; Rainbow trout; Salmon, Atlantic (farmed); Sardines; Sprat<br><b>FISH LIVER:</b> Cod, Atlantic (liver); Saithe (liver)<br><b>SHELLFISH:</b> Crab (brown meat) |
|           | <b>0.1 &lt; x ≤ 0.5 µg/g</b> | <b>FISH:</b> Anglerfish; Catshark; Dab; Grenadier; Grouper; Gurnard; Hake; Ling; Lingcod and Scorpionfish; Nile perch; Pout; Ray; Snapper, Porgy, and Sheepshead; Tuna, yellowfin; Tusk; Whiting<br><b>SHELLFISH:</b> Lobster; Lobsters, American                                       | <b>FISH:</b> Bass, Freshwater; Carp and Buffalo fish; Perch, Freshwater; Scorpion fish; Skate; Tuna; Tuna, Albacore<br><b>SHELLFISH:</b> Crab; Lobster, Norway; Lobsters, Spiny | <b>FISH:</b> Bass, Saltwater; Bluefish; Goatfish; Halibut, Atlantic; Halibut, Greenland ; Mackerel, Horse; Mackerel, Spanish ; Seabass; Seabream; Tilefish, Atlantic; Tuna, skipjack | <b>FISH:</b> Eel; Mackerel Pacific; Sablefish; Tuna, Pacific bluefir  |
|           | <b>0.5 &lt; x ≤ 1.0 µg/g</b> | <b>FISH:</b> Alphosino; Marlin; Orange Roughy; Tuna, bigeye   | <b>FISH:</b> Mackerel, King; Shark  | <b>FISH:</b> Emperor   |   |
|           | <b>&gt; 1.0 µg/g</b>         |   | <b>FISH:</b> Swordfish  |  |   |



# La consulta recomienda a los Estados Miembros:

- Reconocer que el consumo de pescado es una fuente importante de energía, proteínas, y un número de nutrientes esenciales y parte de la tradición cultural de muchos pueblos
- Enfatizar los beneficios del consumo de productos pesqueros para reducir la mortalidad de enfermedades cardiovasculares (y el riesgo elevado de enfermedades cardiovasculares por no consumir pescado)

- Enfatizar los beneficios del consumo maternal de pescado para el desarrollo cerebral de sus niños (en particular durante la gestación y la lactancia), y el riesgo al desarrollo cerebral por madres que no consume pescado
- Desarrollar, mantener y mejorar bases de datos sobre nutrientes y contaminantes, en particular niveles de MeHg, dioxinas y compuestos similares en productos pesqueros consumidos en las diferentes regiones.
- Desarrollar y evaluar estrategias de comunicación y manejo para minimizar los riesgos y maximizar los beneficios del consumo de productos pesqueros

**Muchas gracias**