

Appendix 1: What Is Aquaculture?

Directions:

Watch the video "What Is Aquaculture and Why Do We Need It?" either by visiting the link below or scanning the QR code, then answer the related questions.

<https://youtu.be/k6U3IgTlIVQ?feature=shared>



Next, read over the aquaculture facts on this sheet and answer the related questions.

Aquaculture Facts:

Aquaculture is the production of aquatic organisms under controlled conditions throughout part or all of their life cycle.

There are primarily two types of aquaculture: freshwater aquaculture and marine aquaculture.



Freshwater aquaculture primarily takes place in lakes, ponds, or man-made systems and tanks and produces species such as catfish, tilapia and trout.

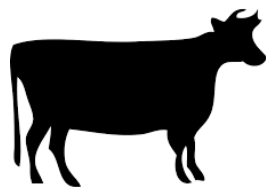


Marine aquaculture refers to farming (primarily saltwater-dwelling) species that live in the ocean and estuaries. Species included are oysters, clams, mussels, shrimp and fish like salmon, seas bass, yellowtail and more.

Why Aquaculture? Pounds for Pound:

Different sources of animal protein have different demands on natural resources. One measure of this is the "feed conversion ratio": an estimate of the feed required to gain one pound of body mass (biomass).

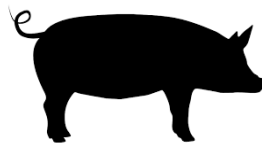
By this measure, farming salmon is about six times more efficient than raising beef.



Beef Cattle
(Hereford)

Pounds of feed needed to produce one pound of body mass for various animals:

6.8 pounds of feed per 1 pound of biomass gain



Pigs/Pork

2.9 pounds of feed per 1 pound of biomass gain



Broiler Chickens

1.7 pounds of feed per 1 pound of biomass gain



Fish
(Salmon, other species vary)

1.1 pounds of feed per 1 pound of biomass gain

References:

National Oceanic and Atmospheric Administration, National Ocean Service, "What is Aquaculture," <https://oceanservice.noaa.gov/facts/aquaculture.html#:~:text=Aquaculture%20is%20breeding%2C%20raising%2C%20and,of%20threatened%20or%20endangered%20species>
National Geographic Magazine, "How to Farm a Better Fish," <https://www.nationalgeographic.com/foodfeatures/aquaculture/>
United States Department of Agriculture, "Aquaculture," <https://www.usda.gov/topics/farming/aquaculture>

Appendix 2: The Fishing Industry

Directions:

Read over the information below and visit the website by scanning the QR code or navigating to the link. Then answer the questions on your worksheet based on the information you've viewed.

Sustainable Seafood:

The United States is really good at making sure the seafood we catch and farm is sustainable. That means our fishermen follow very intentional and strict rules to protect the environment and the marine populations we are fishing.

We keep a close eye on our oceans to see if we're catching too many fish. If we notice overfishing, we take action fast to fix it. By doing this, we're able to responsibly manage our fishing industry. Right now, over 90% of the fish stocks we watch are not being overfished.

Some of the standards that all U.S. seafood must adhere to are as follows:

Consider Social and Economic Factors for Fishing Communities:

Considering how the fishing industry will benefit or otherwise affect the local economy, the workforce and community institutions



Prevent Overfishing:

Steps are being taken to monitor fish populations and regulate fishing endeavors to ensure that we are not depleting the ocean of fish and giving ample time to reproduce and repopulate.

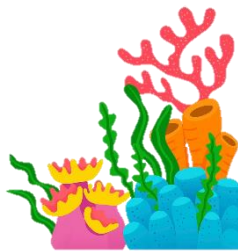


Minimize Bycatch and Interactions with Protected Species:

Bycatch is the unintended catching of fish or other aquatic creatures in the process of catching the target species while fishing. Fishermen are consistently working on doing their best to only catch the species they are targeting and to leave other species alone.

Rebuild Depleted Stocks:

The fishing industry is also working to help populations replenish by different means such as pausing fishing, decreasing the amount of fishing, and breeding and raising fish to restock wild populations and more.



Identify and Conserve Essential Fish Habitats:

The fishing industry is also working to responsibly interact with fish habitats. Different fishing methods are used to help mitigate the destruction of habitats and efforts are being made to protect and revitalize fish habitats.

References:

National Oceanic and Atmospheric Administration, Sustainable Seafood: Understanding Sustainable Seafood, <https://www.fisheries.noaa.gov/topic/sustainable-seafood/understanding-sustainable-seafood>

Fisheries of the United States Infographics:

Scan the QR code or visit the link below to view a couple of infographics from the National Oceanic and Atmospheric Administration about the commercial fishing and seafood industry in the United States.

<https://www.fisheries.noaa.gov/national/sustainable-fisheries/fisheries-united-states>

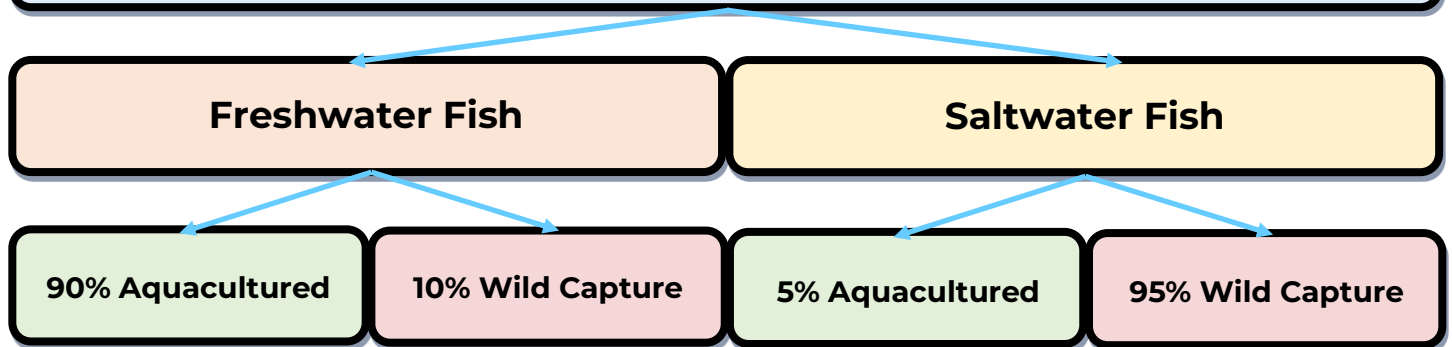


Appendix 3: Ornamental Fish and Aquariums

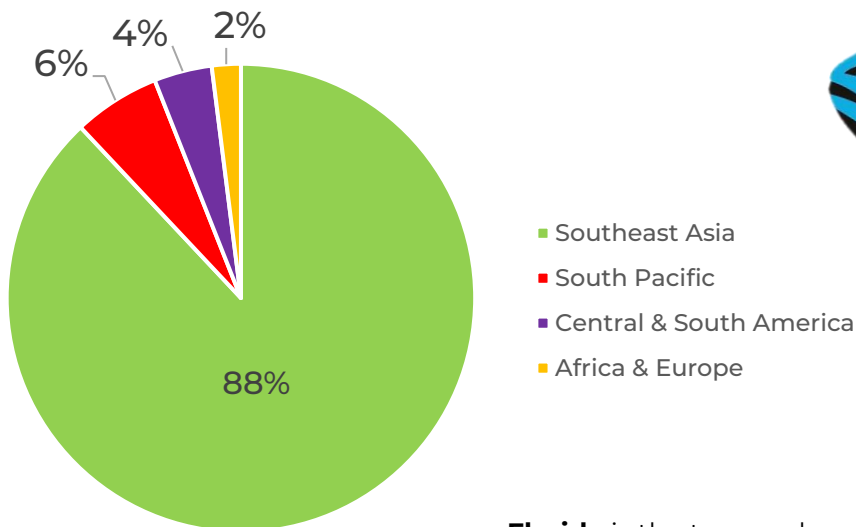
Directions:

Explore the information on the infographic below and watch the video that is linked in order to answer the questions on your worksheet.

Where do ornamental aquarium fish come from?



Where does the U.S. import fish from?



Florida is the top producer of ornamental aquaculture products in the United States with **95%** of ornamentals produced in the U.S. coming from there.



Ornamental Aquaculture Farm:

Watch this video to virtually visit ornamental aquaculture facilities!

<https://youtu.be/cc2fB0aVEJU?feature=shared>

References:

Florida Department of Agriculture, Sharks Aquaculture Life Training, Ornamental Fish Culture, https://shellfish.ifas.ufl.edu/wp-content/uploads/SALT_FDACS_Ornamental_Fish_Powerpoint-1.pdf

Appendix 4: Fishy Jobs

Directions:

Use the QR codes or links below to learn about four careers within the aquaculture and fisheries industry. Use the information from AgExplorer to answer the questions on your worksheet.



Aquaculturist

Overview: Aquaculturists understand the growth, development and production of aquatic animals. Aquaculturists work to bring a variety of healthy fish, lobsters, crabs and more from aquatic environments to our dinner tables. Additionally, they collect and record growth, production and environmental data and perform routine maintenance of equipment.

Salary: \$57,000



AgExplorer.FFA.org/career/aquaculturist/



Aquaculture Hatchery Manager

Overview: Hatchery managers oversee all aspects of an aquaculture hatchery, including the management of personnel, fish, infrastructure and equipment. Additionally, they meet with federal and state officials to establish priorities for fish production and coordinate research projects. A hatchery manager's main roles include supervision and training of farm and ground staff to ensure all maintenance, health, and safety and service standards are maintained and financial objectives are achieved.

Salary: \$60,000



AgExplorer.FFA.org/career/aquaculture-hatchery-manager/



Fisheries Technician

Overview: Fisheries technicians oversee and assist in the daily work completed at a fishery. They ensure fish are healthy, properly housed and fed and are responsible for general maintenance around the facility. Additionally, they assist biologists and technicians in various natural resource management practices or research activities.

Salary: \$39,000



AgExplorer.FFA.org/career/fisheries-technician/



Saltwater Husbandry Technician

Overview: Saltwater husbandry technicians are responsible for general farm operations including the feeding and care of fish grown in a saltwater habitat. Their duties require them to test and maintain saltwater levels and feeding techniques to promote optimal growth of saltwater fish.

Salary: \$47,000



AgExplorer.FFA.org/career/saltwater-husbandry-technician/