

Trends in Emerging American and Canadian Edible Insect Businesses

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Introduction

Widespread growth in edible insect production in the US is not possible without FDA guidelines and inspection. Current US laws only regulate how many accidental insects get into food products. In Canada it is not legal to sell insects as feed products (Redford 2014). We sought to identify whether, despite these barriers, there has been an increase in the number of edible insect businesses in America producing insects for livestock (including fish and poultry) feed and human food. Insect production for pet industry and novelty goods (candy and alcohol shots) were not included in this research. There is no current background research on trends in economic growth for this sector.



Figure 2. Chickens eating black soldier fly larvae feed www.waldeneffect.org



Figure 3. Popular in Oaxaca, "chapulines" (grasshoppers) is the most common insect dish served in the United States. www.losangeles.grubstreet.com

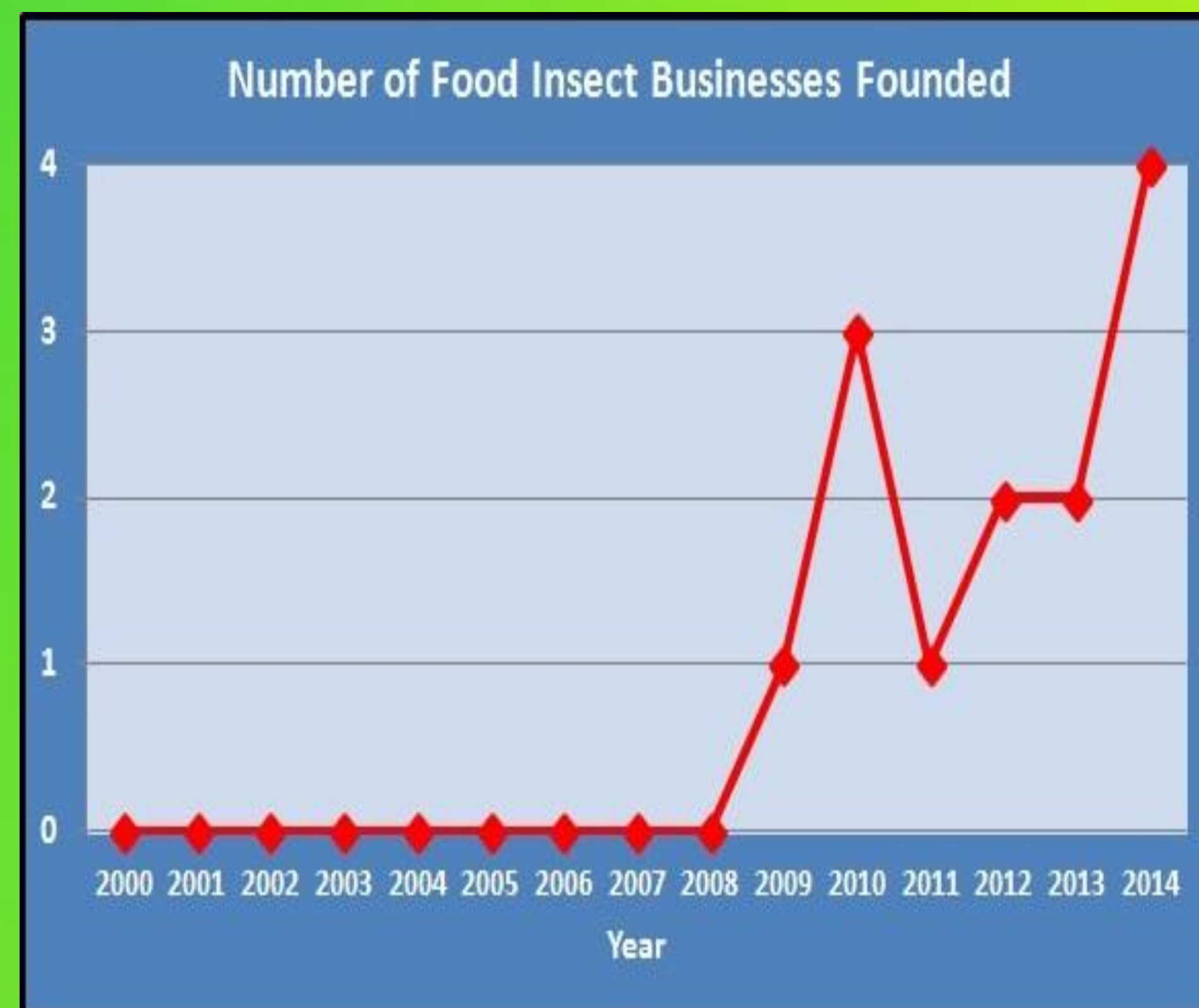


Figure 1. Trend in US and Canadian founding of food and feed insect businesses in USA and Canada.

Methods/Materials:

The FAO map of edible insect businesses was a primary resource to catalogue the existing insect food and feed businesses that currently exist in the United States. Then, with research on the companies' websites and phone interviews, information was added and compiled. Companies reached were asked:

- what was holding back their businesses?
- what their scale of production is currently?
- what market they were targeting?
- what else should we know about their business?



Figure 3. Chapul bars, Salt Lake City, Utah.

Table 2. Restaurants serving edible insects in the United States and Canada. (entomophagy.com)

Name of Business	Where it is?	Which insects served?
California		
La Oaxaqueña	San Francisco, CA	Mexican chapulines (Crickets)
All Seasons Restaurant	San Francisco, CA	Silkworms
Dan Sung Sa	Oakland, CA	Silkworms
Don Buglio	San Francisco, CA	Mealworms and more
Mezcal Mexican Restaurant	San Jose, CA	Grasshoppers
99chickens	Santa Clara, CA	Silkworm pupae
Expresion Oaxaqueña	Los Angeles, CA	Grasshoppers
Guelaguetza Restaurant	Los Angeles, CA	Grasshoppers
Mok Maru Jong Sul Jip	Los Angeles, CA	Silkworm pupae
Petty Cash Taqueria	Los Angeles, CA	Grasshoppers
Real de Oaxaca Restaurant	Los Angeles, CA	Grasshoppers
Typhoon	Santa Monica, CA	Ants, Crickets, Scorpions, and Silkworm Pupa
New York		
Antojeria la Popular	New York, NY	Crickets and Grasshoppers
Pocha 32	New York, NY	Silkworms
Sake Bar Kirakura	New York, NY	Silkworms
Toloache (multiple locations)	New York, NY	Grasshoppers (seasonal)
White and Church	New York, NY	Honey bees, Grasshoppers, and Mealworms.
Other Cities		
La Condesa	Austin, TX	Grasshoppers (August only)
La Carta de Oaxaca	Seattle, WA	Grasshoppers
Restaurant al Tio	Burien, WA	Grasshoppers
Poquitos Mexican Food	Seattle, WA	Grasshoppers
VJ's Restaurant	Vancouver, BC	Crickets
Sticky Rice	Chicago, IL	Ant eggs and silkworm caterpillar
Oyamel	Washington, DC	Grasshoppers
Audubon Insectarium (Bug Appetit)	New Orleans, LA	Crickets, mealworms, and wax worms (sample to anyone who goes in the museum)
Tu y Yo	Somerville, MA	Grasshoppers (seasonally)
Sushi Mazi	Portland, OR	Grasshopper sushi

Table 1. Edible insect businesses for food and feed in the USA and Canada (information sourced from FAO map, interviews, websites)

Company Name	Edible Food	Feed	Technology/Info For insect farming	Location	Founding Date	Species	Intended Market
Enterra Feed Corporation	—	Feed meal Whole larvae, oil	—	Vancouver, B.C. Canada	©2013	Black soldier fly	—
Obug, Inc.	—	Whole larvae?	—	Vancouver, B.C. Canada	©2014	Darkling beetle larvae Black soldier fly	Wholesale global market: Canada will not allow sale as animal feed currently
Fly Farm Systems, LLC.	—	Live, dried, frozen, whole, liquefied, pelletized, flakes larvae	—	Ontario, Oregon, USA	2010	Musca domestica	—
Tiny Farms	—	—	Technology/Info Consultation (breeding, rearing, automation, scaling, research, regulations, compliance, business mgt.)	Oakland, California	2012	—	—
BugMuscle	Paste in a packet	—	—	Redlands, California	Grand Opening 2014	Cricket flour bars and more	Athletes
Bitty Food, Inc.	Cricket flour for protein bars, pizzas, muffins, baking mixes, and more	—	—	San Francisco, CA	2014	Crickets	—
Chapul	Three different flavors of cricket protein bars	—	—	Salt Lake City, UT	2012	Crickets	—
Organic Value Recovery Solutions LLC	—	Black Soldier fly larvae feed	Open source technology	Georgia	2010	Black Soldier Fly	—
Enviroflight LLC	—	Dried black soldier fly larvae for aquaculture feed	—	Yellow Springs, Ohio	2009	Black Soldier Fly	—
All things Bugs	Cricket Flour	—	—	Athens, GA	2011	—	—
Six Foods	Products still waiting to be released	—	—	Boston, MA	2014	—	—
EXO, Inc.	Cricket Flour protein bars	—	—	Brooklyn, NY	2013	—	—
World Entomophagy	Adult crickets, mealworms, pancake mix, brownie mix, cookie mix, flours, snacks	—	—	Austin, TX	2012 incorporated, first sale 2010	Acheia domestica, Jamaican cricket, black cricket	Growing market, growing slowly, concentrated on west and east coasts. Austin is only major hub not in west and west coast

Discussion:

- Edible insect businesses are growing rapidly in US and Canada.
- First businesses to produce insects for human consumption founded 2012.
- There is history of businesses selling insects on their menu, especially Mexican restaurants selling chapulines (grasshoppers).
- With increasing Mexican populations in the US, this may grow.
- With such edible insect sector growth, it is FDA and Canadian health agencies responsibility's to ensure product safety.

Recommendations:

- FDA and Canadian government agencies should act immediately to develop regulatory frameworks for distribution, production, sale of edible insect products
- This industry is taking off, but for it to truly grow, these governmental regulations must be in place.

Work Cited:

"About Us - World Ento." *World Ento*. N.p., 2012. Web. 07 May 2014. <<http://worldento.com/about-us/>>.

"Bug Muscle |." *Bug Muscle |*. N.p., 2013. Web. 07 May 2014. <<http://bugmuscle.com/>>.

Chen, Rena. "Edible Insects Stakeholder Directory." *FAO.org*. FAO, 16 Jan. 2014. Web. 10 Mar. 2014. <<http://www.fao.org/forestry/edibleinsects/B4630/en/>>.

"Contact." *Bitty Foods*. N.p., n.d. Web. 07 May 2014. <<http://bittyfoods.com/>>.

Courtwright, Glen. 2014. Enviroflight founder E-mail interview. 4 May 14.

"Enterra Feed Corporation." *Enterra Feed Corporation Company Comments*. N.p., 2013. Web. 07 May 2014. <<http://www.enterrafeed.com/company/>>.

"Entomophagy -- American Restaurants with Bugs and Insects on Their Menus." *Entomophagy - American Restaurants with Bugs and Insects on Their Menus*. N.p., n.d. Web. 07 May 2014. <<http://www.entomophagy.com/>>.

"Exo | Made With Cricket Flour." *Exo | Made With Cricket Flour*. N.p., 2014. Web. 07 May 2014. <<http://www.exo.co/>>.

Johar, Harman. 2014. World Entomophagy founder. Telephone interview. 4 May 2014.

"New Cricket Powder Sold at Wholesale | All Things Bugs." *All Things Bugs LLC*. Wordpress, 2014. Web. 07 May 2014. <<http://www.allthingsbugs.com/>>.

"The Original Cricket Energy Bar." *The Original Cricket Energy Bar*. N.p., 2014. Web. 07 May 2014. <<http://chapul.com/>>.

"OVRSol Process - Hermetia Mass Production." *OVRSol Process - Hermetia Mass Production*. N.p., n.d. Web. 07 May 2014. <http://www.organicvaluercovery.com/our_process/our_process.htm>.

Redford, Kathryn. "Insect Protein Alternative for Chicken and Hog Feed in Vancouver, Canada." *Insect Protein Alternative for Chicken and Hog Feed in Vancouver, Canada*. Obug Protein Inc., 2014. Web. 07 May 2014. <<http://www.obug.com/>>.

Redford, Kathryn. 2014. founder of Obug Protein, Inc. Telephone interview.

"Six Foods." *RSS*. N.p., 2014. Web. 07 May 2014. <<http://www.sixfoods.com/#product>>.

"Tiny Farms - the Edible Bug Company." *Tiny Farms - the Edible Bug Company*. N.p., 2012. Web. 07 May 2014. <<http://www.tiny-farms.com/>>.

"EnviroFlight, LLC." *EnviroFlight LLC*. Enviroflight LLC, 2014. Web. 07 May 2014. <<http://www.enviroflight.net/>>.