

# Developing novel foods with insects

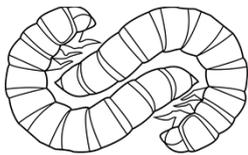
## – to see or not to see

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## Background

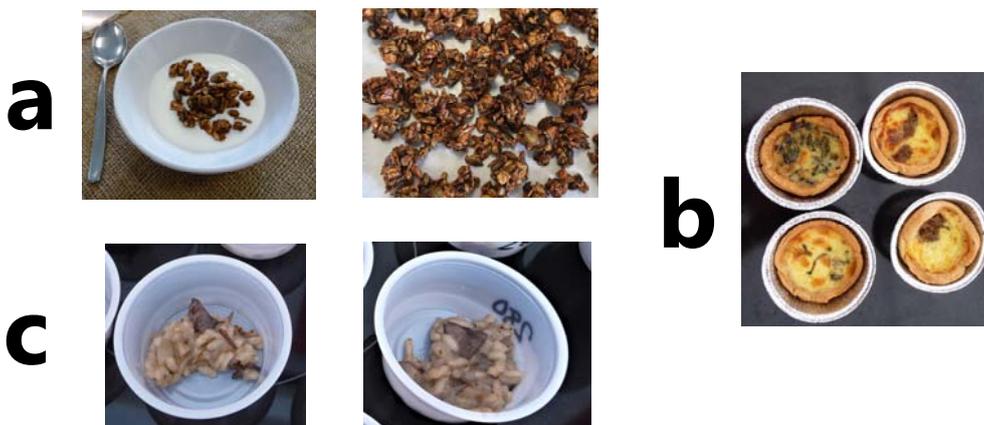
- Novelty of insects is key barrier to eating them in western societies
- Complex foods is a pathway to successfully introduce insects to the market in EU
  - Candidate insects: In commercial production, or in progress
- Design strategy: Create foods in which the sensory properties of insects are clear to the eater.
- The appearance of insects has previously been demonstrated to be a key obstacle to their accept
  - Explore if it is possible to develop foods, where the visual aesthetics of the insects is not a disadvantage, and maybe even an advantage to consumers' accept.



## Food design thinking approach

- Design Thinking approach
  - Iterative fast cycle of prototyping and test rapid sensory methods (projective mapping)
  - Ideation of a larger range of product
- Creative Design methodology
  - Selection and application of experimental design to systematically vary samples in key sensory features
- Aim for three types of product:
  - Ready-to-eat: Buffalo worm (3.8%) granola
  - Ready-to-heat: Buffalo worm (1.8%) quiche
  - Ready-to-cook: Buffalo worm (12%) Risotto
- Develop versions with and without visible insects

## Tested products



**Test samples with and without visible buffalo worms**  
**a: Granola b: Quiche c: Risotto**

## Consumer test

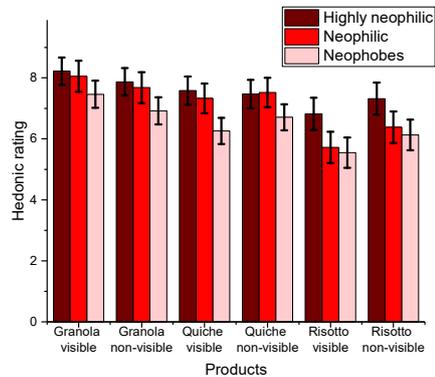
- Location: Western Jutland, manor spring fair at Ausumgaard
- 215 Respondents – 154 completed all parts of test and answers
  - 65 males and 89 females with an average age of 45.5 years SD 7.3 years
- Food Neophobia Test tool – 6 question version
  - Divide into three equally-sized groups to test effects of neophobia level
- Respondents tested 4 foods each (2 with – 2 without visible insects)

## Results: Hedonic response to the tested samples

**Table 1: Mean hedonic rating (9-point scale) by product and visible/non-visible insects version, including Standard deviation (SD), 95% confidence intervals (95% CI)**

| Product | Version     | N   | Mean | SD  | 95% CI |
|---------|-------------|-----|------|-----|--------|
| Granola | Visible     | 114 | 7.8  | 1.2 | 0.3    |
|         | Non-visible | 114 | 7.4  | 1.3 |        |
| Quiche  | Visible     | 117 | 7.1  | 1.6 | 0.3    |
|         | Non-visible | 117 | 7.1  | 1.5 |        |
| Risotto | Visible     | 96  | 6.4  | 2.1 | 0.4    |
|         | Non-visible | 96  | 6.7  | 1.9 |        |

## Effect of neophobia level on hedonic response



**Figure 2: The mean overall liking per product type for the three levels of neophobia, including 95% confidence intervals**

## Conclusions

- The granolas were rated highest in liking
- The consumer liking of the visibility of the insects was dependent on the product type, proving that it is possible to develop novel foods, where the visual aesthetics of insects is an advantage to accept
- Not surprisingly, the neophilic respondents responded more positively to the insects.

## Acknowledgements and references



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### Thank you

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