Farm to School Month – Week Four: Shellfish Day!!

SHELLFISH
Let’s learn about shellfish today!! In 2009, 26 percent of total U.S. crab catches were king and snow (tanner) crab, and they accounted for 35 percent of total U.S. crab value (NMFS 2010a). King and snow crab come entirely from Alaska.

Why take a whole day to look at shellfish? Well, Alaska shellfish are high value group of species. The latest data from the Alaska Department of Fish and Game show that 54 aquatic farms, seven shellfish nurseries and two shellfish hatcheries are operating in Alaska, primarily growing Pacific oysters, with sales topping $1 million in 2014 and 2015. Production in 2015 of 10.6 million oysters fetched an average price of $9.84 per dozen, up $0.24 (2.5 percent) from 2014. That is a lot of clams (the money reference and not the bivalve – hahaha, shellfish pun)! 

Shellfish is a broad term for aquatic animals that have a shell or shell-like exoskeleton. There are two general categories of edible shellfish: crustaceans and mollusks. Crabs, crayfish, lobster, and shrimp are all crustaceans, whose segmented bodies are covered with armor-like sections of thick or thin shell.

Alaska is famous for its king crab, which includes four species in Alaska: red, blue, golden, and scarlet. Red king crab are the predominant king crab in commercial harvests, with the largest harvests coming from Bristol Bay and smaller harvests coming from Southeast Alaska, Norton Sound, and the Adak area.
Historically, very large harvests came from the Kodiak area, but that fishery has failed to recover since being closed in 1983. Several other once important king crab fishing grounds are also now closed due to conservation concerns. Other commercially important crabs include golden king crabs, Tanner crabs, snow crabs, and Dungeness crabs.

Alaska's commercial fisheries produce large volumes of shellfish, including several types of crab and various shrimp. Commercial fishermen also harvest scallops, clams, sea urchins, sea cucumbers, octopus, and squid, and these species are defined as "miscellaneous shellfish" in state regulations. More information about commercial harvest of sea cucumbers, sea urchins and geoduck clams can be found in the Alaska Department of Fish and Game’s dive fisheries section of their website. All commercial shellfish fisheries in state and federal waters of Alaska are managed by the Alaska Department of Fish and Game.

There are small shrimp trawl fisheries in Southeast Alaska and Prince William Sound and the Kodiak area, and a large pot fishery for the spot prawns occurs in Southeast Alaska.

Weatherwane scallops, the world's largest commercial species, are dredged by a small fleet working historic beds from the Eastern Gulf of Alaska near Yakutat to the Bering Sea. Commercial clam fisheries in Alaska include a dive fishery for Geoduck clams in Southeast Alaska and intertidal fisheries for hard shell clams, principally littleneck clams and razor clams in Cook Inlet. More information about dive fisheries is available. Commercial harvests of octopus and squid occur in the Bering Sea and Gulf of Alaska, primarily as bycatch in other fisheries.

The Roots of Shellfish History

- Food historians tell us crabs were known to ancient Greeks and Romans. How do they know? Art and literature. Historians also tell us crabs were not well liked by these ancient Mediterranean people as food.
- "Squilla" is the Latin word for shrimp. According to the food historians, both ancient Romans and Greeks had ready access to very large specimens and enjoyed their shrimp prepared many different ways. Apicius, an ancient Roman author, collected these recipes in his cookbook.
- Archaeological evidence suggests oysters were consumed from the dawn of humanity forwards. Easy to collect, nourishing and tasty, these versatile mollusks were consumed raw, cooked, and preserved.
- Food historians confirm ancient Romans enjoyed these delicious morsels. By the 17th century, one of the more popular methods for serving this bivalve mollusk was to slice it up, mix it with a sauce, add some bread crumbs and bake it in its shell.
- Besides crab, shrimp, and scallops, the State of Alaska also regulates harvests of other invertebrates, including three species of echinoderms (sea cucumbers, red urchins, and green urchins), various clams, as well as octopus and squid. Sea cucumbers, urchins, and geoduck clams are harvested by divers. Beach clams, including razor and little-neck clams, are dug from the intertidal by hand, whereas octopus and squid are taken as bycatch in pots and trawls, respectively.
- The Aquatic Farm Act (Section 19, Chapter 145, SLA 1988) was signed into law on June 8, 1988, authorizing the Commissioner of Alaska Department of Fish and Game (ADF&G) to issue permits for the construction or operation of aquatic farms, and hatcheries to supply aquatic plants or shellfish to aquatic farms. The intent of the program was to create an industry in the state that would contribute to the state's economy and strengthen the competiveness of Alaska seafood in the world marketplace, broadening the diversity of products and providing year-round supplies.
of premium quality seafood. The law limited aquatic farming to shellfish and aquatic plants. In 1990 CSHB 432 became law, prohibiting farming of finfish in the state.

Let’s Move into the Science of Shellfish

Pronunciation: shel-fish
Spanish name: mariscos

**Crabs**
Crabs are a dominant and famous source of aquaculture found in Alaska, particularly the king crab, which includes the varieties of blue, scarlet, golden, and red. Red king crabs dominate over the other species in commercial harvesting and are most commonly found in the Bristol Bay area and less commonly but still found in the Southeast, Norton Sound, and Adak areas. Other important crabs harvested in Alaskan areas include the Tanner crab, snow crab, and Dungeness crab.

**Shrimp**
In the 1980s, shrimp production was a key and important role in Alaskan shellfish harvests but an increase in Pacific cod caused shrimp production to decrease. Small trawl shrimp fisheries are still located in Southeast Alaska, Kodiak, Bering Sea, and Aleutian Island areas. The main shrimp species commercially harvested in Alaska are the pink, coonstripe, spot, and sidestripe shrimp.

**Clams**
Alaska has clam fisheries in Southeast Alaska and fisheries in the Cook Inlet specifically for razor clams. Geoduck and littleneck clams are also commercially harvested clam species in Alaska. Geoduck clams are harvested by divers where the other two varieties are beach clams and are harvested in the intertidal zones by hand.

**Scallops**
Weathervane scallops are dredged off the Eastern Gulf of Alaska and continue to be the overall largest commercial species in the world.

**Oysters**
Pacific oysters do not reproduce in the cold waters of Alaska. As a result, Alaskan oyster farmers must buy oyster spat (juvenile oysters) from a shellfish hatchery. Mariculture, or aquatic farming, is the cultivation of marine organisms for food in the open ocean in enclosed areas. Oysters are grown in this system here in Alaska.

**Sea Cucumber**
The commercial species of sea cucumber harvested in Southeast Alaska is the California sea cucumber *Parastichopus californicus*. It is distributed from Mexico to as far north as the Alaska. The major products from this fishery are the longitudinal and transverse muscle bundles or meat, and the skins. Fisheries occur for sea cucumbers in Southeast Alaska and the Kodiak area.
Octopus and Squid
Octopuses and squid harvesting occur in the Bering Sea and Gulf of Alaska for commercial purposes. Generally, octopus and squid are taken as bycatch in pots and trawls, respectively.

Reasons to Eat Shellfish
A 3 oz serving of shellfish provides:
- Shellfish are foods that contain niacin, potassium, selenium, and vitamin B6.
- It is an excellent source of omega-3 fatty acids and protein.
- It is low in saturated fat.

What saturated fat?
- Most animal fats are saturated. The fats of plants and fish are generally unsaturated.
- Saturated fats tend to have higher melting points than their corresponding unsaturated fats, leading to the popular understanding that saturated fats tend to be solids at room temperatures, while unsaturated fats tend to be liquid at room temperature.
- Since the 1950s, it has been demonstrated that consumption of foods containing high amounts of saturated fatty acids (including meat fats, milk fat, butter, lard, coconut oil, palm oil, and palm kernel oil) is potentially less healthy than consuming fats with a lower proportion of saturated fatty acids.
- In a 2017 comprehensive review of the literature and clinical trials, the American Heart Association published a recommendation that saturated fat intake be reduced or replaced by products containing monounsaturated and polyunsaturated fats, a dietary adjustment that could reduce the risk of cardiovascular diseases by 30%.

Some Great Shellfish Facts
- All oysters are born male and will swap genders at least once. Given that they are born with both sets of reproductive organs, oysters can also fertilize their own eggs.
- The longer version of the term “happy of a clam” is “as happy as a clam at high water,” though it’s rarely used. The idiom makes more sense in full because a clam at high tide is typically free from predators.
- Crabs create sounds by drumming and flapping their sharp appendages in what can only be described as crustacean Morse code. Some species of crab have one especially large claw used for communication.
- In a single season, a female shrimp will produce an absurd amount of offspring, which will hatch in two weeks’ time. They can also survive in any water conditions as long as there’s food, so a breeding area can be pretty much anywhere.
- About two BILLION pounds of oysters are eaten every year.
- There are over 12,000 species of clams.
- Mussels have been cultivated for about 800 years in Europe and have been a food source for over 2,000 years.
- Clams are low in fat and high in protein. They also have great minerals like selenium, zinc, iron, magnesium and B vitamins which make it a healthy choice.
- If you were to eat four oysters a day you would get the recommended daily value for calcium, copper, iodine, iron, magnesium, manganese, phosphorus and zinc.
Let’s Eat...  

**Shrimp Tacos**

**Serves 4**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Shrimp, peeled, deveined</td>
<td>1 pound</td>
</tr>
<tr>
<td>Vegetable oil</td>
<td>1 ½ Tablespoons</td>
</tr>
<tr>
<td>Paprika, ground</td>
<td>2 teaspoons</td>
</tr>
<tr>
<td>Cumin, ground</td>
<td>2 teaspoons</td>
</tr>
<tr>
<td>Salt</td>
<td>½ teaspoon</td>
</tr>
<tr>
<td>Pepper, ground</td>
<td>½ teaspoon</td>
</tr>
<tr>
<td>Garlic, peeled, minced</td>
<td>2 teaspoons</td>
</tr>
<tr>
<td>Corn tortillas</td>
<td>8 tortillas</td>
</tr>
<tr>
<td>Salsa</td>
<td>1/3 cup</td>
</tr>
<tr>
<td>Cilantro, chopped</td>
<td>1/3 cup</td>
</tr>
<tr>
<td>Lettuce, shredded</td>
<td>1 ½ cups</td>
</tr>
<tr>
<td>Queso fresco</td>
<td>¼ cup</td>
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<tr>
<td>Lime, cut into wedges</td>
<td>1 each</td>
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1. In medium bowl, combine shrimp, paprika, cumin and salt and pepper.
2. Heat up large saucepan on the stove over medium-high heat. Place oil in pan. Once oil is hot, add in seasoned shrimp. Cook for 3 to 5 minutes then flip the shrimp. Cook for an additional 2 minutes, add in garlic, stir and continue cooking for 3 to 5 minutes, or until fully cooked. Once done, remove from heat.
3. Warm tortilla in a dry pan or griddle.
4. Place cooked shrimp on tortilla and top with salsa, cilantro, lettuce, and queso fresco. Serve 2 tacos per person with 1 to 2 lime wedges.
5. Enjoy with steamed rice and beans.

**Yummy Goodness and Tasty Tips!!**

- When in doubt about whether to purchase shellfish or not, give it the sniff test: clams, oysters and shellfish should smell like the ocean, and that’s all. Any overly “fish” smell means they’ve been sitting around too long, and are past their prime.
- When purchasing, the shells of fresh clams, oysters and mussels need to be tightly closed, or just slightly ajar. And if they are open a little, they should quickly close when tapped lightly. If they don’t close, they’re not fresh and probably dead.
- If you plan on gathering your own shellfish, always check with your local ocean and fishery department to ensure that the area you plan to harvest in is safe. It is important to keep the halibut in cold storage. Do not keep it unrefrigerated for a long time, as these marine creatures are sensitive to temperatures.
- Even though they may not look very lively, fresh shellfish are indeed alive and need to breathe. Sealing them in a plastic bag will smother them, so be sure to poke numerous holes in the bag with a wooden skewer.
- A better storage alternative is to place the shellfish in a bowl half filled with crushed ice, then cover with a wet, clean towel. Put a bit more ice on top of the towel to keep it moist, and place the bowl in the coldest part of your fridge. Drain off any meltwater that collects in the bowl, and use within a day or two.