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IFPTI Fellowship Cohort V: Research Presentation

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Review of U.S. State-Level Entomophagy Regulation 2015

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- Entomophagy – “Insect consumption by humans”
- Worldwide entomophagy is common
 - Over 1,900 known consumable insects—beetles #1
- Why eat insects?
 - Healthy
 - Environmentally friendly
 - Economical



Image source: <https://media.npr.org/>

Entomophagy Regulation

- Currently regulated by the U.S. Food and Drug Administration (FDA), State, and Local agencies
 - Good Manufacturing Practices (GMPs), Retail Food Code



Image source: <https://shawglobalnews.files.wordpress.com>

Entomophagy Regulation (continued)

- Food Safety Modernization Act (FSMA)—Preventative Controls for Human Food (PCHF) rule
 - Recently passed, based on Hazard Analysis Critical Control Point principles
 - Farms exempt unless they change the raw agricultural commodities (RAC) into a processed food
 - If no exemption, facilities must follow PCHF
 - No entomophagy guidance document

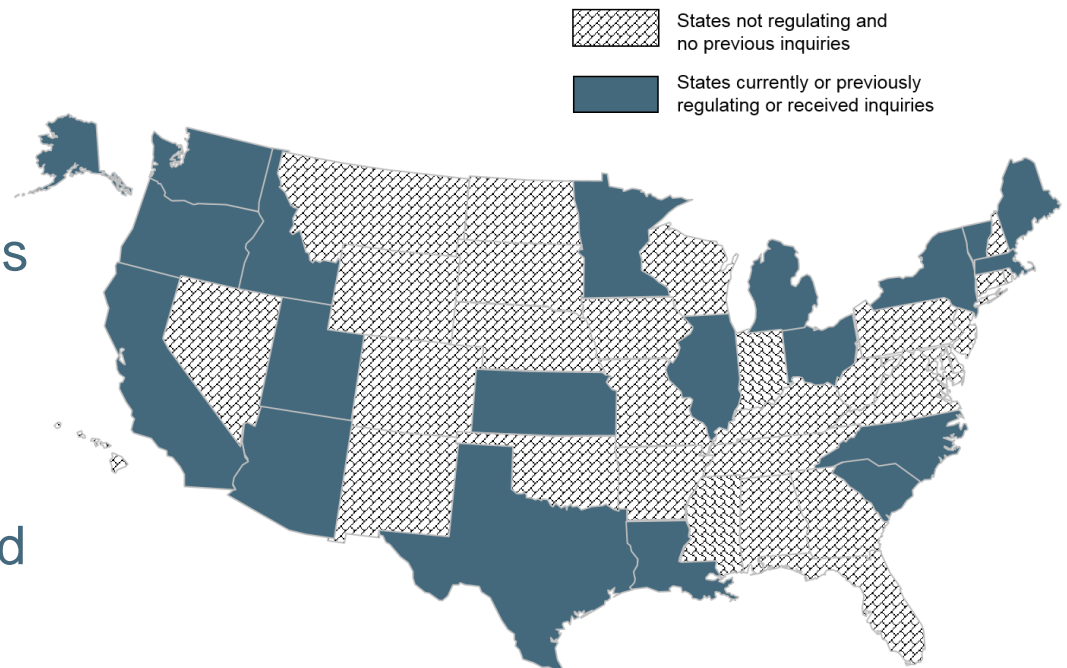
At present, there is no comprehensive description of the state regulation of the processing and sale of insects for human consumption.

1. What types of insects are most commonly being processed and consumed for human consumption?
2. What types of foods are produced using insects?
3. What are the challenges associated with the regulation of entomophagy facilities?
4. What are the food safety risks related to insect processing and consumption based on the current understanding of state food safety regulators?

- Developed survey for State agriculture/health leaders
 - 13 questions (8 regulatory framework; 5 regulatory process)
- Sent an introductory e-mail and then conducted telephone interviews
- Survey extended over 4 months
- Survey responses

Study Population

- 100% response from states
- 30 states
 - Not regulating
 - No previous inquiries
- 20 states
 - Currently regulate
 - Previously regulated
 - Received inquiries



- 6 states regulate cricket products using GMPs
 - CA, IL, MA, NC, OH, OR
- 9 states received inquiries to produce cricket products
 - AK, ID, ME, MI, MN, SC, TX, VT, WA
- 2 states regulate entomophagy at the retail level using food code
 - NY, AZ
- 2 states previously regulated cricket products using GMPs
 - LA, UT
- 1 state received a non-cricket inquiry (falls under state exemption)
 - KS

State	Regulating Cricket Product Entomophagy?	Cricket Used as an Ingredient?	Selling Whole Cricket?	Regulating Other Insect Products Using GMPs?	Food Products Manufactured
CA	Yes	Yes	No	Yes	Chocolate dipped insects, hard candy with insects, and cricket flour
IL	Yes	Yes	No	No	Power bar
MA	Yes	Yes	No	No	Snack products, chips
NC	Yes	Yes	No	No	Baked goods
OH	Yes	Yes	Yes	No	Whole crickets
OR	Yes	Yes	No	No	Cricket flour, instant Oatmeal

Challenges	Responses
Approved source	24 (30%)
Understanding the process	18 (23%)
Understanding the hazards	10 (13%)
No response	9 (11%)
Training staff	7 (9%)
No specific regulation	4 (5%)
No challenges	3 (4%)
Establishing jurisdiction	2 (2%)
No scientific evidence	2 (2%)
The unknown	1 (1%)
Total	80 (100%)

Challenges for GMP Regulation by States

- Approved source (40%)
- Understanding the hazards (20%)
- Understanding process (20%)
- The unknown (10%)
- Establishing jurisdiction (10%)



Image source: <http://www.nydailynews.com/>

Entomophagy Is Widespread

- Example: 2 food manufacturers (Exo and Chapul)
 - Distribute to 42 of 50 states
 - Packaged cricket bars product sold at retail
- Two large cricket growers
 - Aspire (TX) – Capacity to produce 7 million cricket weekly
 - Big Cricket Farms (OH) – First food grade certification from FDA

Hazards of Entomophagy

- 8 states currently/previously regulated entomophagy
 - No hazards identified
- Tarantula example
 - Explorers Club Banquet
- Possible allergen relationship to shellfish
- E-mail guidance from FDA
 - Facilities must prove product is safe and wholesome

- Entomophagy lacks national standardization.
- Found in most states.
- The volume of product sold is increasing.
- FDA has not provided guidance to states and industry regarding hazards, processes, and sources.
- As a result, there is a current and significant need for increased guidance for consistent entomophagy regulation.

1. FDA work with the manufacturers of entomophagy.
2. Provide a clearly defined guidance document for entomophagy.
3. An expanded study should be conducted to identify potential hazards associated with the production of insect-based foods.

- Dr. Ben Miller, MDA Division Director
- Jeff Luedeman, MDA Retail Food Program Manager
- Lorna Girard, MDA Retail Food Inspection Supervisor
- Valerie Gamble, MDA Outreach and Development
- Gerald Wojtala, IFPTI Executive Director
- Dr. Paul Dezendorf, IFPTI Research Subject Matter Expert
- Cameron Smoak, Mentor
- IFPTI staff
- Participants in the survey
- Cohort 5 Fellows

Questions?



Image source: <http://inhabitat.com>

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- [*Botulinum*](#)
- [Cricket Harvesting—Big Cricket Farm Ohio](#)
- [Process—European Food Safety Authority](#)
- [Product Example](#)
- [Label Example](#)

- “Contamination of insects and products thereof can also occur after farming and before consumption, as happened when five individuals in Kenya died of *botulism* following the consumption of termites (Nightingale and Ayim, 1980). In this case, the insects had been stored in plastic bags, in anaerobic conditions during four days of transportation. *C. botulinum* has also been considered the cause of three lethal cases in Namibia, following the ingestion of caterpillars (Schabel, 2010). “
- Risk profile related to production and consumption of insects as food and feed – EFSA

Return to Table
of Contents

- Life Cycle House Cricket
 - 8-12 weeks
 - Harvested at 6 weeks
 - Fed organic fruits and vegetables last 10 days
 - Crickets fast 1-2 days
 - Frozen

[Return to Table
of Contents](#)

- Blanching, chilling and drying are the most common processes that have been encountered in this respect each with the aim of extending shelf life and also reducing microbial load.
- Instructions for cooking and ‘wash before use’ types of message. In some cases, specific parts of the insect are advised to be removed such as the wings and legs of crickets, to improve the eating experience and reduce choking risks.

[Return to Table
of Contents](#)



[Return to Table of Contents](#)

30g

Nutrition Facts

Serving Size 1/4 cup (3g)
Servings Per Container 12

Amount Per Serving

Calories Calories From Fat 20

	% Daily Value
Total Fat 2g	3%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 30g	%Daily Value
Sodium 600mg	%Daily Value
Total Carbohydrate 3g	%Daily Value
Dietary Fiber 2g	0g
Sugars 0g	
Protein 8g	

Vitamin A 25%	Vitamin C 4%
Calcium 2%	Iron 6%

Percent Daily Value are based on a diet of 2000 calories a day. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2000	2,500
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Total Fat	Less Than	65g	80g
Saturated Fat	Less Than	20g	25g
Cholesterol	Less Than	300g	300mg
Sodium	Less Than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	

Calories per gram:
Fat 9 Carbohydrate 4 Protein 4



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Contains : Seeds

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Return to Table
of Contents

Photo Courtesy of Andrew Linton, Division Manager, Environmental Services Department Maricopa County, AZ