

Aquaculture Webinar Series

Introduction: David Cline, USAS President Elect



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U.S. Farm-Raised Finfish and Shellfish 101



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National Aquaculture Association

NATIONAL
Aquaculture
ASSOCIATION





AQUACULTURE (fish farming)

Production of aquatic animals and plants under controlled conditions for all or part of the life cycle





What is Produced?



- Food -both finfish & shellfish
- Plants-food, ornamentals, remediation
- Baitfish & sportfish
- Wildlife restoration
- Companion animals
- Biological controls
- Medical research
- Amphibians & reptiles



Ponds

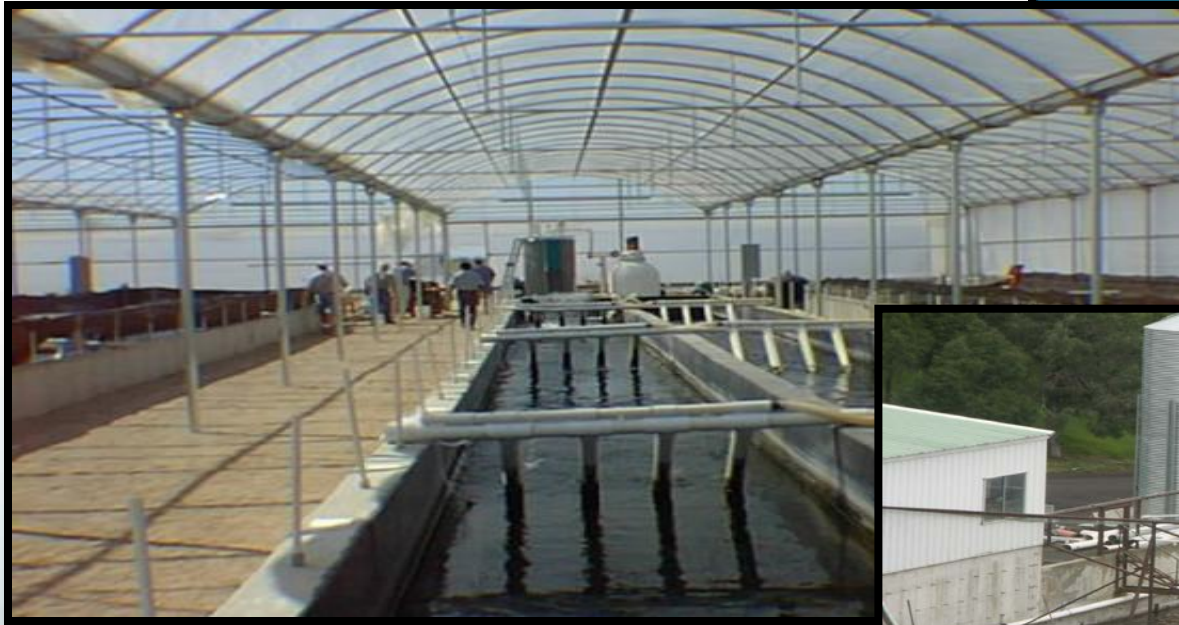


Catfish, tilapia, red drum, hybrid striped bass

Tanks



Raceways



Net pens



IMTA





Open Ocean



Shellfish Aquaculture



The most commonly farmed fish in the world is:

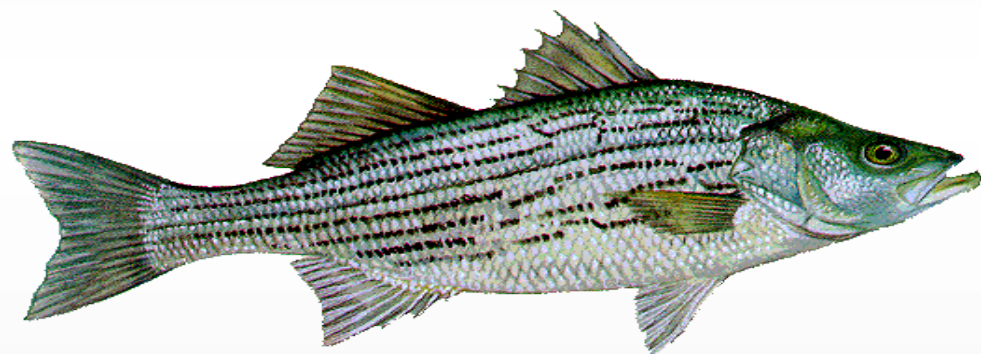
- Carp
- Atlantic salmon
- Catfish
- Trout
- tilapia



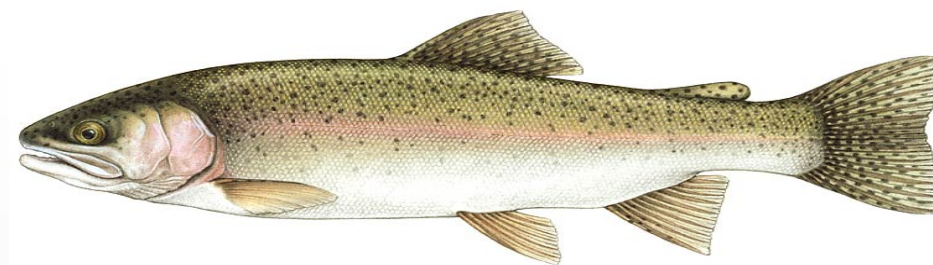
Common species



Atlantic Salmon



Hybrid Striped Bass



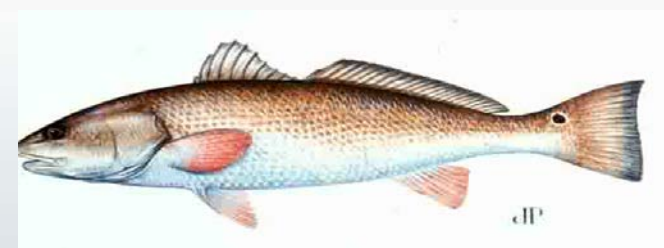
Rainbow Trout



Catfish



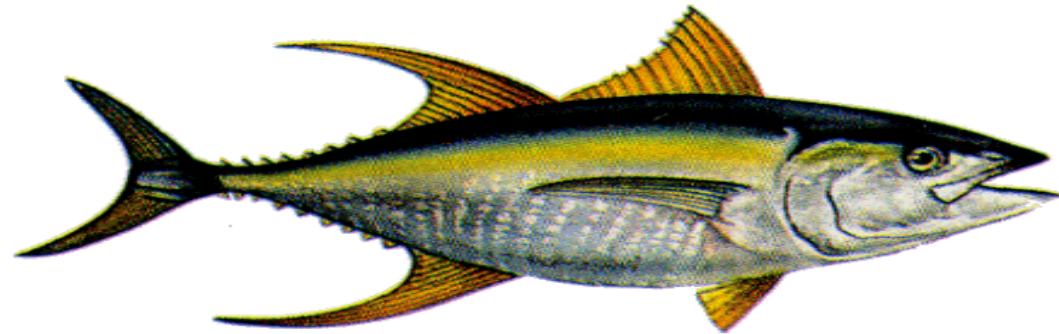
Tilapia



Red Drum

tilapia

Other species



Tuna



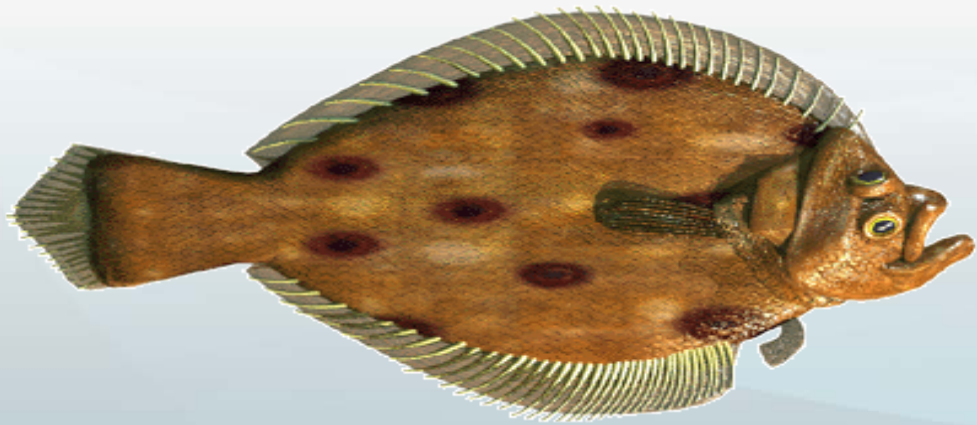
Cod



Sturgeon



Cobia



Atlantic Halibut



Barramundi



Eastern Oyster



Olympia



Pacific Oyster

Merroir



Kumamoto



European Flat

Sustainability

1. Wise use of natural resources
2. Maintain environmental integrity
3. Food Security
4. Social
5. Economic



U.S. Regulations cover:

- Water quality
- Wetlands protection
- Wastewater treatment
- Water supply
- Non-native species
- Fish health programs
- Food safety
- Human Rights





Scientific Report of the 2015 Dietary Guidelines Advisory Committee

Advisory Report to the Secretary of Health and Human Services
and the Secretary of Agriculture

“Consistent with overall sustainability goals, farm-raised finfish (e.g., salmon and trout) is more sustainable than terrestrial animal production (e.g., beef and pork) in terms of GHG emissions and land/water use.”



**THE AUDUBON/
JOHN G. SHEDD AQUARIUM**

Special Edition
**Seafood
Wallet Card**



THE AUDUBON/
JOHN G. SHEDD
AQUARIUM



Special Edition
Seafood Wallet Card



Wild Alaska salmon
Dungeness crab

POCKET
**SEAFOOD
SELECTOR**



Fish choices that are good
for you and the ocean



ENVIRONMENTAL DEFENSE FUND
finding the ways that work

BEST CHOICES

- Abalone (farmed)
- Barramundi (U.S.)
- Catfish (U.S.)
- Caviar/sturgeon (farmed)
- Char, Arctic (farmed)
- Clams (farmed)
- Clams, softshell
- Cod, Pacific (bottom longline)
- Crab, Dungeness
- Crab, stone
- Crawfish (U.S.)
- Halibut, Pacific
- Lobster, spiny (Australia, Baja, U.S.)
- Mackerel, Atlantic
- Mahimahi (U.S. pole/troll)
- Mullet (U.S.)
- Mussels (farmed)
- Oysters (farmed)
- Pollock, Alaska
- Sablefish/black cod (Alaska, Canada)
- Salmon (Alaska wild)
- Salmon, canned pink/sockeye
- Sardines (U.S.)

- Scallops, bay (farmed)
- Shrimp, pink (Oregon)
- Shrimp (U.S. farmed)
- Spot prawn (Canada)
- Squid, longfin (U.S.)
- Striped bass (farmed)
- Tilapia (U.S.)
- Trout, rainbow (farmed)
- Tuna, albacore (Canada, U.S.)
- Tuna, skipjack (pole/troll)
- Tuna, yellowfin (U.S. pole/troll)
- Wreckfish

● Indicates fish high in heart-healthy omega-3s and low in contaminants.

www.edf.org/seafood

Cover image: "Endangered Ocean"
©2008 www.marianosher.com

Choices for Healthy Oceans

You Have the Power

Your consumer choices make a difference. Choose seafood from the **green** or **yellow** lists to support those fisheries and fish farms that are healthier for ocean wildlife and the environment. It's OK to ask questions when shopping or eating out. Ask staff where their seafood is from, if it's farmed or wild-caught? How is it caught? If they're not sure, choose something else.

This is a **National Pocket Guide**. Please be sure to visit www.montereybayaquarium.org to view regional guides that identify sustainable alternatives in your area, or in places you plan to visit, and to learn more about your seafood choices.

AVOID

- Cakefish (wild-caught)
- Cod (wild-caught)
- Cod: Pacific
- Cod: Atlantic/Canadian
- Cod: King (imported)
- Cod: King (Atlantic) except
- Flounder (Atlantic)
- Flounder: Summer/Florida
- Flounder: Summer/Maine
- Flounder: Spring/Maine
- Flounder: Spring/Alaska
- Groper
- Groper: Atlantic
- Monterfish
- Orange Roughy
- Rockfish/Sebasteodontidae
- Rockfish/Sebasteodontidae
- Salmon (farmed/Atlantic)
- Shark
- Shrimp (imported)
- Shrimp: Red
- Sole (Atlantic)
- Sturgeon (wild-caught)
- Swordfish
- Tuna: Bluefin

PROCEED WITH CAUTION

- Clams (wild-caught)
- Cod: Pacific
- Cod: Atlantic/Canadian
- Cod: King (imported)
- Cod: King (Atlantic) except
- Flounder (Atlantic)
- Flounder: Summer/Florida
- Flounder: Summer/Maine
- Flounder: Spring/Maine
- Flounder: Spring/Alaska
- Groper
- Groper: Atlantic
- Monterfish
- Orange Roughy
- Rockfish/Sebasteodontidae
- Rockfish/Sebasteodontidae
- Salmon (farmed/Atlantic)
- Shark
- Shrimp (imported)
- Shrimp: Red
- Sole (Atlantic)
- Sturgeon (wild-caught)
- Swordfish
- Tuna: Bluefin

BEST CHOICES

- Catfish (farmed)
- Caviar (farmed)
- Clams (farmed)
- Clams (wild-caught)
- Cod: Pacific
- Cod: Atlantic/Canadian
- Cod: King (imported)
- Cod: King (Atlantic) except
- Flounder (Atlantic)
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Use This Guide to Make Choices for Healthy Oceans

Best Choices
These are your best seafood choices! These fish are abundant, well managed and caught or farmed in environmentally friendly ways.

Proceed with Caution
These are better choices than seafood on the Avoid list. However, there may be some problems with the way they are caught or farmed, or important scientific information is lacking.

Avoid
Avoid these products for now. These fish come from sources that are over fished or caught or farmed in ways that harm the environment.

This is a National Pocket Guide. Please be sure to visit www.montereybayaquarium.org to view regional sustainable alternatives in your area, or in places you plan to visit. Our researchers and aquaculturists update this list twice a year.

When you click Watch icon you latest version of seafood fact sheet resources and...

MONTE
AQU
The California
Marine Life
Aquarium

MONTEREY BAY AQUARIUM
Seafood Watch



National Seafood Guide



MONTEREY BAY AQUARIUM

Antibiotics and Hormones

- No growth or production hormones
- No growth promotion with antibiotics
- No pesticides
- Very few drugs



Seafood Consumption & Pregnancy





FDA Advice on Mercury & Seafood

Pregnant women, nursing mothers, women who may become pregnant, and small children should avoid certain fish—

King mackerel,

Tilefish,

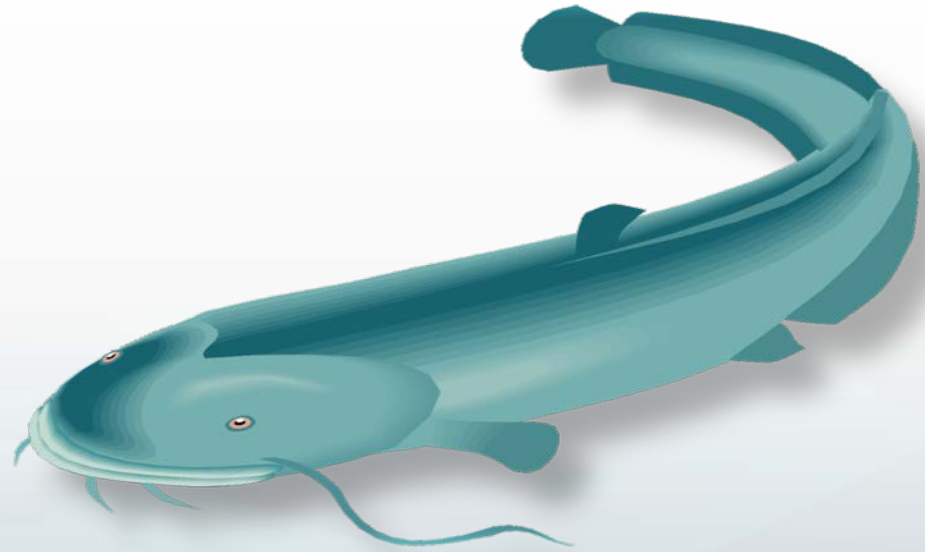
Swordfish,

Shark

limit their consumption of **albacore tuna** to 6 ounces per week

Farmed Fish & Health

- Low mercury fish and shellfish include:
 - Shrimp
 - Channel Catfish
 - Tilapia
 - Trout
 - Salmon



Source: FDA

Benefits of Fish Consumption During Pregnancy and Breastfeeding



- Neurodevelopmental
 - Visual
 - Cognitive
 - Motor
- Improved nutritional content of breast milk
- Increased gestational length
- Management of perinatal depression
- Lower body fat in infancy and childhood
- Improved immune response

Documented Benefits

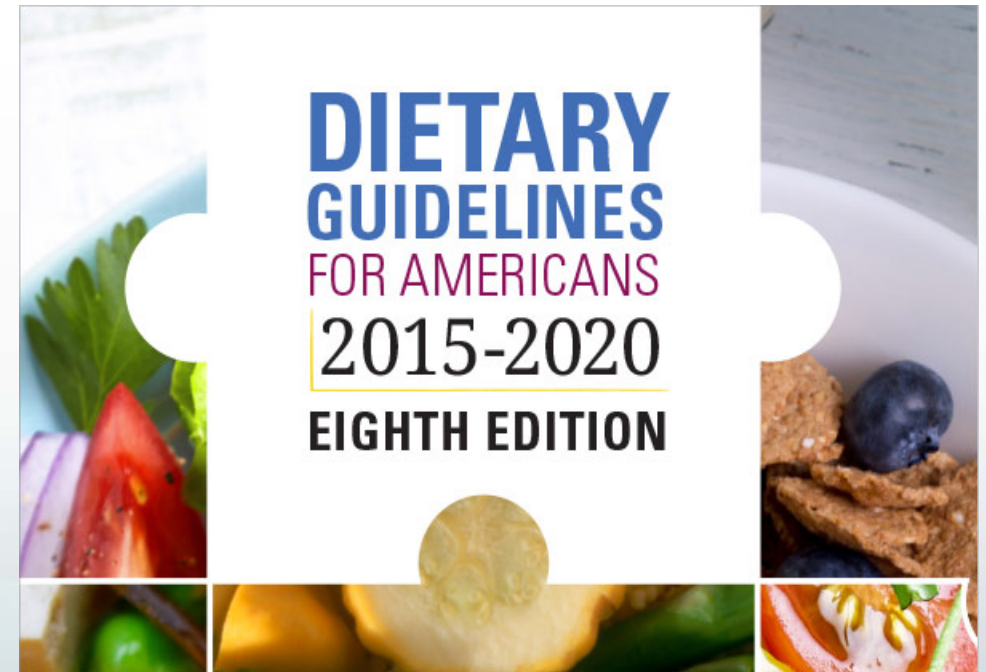
Emerging Benefits

2015-2020 USDA Dietary Guidelines

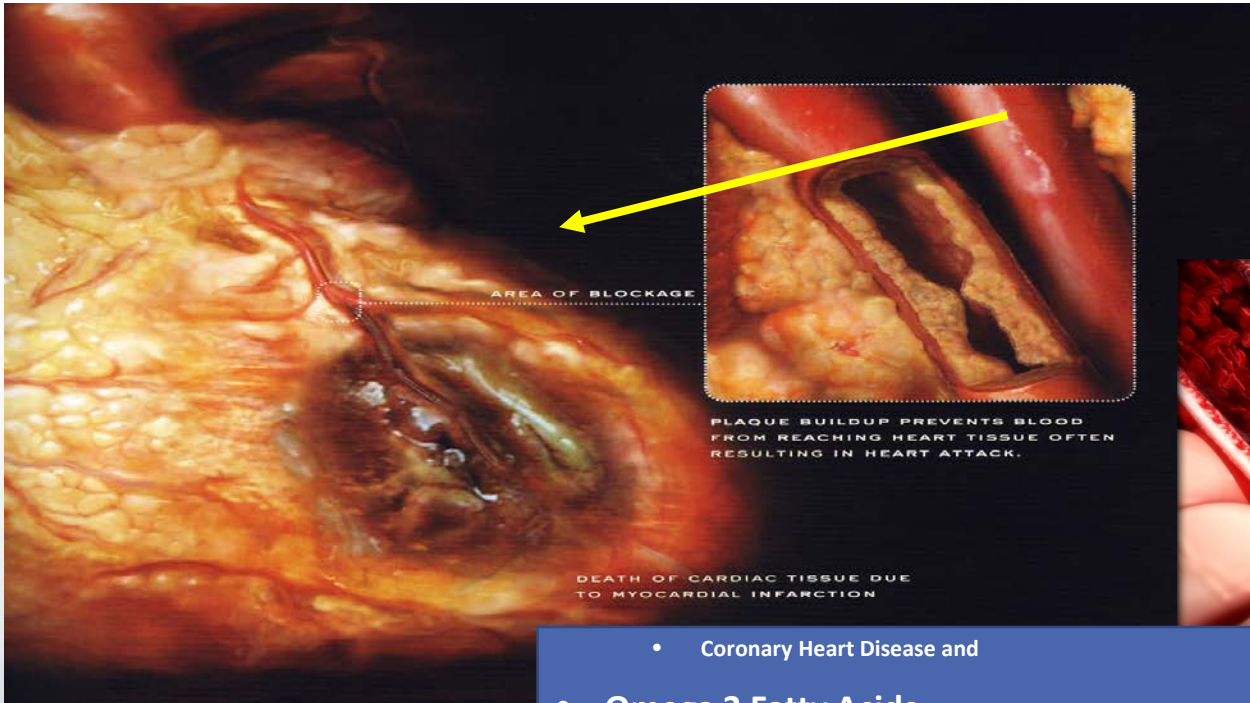
About half of all Americans have one or more preventable, diet-related chronic diseases, including cardio-vascular disease, diabetes, overweight and obesity

Americans consume only 44% of the seafood that they should be consuming.

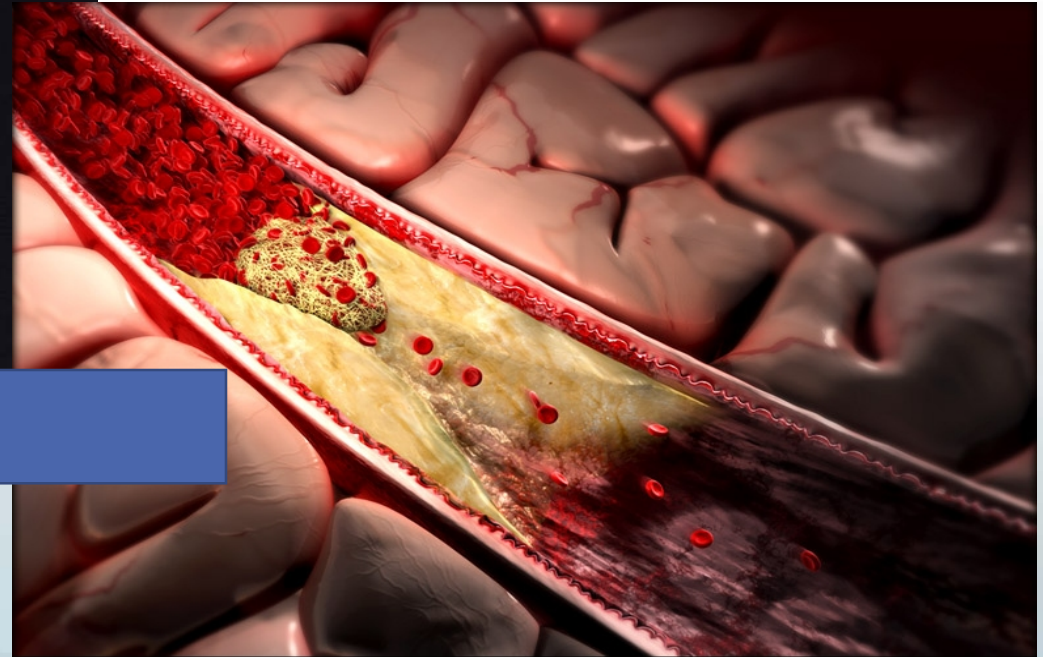
The review of the evidence demonstrated, in the species evaluated, that farm-raised seafood has as much or more EPA and DHA per serving as wild caught.



Plaque Build-Up

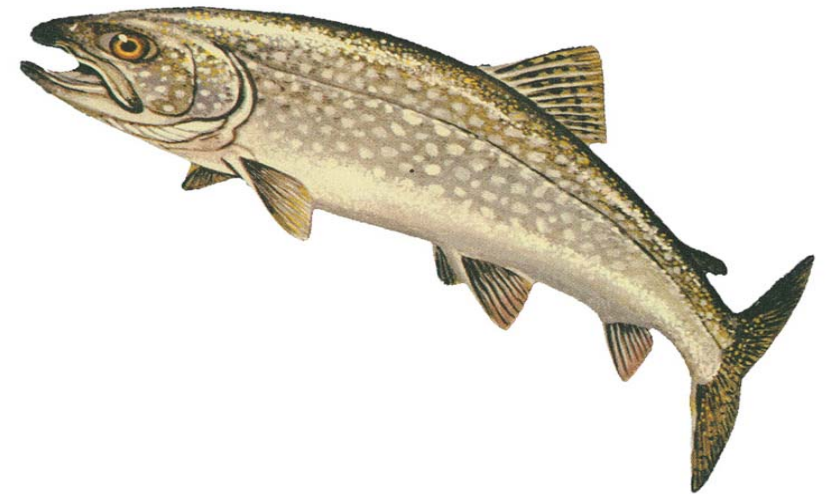


- Coronary Heart Disease and
- Omega 3 Fatty Acids

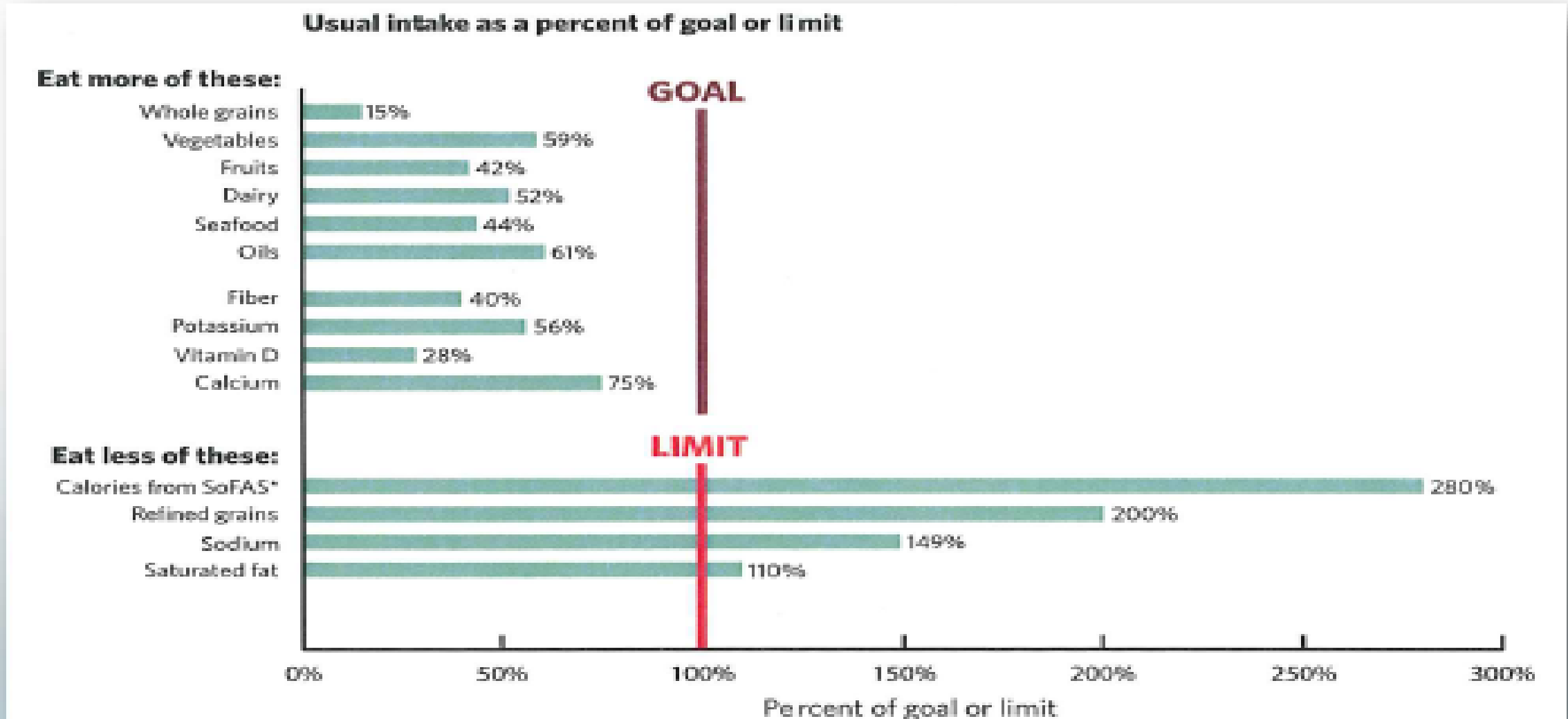


Omega 3 Fatty Acids

- Changes the critical balance of certain blood components reduces “bad cholesterol” (LDL)
- Increases “good cholesterol” (HDL)
- Lowers the level of triglycerides
- Lower the “stickiness” of red blood cells
- Stabilizes irregular heartbeat
- Lowers blood pressure



Typical American Diet Intake

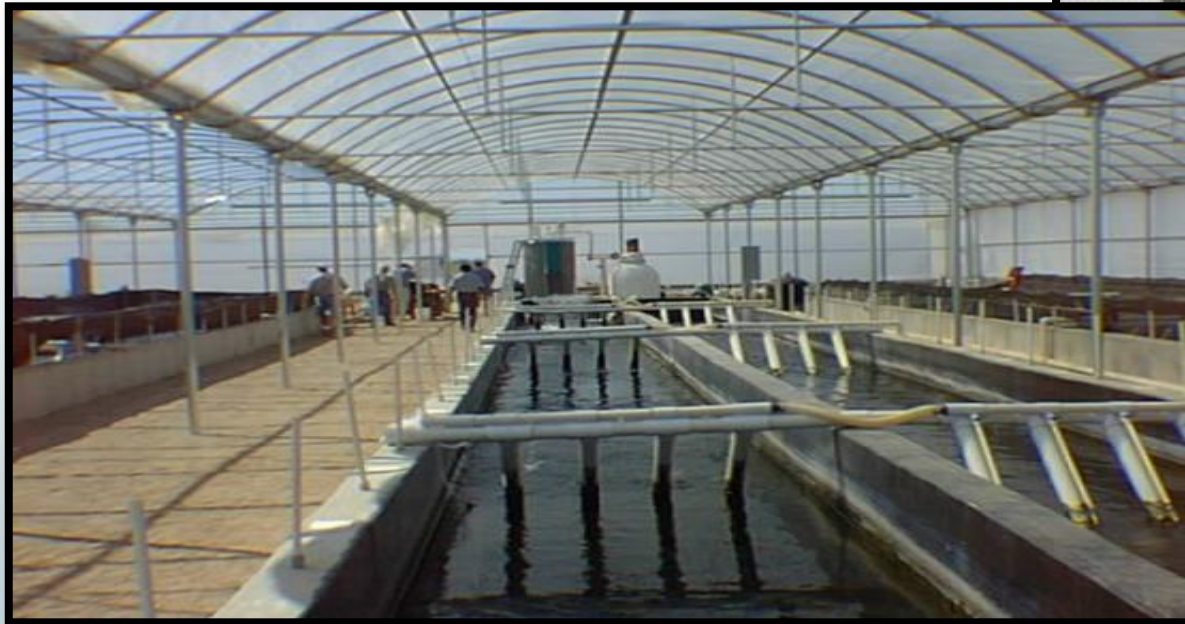


U.S. Farm-Raised Seafood and Health

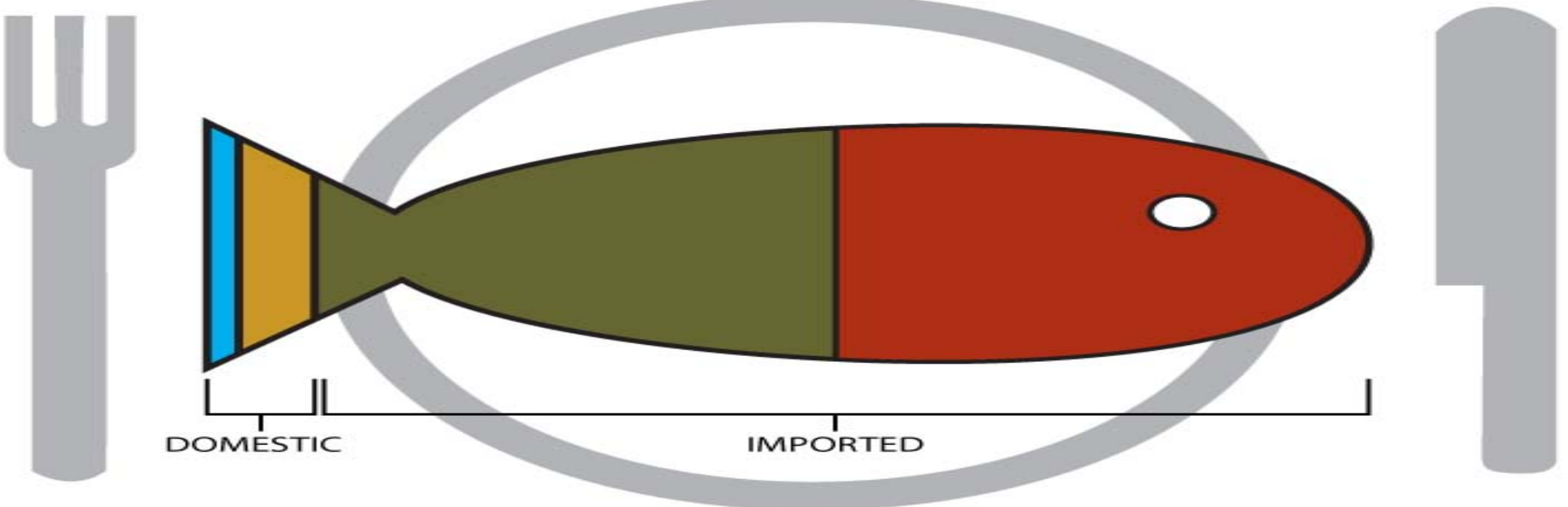
- Alzheimer's Association
- American Diabetes Association
- American Dietetic Association
- American Heart Association
- American Optometric Association
- Arthritis Foundation
- Food and Agricultural Organization
- National Healthy Mothers, Healthy Babies Coalition
- National Heart, Lung and Blood Institutes
- US Department of Agriculture
- US Food & Drug Administration



“Expanded supply of seafood nationally and internationally will depend upon the increase of farm-raised seafood worldwide”



Sources of all seafood consumed in U.S.



**U.S.
Farmed**
2.5%

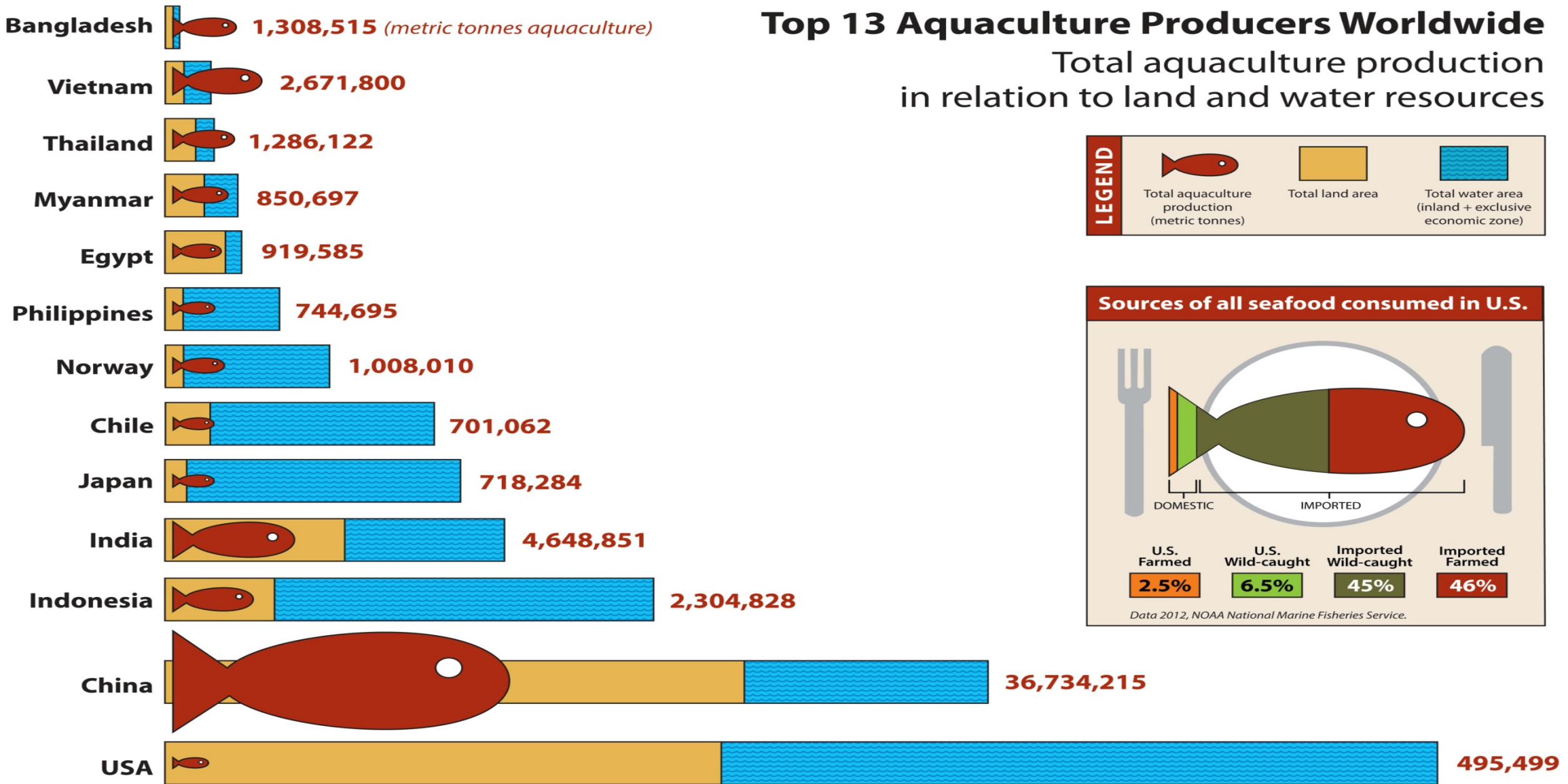
**U.S.
Wild-caught**
6.5%

**Imported
Wild-caught**
45%

**Imported
Farmed**
46%

Data 2012, NOAA National Marine Fisheries Service.

David J. Landkamer, Ed.D., Aquaculture Extension Specialist, Oregon Sea Grant Extension Program.
Infographic by Patricia Andersson, Oregon Sea Grant



LEGEND

- Total aquaculture production (metric tonnes)
- Total land area
- Total water area (inland + exclusive economic zone)

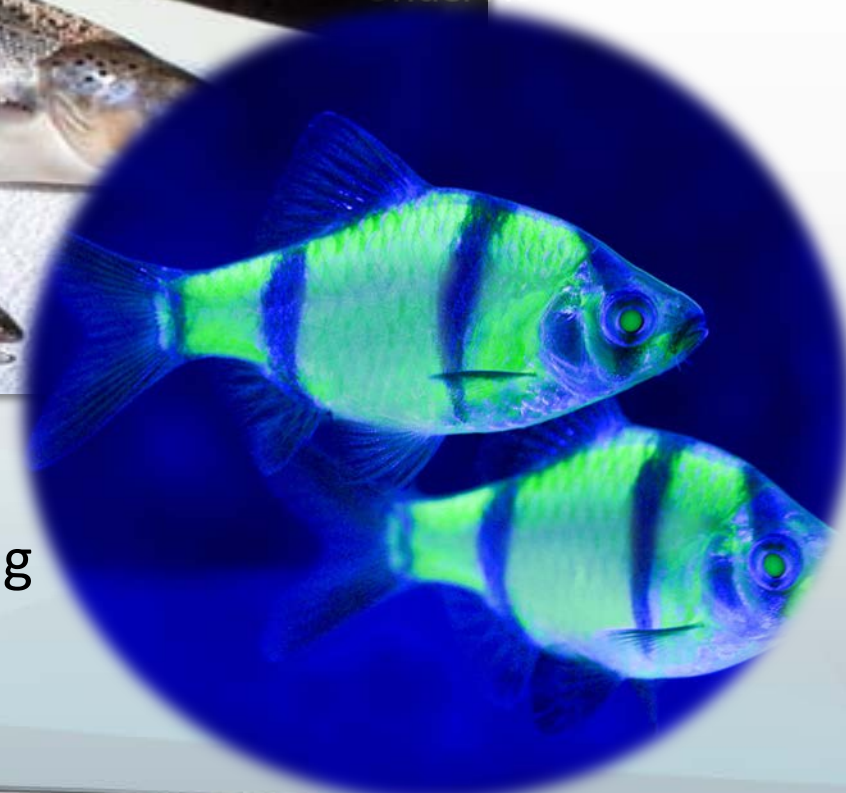
Sources of all seafood consumed in U.S.

Source	Percentage
U.S. Farmed	2.5%
U.S. Wild-caught	6.5%
Imported Wild-caught	45%
Imported Farmed	46%

Data 2012, NOAA National Marine Fisheries Service.

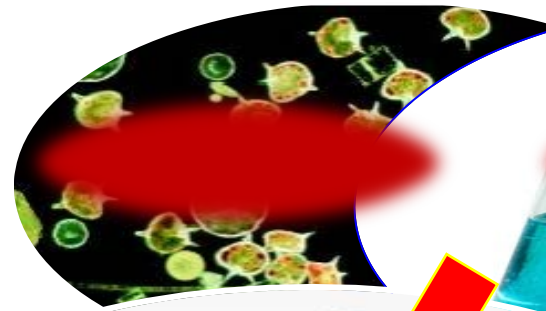
2010, UN Food and Agriculture Organization

Sustainability-GMOs



- Sterile
- Produce growth hormone all year long

Astaxanthin



Wild

Farmed



Raw Shellfish/Fish Safety

High risk individuals should *not* consume raw or partially cooked shellfish or fish



www.fda.gov/Food/ResourcesForYou/HealthEducators/ucm085365.htm

Attributes of U.S. Farm-Raised Seafood

- Environmentally-sound production methods
- Product safety
- Consistency in price
- Consistency in supply
- Local production
- Product quality



“We must plant the sea and herd its animals using the sea as farmers instead of hunters. That is what civilization is all about - farming replacing hunting.”



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with additional support from the



Questions about this webinar series should be directed to
brentoncontact@iastate.edu



Recorded webinars are available at:

- The National Aquaculture Association www.thenaa.net/webinars
- The North Central Regional Aquaculture Center www.ncrac.org/video
- United States Aquaculture Society <http://usaquaculture.org/webinars>