



Acceptance of Insect Foods Amongst Danish Children is Positively Affected by Information About Their Sustainability Benefits, Not by Information About Taste or Nutrition

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Acceptance of Insect Foods Amongst Danish Children is Positively Affected by Information About Their Sustainability Benefits, Not by Information About Taste or Nutrition

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Background

Edible insects are a promising alternative protein source to unsustainable conventional meat. Despite this, disgust and neophobia are cited as significant barriers to the adoption of these novel foods in Western diets.

The aim of this study was to assess the effects of providing three types of information — the taste, health, and sustainability benefits of entomophagy (i.e. the practice of eating insects) — on the willingness to try and hedonic response to insect-based foods among children. Online educational material for the children about the three types of benefits was developed.

Methods

Participants: 5th and 6th grade students from Danish schools (n=181, m=83, f=96, 11-13y).

Intervention: Classes were randomly assigned to one of three experimental groups. Participation in an online lecture and quiz on the benefits of eating insects in relation to either taste, health, or the environment during Summer 2020.

Data collection: Quantitative measures pre- and post-intervention via an online questionnaire taken in the classroom. Hedonic responses were provided on a 7-point emoji smiley scale¹.

Data analysis: Answers on emoji scale were converted to continuous numerical values ranging from 1-7.

Participants segmented into three groups based on FNTT score quartiles. Incomplete surveys were eliminated from the dataset prior to analysis. Data analysis: RStudio® version 1.2.5001 and Excel version 16.50.

Results

- Participants were moderately willing to try insect foods before (3.9 ± 1.8) and after (4.0 ± 1.8) the intervention.
- An ANCOVA revealed significant differences in post-WTT between interventions after controlling for pre-WTT (p < 0.01). Per post hoc analysis, mean WTT score was significantly higher in the sustainability (4.6 ± 0.4) group than the health (3.9 ± 0.3) and taste group (3.7 ± 0.4), p < 0.01.
- A paired t-test demonstrated a significant difference (p = 0.02) between pre- and post-WTT scores in the sustainability group (see table).
- FNTT scores were negatively correlated with WTT both pre-(r = -0.55, p < 0.001) and post-(r = -0.54, p < 0.001).
- There was close to zero correlation between FDS and WTT pre- r (179) = -.02, p = .80 and post, r (179) = -0.04, p = 0.56.
- The whole cricket received lower hedonic ratings (3.0 ± 1.5) than the buffalo worm (4.1 ± 1.4, p < 0.001) but no sig. difference in hedonic rating between processed foods made with flour from the two species (e.g. BUF-bar versus CR-bar and BUF-bread versus CR-bread).
- The cookies received the highest (5.1 ± 2.0) and the falafel the lowest average hedonic rating (2.8 ± 1.6).

Discussion

Caution should be taken when anticipating adoption of novel foods and assimilation into diets from measures of willingness to try, especially when self-reported. The use of commercially available products, made it impossible to control for differences in appearance across items allowing individual preferences to confound hedonic response.

Conclusion

Communicating information about sustainability benefits of entomophagy increased willingness to try insect foods, while information on the taste and health benefits did not. Neophobia was a strong predictor of willingness to try, whereas disgust sensitivity was not. Certain types of insect products were better liked than others (e.g. cookies over falafel). There was a species effect on hedonic response when presented whole, although not when processed into products made with insect flour.

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References:

¹Swaney-Stueve, M., Jepsen, T., & Deubler, G. (2018). The emoji scale: A facial scale for the 21st century. *Food Quality and Preference*, 68(March), 183–190. <https://doi.org/10.1016/j.foodqual.2018.03.002>

²Damsbo-Svendsen, M., Frøst, M. B., & Olsen, A. (2017). Development of novel tools to measure food neophobia in children. *Appetite*, 113, 255–263. <https://doi.org/10.1016/j.appet.2017.02.035>

³Hartmann, C., & Siegrist, M. (2018). Development and validation of the Food Disgust Scale. *Food Quality and Preference*, 63(August 2017), 38–50. <https://doi.org/10.1016/j.foodqual.2017.07.013>

The results are presented in full in: Erhard, A. L., Silva, M. Á., Damsbo-Svendsen, M., Menadeva Karpantschov, B.-E., & Frøst, M. B. (n.d.). Acceptance of Insect Foods Among Danish Children Effects of Information Provision, Food Neophobia, Disgust Sensitivity, and Species on Willingness to Try To. submitted to *Food Quality and Preference*.

Images of Insect Products Included in Survey (Post-Intervention)

- | | | |
|-----------------------|---------------------|------------------|
| 1. Whole buffalo worm | 5. Protein bar (CR) | 9. Falafel (CR) |
| 2. Whole cricket | 6. Crisp bread (CR) | 10. Cookies (CR) |
| 3. Protein bar (BUF) | 7. Chocolate (CR) | 11. Chips (CR) |
| 4. Crisp bread (BUF) | 8. Burger (CR) | |

BUF: made with buffalo worm flour; CR: made with cricket flour

Measures

Pre-Intervention

1 multiple choice question on familiarity with insect foods

1 question on willingness to try insects

9-item tool assessing food neophobia (Food Neophobia Test Tool²)

8-item tool assessing disgust sensitivity (Food Disgust Scale-Short³)

Post-Intervention

1 question measuring hedonic response for each of the 11 images (2 whole insects, 9 processed insect products)

2 questions on appropriateness of the two insect species i) as a food ingredient and ii) for being raised as livestock

2 questions on perceptions of each of the 7 types of insect foods as being for everyday or occasion consumption

1 question on willingness so try insects in the future

All evaluations of statements were done using 7-point scales.

Results of a Paired t-test of Pre-and Post-Intervention Willingness to Try

| | Pre | | Post | | Mean difference | t-value | df | Sig (two-tailed) |
|----------------|-----|-----|------|-----|-----------------|---------|-----|------------------|
| | M | SD | M | SD | | | | |
| Taste | 3.9 | 1.9 | 3.7 | 1.7 | 0.2 | 0.82 | 61 | 0.414 |
| Health | 4.0 | 2.0 | 3.9 | 2.0 | 0.1 | 0.31 | 70 | 0.760 |
| Sustainability | 3.9 | 1.4 | 4.5 | 1.7 | 0.6 | 2.40 | 47 | 0.021* |
| Total | 3.9 | 1.8 | 4.0 | 1.8 | 0.1 | 0.79 | 180 | 0.429 |
| p ≤ 0.05 | | | | | | | | |

