

PROteINSECT Conference

Insects as sustainable sources of Protein

Brussels 27 April 2016

INSECTS as FOOD and FEED:

A global perspective



PROteINSECT 
INSECTS AS SUSTAINABLE SOURCES OF PROTEIN

Global **FOOD** & **FEED** production

- **FOOD** for direct human consumption, including food ingredients like colorants, flavours, fragrances, spices, thickeners, etc:

8.4 b tons (fresh)/year (source FAOSTAT 2015)

- **FEED** for our animals (feed, fodder, ingredients,...)
 1. Livestock, farmed animals for human consumption
 2. Pet animals (cat, dogs, race horses, zoo animals,.....):

6.4 b tons dry matter/year (source GLEAM 2014)

To feed the WORLD in 2016

Global food/feed production requires:

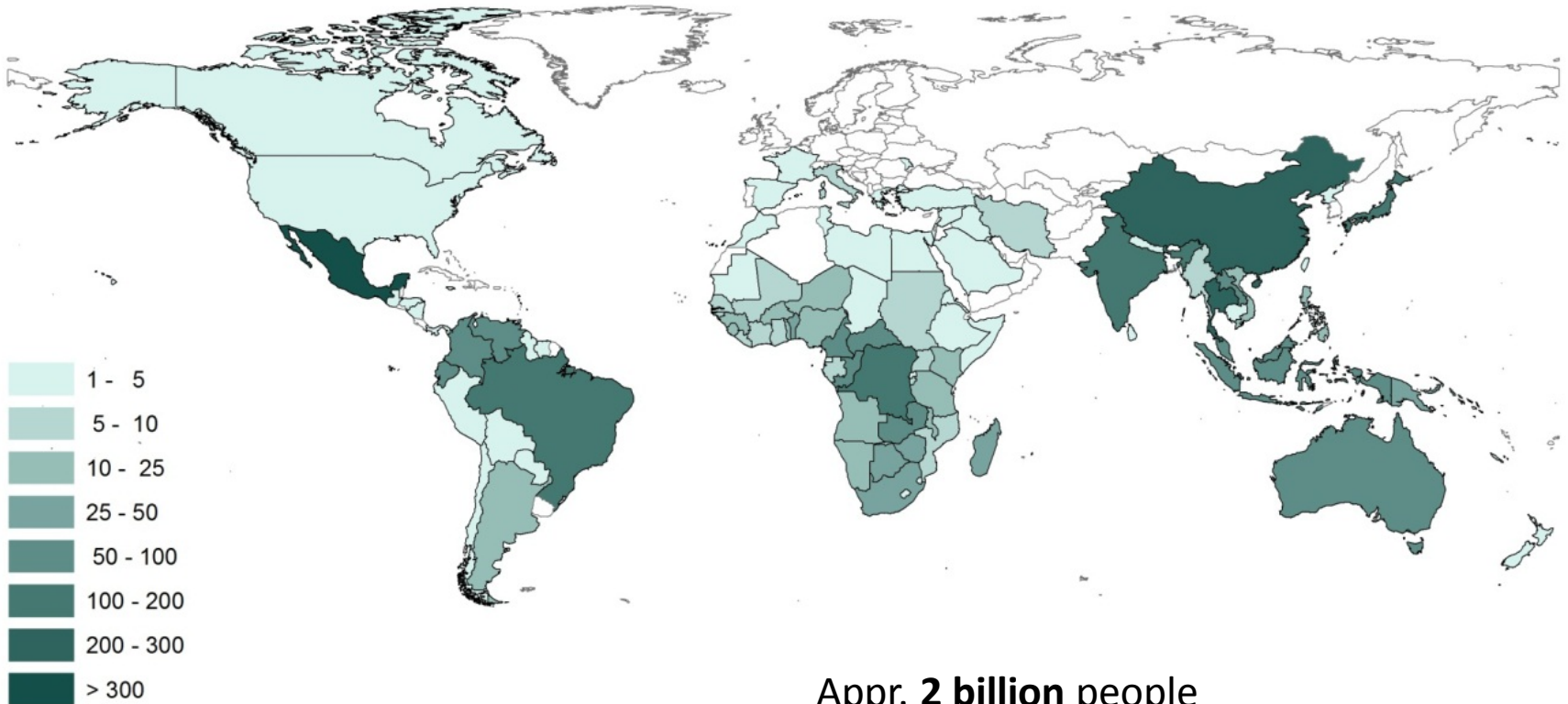
- 40% of world ice-free land surface is for AGRICULTURE (forest: 30%; deserts-mountains:25; wetlands,urban,....)
- **70% of total agriculture land use is for feeding livestock**
- **30% of all grains fed to animals (Soy:80%/Corn:50%)**
- **70% of total fresh water** use is for agriculture
- 110 million tons of chemical fertilizer
- 2,3 million tons of pesticides (1/3 glyphosates!)
- **14 a 17% of total GHG emissions (65% CATTLE!)**

The case of Insects

- Why Insects ????? Why not frogs, algae,...?
“Across all food / feed markets and beyond” !
- Biggest challenges:
 1. Yuck factor both in food and feed !
 2. legal framework (EU in progress)
 3. From gathering to farming
 4. Re-use of “Waste” streams
 5. Product innovation and scaling up
.....but no validated production and trade data by countries yet !

Insect Consumption

Recorded edible insect species, by country



Appr. **2 billion** people
some **50 Countries** (with at least 5 species)

Supply

- mostly by **gathering in nature** (2000+ species)
- some 20+ species by semi domestication (bees, bamboo worms) and now by farming (10+ sp., fly larvae)



Mainly for **FOOD**

Insects as animal feed

- **Chicken feed:**

- Silk worm pupae: from Europe to China
- Termites: [Africa](#), Laos,

- **Fish feed: # species**



Traditional, artisanal uses

Edible insects

Future prospects for food and feed security



+7 million downloads...!

(since may **2013**)

and

+10 million tweets !

(launch on 13 May 2013)

Free available at :

<http://www.fao.org/docrep/018/i3253e/i3253e.pdf>

"Insects to feed the world"

Intern. Conference, NL

May 14-17, 2014.

- 450 participants from 45 countries
- organized by Wageningen University and the Food and Agriculture Organization of the United Nations

The conference was a milestone in the recognition of the professional insect industry. Feed industry leaders, insect breeders, universities, NGO's and other stakeholders gathered for the first time, with a clear message - insects for feed and food are a viable solution for the protein deficit.

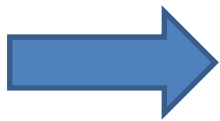
Global acceleration

- High Media coverage
- Company start ups (IPIFF)
- Projects: Proteinsects, Greeinsects, Insfeed,....
- Research & Universities
- Chefs
- “Pestivals”
-

Key messages: Insects are

1. **Healthy and Nutritious** (food/feed)
2. **Environmentally** more friendly (climate change, waste recycling, protein/meat prod.....)
3. **Socially** more accessible

What's going on?



Fast unfolding sector

**Info sharing, consumer acceptance and
policy/regulation development**

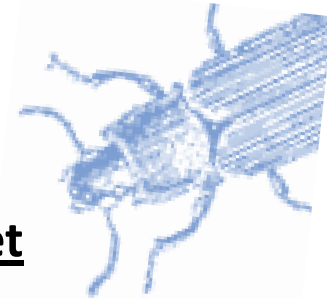
1. Insects and Nutrition / Health

- Nutritional values are GOOD but highly variable :
 - depending on **species**, metamorphical stage, habitat and **diet**
 - processing plays a large role in determining nutritional content
- Insects are particularly important as a food/feed supplements (comparable with fish):

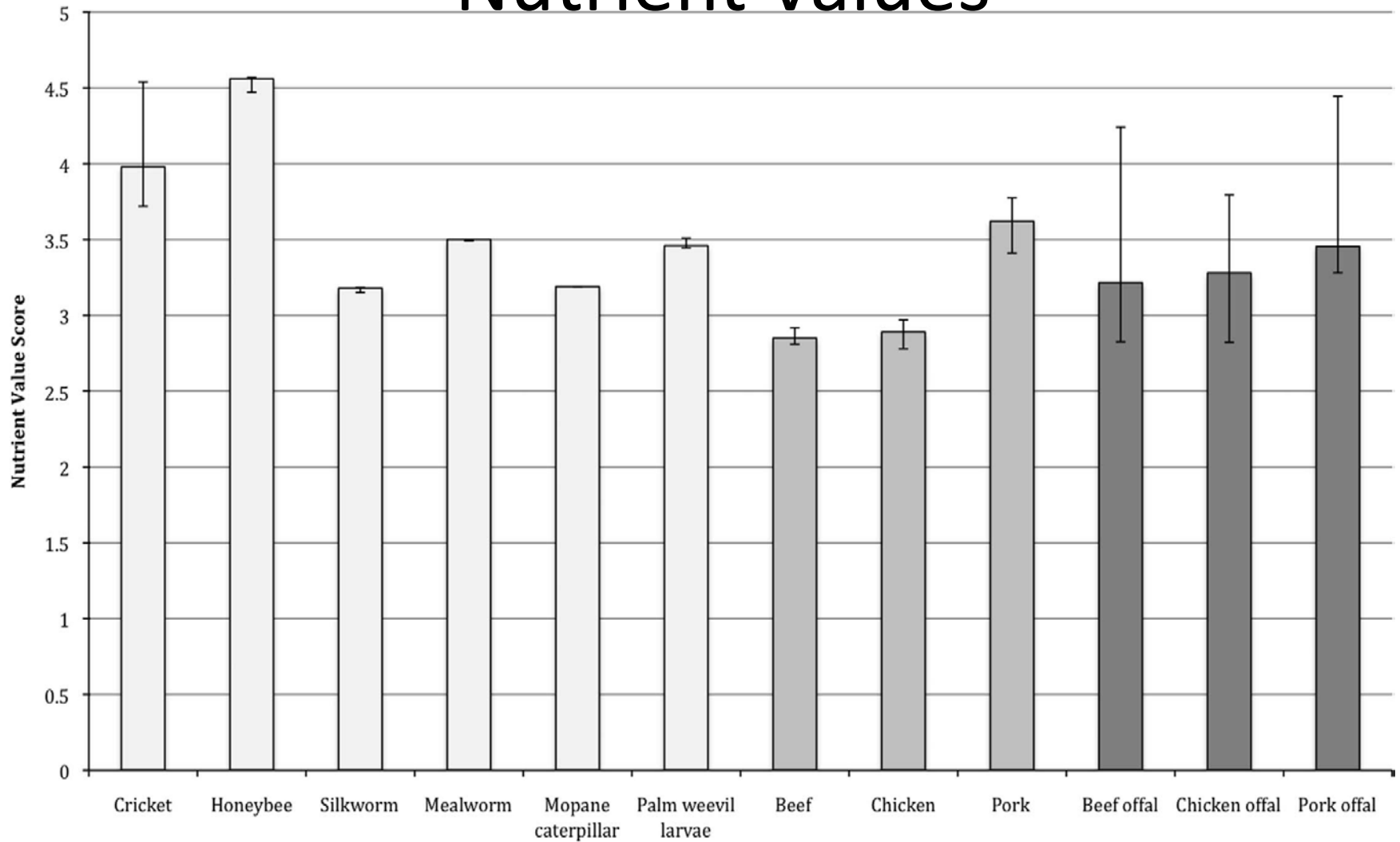
- Provide satisfactory amounts of energy and protein, meet amino acid requirements
- High in monounsaturated and/or polyunsaturated fatty acids
- Rich in micronutrients:

- copper
- iron
- magnesium
- manganese
- phosphorous
- selenium

- zinc
- riboflavin
- pantothenic acid
- biotin
- in some cases, folic acid



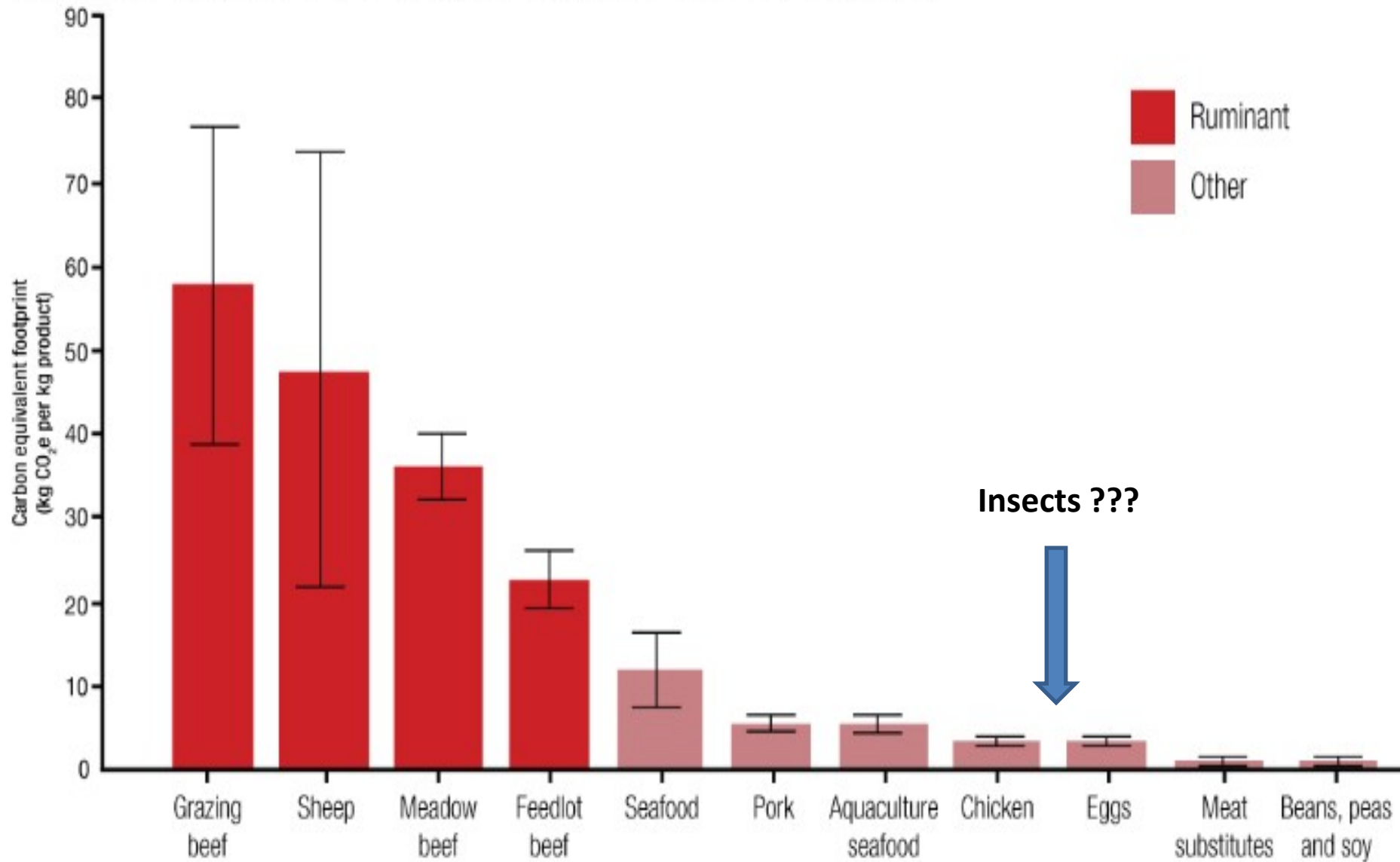
Nutrient Values



CLR Payne et al. "Are insects more healthy than common meats....."

© 2015 Macmillan Publishers Limited European Journal of Clinical Nutrition (2015) 1 – 7

2.YOUR FOOD'S CARBON FOOTPRINT



Reproduced from Nature Climate Change: Ruminants, climate change and climate policy; January 2014

3. Insects are Socially more accessible

Farming insects does NOT require high investments

Knowledge – Capital - Land - Resources :

- also possible for the poor to farm insects, improve their diets and gain cash income
- Farming insects is possible **at any scale** of commercial undertaking , **everywhere** around the world and **during the full year**.
- Good for the **local economy** and **jobs** for the young !





Insect farming contributes to a closer, local circular economy in livestock rearing

- Locally produced side-streams from agriculture, agro-industries, food and waste management available to local insect farmers to produce proteins, fats as feed ingredients for livestock, meat & fish producers in the same region
- Shortening the chain for feed producers by incorporating more locally produced ingredients
- Improving local farming economies (including for small farm operators!power of the numbers !)

Examples from around the world

Global stakeholders: 1000+... and fast increasing !

<http://www.fao.org/forestry/edibleinsects/stakeholder-directory/en/>

- **Examples from the US:** Chapul, Exo, Tiny Farms, All things Bugs, Six Foods, Don Bugito,(25 start-ups since 2012 !)

<https://www.exoprotein.com/>

<https://www.youtube.com/watch?v=cpol2d0c820>

Way Forward

- Improve and focus awareness (Media, sectors: food, feed,...
 - Events, projects, gastronomy.  **Consumer acceptance**
- Increase knowledge generation, dissemination, networking.... (incl. protection of (indigenous) knowledge, nutrition data, environmental benefits, LCA, socio-economic contribution, jobs,
- Legislation and regulatory frameworks (food, feed, waste disposal, insect inclusive nature conservation strategies, habitat protection, gathering, processing, trade, consumer protection, health, (Codex Alimentarius)
- Economic's and technology: reduce costs, improve efficiencies, automation, business innovation and new products,

Academia

Policy makers

Private sector



help structuring this emerging sector (organizing expert meetings – Chiang Mai 2008, Rome 2012, International Conferences – Wageningen 2014 , info sharing and networking, Best Practices and [Codex Alimentarius](#))

Many Thanks

<http://www.fao.org/forestry/edibleinsects/en/>

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