

Fish Fraud

When buying salmon, some consumers prefer the more expensive wild-caught Pacific salmon (*Oncorhynchus* species) over farmed Atlantic salmon (*Salmo salar*). A 2016 report from the ocean conservation advocacy group Oceana claimed that one in five of over 25,000 samples of seafood tested globally was mislabeled. Other recent studies reveal that about 40% of the time, consumers are not getting the fish they paid for.

DNA sequences from within a species or from closely related species are more similar to each other than are sequences from more distantly related species.

In order to find evidence of such incorrect labelling, researchers purchased a piece of fish labeled as coho salmon (*Oncorhynchus kisutch*). To see if the fish was correctly labelled, they compared a short DNA sequence from the sample to standard sequences from the same gene for three salmon species. The sequences are shown in Table 2.

Table 2: DNA sequences from salmon species

Sample	Sample	
Sample	Labelled as Coho salmon (<i>O. kisutch</i>)	5'-CGGCACCGCCCTAAGTCTCT-3'
Reference 1	Coho salmon (<i>O. kisutch</i>)	5'-AGGCACCGCCCTAAGTCTAC-3'
Reference 2	Chum salmon (<i>O. keta</i>)	5'-AGGCACCGCCCTGAGCCTAC-3'
Reference 3	Atlantic salmon (<i>Salmo salar</i>)	5'-CGGCACCGCCCTAAGTCTCT-3'

1. [SP 5] Scan the sequences and circle any bases that do not match the sequence from the sample. State the number of bases that differ between the subject and each of the three references.

b) For each standard, what percentage of its bases are identical to the sample?

2. [SP 3] Based on these data, propose a hypothesis about the identity of the subject fish. Justify your reasoning.