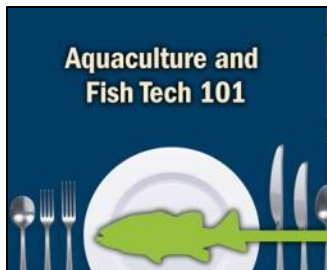
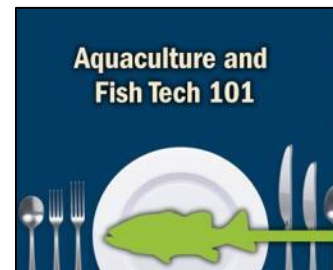


Seafood and Aquaculture Issues: Communicating the Positive Message



John Ewart and Doris Hicks
Delaware Sea Grant Marine Advisory Service
2016 North Central Aquaculture Conference
March 12-13, 2016 Milwaukee, Wisconsin



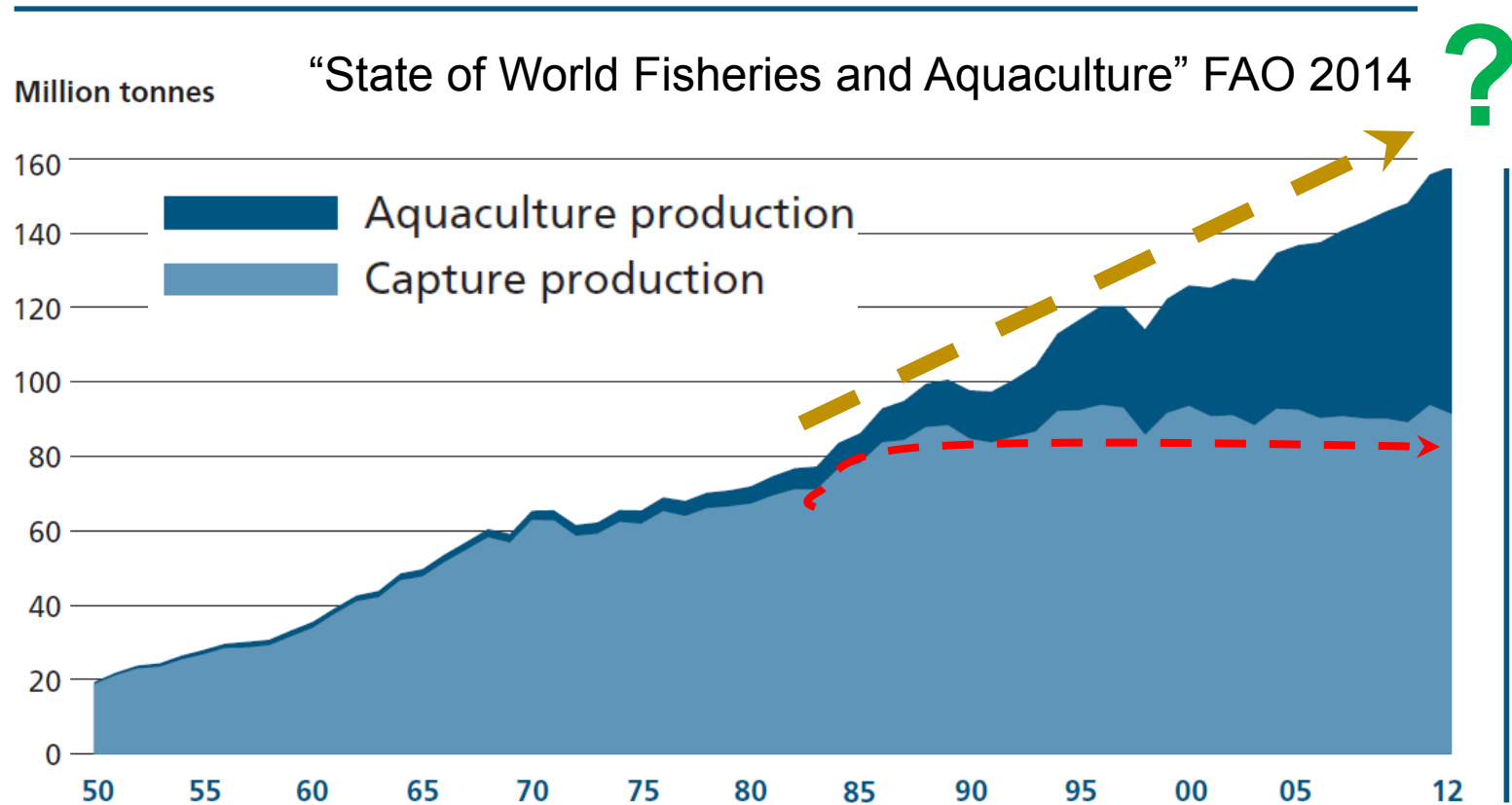


*“Seafood, as eaten
in the USA, is the
safest and healthiest
source of muscle
protein eaten in the
world !”*

Dr. Steve Otwell
University of Florida
4/20/15

But is there
enough ?

Aquaculture will need to provide an increasing % of the world seafood supply



Can the farm raised pace continue ?

Persistent Issues

- Fear of methyl mercury in seafood
- Fear of oil spill residuals in certain harvest areas
- Farm Raised vs. Wild Harvest (traditional)
- Imports vs. Domestic and Local (traditional)

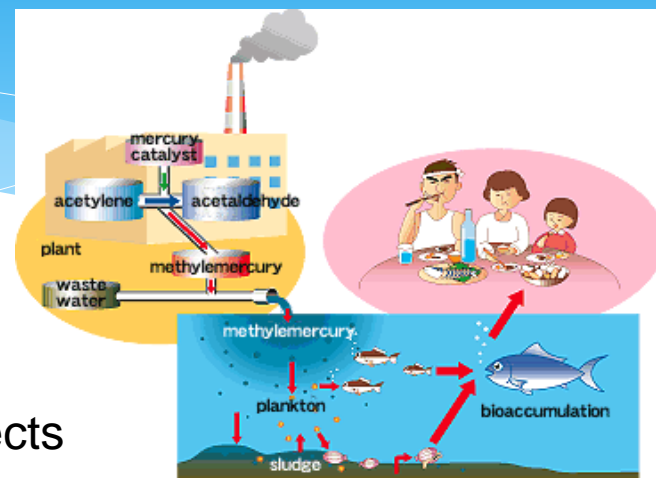


AquaBounty Salmon



Major Organic Mercury Poisonings


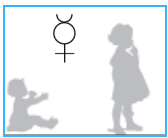



- Minamata Disease (1950s-'60s)
 - Unregulated dumping of mercury into bay
 - Accumulation in fish and shellfish consumed by Minamata inhabitants
 - Irreversible nervous system damage, deaths, children born with severe birth defects
 - >2000 cases, ~600 deaths



- * Iraqi Wheat Seed Consumption (1950s, '60s, &'70s)
 - * Seeds coated with organic mercury fungicide used to make bread
 - * 6500 cases and >400 deaths



Epidemiology Studies

| | Faroe Islands Study ★ | Seychelles Study ★ |
|--|---|---|
| Location  | <ul style="list-style-type: none"> •North Atlantic Ocean/Norwegian Sea | <ul style="list-style-type: none"> •Indian Ocean |
| Hg Effect?  | <ul style="list-style-type: none"> Yes in some tests (learning, memory, vocab) | <ul style="list-style-type: none"> No Correlation |
| Hg Levels  | <ul style="list-style-type: none"> •Maternal hair ave. 4.27 (2.6-7.7*) •Children age 7 hair: ave. 3.0 ppm (1.7-6.1*) •Ave. umbilical cord blood 22.9 ug/L (13-41*) | <ul style="list-style-type: none"> •Maternal hair ave. 6.8 ppm (0.5-26.7) •Children age 5 hair: ave. 6.5 ppm (0.9-25.8) |
| Fish Intake  | <ul style="list-style-type: none"> •High fish intake •Occasional pilot whale meat (high [Hg], up to 150 ppm) •Exposure to PCBs  | <ul style="list-style-type: none"> •High fish intake (ave 12 servings/wk) •Typical fish [Hg] range: 0.004-0.75 ppm |

* Refers to interquartile range

Risk Messages Outweigh Benefit Messages 4:1

Analysis by Bloomberg School of Public Health, Johns Hopkins University
Media Portrayal of Risks and Benefits of Seafood Consumption

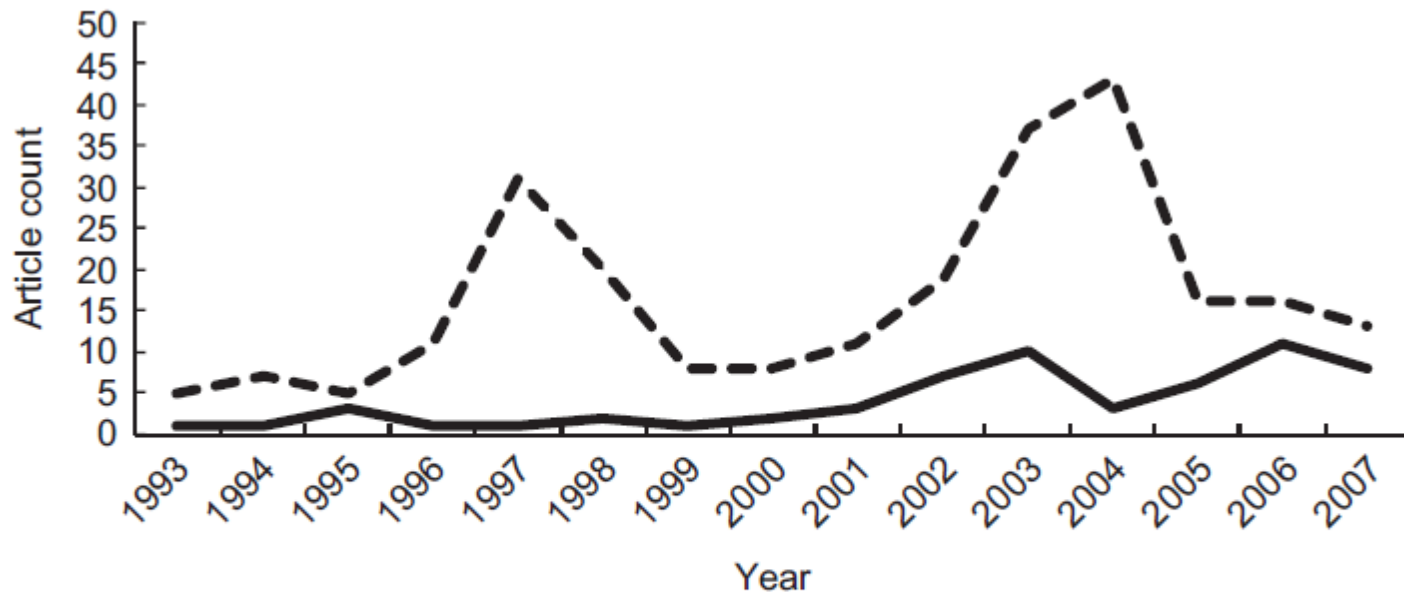
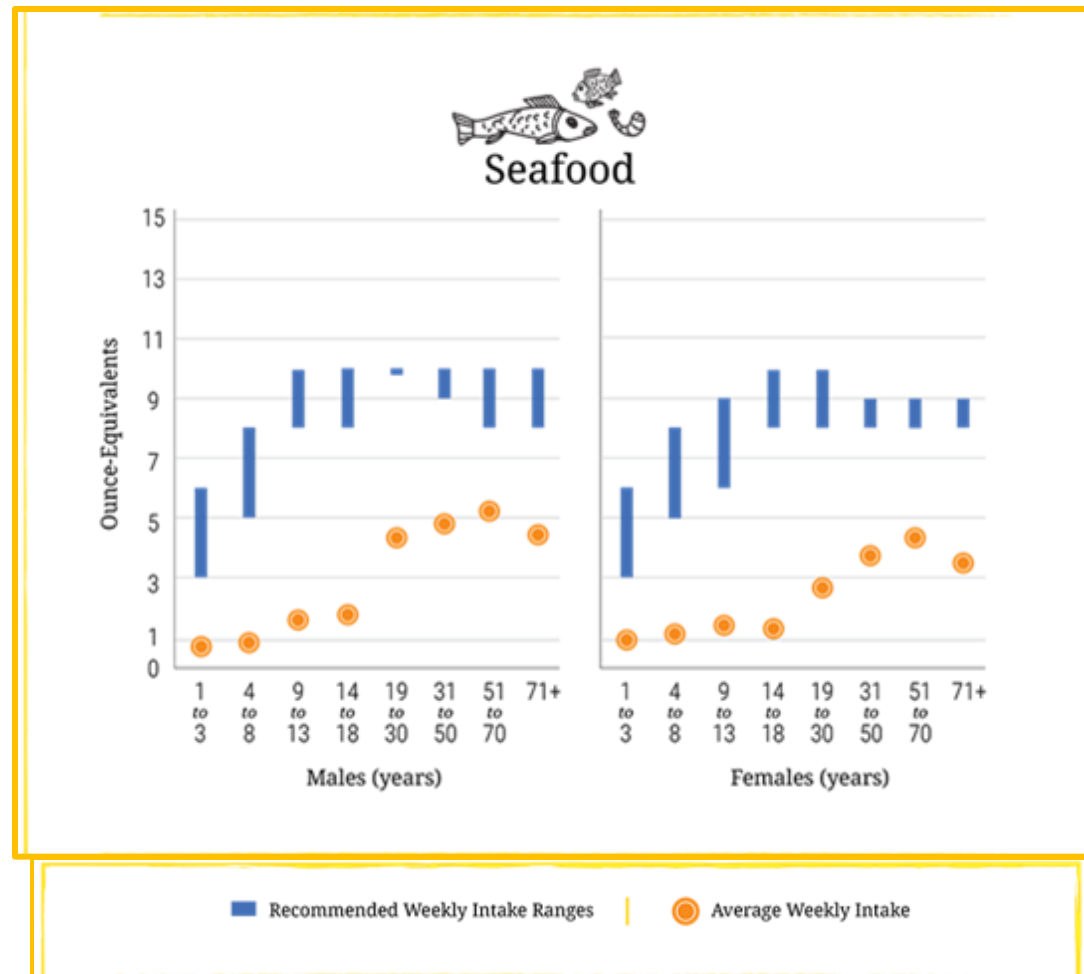


Fig. 2 Health benefits (—) and health risk (— — —) framing by year

One risk we all must consider ...

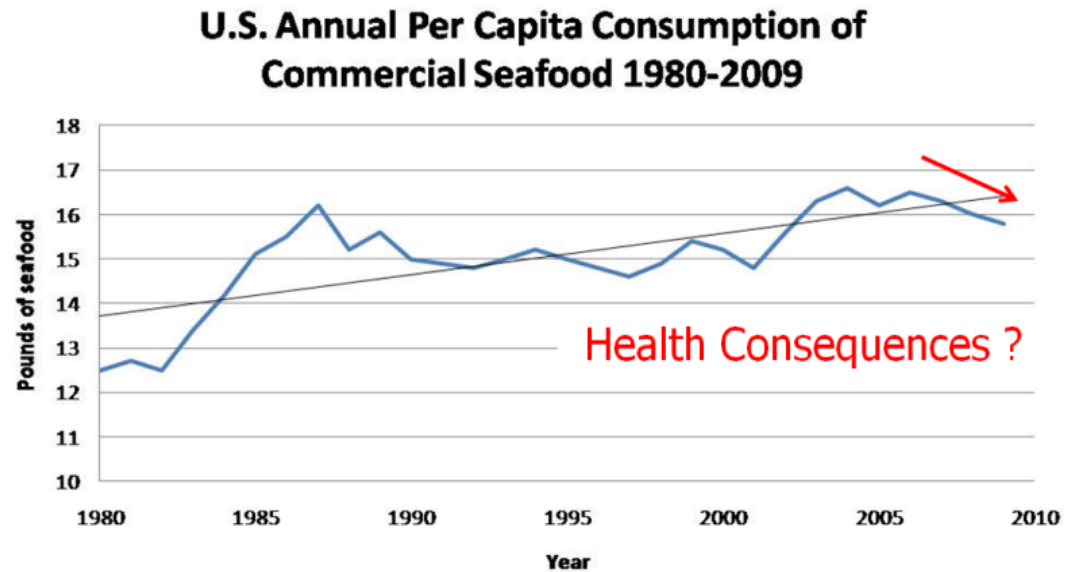
Not enough seafood consumption



<http://health.gov/dietaryguidelines/2015/guidelines/chapter-2/a-closer-look-at-current-intakes-and-recommended-shifts/#callout-nutrient-dense>

Limiting seafood consumption ...

- Local Supply
- Higher Cost
- New Choices ?
- Apprehension About Source and Quality
- Confusing and Fearful Media and Advisories

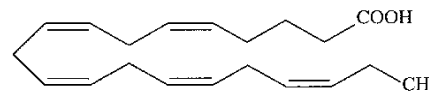


Health Benefits from Seafood Consumption

- * Reduced coronary heart disease
- * Improved cognitive development in infants
- * Improved vision in children
- * Other potential effects (less certain)
 - * reduction of certain cancers
 - * immunological response
 - * delay onset of Alzheimer's
 - * depression



DHA added to infant foods



EPA (5,8,11,14,17-Eicosapentaenoic Acid)

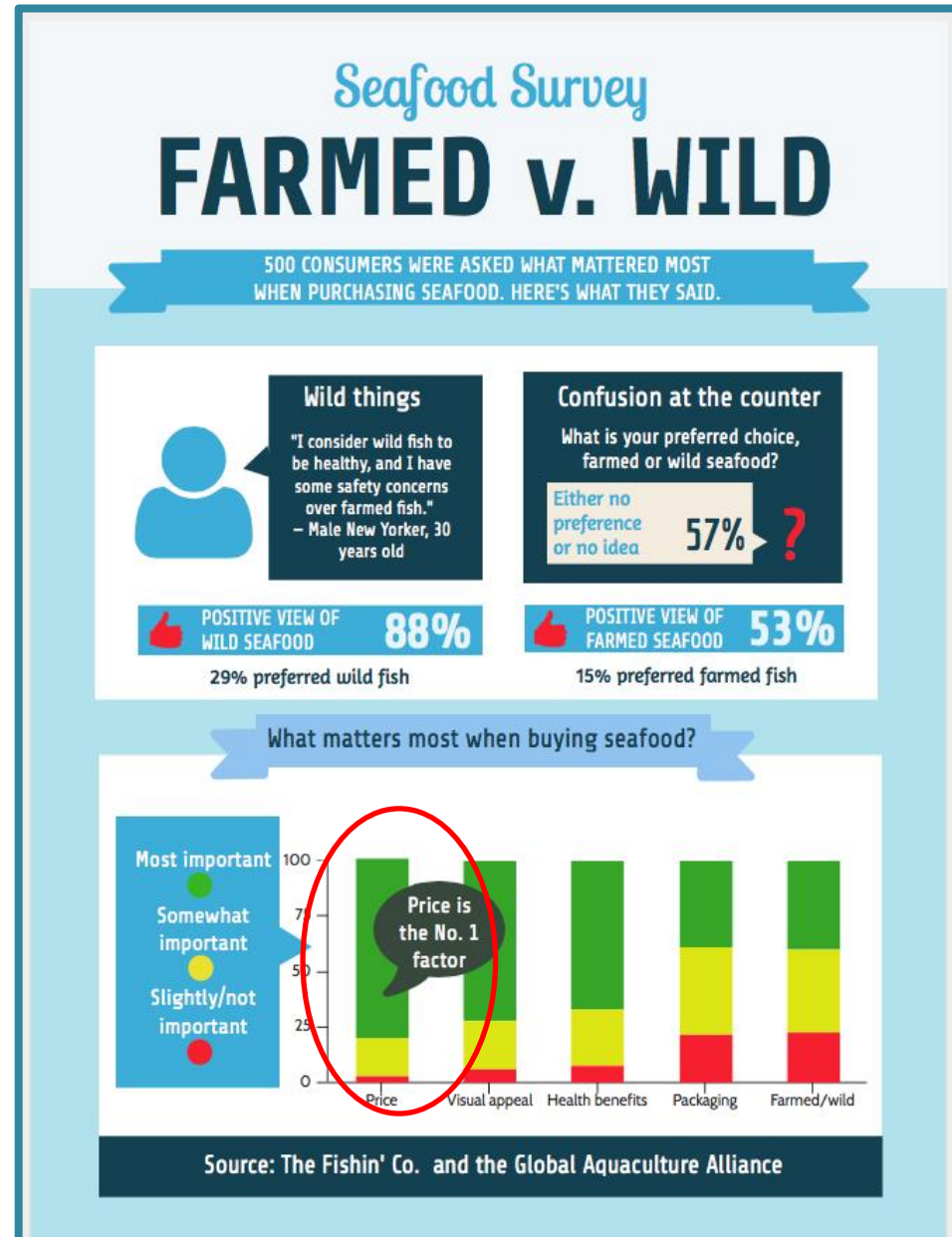


DHA (4,7,10,13,16,19-Docosahexaenoic Acid)

EPA and DHA found only in marine plants and animals

So What Else Do We Know?

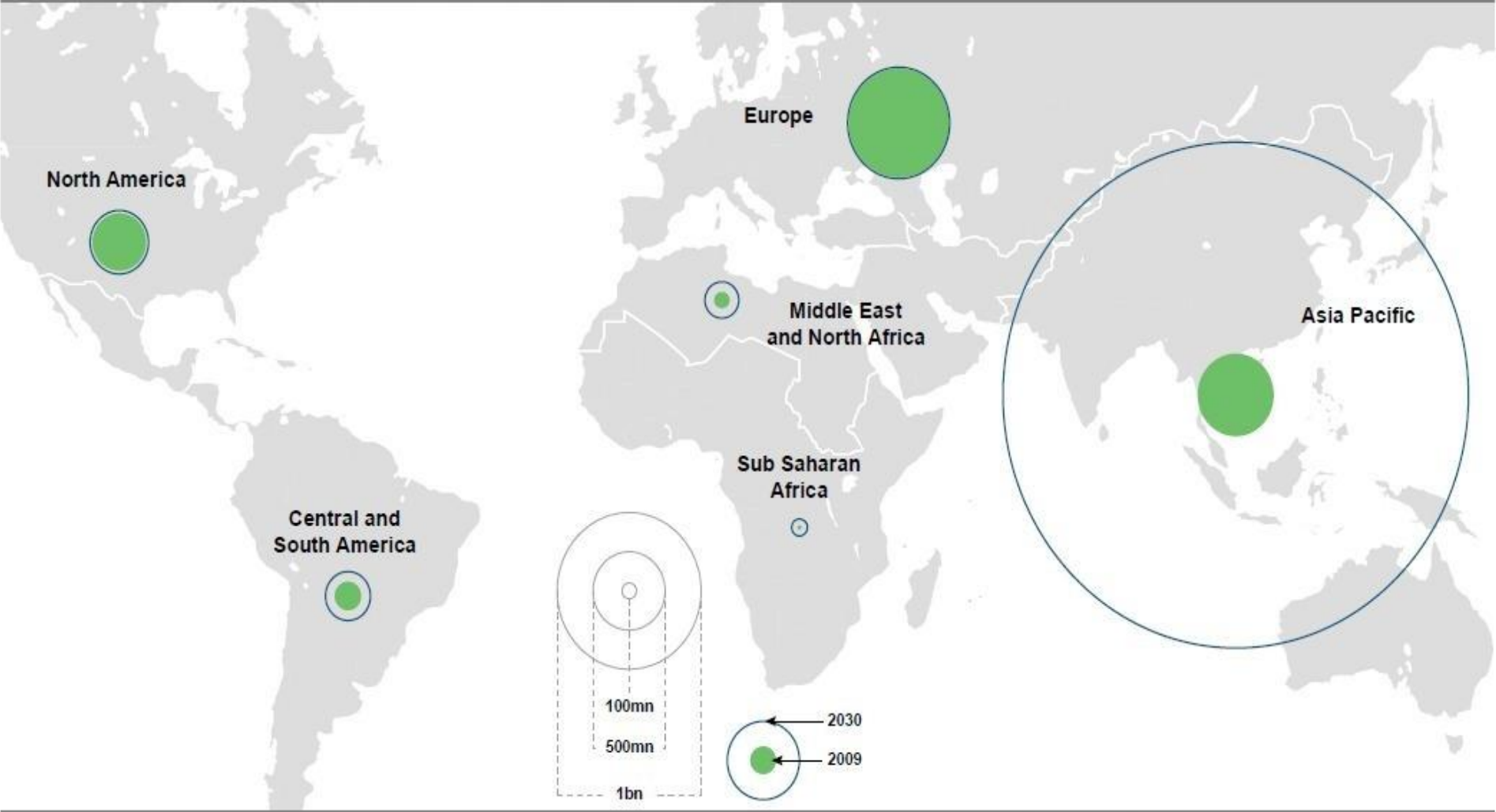
- Majority of the public consuming some seafood, but for most not as much as is recommended
- Most recognize the health advantages of seafood, but over half have also heard something negative
- Advisory recommendations are not clearly understood
- Consumers prefer to use the media and internet to get their information about seafood
- Price is the number one consideration in most purchase decisions



Future Prospects

- **World population** is projected to grow to 9-10 billion by the year 2050. This will require global food production to double by 2050.
- Increase in **animal protein** demand will be required by improved economies in developing countries.
- **Natural resource** expansion (land and water) will be stretched to their limits.
- Higher demands for food production will compete for **energy** in energy markets

Chart 9: Global middle class in 2009 and prediction for 2030



Sources: OECD, Standard Chartered Research

21st Century Global Food Challenges

THE WALL STREET JOURNAL. Digital Network W.S.J.com MarketWatch

THE WALL STREET JOURNAL.

As of 12:14 p.m. EDT Friday, August 1, 2008

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THE FOOD CRISIS



José Batista Jr. at a feedlot outside Andradina, Brazil.

Brazilian Beef Clan Goes Global Amid Troubles

With grain prices high, the meat business is reeling. Brazil's JBS smells blood, and has set out to assemble a global beef empire. Its premise is simple: Meatpackers, at the moment, are cheap.

• [Find out the Beef: The world's obsession awaits.](#)

The Economist

APRIL 19TH 2008 www.economist.com

Brazil as the next oil giant
God help Italy
London's funny but sad election
The return of Disney
Cancer's link to stem cells



The silent tsunami
The food crisis and how to solve it

U.S. News & World Report
usnews.com

Tuesday, August 5, 2008

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8 Ways to Fix the Global Food Crisis
Ideas range from improving aid programs to taking a

By Marianne Lavelle, Kent Garber
Posted May 9, 2008

The world food crisis has two faces. Here in the United States price of milk, meat, and eggs. But elsewhere on the globe, an last week when tens of thousands of rioters converged on the

PHOTO GALLERY
Global Food Crisis
Click to view

The strain on U.S. consumption in grocery prices in years that toppled Haiti's government is deepening the tragedy

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The rising cost of food

Moscow to seize grain export controls

Russia plans to form a state grain trading company to control up to half the country's cereal exports, intensifying fears it wants to use food exports as a diplomatic weapon - Jul-31

More donations to UN food agency urged

Report looks into WFP's future financial needs - Jul-23

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The New York Times **World Business**

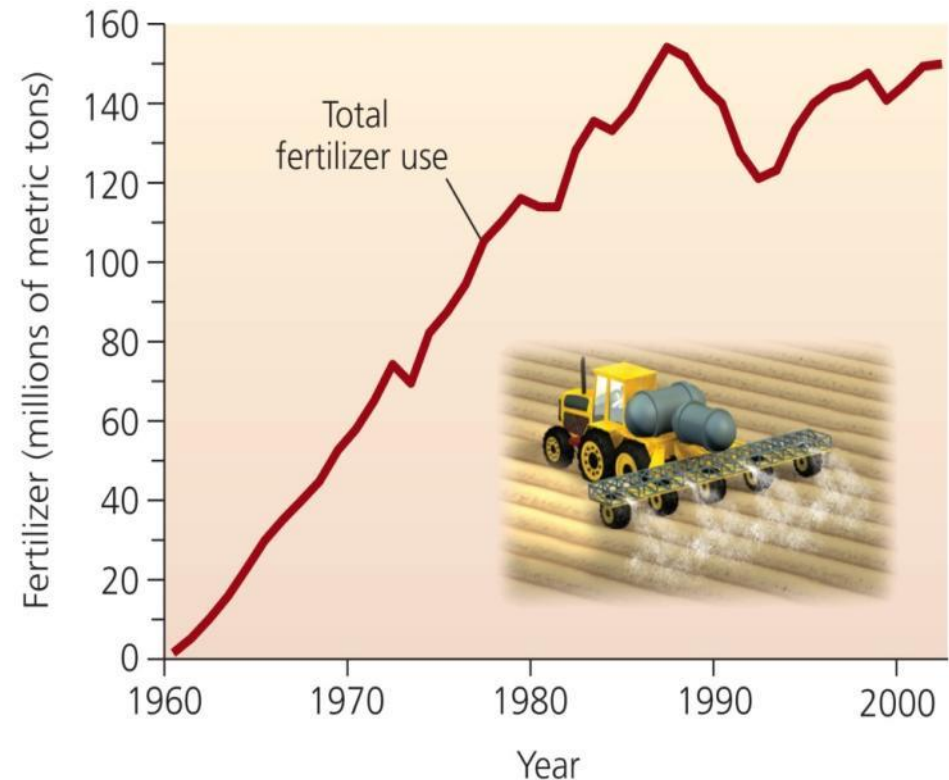
WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH SPORTS OPINION

THE FOOD CHAIN
Worries Mount as Farmers Push for Big Harvest



Over-application of Fertilizer to grow the crops to produce the feed

- Inorganic fertilizer use has skyrocketed
- Over-applying fertilizer can ruin the soil and pollute several areas
- Runoff causes eutrophication in nearby water systems
- Nitrates leach through soil and contaminate groundwater
- Dead Zone – Gulf of Mexico
Effect on fisheries



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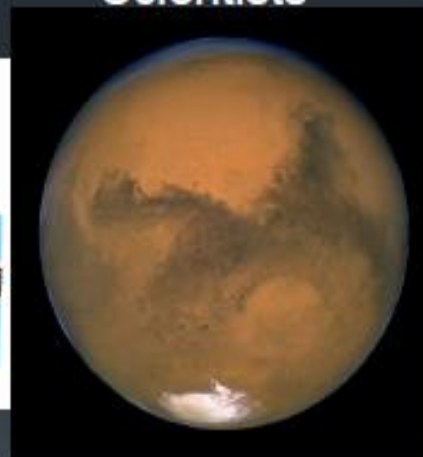


Consider this . . .

Consumers



Scientists



***How do we bridge the gap to build consumer
confidence and trust?***

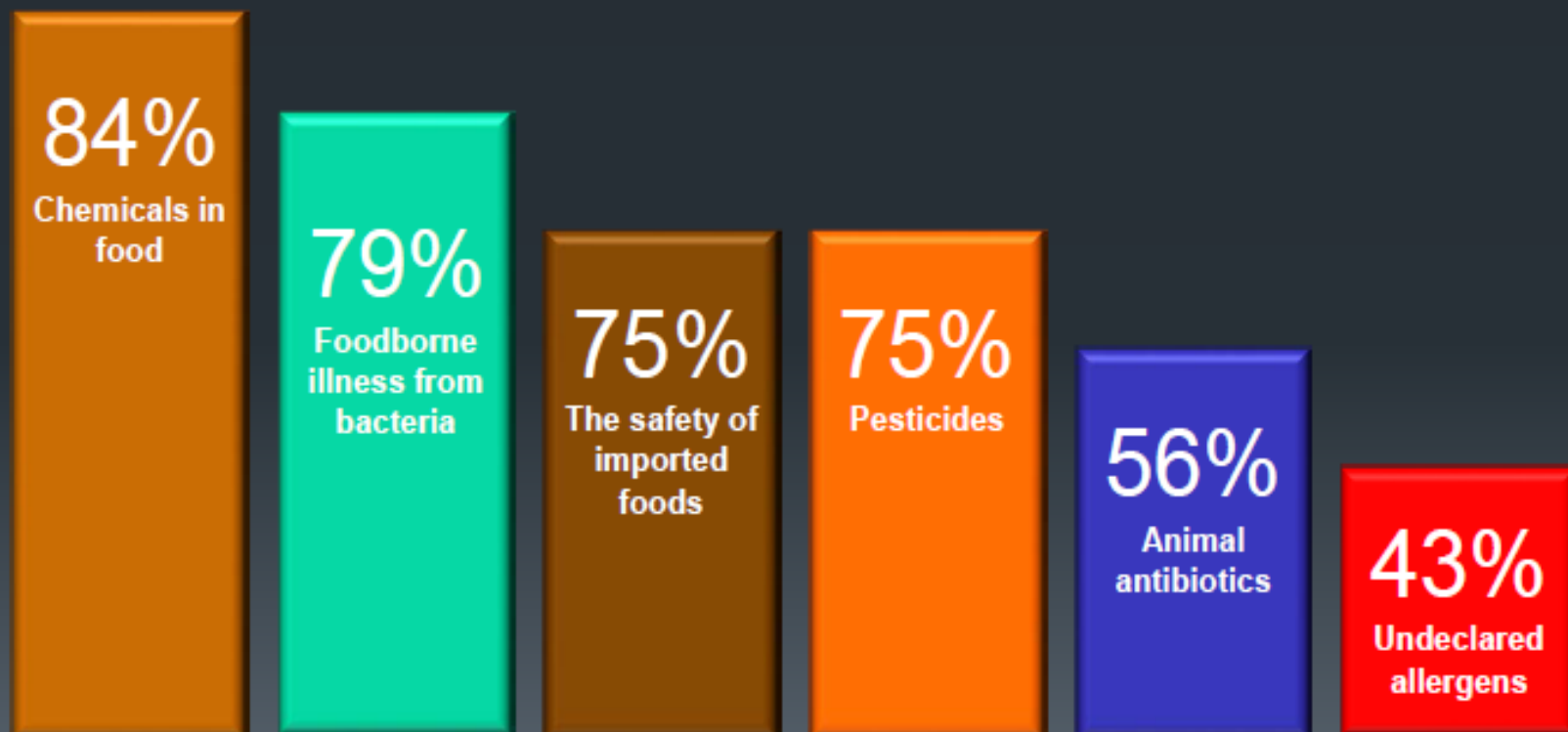
The Starting Point . . . Years of Consumer Insights



**Consumer Attitudes Toward
Chemicals in Food**

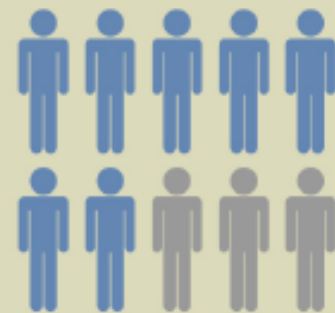


How much thought (if any) have you given to the following issues?

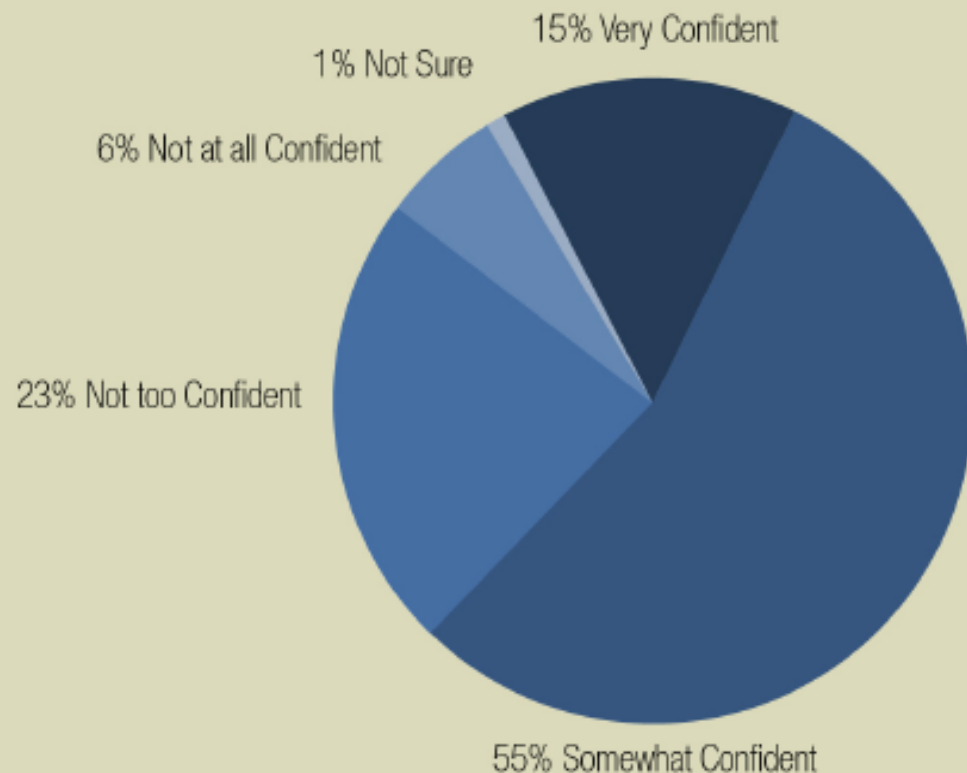


Respondents represent "a little" or "a lot"
2013 IFIC Foundation food & Health Survey www.foodinsight.org

7 OUT OF 10 CONSUMERS ARE CONFIDENT IN THE SAFETY OF THE U.S. FOOD SUPPLY



BREAKDOWN OF ALL RESPONSES:



70%

of consumers are **VERY**
or **SOMEWHAT** confident
in the safety of the U.S.
food supply.

Seafood Certification Programs



Market already is demanding reduced labels



Key Influencers that Prompt Behavior Change

Health professional recommendation 67%

Media reports (Traditional, on line news) 46%

Government agency recommendation 45%

PSAs 44%

Family and friends 12%

Blog / social networking site 12%



Call to Action . . .

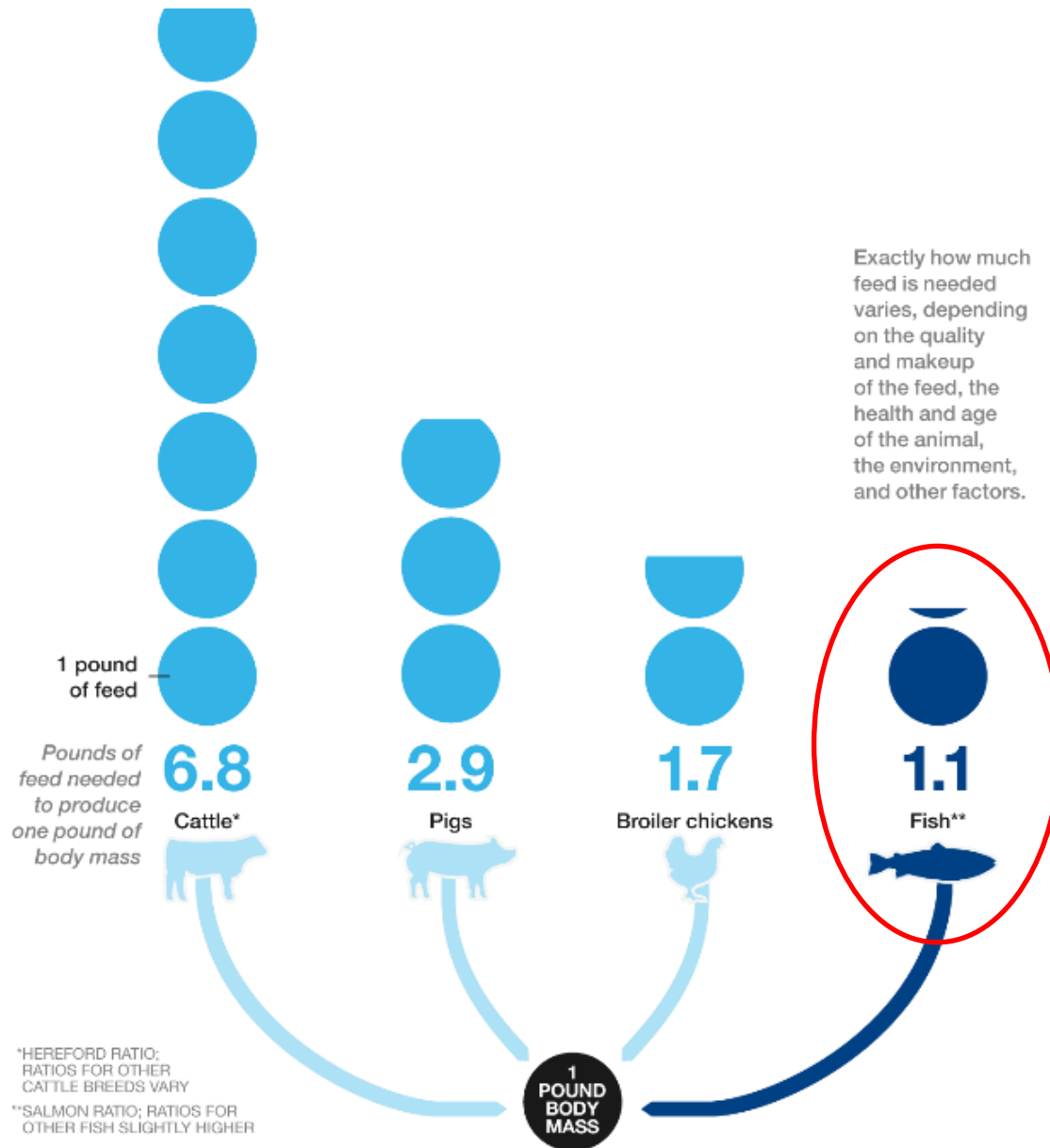
- Build the positive; reduce the negative
 - Focus communications on the benefits
- Engage experts; medical community and health professionals, dietitians as key message multipliers
- Engage where the conversation is taking place
 - Become a “maven”
- Communicate in terms that consumers understand

Are Fisheries Sustainable?

The good news is **Yes** – where fisheries management is applied

- 1) A combination of policies to support sustainability, science to support the policies, and the ability to enforce policies and regulations has been shown to work wherever it is applied
- 2) What gets measured gets managed
- 3) Fisheries appear to be in decline where fisheries are not being managed

Energy Inputs and Environmental Impact



Feed Conversion Efficiency

| | Fish | Chicken | Pork | Beef |
|--|------|---------|------|------|
| Feed Conversion Kg feed/kg live weight | 1.5 | 2.3 | 5.9 | 12.7 |
| Feed Conversion Kg feed/kg edible part | 2.3 | 4.2 | 10.7 | 31.7 |
| Protein Content % | 18 | 20 | 14 | 15 |
| Protein Conversion Efficiency | 30 | 25 | 13 | 5 |

Over 90% USA Seafood Consumption is Imported

North and Central America



Dependence on imports is inevitable and necessary for the majority of US consumers



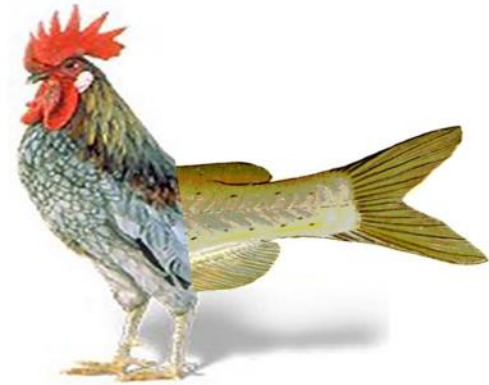
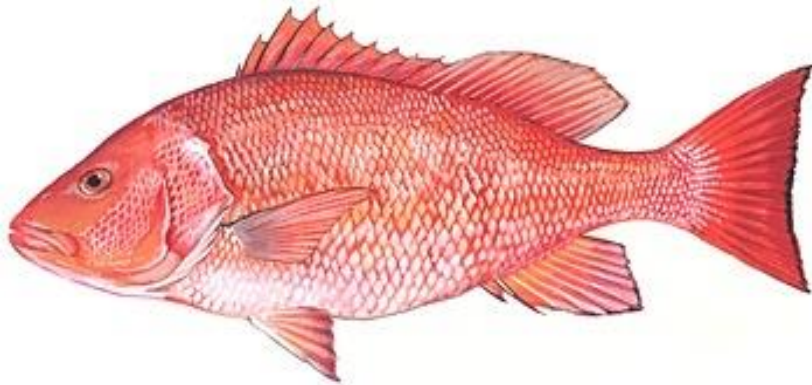
Biological and market indicators suggest this trend will only increase

Situation ...

- Demand >> Supply
- Cost for traditional preferences will continue to increase
- New choices will depend on aquaculture (farmed) and imports
- New choices will cause initial apprehension that will question food safety and source



Who Gets What Fish ?



Traditional & Popular

New & Acceptable ?



Tilapia

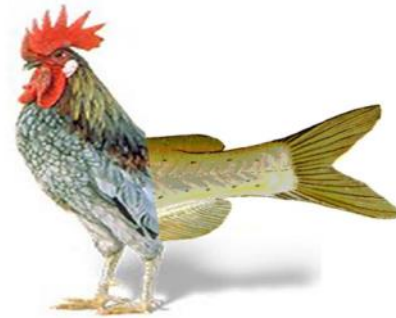


Basa & Swai



Channel Catfish

Era of the Aquatic Chicken





Branzino



Cobia

New Choices



**Ocean
Trout**



Kampachi



Barramundi

Transition



Basa

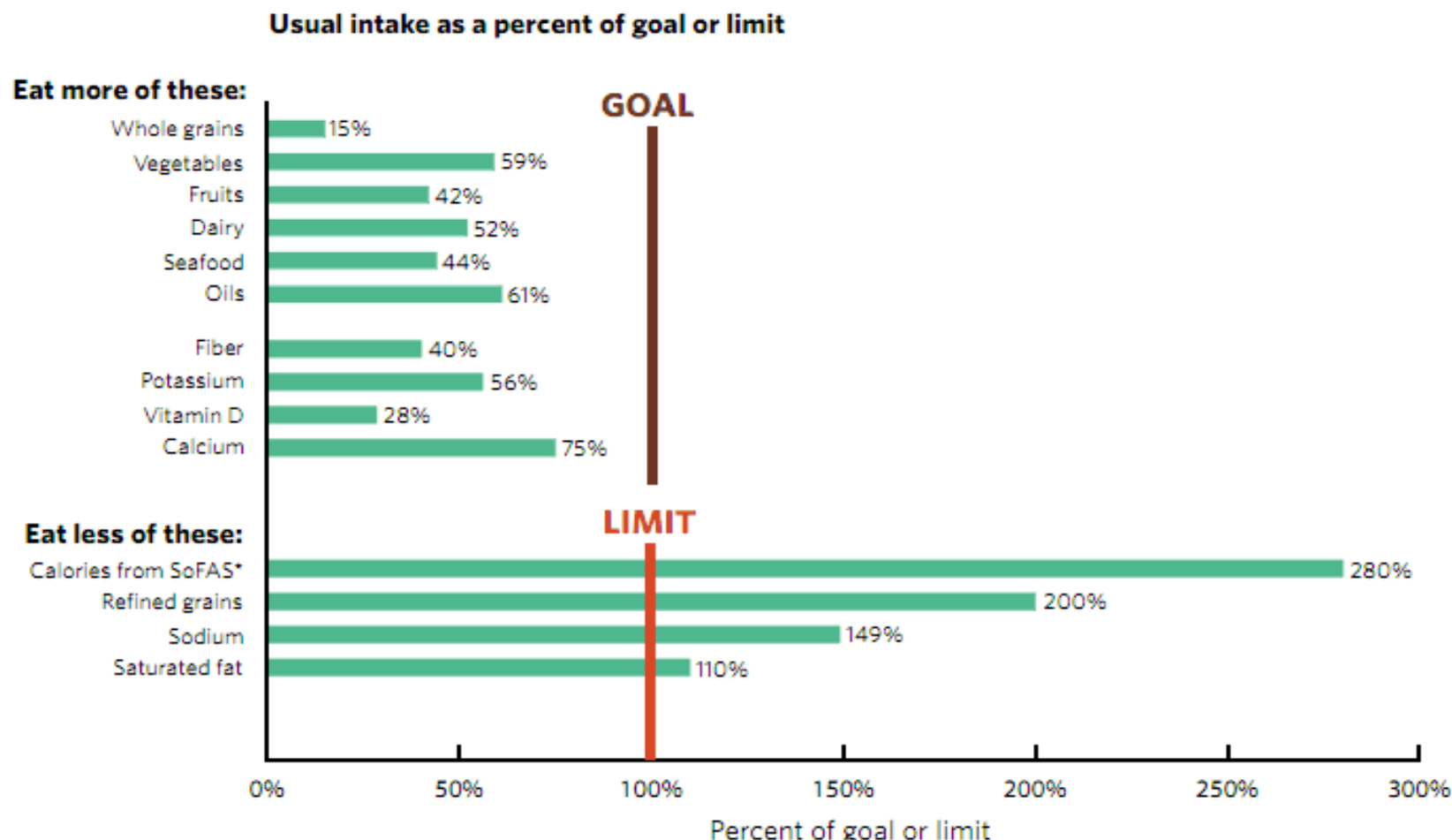
Call to Action . . .

- Build the positive; reduce the negative
 - Focus communications on the benefits
- Engage experts; medical community and health professionals, dietitians as key message multipliers
- Engage where the conversation is taking place
 - Become a “maven”
- Communicate in terms that consumers understand

Points to Communicate.....

- Fish or aquatic foods are an important but often little recognized element in food security and nutrition**
- Supply will have to be expanded significantly to meet future population growth**
- Environmental impacts from both wild-caught fisheries and aquaculture less than land-based animal protein production**
- Many of the world's major fisheries are sustainable and will continue to play an important role in human nutrition**
- Future supply increases will come from aquaculture, which may have to double in output to meet future seafood demand**
- US Consumers and policy makers need to better understand the role of fish protein in the meeting dietary and health needs of present and future populations**
- US seafood: highest quality and international demand**

FIGURE 5-1. How Do Typical American Diets Compare to Recommended Intake Levels or Limits?



*SoFAS = solid fats and added sugars.

Note: Bars show average intakes for all individuals (ages 1 or 2 years or older, depending on the data source) as a percent of the recommended intake level or limit. Recommended intakes for food groups and limits for refined grains and solid fats and added sugars are based on amounts in the USDA 2000-calorie food pattern. Recommended intakes for fiber, potassium, vitamin D, and calcium are based on the highest AI or RDA for ages 14 to 70 years. Limits for sodium are based on the UL and for

saturated fat on 10% of calories. The protein foods group is not shown here because, on average, intake is close to recommended levels.

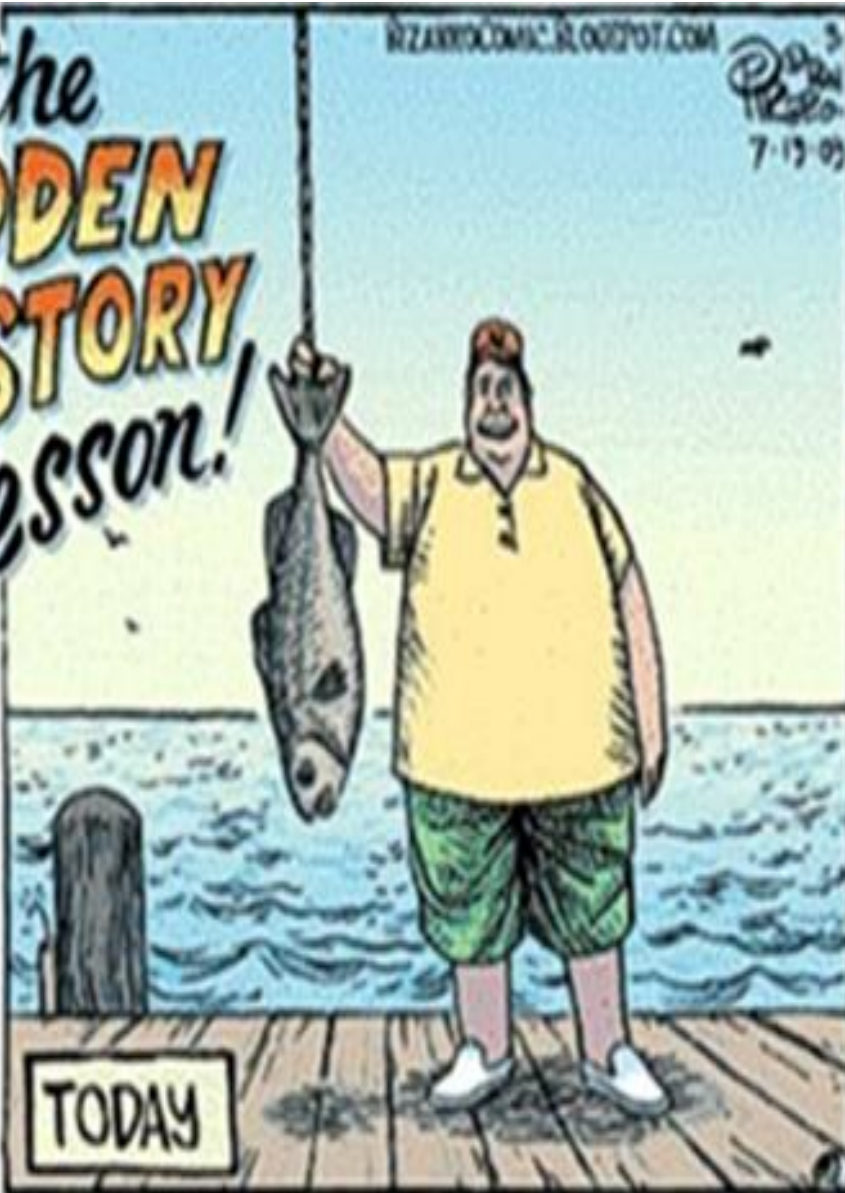
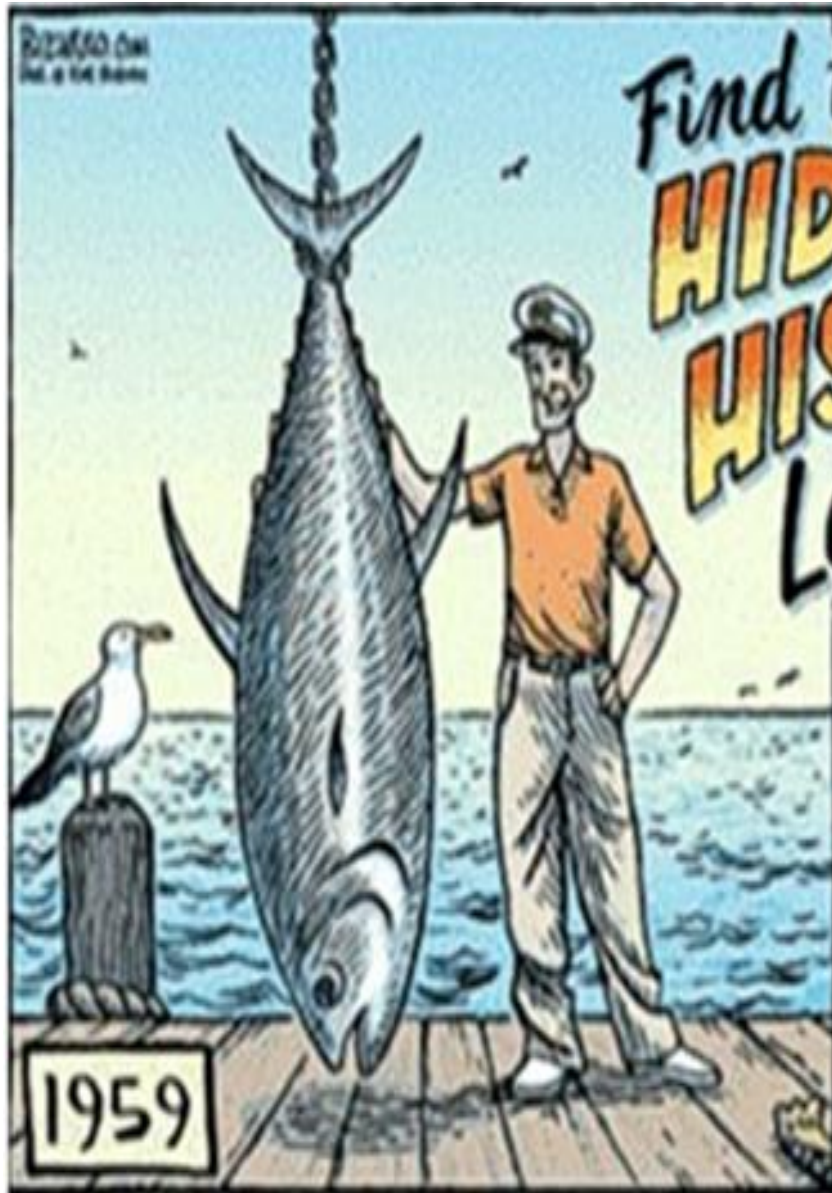
Based on data from: U.S. Department of Agriculture, Agricultural Research Service and U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. What We Eat in America, NHANES 2001-2004 or 2005-2006.

WIZARD COMICS
Vol. 9 No. 10

Find the **HIDDEN HISTORY** Lesson!

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<http://seafoodhealthfacts.org/>



Seafood Health Facts: Making Smart Choices Balancing the Benefits and Risks of Seafood Consumption Resources for Healthcare Providers and Patients

A joint project of Oregon State University, Cornell University, and the Universities of Delaware, Rhode Island, Florida and California.

[Home](#) [Site Overview](#) [Seafood Choices](#) [Seafood & Nutrition](#) [Seafood Safety](#) [Compare Benefits & Risks](#) [Seafood Q & A](#)



FACT: The mercury levels in salmon are often so low as to be undetectable.

Welcome to SeafoodHealthFacts.org

Overview: Eat Seafood Twice a Week

Current advice from the government and health organizations recommends eating two seafood meals each week. Scientists from government and universities, and healthcare professionals have all concluded that for most people the overall benefits of this level of seafood consumption outweigh potential food safety risks.

Nutritional Benefits

Seafood is a nutrient rich food that is a good source of protein, vitamins and minerals. Scientific studies continue to explore the relationship between the unique type of fat found in seafood, the omega-3 fatty acids DHA and EPA, in the prevention or mitigation of common chronic diseases. Click on the "Seafood and Nutrition" tab to learn more.

Food Safety

Like other perishable foods, food borne illness caused by microorganisms or naturally occurring toxins is the primary food safety risk associated with seafood. Illness is usually associated with improper harvesting, handling, storage or preparation. Those seafood products that are consumed raw or partially cooked represent the highest risk. Other risks associated with environmental contaminants could be a concern for some individuals especially those who catch and eat their own fish or shellfish from lakes, rivers, streams or bays or harbors that are contaminated by environmental pollutants. Click on the "Seafood Safety" tab to learn more.

Compare Risks and Benefits

Risks associated with seafood are as diverse as the commodity itself. Fish and shellfish can come from the wild, from fish farms, and from individuals who catch fish for recreation or to supplement their household food supply. Click on the "Seafood Risks and Benefits" tab to learn more.

Site Map and Overview

This Website is designed to provide science based information to help individuals and healthcare professionals understand both the benefits and the risks that could be associated with seafood. This information is organized to provide useful resources for:

- consumers who are interested in overview information,
- healthcare professionals who are seeking more detailed information, and
- researchers interested in original scientific publications or government reports.

NEWS & FEATURED ARTICLES

July 8, 2011

[Framing The Message About Seafood Registration for Conference on September 20-21, 2011, University of Delaware](#)

February 9, 2011

[Eat for a Healthy Heart, New FDA Consumer Update](#)

January 31, 2011

[USDA Announces New Dietary Guidelines for Americans \(2010\)](#)

November 15, 2010

[Hawaii Seafood Symposium: Making Sense of Seafood Health Benefits and Risks](#)

PUBLICATIONS FOR CONSUMERS OR PATIENTS

[Seafood for Health \(Two Page Tri-fold Brochure\)](#)

[Seafood for Health \(Two Page 8.5 x 11 Factsheet\)](#)

[Seafood for Health \(Two Page 8.5 x 14 Four Fold Brochure\)](#)

PUBLICATIONS FOR HEALTH CARE PROFESSIONALS

[Seafood for Health Reference Guide](#)

[\(Six Page 8.5 x 11 Factsheet\)](#)

[Seafood for Health Summary Guide](#)

[\(Two Page 8.5 x 11 Factsheet\)](#)

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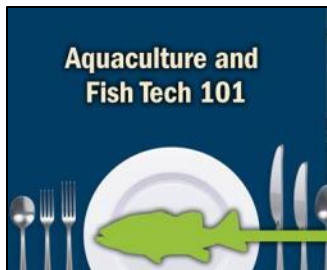


MONTEREY BAY AQUARIUM

Seafood WATCH®



Seafood and Aquaculture Issues: Communicating the Positive Message



John Ewart and Doris Hicks
Delaware Sea Grant Marine Advisory Service
2016 North Central Aquaculture Conference
March 12-13, 2016 Milwaukee, Wisconsin

