



Making Healthy Choices with Florida Seafood

Name

Title

Affiliation

UF IFAS Extension UNIVERSITY of FLORIDA Sea Grant Florida

Notes to Instructor



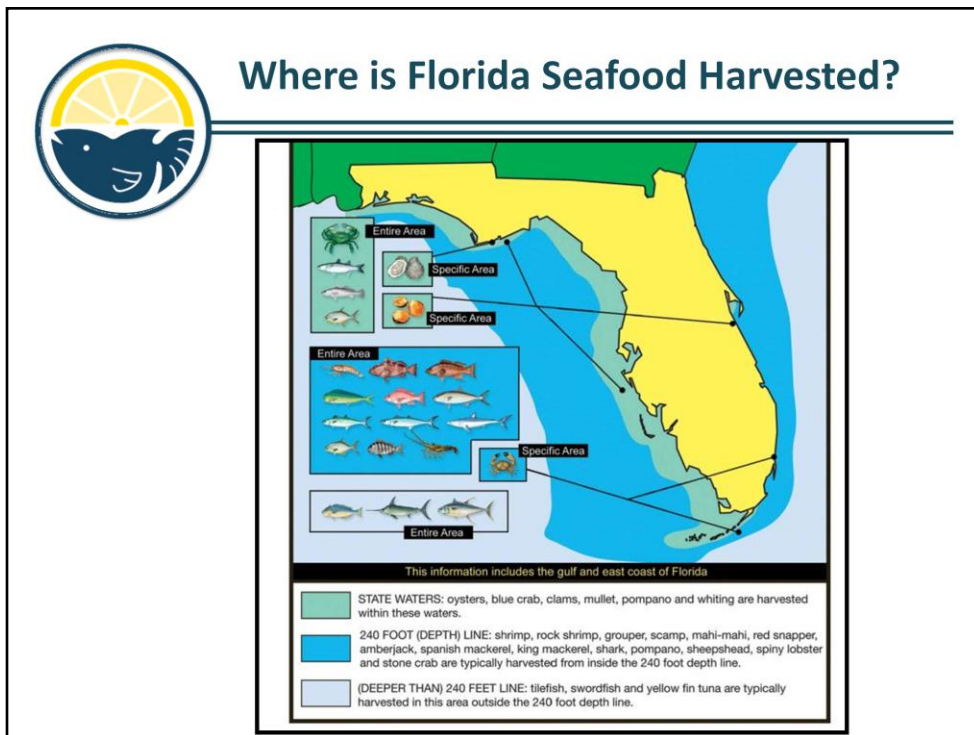
Goals

- Increase your knowledge of the health benefits of eating seafood
- Increase your understanding of how health benefits of seafood consumption fit within the Dietary Guidelines and advisories
- Recognize that the health benefits of consuming seafood outweigh any risks

Notes for Instructor

The purpose of this presentation is to educate consumers on the health benefits of seafood, dietary guidelines and advisories. There are plenty of opportunities to ask your participants questions about their experiences/observations when thinking about seafood nutrition. The presentation should take 20-30 minutes to complete.

The Making Healthy Choices with Florida Seafood activity found in the supplemental materials section can be incorporated throughout the talk, used as a pre-post, or used as an ice breaker.

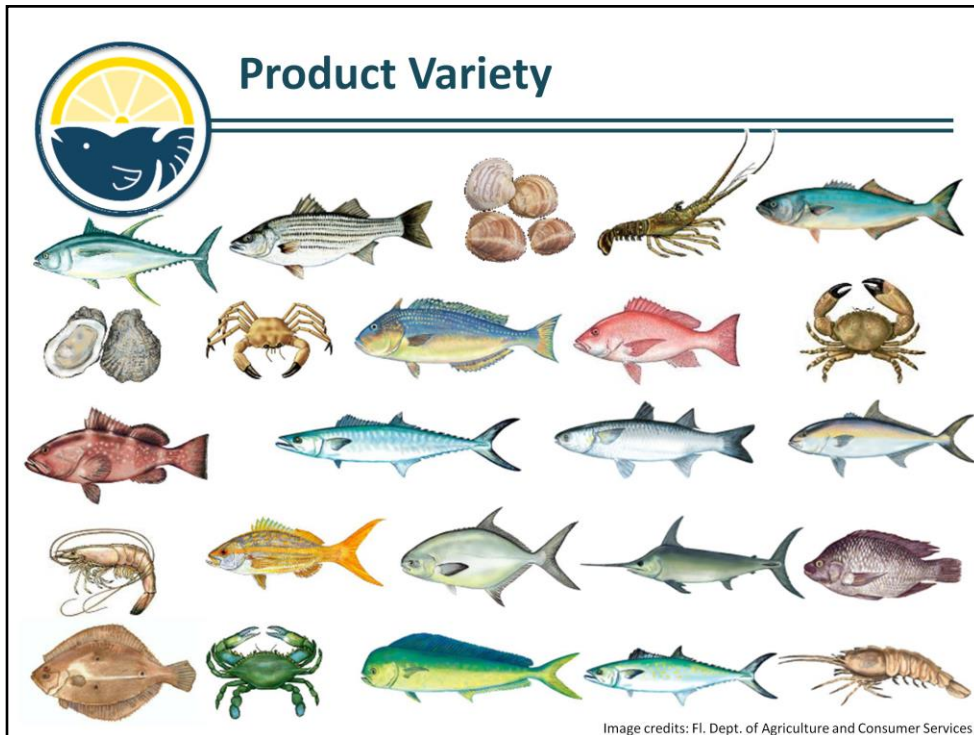


Background

When asking where seafood is harvested in Florida, a more appropriate question to ask might be “where is it *not* harvested?”

Florida’s mainland has the longest coastline (1,350 mi.) in the contiguous United States. When islands are included in this, the number climbs to 8,400 miles! Florida’s climate spans from tropical to temperate conditions, and includes a multitude of productive near-shore and estuarine environments such as marshes, seagrasses, mangroves, and coral reefs. Florida is also surrounded by the Gulf of Mexico and Atlantic Ocean, which provide a variety of warm water currents, bottom topography, and physical/chemical properties that support a variety of highly productive fisheries.

Florida’s commercial fishermen harvest a variety of seafood throughout the bays, near-shore, and offshore habitats in state and federal waters on both the Gulf and Atlantic sides. State waters on the Gulf side extend out to 9 nautical miles; state waters extend 3 nautical miles on the Atlantic side. Federal waters extend beyond these limits out to 200 nautical miles. In addition, a variety of farm-raised or aquacultured products are grown in state waters and land-based facilities.



Notes to Instructor

Before going over the information on the slide, you may want to ask your participants about what type of Florida seafood they like to eat and/or what species they do or don't recognize from this slide (obviously not all types of Florida seafood are represented. For instance several species of grouper/snapper exist, and we only have one or two of the species represented on the slide).

Or you may want to ask if they have tried all the types shown?

Left to Right: 1st Row: Tuna, Striped Bass (aquaculture), Hard Clams (aquaculture), Spiny Lobster (aka Florida Lobster), Bluefish. 2nd Row: Oysters, Golden Crab, Golden Tilefish, Red Snapper, Stone Crab. 3rd Row: Red Grouper, Wahoo, Mullet, Amberjack. 4th Row: Brown Shrimp, Yellowtail Snapper, Pompano, Swordfish, Tilapia (aquaculture or wild). 5th Row: Flounder, Blue Crab, Mahi-mahi (Dolphin), Spanish Mackerel, Rock Shrimp

*To find the most recent landings data specific to your area visit:

<http://myfwc.com/research/saltwater/fishstats/commercial-fisheries/landings-in-florida/>

Scroll down the page to find landings data for the most recent year with commercial landings data categorized by statewide, coast, county and month.

Background

According to the Florida Department of Agriculture and Consumer Services, Florida produces over 80 varieties of both wild-caught and farm-raised products across the state in the Gulf and Atlantic in both state and federal waters.

According to NOAA's National Marine Fisheries Service, in 2011 Florida ranked among the top twelve states for fresh seafood production (only commercial seafood is included, not recreational seafood or farm-raised products) with nearly 110 million pounds harvested and a dockside value of more than \$226 million.* (see instructor notes for landings reference)

Florida aquaculture products are managed by the Florida Department of Agriculture and Consumer Services (FDACS) through the division of aquaculture (<http://www.floridaaquaculture.com/>). Florida aquaculture producers reported sales in 2012 of \$69 million based upon a survey conducted for FDACS Division of Aquaculture and administered by the Florida Agricultural Statistics Service. (<http://www.floridaaquaculture.com/publications/Aquaculture2013-FDA.pdf>).

The most recent 2007 report by the USDA ranked Florida aquaculture as 7th among all states in the US with 469 farms reporting farm income of \$61.3 million (http://www.floridaaquaculture.com/publications/Issue_69.pdf). The next census of agriculture by the USDA was scheduled in 2012.



Background

Despite being a major seafood producer, Florida (or the U.S.) cannot meet the growing demand for seafood alone. In fact, in 2011 approximately 91% of the seafood consumed by Americans was imported from other countries. Approximately half of this seafood was farm-raised.

During the past several years, however, the influx of lower-cost, imported seafood has displaced local seafood in many commercial markets along with the rich traditions associated with it. Many Floridians, however, are becoming more concerned about the origin, sustainability, and safety of the seafood they consume, and local food movements are compelling people to buy more locally harvested products.



Why Florida Seafood?

1. Stimulates local economy
2. Freshness and quality
3. Transparency and accountability
4. Affordability
5. Sustainability

Notes to Instructor

This is a good time to ask participants about their experiences/observations of finding local seafood. Have they found it to be easy to find local seafood? How important is it to them to purchase/find locally produced seafood?

Rankings reflect the results of the Florida Seafood at Your Fingertips Statewide Survey (Question 18)

Background

1. Stimulates local economy

Florida's seafood industry has an economic impact of nearly \$13 billion annually and employs approximately 65,000 people throughout the state. (<http://www.st.nmfs.noaa.gov/st5/publication/econ/2009/FEUS%202009%20ALL.pdf>). The seafood industry underpins the economy of many coastal towns providing employment and income, and at times of the year, where there is little other economic activity. Buying local helps local jobs and also ensures that the ecological footprint, from catch to plate, is minimized. "By investing in fishermen, a shareholder helps to strengthen the local community."

2. Freshness and quality

In many cases, local seafood will get to the consumer faster than imported seafood that needs to be transported by ship, plane or rail.

2. Transparency and accountability

Florida fishermen also have to follow local, state, and federal regulations to ensure its fisheries are and remain sustainable for future generations. There are a number of management efforts that require fishermen to report their effort and landings so that resource managers can better track the status of local fish populations.

4. Affordability

As with many harvested products, prices will reflect seasonality. When fish and shellfish are harvested locally, larger quantities may be available in local markets, which can reduce costs and prices. These times of increased availability of high-quality products tend to cause prices to drop, creating the best value for the consumer.

5. Sustainability

Florida fisheries are considered sustainable because of effective state and federal management. Consumers should feel confident when purchasing Florida seafood because it is managed responsibly. The social and economic side of "sustainable seafood" is covered because your purchasing decisions support the local fishing communities and the seafood industry in your region. You're also creating a stable marketplace for the fishermen, helping the fishermen feel more comfortable in making adjustments to improve the long-term sustainability of the fishery instead of focusing on short-term survival. In most cases, the carbon footprint of purchasing local seafood is less as it takes less energy (fuel, electricity) to move seafood from the harvester to the consumer.

Whatever your reason for choosing Florida seafood, because the majority of seafood found in Florida's market is not harvested locally, it may be difficult for those who are interested to find it.

HOWEVER, while nutrients vary by seafood commodity and geographic location the overall health benefits are consistent for all seafood products.



Health Benefits of Seafood

- High quality protein
- Omega-3 fatty acids (DHA & EPA)
- Essential vitamins & minerals

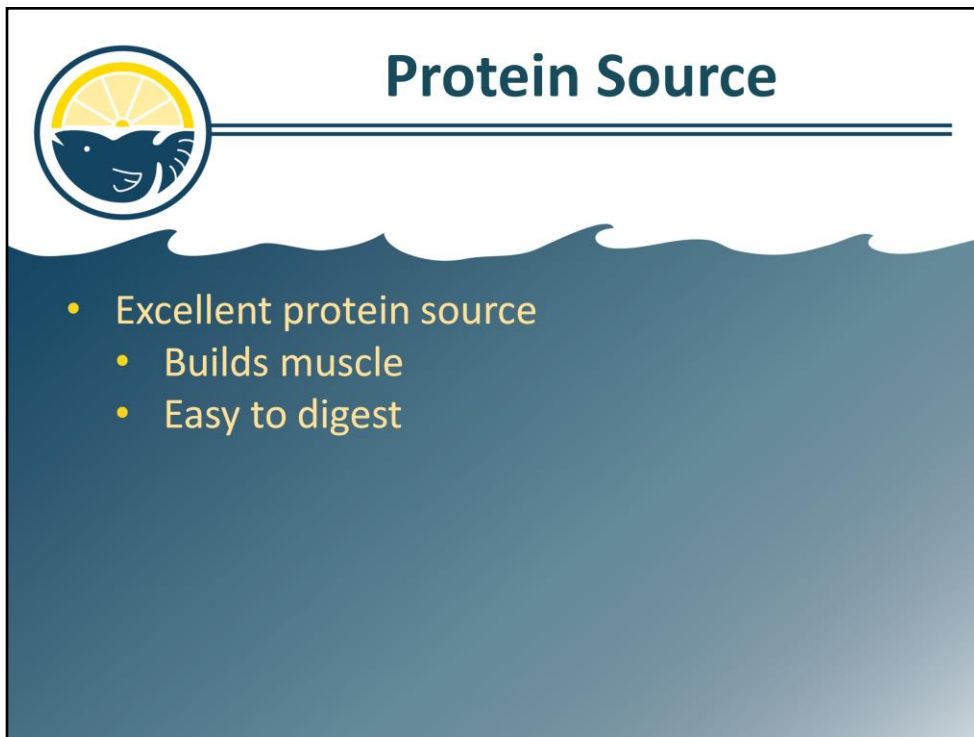


Notes to Instructor

The following slides are going to focus on the health benefits of seafood as a high protein, nutrient rich source of Omega-3 fatty acids.

Background

Seafood is an excellent, typically low-calorie source of protein and essential nutrients. It also tends to be low in saturated fats and many selections are rich in long-chain polyunsaturated fatty acids, also known as the omega-3s. There is a lot of evidence that eating fish can help prevent cardiovascular disease.



Note to Instructor

For more interaction with the class – ask participants what cooking methods would make seafood/fish less nutritious. It is important to note that HOW you cook seafood affects its nutritional value. If you fry seafood or use butter /fat based sauces and creams, you are adding fat, calories and sodium. Frying seafood reduces the amount of omega 3 fatty acids (which is one of the benefits).

(Check with your FCS agent to see if they have fat or sodium test tubes. These can be used to show the difference in fat and/or sodium to compare seafood with other types of meat or different methods of cooking)


Background

Protein in the diet

What is protein and what is its role? Protein is the body's primary building block for muscle, bone, skin, hair, and many other tissues. Proteins vary in quality and are found in a variety of foods. A high quality protein, also known as a complete protein, contains all eight essential amino acids. A low quality or incomplete protein, on the other hand, is missing one or more of the essential amino acids. Complete proteins often come from animal sources such as beef, poultry, fish, eggs etc., whereas incomplete proteins usually include fruits, vegetables, grains, and nuts. As compared to some other animal proteins, fish are a high quality source of protein that contain less saturated fat.

For example, a 6 oz broiled Porterhouse steak contains 38 g of protein but also 44 grams of fat, of which 16 are saturated. On the other hand, 6 ounces of salmon contains 34 grams of protein and only 18 grams of fat, of which 4 grams are saturated.

A 6-ounce serving of seafood provides about one-third to one-half of the average daily recommended amount of protein. The protein in seafood is also easier to digest because seafood has less connective tissue than red meats and poultry.



Seafood

- Low in Sodium –
Read labels
- Read labels of
processed seafood

- Low in cholesterol
- BEWARE of
Cooking Methods

Sodium

Seafood is naturally low in sodium; however when selecting processed seafood (such as seafood that has been canned, smoked, dried or placed in a brine solution) it is important to read the nutrition facts label as many times there is additional salt added as part of the preserving process, or for taste. Processed seafood may be higher in fat and sodium. Many times in all processed foods (not just seafood) sodium and fat are added to increase flavor (although sometimes it is added as a preservative).

Cholesterol

Everyone's body produces different amounts of cholesterol. High cholesterol levels may be due to genetics and not diet. However, to reduce cholesterol levels in the body, changes in diet may be necessary. Dietary cholesterol only comes from foods of animal origin. Common sources are eggs, meats, poultry, fish, dairy products and animal fats, such as butter or lard.

Seafood is naturally low in cholesterol. Shrimp and lobster have higher amounts of cholesterol but they are very low in fat and saturated fat.

Unfortunately with most shellfish adding butter is the norm which will add to the amount of saturated fat. Similarly, cooking methods may affect cholesterol. To keep cholesterol low, avoid cooking methods which increase fat. (Frying, adding butter, etc.)

Further information:

Caloric Values for Seafood and Other Protein Foods (3-ounce edible portions, cooked)

Seafood	Calories	Other Protein Foods
Shrimp, boiled	80	
Cod & Pollock, broiled, skinless	90	
Flounder/Sole	100	
Tuna, light, canned in water, drained	111	
	127	Eggs, boiled
	130	Chicken, light meat,w/out skin, roasted
	151	Chicken, dark meat,w/out skin, roasted
Salmon, Atlantic/Coho, baked, skinless	160	
Herring, Atlantic	172	
	204	Pork loin, lean, roasted
Mackerel, Atlantic/Pacific	210	
	212	Ground beef, extra lean
	218	Hot dog, beef
	502	Peanut butter

Table source: University of Georgia Marine Extension Service and the Georgia Sea Grant College Program

Omega 3 Fatty Acids

Disease or health condition	Strong evidence of significant health benefits	Promising preliminary results
Coronary heart disease	✓	
Hypertension	✓	
Heart health	✓	
Diabetes	✓	
Arthritis	✓	
Infant development	✓	
Asthma		✓
Cancer		✓
Crohn's disease		✓
Psychological Health		✓



Background

Omega-3 fatty acids are considered essential polyunsaturated fatty acids. They are essential to human health but cannot be manufactured by the body. For this reason, omega-3 fatty acids must be obtained from food. The three main omega-3 fatty acids are: alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). ALA comes from plants. DHA may be available in certain fortified foods (eggs, milk). EPA and DHA have the most potent health benefits of the omega-3 fatty acids. Unfortunately, they are especially low in the American diet. Seafood is unique among animal protein foods as a rich source of the omega-3s EPA and DHA.

What are the benefits of including omega-3 fatty acids in your diet?

- Strong evidence for heart health - The biggest benefits from including omega-3 fatty acids in your diet relate to heart disease. Omega-3s protect the heart by decreasing arrhythmias, blood clot formation, blood triglycerides, growth rate of atherosclerotic build-up, blood pressure and inflammation, not to mention they may improve the function of artery cells. The 2010 U.S. Dietary Guidelines Advisory Committee concluded that there is moderate evidence that consumption of two servings of seafood per week (4 oz per serving), which provides an average of 250 mg per day of long-chain n-3 fatty acids, is associated with reduced mortality from coronary heart disease or sudden death in persons with and without heart disease.
- Primary prevention of coronary heart disease - For healthy adults without prior heart disease, omega-3 fatty acids (EPA + DHA) may reduce the risk of death from cardiac events.
- Secondary prevention of coronary heart disease - For adults with established coronary heart disease who have a high risk of subsequent cardiovascular events, omega-3 fatty acids (EPA + DHA) may reduce the risk non-fatal heart attacks, non-fatal strokes and death from cardiovascular disease. The strongest evidence relates to the prevention of sudden cardiac death (due to arrhythmias), which claims approximately 500,000 lives per year in the United States. Omega-3 fatty acids stabilize the heart's rhythm and prevent potentially fatal, erratic rhythms.
- Lowering blood triglycerides - It is well established that omega-3 fatty acids from fish lower blood triglycerides. Triglycerides (TG) are fats in your blood; their presence in blood is normal. High levels ($TG \geq 150$ mg/dL), however, may be a risk factor for heart disease, especially in combination with high LDL (bad) cholesterol or low HDL (good) cholesterol. EPA and DHA lower triglycerides in your blood by decreasing your body's ability to make triglycerides. High levels ($TG \geq 150$ -499 mg/dL) call for diet and lifestyle modifications, including eating two servings of oily (dark meat) fish per week. Very high triglycerides ($TG \geq 500$ mg/dL) require an amount of fish oil that is difficult to achieve with diet, and supplementation is needed. All treatment should be provided under medical supervision.
- Hypertension - Hypertension is the diagnosis of high blood pressure (blood pressure 140/90 mmHg); it is an independent risk factor for heart disease. Studies show that a high level of supplementation with EPA + DHA (4-6 g/day) slightly reduces blood pressure. Since dietary and lifestyle modifications as well as medications are effective at lowering blood pressure, omega-3 supplementation may have a limited role in managing hypertension.
- DHA and Maternal/Infant Nutrition and Infant Development - DHA is important for the structure, growth and development of the fetal central nervous system and retina. Comprising roughly 30 percent of the fetal brain's weight, DHA is a major part of fetal neural tissue, and it maintains good neurotransmitter function. DHA is also a major fatty acid in the retina. Infants acquire DHA from their mothers. It accrues rapidly in the brain during the third trimester and the first six weeks of life. DHA naturally occurs in human milk, and omega-3 supplementation during pregnancy and lactation increases levels of DHA in breast milk as well as the infants. Since FDA approval in 2001, infant formula is

supplemented with DHA to support optimal brain and eye development. The significance of DHA for brain and eye development is widely recognized, and evidence has emerged to demonstrate that DHA supplementation during pregnancy, lactation or infancy improves mental and visual development in infants. Emerging research suggests that DHA supplementation reduces the risk for early premature birth.

- Emerging Research for Many Other Health Benefits - Emerging research indicates that the benefits of omega-3 fatty acids may extend well beyond heart health and maternal/infant health. Omega-3 fatty acids may be of benefit in conditions ranging from rheumatoid arthritis and lupus, from major depression and bipolar disorder to Crohn's disease and ulcerative colitis, from Alzheimer's disease and schizophrenia to eczema, asthma and cancer.

What are the best sources of omega-3 fatty acids?

Oils, Nuts, Seeds and Other*

<u>Oils</u>	<u>ALA(g/Tbsp)</u>
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Flaxseed	7.2
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Walnut	1.4
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Canola	1.3
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Soybean	0.9
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Corn	0.2
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Olive	0.1
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Sunflower	0
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<u>Nuts</u>	<u>ALA (g/oz)</u>
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Walnuts	2.5
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Pecans	0.3
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<u>Seeds</u>	<u>ALA(g/oz)</u>
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Flaxseeds	2.4
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Fish – Content of EPA/DHA in commonly consumed types of fish

<u>Fish</u>	<u>mg/3oz serving</u>
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Atlantic Salmon (farmed)	1825
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Atlantic Herring	1712
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Atlantic Salmon (wild)	1094
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Bluefin tuna	1279
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Sardines	835
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White Tuna	733
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Shark (raw)	711
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Swordfish	696
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Sea Bass	648
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Pollock	460
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Flat Fish	426
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Blue Crab	403
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Halibut	395
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Oysters (farmed)	374
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King Crab	351
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Dungeness Crab	351
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Scallops	310
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Skipack Tuna	278
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Mixed Shrimp	267
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Clams	241
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Yellowfin Tuna	237
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Light Chunk Tuna	230
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Catfish (wild)	201
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Catfish (farmed)	155
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Cod	134
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Mahi-Mahi	118
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Tilapia	115
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Orange Roughy	26
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*Harris et al., 2008 Curr Atheroscler Rep. 10:503-509

Notes to Instructor

All research is current as of 2011. Omega 3 PUFA (polyunsaturated fatty acid) is another way of noting Omega-3s.

Dietary Recommendations of Omega-3 fatty acid

Academy of Nutrition & Dietetics: ALA (g/2000 cal) is 1.3 – 2.7 grams for EPA=DHA (mg/day) is 500 mg

The American Heart Association recommends for EPA=DHA (mg/day) 8 oz of seafood a week which equals about 500 mg/day

Rich Vitamin Content

- B Complex Vitamins
 - *riboflavin, thiamin, niacin*
- Vitamin A
 - Important for vision
- Vitamin D
 - Proper bone growth and immune function



Note to Instructor

A good way to start this topic is to mention that years ago many people used to take cod liver oil as a “supplement” for vitamin D. One of the reasons for taking this oil from fish was the large amounts of vitamin D in fish. Now vitamin D is added to many foods (examples include, milk –this is the main one, breads, cereals, etc.).

Background

What Are Vitamins and Minerals?

Vitamins and minerals make people's bodies work properly. Vitamins and minerals boost the immune system, support normal growth and development, and help cells and organs do their jobs. Although you get vitamins and minerals from the foods you eat every day, some foods have more vitamins and minerals than others.

What is the difference between vitamins and minerals?

Whereas vitamins are organic substances (made by plants or animals), minerals are inorganic elements that come from the soil and water and are absorbed by plants or eaten by animals. Your body needs larger amounts of some minerals, such as calcium, to grow and stay healthy. Other minerals like chromium, copper, iodine, iron, selenium, and zinc are called trace minerals because you only need very small amounts of them each day.

When eating a balanced diet most people can get all of the vitamins and minerals they need by the foods they consume. Remember – whether it is natural consumption or by a supplement, the adage that “Some is good, more is better” does NOT apply.

Seafood is a good source of B complex vitamins (there are many B vitamins) which help the body obtain energy from food. Vitamin B12, which is important for manufacturing red blood cells, is not found in plant foods.

Vitamins A and D are found in fatty fish which makes sense since both are fat soluble vitamins. Vitamin A is important for vision, and healthy hair and skin. Vitamin D is essential for proper bone growth and proper immune function. Vitamin D is usually added to calcium rich foods as it helps calcium to be utilized by the body.

Food	Vitamin D (IU)
Salmon, cooked, 3 oz	320
Sardines, canned in oil, 3 oz	240
Milk, fortified, 1 cup	100
Shrimp, canned, 3 oz	90
Fortified orange juice, ¾ cup	75
Cereal, fortified, 1 serving	40 or more
Egg yolk, cooked, 1 large	25

oz = ounces

IU = International Units

Table Source: EDIS document FCS8640

Rich Mineral Content

- Calcium (*sardines, mullet, red snapper*)
- Iron (*oysters, bluefish and shrimp*)
- Zinc (*oysters and crustaceans*)
- Copper (*oysters, crab and lobster*)
- Potassium (*scallops, and clams*)
- Iodine (*all seafood*)



Additional references/handouts:

Facts about Zinc <http://edis.ifas.ufl.edu/pdffiles/FY/FY21800.pdf>

Facts about Calcium <http://edis.ifas.ufl.edu/pdffiles/fy/fy21600.pdf>

Background

Seafood is also an excellent source of many minerals.

Calcium is an important nutrient for your body and for your health. Calcium helps your heart, muscles, and nerves function. It is also important for bone health. Most of the calcium that from these fish are from eating the bones – this is where fish store calcium – just like humans. (<http://edis.ifas.ufl.edu/pdffiles/fy/fy21600.pdf> From UF EDIS)

Iron has many different roles in the body. A lack of iron in the diet may result in the development of iron deficiency anemia. The greatest need for iron is during growth or periods of blood loss. (<http://edis.ifas.ufl.edu/pdffiles/FY/FY21700.pdf>) University of Florida Extension

Zinc plays an important role in body growth, development and maturation; in tissue repair; and in resistance to disease. Low zinc intake has been linked to reduced growth (in children) and to delayed wound healing and reduced resistance to infection in adults, especially the elderly. Poor zinc intake may occur among some groups in the U.S. population. For example, individuals on limited budgets and fixed incomes are more likely to have low zinc intakes because several good food sources of zinc, such as beef and seafood, are expensive. But this situation occurs among high- income groups, too. The reason? Poor food choices and diets that are too limited in the amounts and variety of foods eaten. (<http://edis.ifas.ufl.edu/pdffiles/FY/FY21800.pdf>) University of Florida Extension

Copper contributes to several important bodily functions. It helps the body use iron effectively in forming blood; it plays a prominent role in cartilage and bone development; and it is one of several nutrients that enable body cells to use the energy present in carbohydrate, protein and fat. Note: copper deficiencies are uncommon because of the small amounts needed by the body and because copper is present in so many foods. (<http://ag.udel.edu/extension/fnutri/pdf/Nutrition/fnf-21.pdf>) University of Delaware Extension

Facts About Minerals <http://edis.ifas.ufl.edu/pdffiles/FY/FY89100.pdf> University of Florida Extension EDIS

Potassium is a mineral found inside body cells. It is one of several minerals known as electrolytes. Potassium is important because it helps:

- regulate fluid and electrolyte balance
- maintain normal blood pressure
- transmit nerve impulses
- control muscle contraction, including the heart
- maintain healthy bones

Studies show that eating the recommended level of potassium can help maintain normal blood pressure. The best results occur when sodium intake is kept low. Eating enough potassium can also reduce risk for stroke, and may reduce bone loss. A potassium-rich diet also can reduce the risk for kidney stones. (<http://edis.ifas.ufl.edu/pdf/FY/FY88900.pdf>) University of Florida Extension

Iodine is an essential component of thyroid hormones that are involved in the regulation of various enzymes and metabolic processes. The iodine content of most food sources is low and can be affected by soil content, irrigation, and fertilizers. Most foods provide 3-75 micrograms per serving. Seafood has higher concentrations of iodine because marine animals can concentrate iodine from seawater.

Processed foods may also have higher levels due to the addition of iodized salt or additives that contain iodine. Iodized salt is mandatory in Canada and optionally used by about 50 percent of the U.S. population.



Selenium

- Trace mineral
 - Essential for proper bodily functions
 - May play a role in cancer prevention
 - Reduces absorption of mercury
- High in selenium
 - Fish (tuna, swordfish)
 - Shrimp
 - Crab (blue)

Notes to Instructor

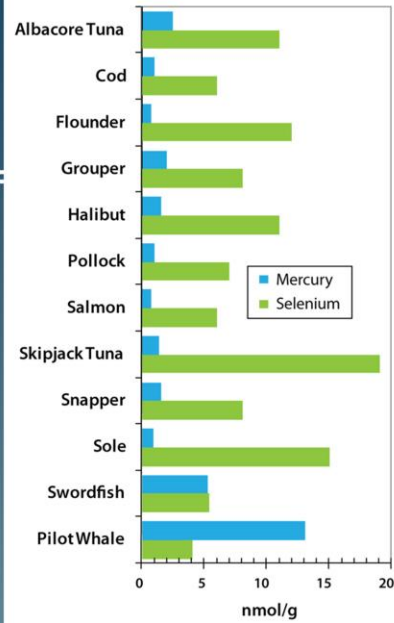
See pdf (<http://www.undeerc.org/fish/pdfs/Selenium-Mercury.pdf>) for a table of omega-3 and selenium content of various seafood types.

Background

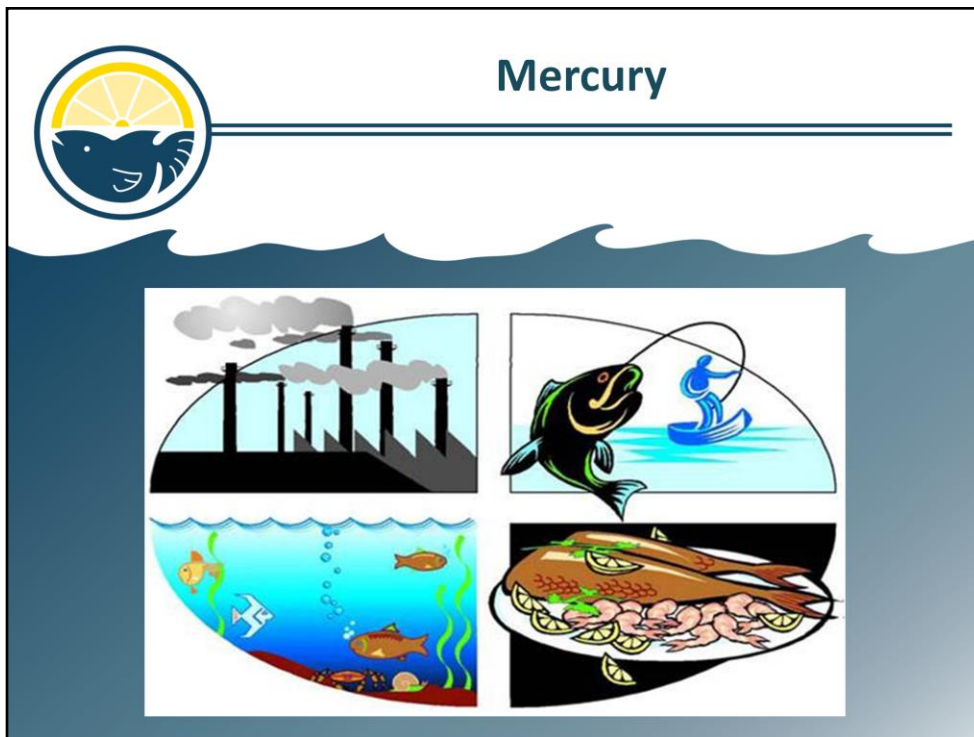
Selenium is a trace mineral that is required by our bodies to function properly. Selenium has important roles throughout our bodies, especially in our brain and nervous system and protects against oxidative stress. Insufficient selenium in our diets is linked to many diseases occurring from prenatal development through old age. Researchers are studying the antioxidant properties of selenium and the role it may play in the prevention of cancer.

Ocean fish are among the richest sources of nutritional selenium in the American diet. Seafood constitutes 17 of the top 25 sources of dietary selenium commonly consumed in the United States.

Selenium is the key to understanding mercury exposure risks. Scientists discovered that if a body has sufficient selenium to maintain proper function, the risks from mercury are mitigated. Since ocean fish are excellent sources of selenium, they provide nutrients without repercussions from mercury exposure. (Source: <http://www.undeerc.org/fish/pdfs/Selenium-Mercury.pdf>)



Source: Selenium and Mercury: Fishing For Answers



Background

What is mercury and methylmercury?

Mercury is a heavy metal that occurs naturally in the environment and can also be released into the air through industrial pollution. Mercury falls from the air and can accumulate in streams and oceans and is converted by microbial activity into organic methylmercury. Methylmercury bioaccumulates in aquatic food chains. Consumption of aquatic foods is the major route of human exposure to methylmercury. Concentrations of methylmercury in aquatic species depend on levels of environmental contamination and on the predatory nature and lifespan of the species. Larger, longer-living predators have higher tissue concentrations, while smaller or shorter-lived species have very low concentrations.

Mercury

- **For most people mercury from seafood is not a concern**
- The FDA/EPA mercury advisory targets those most at risk:
 - Women who may become pregnant
 - Pregnant Women
 - Nursing Mothers
 - Young Children



Notes to Instructor

According to the Florida at Your Fingertips consumer survey, 59% (331) out of 564 thought that the FDA/EPA mercury advisory was intended for all seafood consumers. Another 25% of the population was unsure. The FDA/EPA mercury advisory can be found at:

http://water.epa.gov/scitech/swguidance/fishshellfish/outreach/upload/2004_03_19_fish_advice_advisory.pdf.

Background

The 2004 EPA and FDA advisory regarding mercury in seafood recognizes that fish and shellfish are an important part of a healthy diet. They contain high-quality protein, essential nutrients, are low in saturated fats and high in omega-3 fatty acids. The advisory also recognizes that nearly all fish and shellfish contain mercury. While low levels of mercury are not a concern for the majority of healthy people, there are a few species of fish that contain higher levels that may harm an unborn baby or young child's nervous system. Therefore, the EPA and FDA advise women who may become pregnant, pregnant women, nursing mothers, and young children to do the following:

(This information is on the next slide).

1. Avoid eating shark, swordfish, king mackerel, and tilefish (also known as golden bass or golden snapper) since they contain high levels of mercury.
 2. Limit albacore ("white") tuna to 6 oz per week; albacore has more mercury than canned light tuna.
 3. Eat up to 12 ounces a week of various fish and shellfish that are lower in mercury, such as shrimp, canned light tuna, salmon, pollock and catfish.
 4. Check advisories about the safety of eating fish caught in local waters, if you or someone you know goes fishing.
- <http://www.doh.state.fl.us/floridafishadvice/2011%20Advisories.pdf>

Another health concern for pregnant women, older adults and those with weakened immune systems is listeriosis, which is a serious infection caused by a bacterium called *Listeria monocytogenes*. Do not eat refrigerated smoked seafood, unless it is contained in a cooked dish, such as a casserole. Refrigerated smoked seafood, such as salmon, trout, whitefish, cod, tuna, or mackerel, is most often labeled as "nova-style," "lox," "kippered," "smoked," or "jerky." The fish is found in the refrigerator section or sold at deli counters of grocery stores and delicatessens. Canned or shelf-stable smoked seafood may be eaten. Source: <http://www.fda.gov/Food/ResourcesForYou/Consumers/ucm085503.htm>



FDA/EPA Mercury Advisory

- Avoid eating shark, swordfish, king mackerel, and tilefish
- Eat up to 12 oz a week of various fish and shellfish that are lower in mercury
 - Limit albacore (white) tuna to 6 oz per week
- Check local advisories for recreationally caught seafood



Note to Instructor

Ask the audience if anyone has ever eaten shark, swordfish, king mackerel and/or tilefish.

Background

1. Avoid eating shark, swordfish, king mackerel, and tilefish (also known as golden bass or golden snapper) since they contain high levels of mercury.
2. Limit albacore ("white") tuna to 6 oz per week; albacore has more mercury than canned light tuna.
3. Eat up to 12 ounces a week of various fish and shellfish that are lower in mercury, such as shrimp, canned light tuna, salmon, pollock and catfish.
4. Check advisories about the safety of eating fish caught in local waters, if you or someone you know goes fishing. If no advice is available, eat up to 6 oz per week of fish you catch from local waters, but don't consume any other fish during that week.

<http://www.doh.state.fl.us/floridafishadvice/2011%20Advisories.pdf>

http://water.epa.gov/scitech/swguidance/fishshellfish/outreach/upload/2004_03_19_fish_advice_advisory.pdf



State and Local Water Advisories

Florida Department of Health

<http://doh.state.fl.us/floridafishadvice/>

Table 3. Fish Consumption Advisories for Dioxin, PCBs, Pesticides, and Saxitoxin

WATER BODY	CONTAMINANT	COUNTY	SPECIES	EVERYONE
Emeralda Marsh Area 7	Pesticides	Lake	Largemouth bass, Bowfin, Gar, Brownbullhead Catfish	DO NOT EAT
	Pesticides	Lake	Black crappie	ONE MEAL PER MONTH
Escambia River south of SR 184 to mouth of river	PCBs	Santa Rosa Escambia	Striped mullet (prepared without skin)	ONE MEAL PER WEEK
Escambia Bay; Upper and Lower	PCBs	Santa Rosa Escambia	Striped mullet (prepared without skin)	ONE MEAL PER WEEK
Lake Apopka	Pesticides	Orange Lake	Brown bullhead Catfish	DO NOT EAT
Lake Munson	PCBs	Leon	Largemouth bass 19 inches or more	ONE MEAL PER MONTH
Wagner Creek	Dioxin	Miami-Dade	Checker puffer fish or Striped mojarra	DO NOT EAT

Notes to Instructor

The local advisory can be found at: <http://www.doh.state.fl.us/floridafishadvice/2011%20Advisories.pdf>.

Background

For those recreationally catching local fish, local advisories exist that are meant to inform the public of potential health risks of specific fish species from specific water bodies. When talking about environmental contaminants such as mercury, PCBs (polychlorinated biphenyls), and POPs (Persistent Organic Pollutants) these local advisories can help consumers know about the risks of contaminants in various geographical regions.

What are PCBs?

PCB's (polychlorinated biphenyls) are a family of organic compounds that have been widely used since 1929 as coolants and lubricants in electrical equipment (transformers, capacitors, etc.) because they don't burn easily and are good insulators. There are no known natural sources of PCBs. Over 1,200,000 tons of PCBs were manufactured in the United States. Of this, about 65% is still in use, 31% is an environmental burden, and 4% has degraded or been incinerated. PCBs are stable compounds, are long-lived in the environment, and can be found everywhere. Concern over toxicity and persistence in the environment led Congress in 1979 to prohibit the manufacture, processing and distribution of PCBs.

What are POPs?

POPs are organic chemicals that remain intact in the environment for long periods of time. Because of regulatory action, levels of POPs in the environment have been declining, resulting in declines within humans. Concern persists for populations obtaining their seafood through cultural, subsistence, or recreational fishing.

Can I eat seafood during a red tide event?

Commercially caught seafood (including seafood at local restaurants and grocery stores) is safe to eat because it is closely monitored for *Karenia brevis* toxins. The state of Florida closes shellfish beds in red tide areas quickly and will not re-open them until the shellfish are safe to eat. For recreationally caught seafood, it is important to follow a few guidelines. Finfish are safe to eat if they are caught live and filleted. Crabs and shrimp are also okay to eat because the toxins are not absorbed into the edible tissues of these animals. It is not safe to eat bivalves (clams, mussels, or oysters) from areas with red tide. To check the status of shellfish beds, check <http://www.floridaaquaculture.com/redtide/redtideinfo.htm>. Cooking does not destroy red tide toxins!

<http://www.doh.state.fl.us/floridafishadvice/2011%20Advisories.pdf>

http://water.epa.gov/scitech/swguidance/fishshellfish/outreach/upload/2004_03_19_fish_advice_advisory.pdf

How much should I eat?

- Twice a week, make seafood – fish and shellfish – the main protein food on your plate
- Seafood contains a range of nutrients, including healthy omega-3 fats. How much should I eat?
- According to the 2010 Dietary Guidelines for Americans, eating about 8 ounces per week (less for young children) of a variety of seafood can help prevent heart disease



Note to Instructor

A serving size of fish can range anywhere from 3-6 oz, but with the FDA/EPA advisories, the concern is not eating more than 12 ounces per week for that target audience for that advisory. The USDA recommends that twice a week, seafood should be the main protein food on your plate. To get your 8 ounces of seafood a week (less for young children), use these as guides: A drained can of tuna is about 3 to 4 ounces and a swordfish steak ranges from 4 to 6 ounces. Three ounces is about the size of a deck of cards or a drained can of tuna. You may wish to demonstrate serving sizes. Your FCS agent may have food models for this purpose.

Background

Serving size is defined as the amount of food used as a reference on a nutrition label of that food. This is not necessarily the amount that a person would eat at a meal or the total amount that should be consumed for a day. A portion is the amount of food eaten by an individual at a meal or snack, sometimes called a helping of food.

Based on two years of scientific review conducted by independent experts, the Dietary Guidelines recommend Americans, "Increase the amount and variety of seafood consumed by choosing seafood in place of some meat and poultry." Eating about 8 ounces of seafood a week reduces the risk of heart disease, whether people already have heart disease or not. It is recommended that "women who are pregnant or breastfeeding consume at least 8 and up to 12 ounces of a variety of seafood per week" to boost their babies' eye and brain development.



Bottom Line

- Seafood has amazing nutritional/health benefits.
- All people are encouraged to eat seafood twice a week.
- For almost everyone, the health benefits of eating seafood outweigh the risks.
- Maximize your health benefits by eating a variety of seafood; take advantage of all that Florida has to offer.

References and Resources

- Updating Advice on Eating Seafood
Florida Sea Grant/IFAS Extension SGEF 207
- 2010 Dietary Guidelines, USDA
<http://www.choosemyplate.gov>
- 2009 Seafood and Your Health, Marine Fisheries, NOAA
http://www.nmfs.noaa.gov/fishwatch/seafood_and_health_research.htm
- Seafood Health Facts – a multi-state university project
<http://seafoodhealthfacts.org>
- Low fat recipes – National Fisheries Institute
<http://www.aboutseafood.com>
- American Heart Association
www.heart.org





Eat Fish! Let's go Eat!

