Nourishing the Future: Sustainable Food Systems for Nutrition and Dietetic Students

Module 4: Aquatic Foods, Nutrition, and Sustainability

Practice and Resources Booklet

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Case Study 1: Sustainable Aquatic Foods Communication

Background

Some of the great sustainability challenges in the aquatic foods sector include mislabeling, fraud, and illegal fishing. These issues threaten marine ecosystems, undermine responsible fishermen, and reduce consumer trust.

COMEPESCA is a nonprofit organization based in Mexico whose mission is to promote sustainable seafood consumption and support responsible fisheries. In 2019, it launched iPescado, an online platform that connected stakeholders with seafood products sourced from verified Mexican fishermen and fish farmers. It aims to increase the visibility of locally caught, traceable, and sustainably produced seafood. It serves as an invaluable tool for providing current information on seafood products and educational material for consumers.

Assignment

You are a member of the communications team, and it is World Oceans Day. Your task is to propose an educational campaign that highlights sustainable fishing or aquaculture practices used in Mexican seafood production.

Discussion Questions

Consumer education plays a critical role in raising awareness about sustainability issues and encouraging behavior change. iPescado utilizes blog posts to educate consumers, distributors, and stakeholders about responsible fishing and aquaculture.

1. What are three barriers you anticipate during the process of transporting aquatic foods from the ocean to the food banks? What is a practical strategy to overcome each barrier?
2. What key messages do you want to share through this campaign? What strategies will you use to communicate your messages? How will you tailor these messages to resonate with different audiences (e.g., consumers, distributors, policymakers)?
3. In what ways does media influence consumer purchasing decisions and food choices? What principles can dietitians communicate to help consumers identify reliable media sources?

Application in Practice

This is an optional addition to the case study. The iPescado website is in Spanish. Tip: Use Google Translate to read it in English.

- Visit iPescado's Productos destacados (Featured products):
    - Select two species.
    - Review and summarize each species' name, source, fishing or farming method, and any listed sustainability certifications or claims.
- Write a blog post based on your findings:
    - Explain why sustainable seafood matters.
    - Highlight the sustainable practices for each selected species.
    - Encourage readers to support responsibly sourced seafood.
    - Tip: Review past iPescado blog posts before writing your blog post.

Case Study 2: Aquatic Foods Access for Low-Income Families

Background

The seafood industry faces a major inefficiency: bycatch, which refers to the unintentional capture of animals that are then discarded during fishing operations. It is estimated that up to 40% of total catch is discarded annually. Much of this bycatch consists of edible fish that are already dead or dying and therefore cannot be sold commercially.

SeaShare is a nonprofit organization that works with fishermen to recover and donate edible bycatch to food banks across the U.S. Their mission is to deliver nutrient-dense seafood protein to hunger relief organizations, helping to meet essential nutrient needs while reducing food waste. They have formed dozens of partnerships, including Feeding America, to make their vision a reality. In 2024, they were able to accomplish the following:

- 6.8 million servings of seafood donated to food-insecure Americans.
- 54 food banks and feeding centers served in 21 states.
- 2.2 million Americans reached nationwide.

Assignment

As part of the SeaShare leadership team, you will analyze the seafood donation process and identify opportunities to strengthen its effectiveness. Begin by reviewing the Home and How We Work pages.

Discussion Questions

SeaShare oversees the logistics in fish donations, cold storage, processing, shipping, and distribution.

1. What are three barriers you anticipate during the process of transporting seafood from the ocean to the food banks? Propose practical strategies to overcome each barrier.
2. To what extent do you think SeaShare's model can be scaled globally? What factors might support or limit the implementation of similar programs in other countries?
3. From a dietitian's perspective, what roles can nutrition professionals play in shaping and contributing to a more equitable, sustainable seafood system?

Case Study 3: Seafood Watch Super Green List

Background

Seafood Watch, established by the Monterey Bay Aquarium, assesses the environmental impacts of farmed and wild caught aquatic foods to inform producers, vendors, and consumers on recommendations for sustainable practices. Some of its key outcomes include:

- Increased awareness of aquatic foods.
- Health professional engagement.
- Ecosystem protection.
- Empowered customers.

Assignment

Read the Seafood Watch case study. Also available on the Food + Planet homepage.

Discussion Questions

As demonstrated by Food + Planet's collaboration with Monterey Bay Aquarium's Seafood Watch program, the Super Green List helped to fill a need for information on sustainable seafood.

- What are other information gaps that you feel exist about sustainable foods?
- How can dietitians partner with other professionals or organizations to provide more accessible, science backed information to fill these gaps?

Supplemental Activity 1: Ocean Regulation in the United States

Objective

Explore regulatory policies, species significance, and economic dimensions of water resource management within the U.S. and propose policy recommendations to strengthen its governance.

Background

The governance of seafood systems is complicated by the ocean's vastness, interconnectedness, and species movement. Effective governance requires a comprehensive understanding of the political, environmental, and economic dimensions of ocean space to balance conservation objectives with sustainable resource use.

OceanReports is an online, geospatial tool developed by the Bureau of Ocean Energy Management (BOEM) and the National Oceanic and Atmospheric Administration (NOAA) that integrates spatial data for the visualization and analysis of ocean space in the U.S. It was designed to help with efforts in conservation, ocean planning, and industry development.

Instructions

A legislator is interested in learning about the governance strategies and implications in the waters surrounding the U.S. Using OceanReports, you will compile water resource management data to help inform their policy.

- Watch the Overview and Uses videos for OceanReports.
- Choose one location off of a U.S. coast on OceanReports via Draw Custom Area or View Quick Reports. Think about the following:
    - What are the regulations or management priorities of that location? Why might that be?
    - Which species are most dependent on this habitat? Which, if any, are protected or commercially important?
    - What industries are present or restricted? How do they reflect policy tradeoffs?
- Fill in the table below or create a similar one to present the policies, species, and economic significance for your chosen region. Write a brief summary describing the key findings and provide 1–2 policy recommendations for your legislator to improve its governance.

	Place-Based Water Governance
Location	
Policies	
Species	
Economics	
Summary	
Recommendations	

Supplemental Activity 2: Introducing Underconsumed Aquatic Foods

Objective

Educate a specific audience about the benefits of a less commonly consumed aquatic food and identify recipe ideas to encourage its use.

Background

The most consumed aquatic foods in the United States are shrimp, salmon, tuna, cod, tilapia, and oysters. However, many other aquatic species are nutritious, affordable, and sustainably produced. Consuming a variety of these foods can increase dietary diversity and support more resilient food systems. As nutrition educators, it is important to raise the visibility of these lesser-known food options through clear, engaging education.

Instructions

You will design a handout for consumers. The final product should be clear, visually engaging, and written in an accessible manner. The Monterey Bay Aquarium Seafood Watch website and Seafood Nutrition Partnership handouts are great resources.

- Identify a target audience that you want to educate.
- Choose an aquatic food that is not a commonly consumed species in the U.S.
- Research and review the information for your chosen aquatic food. Create a handout introducing it to your audience with the title: "Why [underconsumed aquatic food you chose]".
- Incorporate the following information:
    - Key nutrients and associated health outcomes.
    - Environmental impacts of production.
    - Ways to address barriers to consumption.
    - 1–2 recipes featuring this food that align with the cultural values and taste preferences of your target audience.

Learn More

Buying Aquatic Foods

- Advice About Eating Fish for Those Who Might Become or Are Pregnant or Breastfeeding and Children Ages 1–11 Years (FDA and EPA, 2021)
- Monterey Bay Aquarium Seafood Watch

Preparing Aquatic Foods

- Blue Foods as Medicine Cookbook (Food + Planet, 2023)
- Seafood Nutrition Partnership
- Frozen to Table: Easy Tips for Cooking Frozen Seafood (Seafood Nutrition Partnership, 2019)

Professional Integration

- Bivalves and Sea Vegetables: Resources for Health and Nutrition Professionals (Food + Planet)
- Harnessing Blue Foods for Health: A Culinary Medicine Approach for Clinical Practice (Recorded Webinar) (Today's Dietitian, 2025)
- Blue Foods as Medicine Curriculum Four-Part Series (Food + Planet)
- How to Talk About Sea Vegetables in Foodservice (Food + Planet)
- How to Talk About Sea Vegetables in Consumer-Packaged Goods (Food + Planet)
- The World of Aquatic Foods: A Treasure Trove of Nutrition Worth Exploring (Palmer, 2023)

Glossary

Aquatic/blue foods. Food derived from aquatic animals, plants, or algae that are caught (wild) or cultivated (farmed) in freshwater and marine environments. (Tigchelaar et al., 2022)

Aquatic food system. The complex web of all the elements and activities that relate to foods from water along with parts of the broader economic, social, and natural environments in which they are embedded.

- **Filter feeders.** A subgroup of suspension-feeding animals, such as clams, krill, sponges, baleen whales, and many fish, that feed by straining suspended matter and food particles from water, typically by passing the water over a specialized filtering structure. (FAO)
- **Finfish.** Cold-blooded aquatic vertebrates that have gills, fins with rays, and scales covering the body.
- **Seaweeds/sea vegetables.** Macroscopic marine autotrophic algae (macroalgae) used for human consumption or as raw materials for various industrial and commercial products.
- **Shellfish.** Cold-blooded aquatic invertebrates that have gills, various types of locomotory organs, and a shell/exoskeleton covering the body. Crustaceans and mollusks are included in this category.

Bycatch. The part of the catch which is not the primary target of the fishing effort, which includes both fish retained and marketed (incidental catch) and fish that is discarded or released. (FAO)

Fisheries. The sum of activities leading to harvesting fish via wild capture or aquaculture. (World Fish)

Aquaculture. The farming of aquatic animals and aquatic plants (mostly algae) using or within freshwater, sea water, brackish water, or inland saline water. (World Fish)

Wild capture. The catching of aquatic animals (mostly finfish) from a water vessel or from the shoreline. (FAO, 2025)

Illegal, unreported, and unregulated (IUU) fishing. Activities in violation of national and/or international regulations that threaten ocean ecosystems, sustainable fisheries, economic security, and critical natural resources. (NOAA Fisheries)

- **Illegal fishing activities.** Are conducted in contravention of applicable laws and regulations.
- **Unreported fishing activities.** Are unreported or misreported in contravention of national laws and regulations or reporting procedures of relevant authorities or regional management organizations.

- **Unregulated fishing activities.** Are conducted in locations without applicable management measures and/or in a manner that is inconsistent with international marine conservation laws.
- **Filter feeders.** A subgroup of suspension-feeding animals, such as clams, krill, sponges, baleen whales, and many fish, that feed by straining suspended matter and food particles from water, typically by passing the water over a specialized filtering structure. (FAO)

Seafood. Species of marine finfish and shellfish (crustaceans and mollusks) consumed by humans that colloquially includes inland and freshwater fish. (Vidaček & Janči, 2016)

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Appendix A: Comparing Different Forms of Seafood

Seafood is available for purchase in several different forms that influence price, quality, and convenience. Here we summarize some of the considerations when preparing fresh, frozen, canned, and dried fish.

Generally, fresh and frozen fish will have the best flavor, but transportation, storage, and preparation require additional food safety measures. Frozen seafood can vary in quality depending on when it was frozen and the reliability of the supply chain. Seafood that has been canned or dried has gone through additional processing to extend its shelf life, which may impact the nutrition profile of the food and its taste. Additionally, canned or dried seafood does not require refrigeration and can be more affordable.

	Benefits	Drawbacks
Fresh	• Taste and quality (if truly fresh) • Quick cooking	• Need to cook within a few days
Frozen	• Easy to store (if have freezer) • Can purchase when on sale • May be fresher if flash frozen on boat	• Some types need prethawing • Needs continuous freezing
Canned	• Long shelf life • Ready to use • Doesn't require refrigeration • Affordable	• Added ingredients, sodium • Bisphenol A (BPA) in cans
Dried	• Easy to transport • Long shelf life • Affordable	• Loss of nutritional value