Fishy Business: Investigating Economically Motivated Adulteration of Fish Species in the Minnesota Retail Marketplace

This project conducted a comprehensive assessment of fish substitution in the Minnesota retail marketplace by (1) sampling 4 species at retail and performing DNA barcode analysis to evaluate the authenticity of labeling, (2) documenting the supply chain for each fish sample, and (3) performing a qualitative assessment of regulatory, retail, and consumer knowledge and opinions of fish fraud. The results can inform evidence-based policy making and public health efforts.

BACKGROUND

Economically motivated adulteration, often called “food fraud,” is the intentional adulteration or misrepresentation of foods for economic gain. Fish species fraud reduces consumer confidence, manipulates economic markets, increases risks to public health, and undermines seafood sustainability efforts. Various surveys over recent years have identified rates of species substitution in the United States at 25-50% of products sold in retail markets. These surveys have usually not included an exploration of the supply chain for the products tested or an assessment of stakeholder knowledge and opinions. Our aim was to conduct a thorough assessment of the issue in a small marketplace, and to combine retail-level species testing with an exploration of both the supply chain and stakeholder perceptions. Walleye, halibut, and tuna samples were tested for authenticity with respect to species labeling and salmon samples were tested for authenticity with respect to production method (“wild caught”).

RESULTS

We obtained results from almost 300 samples at 100 retail locations in Minnesota. Substitution rates were generally lower than other recent nationwide surveys of fish fraud. Substitution rates were highest in salmon and tuna. Consumer-level supply chain transparency was limited. Supplier information was available for less than half of the samples taken, and information on both source country and supplier was available for only about 1/3 of samples. Selected findings from stakeholder interviews included a growing awareness of fish species substitution, the perception that it is primarily an economic (and not a food safety) concern, and that increased oversight of accurate labeling is needed.

BENEFITS

The combination of DNA barcoding with the collection of supply chain information for fish products and detailed stakeholder interviews allowed a more thorough exploration of the problem of fish species fraud in a local marketplace. This type of survey, conducted on a national scale, can inform industry-level fraud mitigation efforts as well as regulatory guidance for reducing EMA vulnerability.

KEY USERS

• Centers for Disease Control and Prevention
• U.S. Food and Drug Administration
• U.S. Customs and Border Protection
• Food Industry

PROJECT TIME FRAME

• 2014-2015

PROJECT PERSONNEL:

Nicholas Phelps, Ph.D. (PI)
Assistant Professor
University of Minnesota
 phelp083@umn.edu

Karen Everstine, Ph.D. (Co-PI)
Research Associate
University of Minnesota
 ever0152@umn.edu

Karen Lopez, DVM, MPH
CAHFS Resident
University of Minnesota
 llopez203@umn.edu

This project is funded through the National Center for Food Protection and Defense by the Department of Homeland Security Science and Technology Directorate’s Office of University Programs through Award Number 2010-ST-061-FD0001.