



Editorial

Authenticity, Adulteration, and Counterfeits in Food, Drugs, and Dietary Supplements

Ricardo Molins ^a

^a *Office of the Texas State Chemist, Texas A&M AgriLife Research, Texas A&M University System, College Station, TX 77841, USA*

Food fraud has been described by the U.S. Pharmacopeial Convention as the “*deliberate substitution, addition, tampering or misrepresentation of food, food ingredients or food packaging, or false or misleading statements made about a product for economic gain*”.ⁱ

Among foods, some recent studies indicate that current seafood fraud – which consists of substituting cheap species of fish for more valuable ones – could extend to 25-70 percent of such fish as salmon, cod, halibut and red snapper, both at the marketplace and in restaurants worldwide. Fraud involving foods other than seafood may consist of diluting the valuable ingredient or adding an inexpensive one. This type of dilution can be seen with honey, olive oil, cranberry, pomegranate and other fruit juices, maple syrup, spices (particularly saffron), coffee, meat, grain-based foods, and cheese. Examples of for-profit food fraud include sawdust added to cinnamon, cellulose in grated parmesan cheese, and honey that has added corn syrup or had the bee pollen removed by filtration with the purpose of masking its origin. (Note that the pollen present in honey is what determines its origin and whether it comes from legal and safe sources.) Some estimates place the cost of food fraud globally as high as 10-15 billion dollars per year.

Fraud, as described, impacts not only consumer’s pockets, but may also involve the safety of the products. Certain inexpensive fish species, for example, may pose allergy or poison hazards or have elevated levels of heavy metals such as mercury. Milk and infant formulas were the subject of fraud on a massive scale in 2008, through the addition of melamine with the purpose of increasing their apparent protein content (as determined by nitrogen assay). This resulted in serious adverse health effects on hundreds of thousands of infants and a number of deaths.

Misrepresentation of ingredients in dietary supplements has been exposed in a recent major scandal involving some of the largest and most reputable US retail chains. Some widely consumed dietary supplements were found to have a lower content of the purported ingredients, and, in some cases, none at all. These are instances of economically motivated adulteration (EMA), described by the U.S. Food and Drug Administration as “*the fraudulent, intentional substitution or addition of a substance in a product for the purpose of increasing the apparent value of the product or reducing the cost of its production, i.e., for*

*economic gain. EMA includes dilution of products with increased quantities of an already-present substance (e.g., increasing inactive ingredients of a drug with a resulting reduction in strength of the finished product, or watering down of juice) to the extent that such dilution poses a known or possible health risk to consumers, as well as the addition or substitution of substances in order to mask dilution.”*ⁱⁱ Thus, fraud in drugs has two dimensions of concern – lack of efficacy due to misrepresentation of potential ingredients and the presence of safety hazards.

Therefore, it is necessary and urgent to provide the analytical technical support to regulations aimed at curbing fraud in food, drugs, and dietary supplements, to protect public health and allow fair trade.

ⁱ U.S. Pharmacopeial Convention. (2013, January 30). *USP reports 60% increase in food fraud*. Retrieved from New Hope Network: <http://www.newhope.com/breaking-news/usp-reports-60-increase-food-fraud>

ⁱⁱ FDA, U.S. Food and Drug Administration (2009). Public Meeting: Economically Motivated Adulteration. Retrieved from: <https://www.fda.gov/NewsEvents/MeetingsConferencesWorkshops/ucm163619.htm>