Food fraud incidents
More than 1000 staff members in 10 countries
More than 900 volunteers

PHARMACEUTICALS
Nearly 200 years of ensuring trust and confidence among patients and providers

FOOD INGREDIENTS
Globalization means food supplies today face greater risks

HEALTHCARE QUALITY
Ongoing transformation in health delivery reveals additional needs for standards setting

DIETARY SUPPLEMENTS & HERBAL MEDICINES
Explosive industry growth demands a focus on quality to ensure consumer confidence & safety

GLOBAL PUBLIC HEALTH
Combating substandard & counterfeit medicines in under-resources countries around the globe
Savage Chickens

by Doug Savage

I THINK I MIGHT NEED TO START SUPPLEMENTING MY VITAMINS WITH FOOD

www.savagecomic.com
Products that meet the DIVP / DSVP program requirements are awarded the use of a USP Verified Mark on their label.

USP has tested and verified ingredients, potency, and manufacturing process.

USP sets official standards for dietary supplements (see www.uspverified.org).
Food protection

Source: GFSI
How does fraud happen?

Dilution or Substitution
How does fraud happen?

Artificial enhancement
How does fraud happen?

Use of undeclared, unapproved, or banned biocides
How does fraud happen?

Removal of authentic constituents
How does fraud happen?

Misrepresentation of nutritional value

VOLUNTARY PRODUCT REPLACEMENT PROGRAM

Picture 1
Product Targeted by Counterfeitors

Picture 2
Replacement Product

Key Identifiers
• New placement of MJN logo
• New hexagonal DHA+ARA logo (versus round)
• New hexagonal MFGM Complex logo
• Step number in white (versus blue)
How does fraud happen?
How does fraud happen?

Formulation of an fraudulent product
How does fraud happen?

- Dilution or Substitution
- Artificial enhancement
- Use of undeclared, unapproved, or banned biocides
- Removal of authentic constituents
- Misrepresentation of nutritional value
- Fraudulent labeling claims
- Formulation of a fraudulent product
- Counterfeits, theft overruns gray markets
Top Ingredients

- Milk (Fluid, Cow)
- Extra Virgin Olive Oil
- Honey
- Beef Meat
- Olive Oil
- Milk Powder
- Orange Juice
- Chili Powder
- Virgin Olive Oil
- Coffee (Arabica)

No. Records

© 2017 USP
Top Ingredient Groups

- Dairy Ingredients
- Seafood
- Meat/Poultry
- Milk/Cream
- Olive Oil
- Herbs/Spices/Seasonings
- Honey
- Beverages (Alcoholic)
- Vegetable Oils
- Beverages (Non-Alcoholic)

No. Records

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Potentially Hazardous Adulterants

Illness or deaths → Safety-related regulatory action/allergen → Potential to cause illness → Lack of safety information

Potentially hazardous

Unlikely to be hazardous

Permitted in certain regions or excipients → May, by law, be used in foods → Foods or food ingredients

47% of records associated with a potentially hazardous adulterant (N=3939)

Global distribution of food fraud incidents
Spices

- High value
- Long, complex supply chains
- Shelf-stable
- Physical form – ground
- Quality attributes (color)

Spices

Ag & Mkt.
Market Blitz sampling for color:

Nov. 27, 2013

Albany, New York

2 markets,

27 samples

11 adulterated

40% adulterated

“Best” Sample of 2013!

Origin: Pakistan
Contains:
Sudan I > 300 PPM (CFIA)
(427 PPM Oct. 2014)
Sudan IV > 300 PPM (CFIA)

Trace amounts of:
Rhodamine B
Auramine O
Orange II
Dimethyl Yellow
Fast Garnet GBC
Metanil Yellow
Malachite Green

Update Aug. 2014...

Curcumin = 147.0 ppm (CFIA)
Demethoxycurcumin = 54.1 ppm (CFIA)
Bisdemethoxycurcumin = 55.1 ppm (CFIA)

Courtesy: Tom Tarantelli, Retired (New York State Department of Agriculture & Markets Food Laboratory)
Spices

Saffron Flower (Kasubha)

Origin: Philippines

Contains: Acid Orange II, Metanil Yellow & Sudan I.

Also acid dyes: E124 Ponceau 4R, E126 Ponceau 6R.

Turmeric Powder

Origin: Bangladesh (Southern Foods USA Inc.)

Contains: Lead Chromate

Lead 146.0 ppm Chromium 30.0 ppm

Chromate Test = positive (Indian Standard 3576 : 2010)

Courtesy: Tom Tarantelli, Retired (New York State Department of Agriculture & Markets Food Laboratory)
Ground Turmeric as a Source of Lead Exposure in the United States

Whitney Cowell, MPH¹, Thomas Ireland, PhD², Donna Vorhees, ScD¹, and Wendy Heiger-Bernays, PhD¹

“…turmeric containing excessive concentrations of lead is available for purchase in US grocery stores and that childhood lead-poisoning cases attributable to consumption of contaminated turmeric have occurred in the United States.”
“The hazard analysis must consider hazards that may be present in the food because they occur naturally, are unintentionally introduced, or are intentionally introduced for purposes of economic gain.”

"We continue to believe that hazards that may be intentionally introduced for economic gain will need preventive controls in rare circumstances, usually in cases where there has been a pattern of economically motivated adulteration in the past."
What is adulterated food?

A food shall be deemed to be adulterated—

(a) POISONOUS, INSANITARY, ETC., INGREDIENTS

(1) If any valuable constituent has been in whole or in part omitted or abstracted therefrom; or
(2) If any substance has been substituted wholly or in part therefor; or
(3) If damage or inferiority has been concealed in any manner; or
(4) If any substance has been added thereto or mixed or packed therewith so as to increase its bulk or weight, or reduce its quality or strength, or make it appear better or of greater value than it is.

21 CFR § 342
### GFSI food fraud requirements

<table>
<thead>
<tr>
<th>Clause</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food Fraud Vulnerability Assessment</strong></td>
<td>The standard shall require that the organisation have a documented food fraud vulnerability assessment in place to identify potential vulnerability and prioritise food fraud vulnerability control measures.</td>
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<tr>
<td><strong>Food Fraud Vulnerability Control Plan</strong></td>
<td>The standard shall require that the organisation have a documented plan in place that specifies the control measures the organisation has implemented to minimize the public health risks from the identified food fraud vulnerabilities.</td>
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</table>
The food fraud challenge

Supply Chain
Audit Strategy
Supplier Relationship
Supplier History
Susceptibility of QA Methods

Testing Frequency
Geopolitical Considerations
Food Fraud
Economic Anomalies

Source: USP Food Fraud Mitigation Guidance
1270+ internationally-recognized testing methods, specifications, and supporting reference materials for food ingredients

- Food Fraud Mitigation Guidance (Appendix)
- Guidance on Non-Targeted Methods (Appendix)
- Standards in development:
  - Olive oil (refined)
  - Honey
  - Prebiotics
  - Colorants (synthetic, natural)
  - Spices
  - Protein ingredients (plant-based)
What is a standard?

- Common point of reference
- Basis of contractual agreements
- Reliable and repeatable methods
- Complex for foods (vs. food additives)
What is a standard?

Pomegranate Juice:
› What is it? “It is the juice obtained exclusively from the edible parts of whole pomegranate fruit (*Punica granatum*), which may be filtered, treated with pectinase enzymes for clarification, and pasteurized. Pomegranate juice may also be concentrated to enhance stability”

› Identification:
  – Sugar profile
  – Citric, malic, and tartaric acid content
  – Sorbitol and mannitol
  – Potassium
  – Carbon stable isotope ratio
  – D-Isocitric Acid
  – Anthocyanin Profile
What can consumers do?

**HOW CAN CONSUMERS PROTECT THEMSELVES FROM FOOD FRAUD?**

There’s no surefire way to avoid food fraud since perpetrators are clever and know how to "work the system," but here are some things smart consumers can do:

**BUY FROM REPUTABLE BRANDS AND SOURCES**

Brand-name companies work hard to protect their reputations since they have to safeguard very large investments into their brands.

**READ THE LABELS ON THE FOOD PRODUCTS YOU BUY**

Often times, what a consumer might think is "fraud" actually meets FDA labeling requirements. Make sure to read ingredient statements closely and pay attention to the fine print.

**BE SKEPTICAL OF PRICES THAT APPEAR TOO GOOD TO BE TRUE - THEY PROBABLY ARE**

The old adage of "you get what you pay for" should stick in your mind when purchasing groceries, since a fair market price will reflect quality, care, and supply.

**WHEN POSSIBLE, BUY PRODUCTS FROM SHORT, VISIBLE SUPPLY CHAINS**

Speaking directly to local suppliers can give you a good idea of how they ensure the integrity of their products. (This may not be possible for foods that can only be grown in particular climates - chocolate or spices, for example.)

**BUY FOODS IN A MINIMALLY PROCESSED FORM, IF POSSIBLE**

Buying whole foods empowers you to ensure the integrity of those foods. It is much easier to make fraudulent apple juice than a fraudulent apple.

**Food Fraud Resources**

Learn more about food fraud at: www.foodfraudresources.com
In closing

“Authentic food is a social good that benefits consumers. Ensuring that the food supply is authentic is good governance. The pursuit of a food system that is authentic, as well as healthy and sustainable, should and can be achieved...”

Thank You
Karen Everstine  |  kde@usp.org
foods@usp.org

Empowering a healthy tomorrow