



CONSOLIDATION 2: Exploring the Impacts

Suggested Timing: 50 minutes

Students will use a White Hat - Black Hat strategy to consider why fish may be mislabelled. They will then learn about the seafood supply chain and use the White Hat - Black Hat strategy again to consider ways of minimizing fish mislabelling.

Prior Knowledge and Skills

- It is expected that students will have completed Action 2: Fish Market Survey Results prior to beginning this activity.

Success Criteria

- Quality responses are provided during group discussions
- Focused, cooperative work demonstrated during hands-on activity

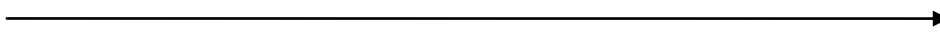
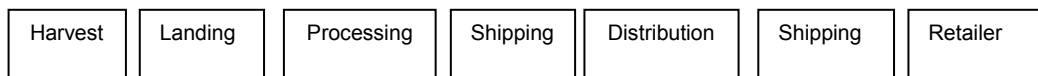
BLM C1: Seafood Supply Chain Activity

Seafood Supply Chain Activity—Answer Page (for teacher use)

Chart paper – 2 sets

Part 1: Seafood Supply Chain Activity

- Print one copy of **BLM C1: Seafood Supply Chain Activity** for each group and cut out the images ahead of time.
- In order to understand potential places where mislabelling can occur, students need to understand how fish get from the source (ocean, lake, aquaculture farm) to the grocery store. The ability to trace the fish from the point of origin to the point of sale is called **traceability**.
- Provide each group with one set of the images from **BLM C1**.
- Have the students arrange the images for the steps of the Seafood Supply Chain into the correct order. Briefly discuss what occurs at each step.
- The correct answer is:



- However, not every fish business works this way. Some fishing ships are actually floating factories that process the fish onboard. For more about each step, see the **Seafood Supply Chain Answer Page**.

Part 2: How and Why Might Mislabelling Happen?

In this activity students will explore how and why mislabelling might occur.

- Assign half of the students to the **White Hat** group. This group will brainstorm how and why fish may come to be mislabelled **ACCIDENTALLY**. This group will assume the motivations of all involved are good.
- Assign the other half of the students to the **Black Hat** group. This group will brainstorm how and why fish may come to be mislabelled for the purpose of **FRAUD**. This group will assume the motivations of all involved are immoral or unethical. They will try to think of ways to have fish mislabelled on purpose.
- The groups will have 10 minutes for brainstorming. Each group should designate a person who will record the ideas as well as a person who will report out to the whole class at the end.
- Bring the groups back together and for the remaining 10 minutes have each group share what they came up with.
- Questions for whole class discussion can include:
 - **What are some of the ways that you think fish could become mislabelled accidentally?**
 Fish were misidentified at the fishing boat; fish were put in the wrong pile at the processing plant; fish were put in incorrectly labelled boxes at the distribution center; fish were put in the wrong pile at the fish counter; fish were given the wrong sign in the grocery store display, etc.

Continued...



- **What are some of the ways that you think fish could become mislabelled purposefully?**
Fish were intentionally renamed on the fishing boat; fish were intentionally mislabelled at the processing plant; fish were intentionally given a different sign at the grocery store, etc.
- **At what stages would it be easiest to accidentally mislabel fish? Why?**
Answers will vary, but could include at the processing plant because once fish have been filleted, many species look the same (e.g., various types of white fish, etc.).
- **At what stages would it be easiest to purposefully mislabel fish? Why?**
Answers will vary, but may be for same reason as above.
- **Why might someone want to mislabel fish on purpose?** (Recall the articles that were read at the beginning of the project).
Cheaper fish varieties could be sold for more money, fisherman could sell species which might be illegal to catch, etc.

Part 3: How Could Fish Mislabelling be Minimized?

In this activity students will explore how mislabelling might be prevented.

- This time, the **White Hat** group will brainstorm ways to prevent the intentional mislabelling of fish, while the **Black Hat** group will brainstorm ways to prevent the accidental mislabelling of fish.
- Encourage both groups to think about how to prevent mislabelling at each stage in the supply chain.
- The groups will have 10 minutes for brainstorming. Each group should designate a person who will record the ideas as well as a person who will report out to the whole class at the end.
- Bring the groups back together and for the remaining 10 minutes have each group share what they came up with. Questions for whole class discussion could include:
 - **How could fish mislabelling be minimized?**
More inspection of fish (although this gets expensive), better technology used by inspectors (e.g., DNA barcoding), greater fines or imprisonment for people caught selling mislabelling fish, certification programs (such as through the Marine Stewardship Council), etc.
 - **How do you see DNA barcoding being used to prevent mislabelling?**
Food inspectors could submit samples of fish to be barcoded at each step in the supply chain.
 - **What would be some of the advantages of using DNA barcoding to prevent mislabelling?**
DNA barcoding has a high degree of accuracy; you do not need the whole fish to know what it is, etc.
 - **What would be some of the disadvantages of using DNA barcoding to prevent mislabelling?**
Process of analysis is costly, fresh fish cannot be left sitting around too long after it is harvested to wait for results from DNA analysis, etc.
 - **Why is it important to minimize mislabelling?**
People want to know what they are eating – they want to know that they are getting what they are paying for (expensive fish versus inexpensive fish), they want to know if the fish comes from an at-risk population, they want to know that they will not get sick by eating the fish (e.g., substitution of puffer fish which is toxic), they do not want to eat food which has not been approved by the Canadian Food Inspection Agency, etc.



Extensions

- Have students do research into chain of custody and traceability requirements for seafood in Canada as well as around the world. Links to resources in this area can be found below.
- Students could explore other forms of technology used to curb the problem of seafood mislabelling, such as the Thisfish system which attaches a tag to the fish upon harvesting and then is kept on the fish until it reaches the consumer. See the Additional Information section in Action 1: Fish Switch for more information.

ADDITIONAL INFORMATION

- <http://www.inspection.gc.ca/food/fish-and-seafood/eng/1299799645255/1299799784160> (Accessed Sept. 9, 2016)
The Canadian Food Inspection Agency (CFIA) develops and verifies compliance with appropriate product and process standards that contribute to the acceptable quality, safety and identity of fish and seafood products that are processed in federal establishments or imported into Canada.
- <http://www.shrimpalliance.com/new-alert-fda-bans-importers-guilty-of-seafood-mislabeling/> (Accessed Sept. 9, 2016)
This story, [FDA \(USA Food and Drug Administration\) Bans Importers Guilty of Seafood Mislabelling](#), on the Southern Shrimp Alliance website posted May 8, 2012 describes how two people were sentenced to imprisonment in the United States after selling falsely labelled fish.

Chain of Custody and Traceability

- <http://oceansbeyondpiracy.org/publications/without-trace-ii-updated-summary-traceability-efforts-seafood-industry> (Accessed Sept. 9, 2016)
This white paper, [Without a Trace II: An Updated Summary of Traceability Efforts in the Seafood Industry](#) (2012), provides an overview of traceability in general, including the importance of traceability systems and current challenges, and then explores how more than seventy international and regional government programs, certification systems, conservation organizations, and industry groups are working on traceability issues.
- <http://singularityhub.com/2011/07/18/new-tagging-system-traces-your-seafood-back-to-the-fisherman-who-caught-it-video/> (Accessed Sept. 9, 2016)
This article (with embedded video) [New Tagging System Traces Your Seafood Back To The Fisherman Who Caught It](#) is about **Thisfish** which is an internet tracking system that allows seafood lovers to trace their dinner back to the fishermen who caught it. Thisfish gives each fish a tag with a unique code that travels with the fish from the ocean to the consumer.
- <http://www.seachoice.org/state-of-our-oceans-2/traceability-and-labelling/> (Accessed Sept. 9, 2016)
This section of the [Seachoice](#) website discusses the importance of traceability (where and how the fish was caught) and labelling (type of fish, farmed or wild, etc.).
- <https://www.congress.gov/bill/113th-congress/senate-bill/520> (Accessed Sept. 9, 2016)
In the United States, U.S. representatives have introduced legislation (2012) aimed at minimizing the prevalence of seafood fraud. Called the Safety and Fraud Enforcement (SAFE) for Seafood Act, the bill would require full traceability for all seafood sold in the United States.
- http://mpaenvironment.ei.columbia.edu/files/2014/06/Fall.FinalReport.2013.final_.pdf (Accessed Sept. 9, 2016)
This report from Columbia University provides an analysis of the implementation of the SAFE Seafood Act in the United States.