



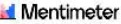
NACIA

**NORTH AMERICAN COALITION
FOR INSECT AGRICULTURE**

NACIA Public Meeting

OCTOBER 22, 2020

Welcome to the 2020 NACIA Annual Meeting - What sector are you in?



- Academia
- Regulatory
- Feed Industry
- Food Industry
- NGO/Non-profit
- Media
- Other



Welcome

CHERYL PREYER -- BOARD PRESIDENT, NACIA

Agenda

- ▶ Broad Industry Overview – J. Tomberlin
- ▶ North American Research Center for Insects as Food & Feed – H. Jordan
- ▶ Regulatory Update – A. Vickerson, L. Koutsos, G. Mott
- ▶ Expert Panel
- ▶ NACIA Strategic Plan Overview – J. Butner
- ▶ Q&A

JEFFERY TOMBERLIN
– TEXAS A&M
UNIVERSITY

Broad Industry Overview



Global Perspective- Insects as Food & Feed

Jeffery K. Tomberlin, PhD
Department of Entomology
Texas A&M University



Why Insects?

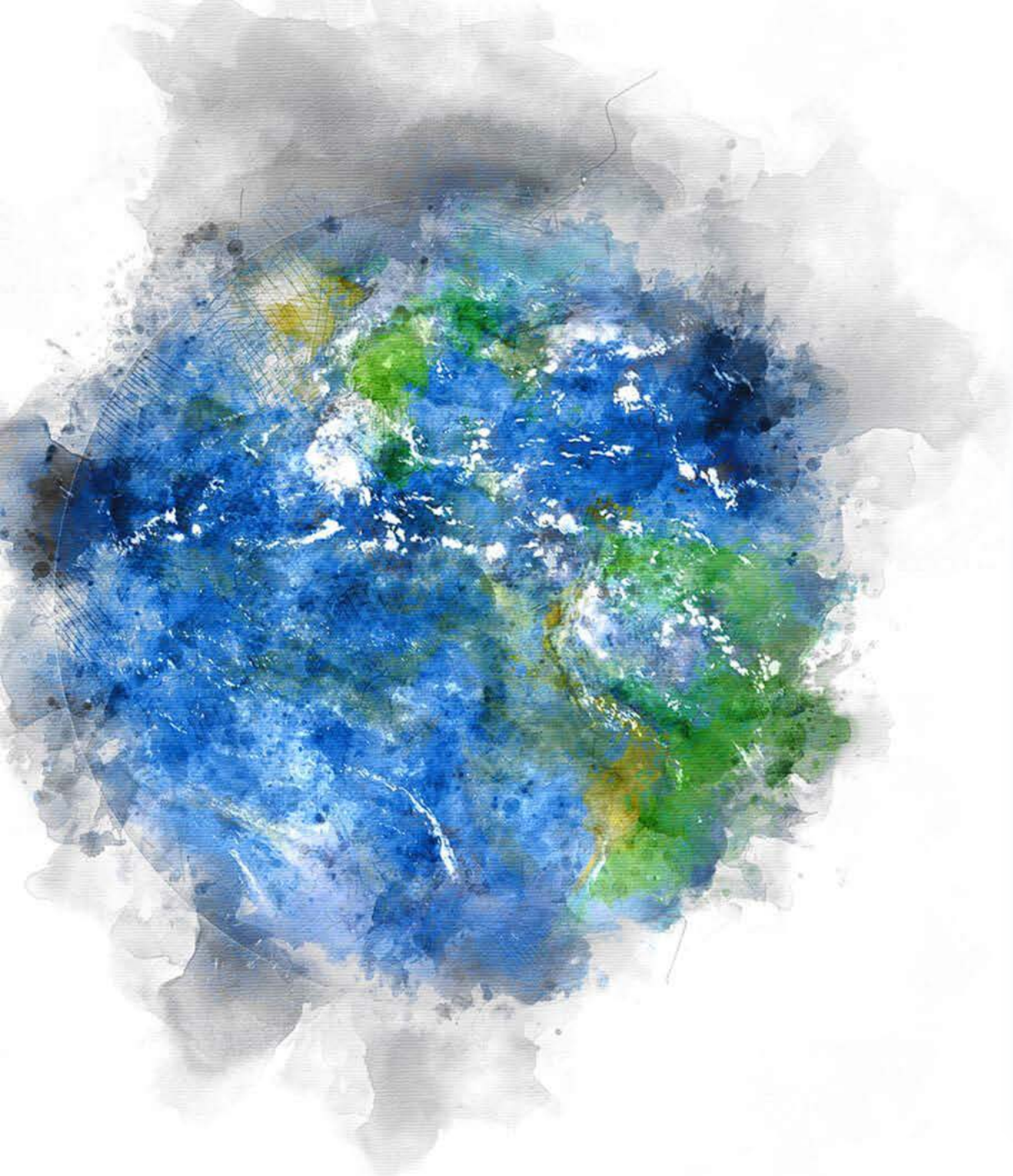
Globally

- Well established
- Local
- Diverse
- Low level of industrialization

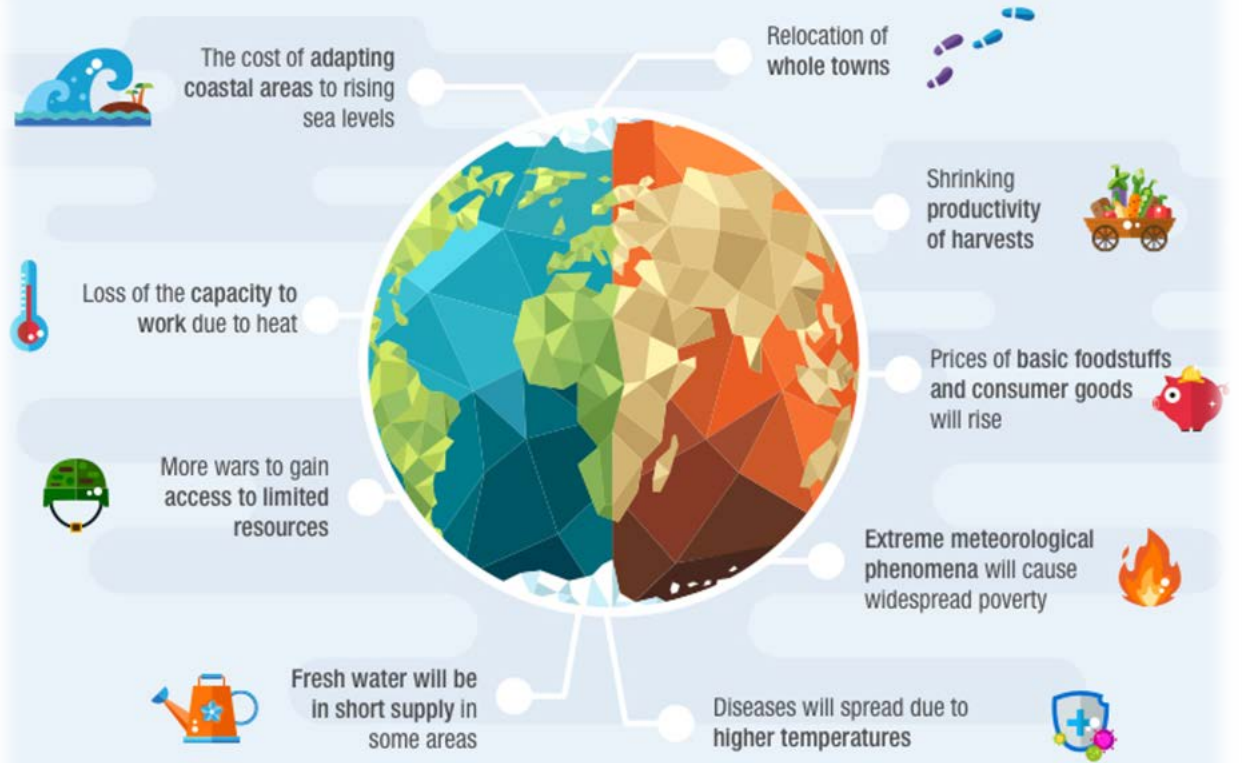
Western Society

- Something new
- Excitement
- Opportunity
- Potential for high valued industry
- Necessity

So, Why Insects?



SOCIAL AND ECONOMIC IMPACT OF CLIMATE CHANGE



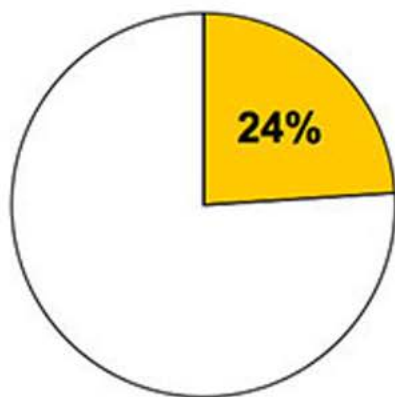
Origins in Western Society



Resource Limitations

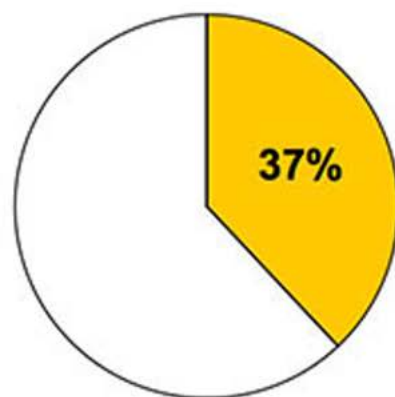
Agriculture's Share of Global Environmental Impact (2010)

GREENHOUSE GAS
EMISSIONS



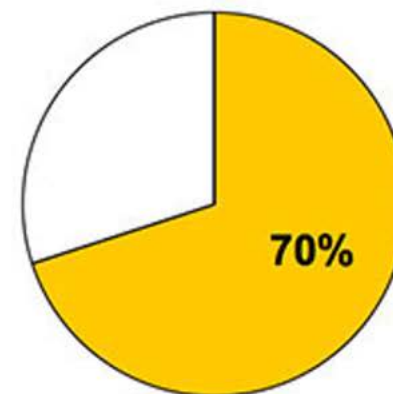
100% = 49 Gt CO₂e

EARTH'S LANDMASS
(EX-ANTARCTICA)



100% = 13.3 bn ha

WATER
WITHDRAWAL



100% = 3862 km³ H₂O

International Fisheries



Food Waste





Present

- Not limiting definition of industry
- Continued efforts linking NACIA, IPIFF, etc with producers and regulatory bodies
- Facilitating growth through training

AgriProtein

nextProtein
feeding the future



BACHHUBER
CONSULTING GROUP
Growing the Edible Insect Industry

griYUM



BEF BIOSYSTEMS
BUGS FOR ENVIRONMENT AND FEED

FLUKER'S
ESTABLISHED 1953

ASPIRE
— FOOD GROUP —

Enterra

entopro

The Wenger Group™

AgroNutris

HARGOL
DELIVERING PROTEIN

orekā
SOLUTIONS

ENVIROFLIGHT®



PROTEINEA

NSF-IUCRC

Beta Hatch

evo
Conversion Systems, LLC®



NUTRI INDUSTRY
뉴트리 인더스트리

CHAPUL

PROTIX



entosystem



COGASTRO



NutritionTechnologies®
Innovation. Naturally.

SANERGY

PROTIELY

Susento
Sustainability through entomology

Phileo



ROCKY MOUNTAIN

A watercolor-style landscape painting on the left side of the slide. It depicts a mountain range with a prominent peak, a lake in the foreground, and a waterfall on the right. The colors are soft and blended, featuring shades of blue, green, and grey.

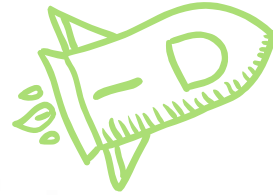
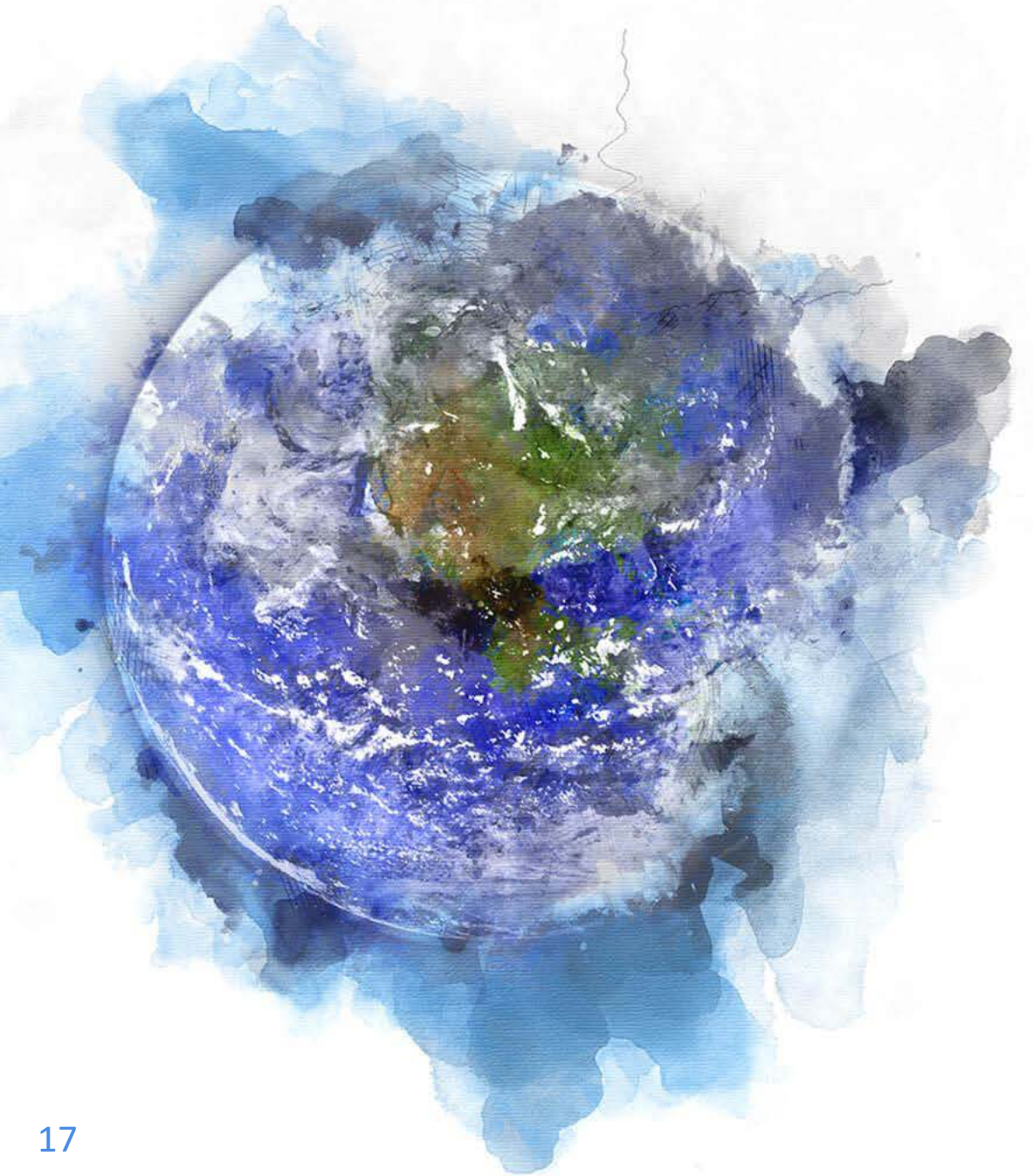
Future

- Increase production to meet potential demand
- National/Global standards of quality- consider a grading system
- National Science Foundation Center to:
 - Advance research
 - Produce next generation of employees

A watercolor illustration of a wind farm. The scene is set at sunset or sunrise, with a warm, golden glow across the sky and a soft, hazy light over the landscape. Several wind turbines are visible, their blades and towers rendered in soft, painterly strokes. The foreground shows a grassy field with some trees and a fence line. The overall style is artistic and atmospheric, with a focus on light and color.

“ *What Does it Mean?*”

- Optimism
- Lots to do
- Continue discussion
- Develop a global agenda
 - Industry
 - Research
 - Outreach



Thinking Outside the Box

HEATHER JORDAN,
MISSISSIPPI STATE
UNIVERSITY

North American Research Center for Insects as Food & Feed/IUCRC



A Vision for the NSF Center for Insects as Food & Feed: Driven by Industry, Global, & Effective

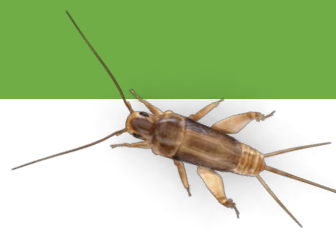
Heather Jordan, MSU

Christine Picard, IUPUI

Jeffery K. Tomberlin, TAMU

and YOU





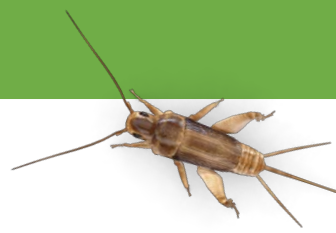
So What Are the Issues?

- Funding
- Synergy
- Corporate development
 - Production diversification
 - Market stabilization
 - Cross pollination- commodities & insect models
 - Employees
- Globalization standards
- Optimization
- Diversification



How Can the NSF Center Help?

- Funding at low levels yields big results
- Synergy- small projects yield significant advancements
- Open for all players
- Training ground
- Working across insect models

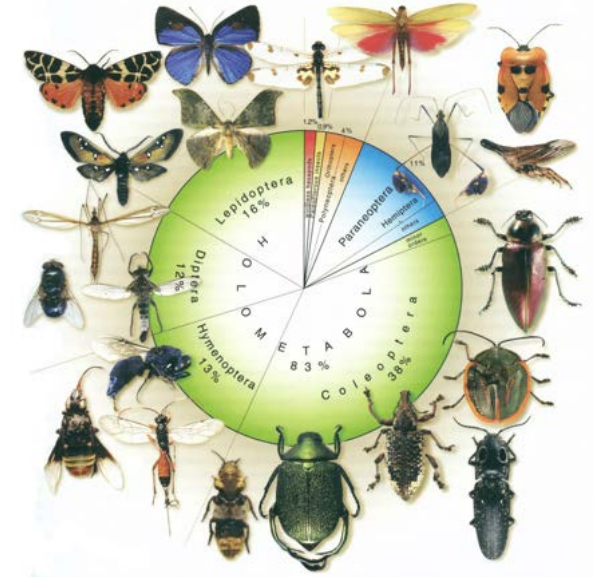
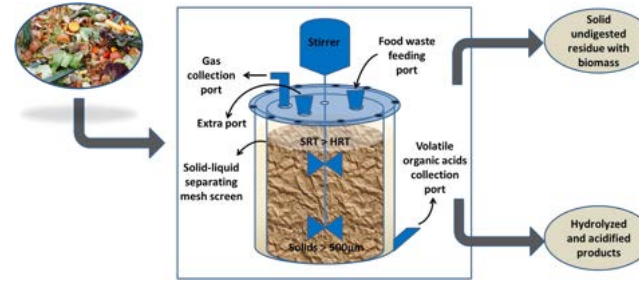


Diversification: Products, Insects and Location

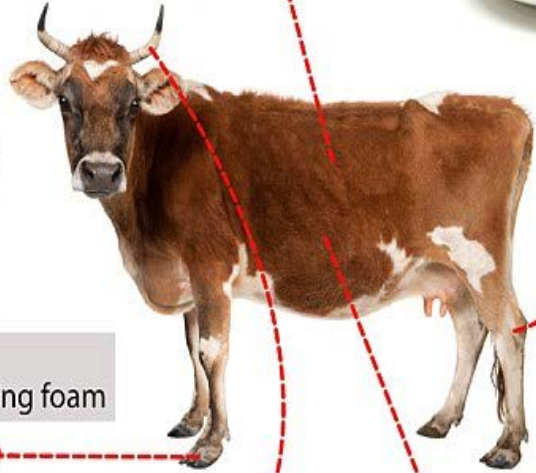
Intestines:
Tennis racquet strings



Bones:
Bone china



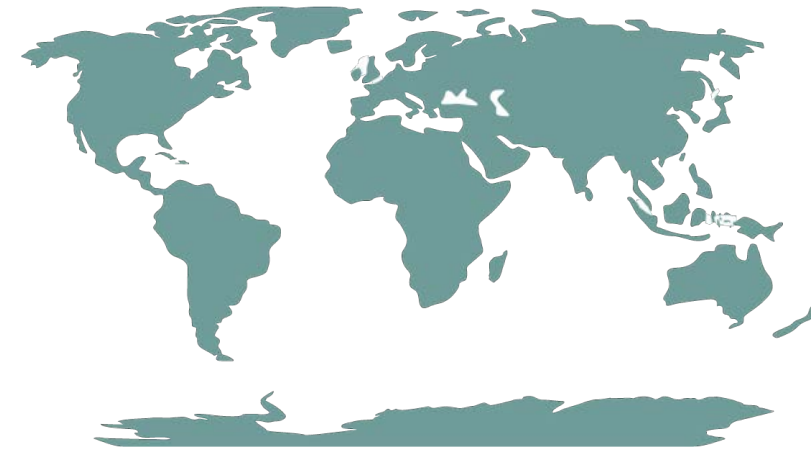
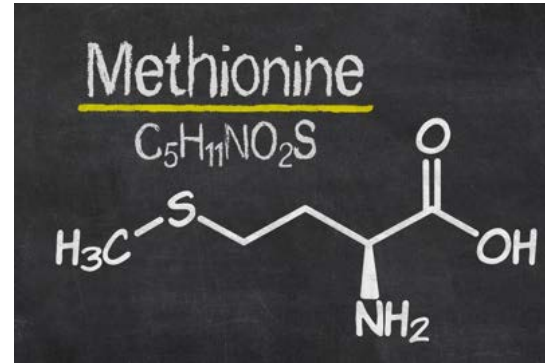
Hooves:
Fire fighting foam



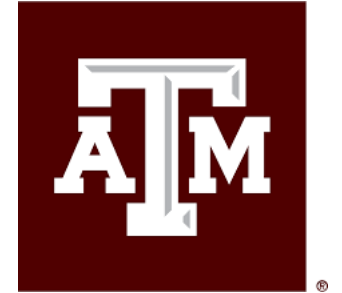
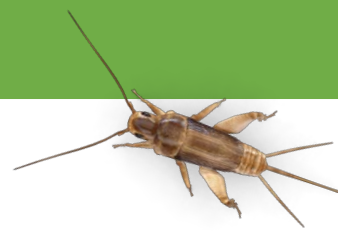
Leather:
luxury car interiors

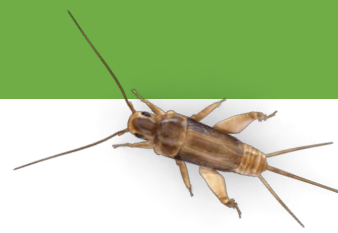


Horn:
Buttons



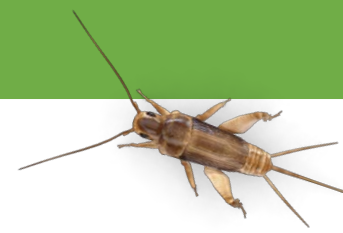
Global Collaborations- Universities





Initial Sites for Center





Vision for Center

NSF Center for Insects as Food & Feed

IUPUI: \$750,000/5 years

MSU: \$750,000/5 years

TAMU: \$750,000/5 years

Industry Advisory Board: \$25,000-50,000/industry/year



Student/Employee Training

Linking with Other Universities

Creating New Sites



Regulatory

Diversification

Rural Development





Vision for Center: Benefits for Industry

NSF Center for Insects as Food & Feed

IUPUI: \$750,000/5 years

MSU: \$750,000/5 years

TAMU: \$750,000/5 years

Industry Advisory Board: \$25,000-50,000/industry/year

1. \$25-50K = \$950K in research results
2. Quick results
3. Royalty free licenses on IP
4. Employee training
5. Decision on projects (everyone weighted similarly)
6. Merge projects
7. Collaborations



AgriProtein

nextProtein
feeding the future



BACHHUBER
CONSULTING GROUP
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griYUM



BEF BIOSYSTEMS
BUGS FOR ENVIRONMENT AND FEED

FLUKER'S
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ASPIRE
— FOOD GROUP —

Enterra

entopro

The
Wenger
Group™

AgroNutris



HARGOL
DELIVERING PROTEIN

orekā
SOLUTIONS

ENVIROFLIGHT®



PROTEINEA

Thank-you!

Beta
Hatch

evo
Conversion Systems, LLC®



NUTRI INDUSTRY
뉴트리 인더스트리

CHAPUL

PROTIX



entosystem



COGASTRO



NutritionTechnologies®
Innovation. Naturally.

SANERGY

PROTIELY

Susento
Sustainability through entomology

Phileo



ROCKY MOUNTAIN

ANDREW VICKERSON,
ENTERRA

LIZ KOUTSOS,
ENVIROFLIGHT

GABE MOTT, ASPIRE
FOOD GROUP

Regulatory Updates

GRAS vs. FAP

Generally Recognized As Safe

Step 1)

- Complete a review of toxicology, safety, utility and submit to an expert panel for review.
- If the panel agrees with your assessment – Self Declare GRAS.

Step 2) (Optional)

- Submit GRAS document to FDA for review. FDA will issue a letter of no objection or no questions.

<https://burdockgroup.com/u-s-ingredient-approval-which-is-best-a-food-additive-petition-or-generally-recognized-as-safe-gras/>

YOUR PARTNER IN THE FUTURE OF FEED

Food (Feed) Additive Petitions

- Complete a review of toxicology, safety, utility and submit to AAFCO
- AAFCO reviews for completeness and sends to FDA – Center for Veterinary Medicine - for scientific review
- FDA reviews and rejects the application or issues a letter of no objection back to AAFCO.
- AAFCO votes on the new ingredient use or definition and ads it their Official Publication



Message from AAFCO for NACIA

- Animal food ingredients are approved by animal species. If a company gets a definition approved for dogs, that ingredient can only be used in animal feed for dogs - not cattle, horses, poultry, etc.
- Crickets are not yet an approved ingredient by AAFCO.
- Ingredients should be defined before the ingredient is sold. Contacting the AAFCO Investigator with a proposed ingredient definition sooner rather than when the company is ready to take it to market will save the company a lot of time and possible problems with stop-sales down the road.

US Regulatory Status for Insects in Animal Feed

| Species | BSFL | Mealworm | Cricket |
|------------------------|---|--|--|
| Salmonid | Meal & whole larvae AAFCO approved Oil under review (AAFCO) | GRAS dossier in prep (Company Specific) | ? |
| All fish | Pending "All species definition" | Q4 2021-Q3 2020 anticipate submission | ? |
| Poultry (all species) | Meal and whole larvae AAFCO approved Oil under review (AAFCO) | Q4 2021-Q3 2020 anticipate submission | ? |
| Swine (all lifestages) | Meal and whole larvae AAFCO tentative Oil under review (AAFCO) | Q4 2021-Q3 2020 anticipate submission | ? |
| Dog | Meal and oil under review (AAFCO) | Anticipate submission in early 2021 | GRAS panel confirmed (Company Specific) |
| Cat | Anticipate submission in late 2021 (AAFCO) | Anticipate submission in early 2021 | ? |
| Wild Bird | Approved | Approved | Approved |
| All Species | Pending Dog & Cat definition | | |

Canadian Regulatory Status for Insects in Animal Feed

| Species | BSFL | Mealworm | Cricket |
|------------------------|-----------------------------|----------|---------|
| Tilapia/Salmonid | Approved (Company specific) | ? | ? |
| Pet/Aquarium fish* | Allowed | Allowed | Allowed |
| All fish | ? | ? | ? |
| Poultry (broiler) | Approved (Company specific) | ? | ? |
| Poultry (all) | ? | ? | ? |
| Swine (all lifestages) | ? | ? | ? |
| Dog * | Allowed | Allowed | Allowed |
| Cat* | Allowed | Allowed | Allowed |
| Wild Bird* | Allowed | Allowed | Allowed |
| All Species | ? | ? | ? |

*Non-agricultural species do not require a safety dossier for review, although company specific registration is still required by CFIA.



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FOR INSECT AGRICULTURE

Regulatory
Updates

Opportunity To
Harmonize
North
American
Standards



Initial Technical
Specification
will be optional

Speed Panel Discussion

- ▶ Moderator: Robert Nathan Allen (RNA)
- ▶ Panelists:
 - ▶ Jarrod Goldin, Entomo Farms
 - ▶ Julie Lesnik, Wayne State University
 - ▶ Pat Crowley, Chapul
 - ▶ Virginia Emery, BetaHatch
 - ▶ David Drew, AgriProtein
 - ▶ Keith Driver, Enterra

JUSTIN BUTNER,
ENTOMO CENTRAL,
NACIA

High-Level NACIA Strategic Plan Overview

Member Priorities

- ▶ Regulatory
- ▶ Industry Knowledge
- ▶ Research
- ▶ Consumer Education and Market Development
- ▶ Media

Working Groups

- ▶ Safety
- ▶ Regulatory Roadmap
- ▶ End Market Information
- ▶ Communication
- ▶ Stakeholder Linkage
- ▶ Administrative

Safety & Regulatory Roadmap

Action Item

- ▶ Develop and publish supply chain guidance
- ▶ Combine existing regulatory knowledge from stakeholders to create a checklist of current status of approvals, review with regulators, and publish guidance

Status

- ▶ Identified need for Industry Guidelines
- ▶ Project has been proposed to Standards Council of Canada and stakeholders sought
- ▶ Adapting the IPIFF Guide on Good Hygiene Practices for North America

End Market Info

Action Item

- ▶ NACIA will create "market reports" that are
 - ▶ defensible, credible, and citable
 - ▶ Adaptable
 - ▶ easy to use
 - ▶ value-adding about the market potential for our industry

Status

- ▶ Enterra Feed has completed an end market study with a credible third party
- ▶ Results will be shared in the NACIA Member Meeting

Communi- cation

Action Item

- ▶ Communicate effectively with members and other stakeholders about the work NACIA is doing

Status

- ▶ Quarterly newsletters
- ▶ Logo redesign and website redesign complete
- ▶ New CRM to facilitate communications
- ▶ Annual meeting
- ▶ Federal Disaster Assistance Programs webinar

Stakeholder Linkage

Action Item

- ▶ Improve the strength of inter- and intra-industry communications

Status

- ▶ White paper with sister organizations
- ▶ Entomological Society of America Symposium
- ▶ Larta Institute Virtual Conference
- ▶ Engagement with North American Research Center for Insects as Food & Feed/IUCRC
- ▶ Through the SCC project, a number of government agencies have been approached as potential stakeholders for the industry

Administrative

Action Item

- ▶ Ensure organizational compliance and build infrastructure to support larger projects in 2021-2024

Status

- ▶ Incorporation completed
- ▶ Bookkeeping and insurance established
- ▶ 501 (c) (6) application submitted; expected approval by December 2020

Working Groups

- ▶ Safety
- ▶ Regulatory Roadmap
- ▶ End Market Information
- ▶ Communication
- ▶ Stakeholder Linkage
- ▶ Administrative



Q&A

CHERYL PREYER,
BOARD PRESIDENT
NACIA

Closing Comments